

Addressing the barriers to improve metabolic health care for people experiencing a severe mental illness

by Andrew David Watkins

Thesis submitted in fulfilment of the requirements for
the degree of

Doctor of Philosophy 92984 Nursing

under the supervision of:

- Professor Emerita Jane Stein-Parbury
- Professor Elizabeth Denney-Wilson
- Professor Philip Ward

University of Technology Sydney
Faculty of Health

May 2023

Certificate of original authorship

I, Andrew David Watkins declare that this thesis, is submitted in fulfilment of the requirements for the award of Doctor of Philosophy in the Faculty of Health at the University of Technology Sydney.

This thesis is wholly my own work unless otherwise referenced or acknowledged. In addition, I certify that all information sources and literature used are indicated in the thesis. This document has not been submitted for qualifications at any other academic institution.

This research is supported by the Australian Government Research Training Program.

Production Note:

Signature: Signature removed prior to publication.

Date: 25.05.23

Acknowledgements

The path to a PhD is not one trekked alone. I have had the support of many wonderful people who have generously provided support, encouragement, and expertise to reach the summit.

My thanks firstly to all the people who were research participants, the people with lived experience of severe mental illness, mental health clinicians and students who unselfishly gave up their time to help make my studies a reality. I am grateful to the staff of the Faculty of Health at the University of Technology, Sydney, many of whom provided practical support and encouragement – with special mention of Priya Nair, who always could be relied upon to provide solutions to whatever left-field issues arose.

Thank you to my many clinical and research colleagues past and present with the Keeping the Body in Mind program. Some of you are co-authors on papers included in this thesis, however, many are not, but that does not diminish your contribution to the work in Keeping the Body in Mind that has facilitated so many wonderful achievements; it has been quite a ride over the past 15+ years. To Jackie Curtis, the clinical and spiritual leader of Keeping the Body in Mind, you have been a colleague, mentor, and friend for more years than either of us will admit, and I will be forever grateful to you.

To my family and in particular my wife Jo. Thank you for all your support and encouragement. Living with someone who is completing a PhD is not something that is usually placed in the ‘fun’ category. Jo, I have appreciated your encouragement and there were periods of time where I would not have reached this point without it. Not only did you support me through this journey, but completed an MBA at the same time (congratulations to you!).

I am grateful to Dr Campbell Aitken, who provided professional editing services in accordance with the Institute of Professional Editors’ *Guidelines for editing research theses*.

Finally, to my supervisors, Jane Stein-Parbury, Elizabeth Denney-Wilson and Philip Ward. Each of you has played different but pivotal roles in the development of this thesis, and I am extremely grateful. Phil, you have been on the wider Keeping the Body in Mind journey with me and have guided the clinical and research work that has gathered the team so much international recognition. You have also been responsible for bringing many clinicians in the team into the world of research. Elizabeth, you are one of the hardest-working and most selfless people I know. Despite changing universities and roles, you remained as dedicated as ever to the research in this thesis. Coming from outside the world of mental health, your willingness to learn some of its intricacies while sharing your expertise in public health and other areas was crucial to my research and this thesis. Jane, our journey began when you talked me into doing a PhD. You have remained with me each and every step of the way, even into your retirement. Your dedication, perseverance, expertise and counsel, have been invaluable on this lengthy road together. Thank you!

Statement of format of thesis

This document consists of a thesis by publication – a single manuscript comprised of seven chapters, of which four include published manuscripts. Where publications are presented, the details are clearly noted, and the reference is provided. In order to explain the relationship between chapters and papers, a preamble is provided at the beginning of the chapter containing the published manuscript.

Publications arising from this research

Paper #1	
<i>Title:</i>	Keeping the body in mind: A qualitative analysis of the experiences of people experiencing first-episode psychosis participating in a lifestyle intervention programme.
<i>Abbreviated title:</i>	KBIM qualitative study
<i>Authors:</i>	Andrew Watkins, Elizabeth Denney-Wilson, Jackie Curtis, Scott Teasdale, Simon Rosenbaum, Philip B. Ward and Jane Stein-Parbury
<i>Journal:</i>	International Journal of Mental Health Nursing 29(2):278-89. doi: 10.1111/inm.12683
<i>Status of publication:</i>	<i>Accepted April 2020</i>
<i>Unique contribution to knowledge</i>	This was the first study to describe the experiences of young people in a multi-modal lifestyle intervention program used in the earliest stages of treatment to attenuate antipsychotic weight gain.
Paper # 2	
<i>Title:</i>	The validity and reliability characteristics of the M-BACK Questionnaire to assess the barriers, attitudes, confidence, and knowledge of mental health staff regarding metabolic health of mental health service users
<i>Abbreviated title:</i>	M-BACK validation
<i>Authors:</i>	Andrew Watkins, Simon Rosenbaum, Philip B. Ward, Joanna Patching, Elizabeth Denney-Wilson and Jane Stein-Parbury
<i>Journal:</i>	Frontiers in Public Health doi: 10.3389/fpubh.2017.00321
<i>Status of publication:</i>	<i>Accepted Dec 11th, 2017</i>
<i>Unique contribution to knowledge</i>	This study developed and validated a tool to reliably measure mental health clinician's knowledge, attitudes confidence and perceived barriers to delivering metabolic health care.
Paper # 3	

<i>Title:</i>	Upskilling Mental Health Nurses to Address the Burden of Poor Metabolic Health: A Mixed Method Evaluation
<i>Abbreviated title:</i>	Upskilling nurses study
<i>Authors:</i>	Andrew Watkins, Jane Stein-Parbury, Elizabeth Denney-Wilson, Philip B. Ward, and Simon Rosenbaum
<i>Journal:</i>	Issues in mental health nursing doi: 10.1080/01612840.2020.174420
<i>Status of publication:</i>	Accepted 2 nd October 2020
<i>Unique contribution to knowledge</i>	It was the first to evaluate the changes in knowledge, attitudes and confidence following an education workshop focused exclusively on metabolic health care of people experiencing severe mental illness.
Paper # 4	
<i>Title:</i>	Tackling change in mental health service delivery: A qualitative evaluation of a lifestyle program targeting mental health staff-Keeping our Staff in Mind (KoSiM)
<i>Abbreviated title:</i>	KoSiM qualitative study
<i>Authors:</i>	Andrew Watkins, Jane Stein-Parbury, Jackie Curtis, Josephine Poole, Scott Teasdale, Hamish Fibbins, Elisa Rossimel, Oscar Lederman, Philip B. Ward, Simon Rosenbaum, Elizabeth Denney-Wilson
<i>Journal:</i>	Health Promotion Journal of Australia doi: 10.1002/hpja.633
<i>Status of publication:</i>	Accepted June 19, 2022
<i>Unique contribution to knowledge</i>	It was the first to qualitatively evaluate the impacts of a lifestyle intervention program delivered to mental health staff.

Copyright permissions, where required, can be found in Appendix 1

Statement of contribution of authors

This thesis contains four published peer-reviewed journal articles. For these publications, I, Andrew Watkins, was lead researcher, and therefore also the first and corresponding author. My contributions and the contributions of the co-authors are provided below.

Chapter 3 of this thesis is published as a qualitative data paper:

Watkins A, Denney-Wilson E, Curtis J, Teasdale S, Rosenbaum S, Ward PB, Stein-Parbury, J. Keeping the body in mind: A qualitative analysis of the experiences of people experiencing first-episode psychosis participating in a lifestyle intervention programme. *International Journal of Mental Health Nursing*. 2020;29(2):278-89.

I led the concept and design of the study, co-collected all data, conducted analysis and interpretation of the data, and drafted the manuscript. Jane Stein-Parbury contributed to study design, conducted qualitative interviews, provided input on analysis and critiqued the manuscript. Elizabeth Denney-Wilson provided input on study design analysis and critiqued the manuscript. All other listed authors provided input on the study design and critiqued the manuscript.

Chapter 4 of this thesis is published as a questionnaire development and validation paper:

Watkins A, Rosenbaum S, Ward PB, Patching J, Denney-Wilson E, Stein-Parbury J. The validity and reliability characteristics of the M-BACK Questionnaire to assess the barriers, attitudes, confidence, and knowledge of mental health staff regarding metabolic health of mental health service users. *Frontiers in Public Health*. 2017; 5:321.

I led concept and design of the study, collected all data, led expert consensus process, conducted analysis of the data, and drafted the manuscript. Jane Stein-Parbury contributed to study conception and design process and critiqued the manuscript. Simon Rosenbaum was involved in the conception and design of the study and critiqued the manuscript. Philip Ward contributed to study design and data analysis and critiqued the manuscript. Joanna Patching assisted with

recruitment, data collection, and critiqued the manuscript. Elizabeth Denney-Wilson provided input on the conceptual framework of the study and critiqued the manuscript.

Chapter 5 of this thesis is published as a mixed-method data paper:

Watkins A, Stein-Parbury J, Denney-Wilson E, Ward PB, Rosenbaum S. Upskilling mental health nurses to address the burden of poor metabolic health: A mixed method evaluation. *Issues in Mental Health Nursing*. 2020;41(10):925-31.

I led the concept and design of the study, collected all data, conducted the analysis and interpretation of the data, and drafted the manuscript. Jane Stein-Parbury contributed to study conception and design process, and critiqued the manuscript. Simon Rosenbaum contributed to the data analysis and critiqued the manuscript. Elizabeth Denney-Wilson provided input on the conceptual framework of the study and critiqued the manuscript. Philip Ward provided input on the conceptual framework of the study and critiqued the manuscript.

Chapter 6 of this thesis is published as a qualitative data paper:

Watkins A, Stein-Parbury J, Curtis J, Poole J, Teasdale S, Fibbins H, Rossimel E, Lederman O, Ward PB, Rosenbaum S, Denney-Wilson E. Tackling change in mental health service delivery: A qualitative evaluation of a lifestyle program targeting mental health staff—Keeping our Staff in Mind (KoSiM). *Health Promotion Journal of Australia*. 2022. doi: 10.1002/hpja.633

I led the concept and design of the study, co-collected data, conducted the analysis and interpretation of the data and drafted the manuscript. Jane Stein-Parbury contributed to the study design and analysis and critiqued the manuscript. Elizabeth Denney-Wilson contributed to the study design and analysis and critiqued the manuscript. Josephine Poole provided input into the study design, co-collected the data, and critiqued the manuscript. All other listed authors provided input on the study design and critiqued the manuscript.

Statement of contribution of authors

<i>Graduate Research Student</i>	ANDREW WATKINS	LEAD AUTHOR
<i>Principal</i>	JANE STEIN-PARBURY	JOINT AUTHOR
<i>Co-supervisor(1):</i>	ELIZABETH DENNEY-WILSON	JOINT AUTHOR
<i>Co-supervisor(2):</i>	PHILIP WARD	JOINT AUTHOR
<i>Other author</i>	SIMON ROSENBAUM	JOINT AUTHOR
<i>Other author</i>	JACKIE CURTIS	JOINT AUTHOR
<i>Other author</i>	SCOTT TEASDALE	JOINT AUTHOR
<i>Other author</i>	JOANNA PATCHING	JOINT AUTHOR
<i>Other author</i>	JOSEPHINE POOLE	JOINT AUTHOR
<i>Other author</i>	HAMISH FIBBINS	JOINT AUTHOR
<i>Other author</i>	ELISA ROSSIMEL	JOINT AUTHOR
<i>Other author</i>	OSCAR LEDERMAN	JOINT AUTHOR

Name	Signature	Date
<i>Andrew Watkins</i> <i>Graduate Research Student</i>	Production Note: Signature removed prior to publication.	<i>(Date)</i> 9/29/2022
<i>Principal</i>	Production Note: Signature removed prior to publication.	<i>(Date)</i> 9/29/2022
<i>Co supervisor (1)</i>	Production Note: Signature removed prior to publication.	<i>(Date)</i> 9/29/2022
<i>Co supervisor (2)</i> Philip Ward	Production Note: Signature removed prior to publication.	<i>(Date)</i> 9/26/2022
<i>Simon Rosenbaum</i>	Production Note: Signature removed prior to publication.	<i>(Date)</i> 9/25/2022
<i>Jackie Curtis</i>	Production Note: Signature removed prior to publication.	<i>(Date)</i> 9/28/2022
<i>Scott Teasdale</i>	Production Note: Signature removed prior to publication.	<i>(Date)</i> 9/26/2022

<i>Joanna Patching</i>	Production Note: Signature removed prior to publication.	(Date) 9/29/2022
<i>Josephine Poole</i>	Production Note: Signature removed prior to publication.	(Date) 9/25/2022
<i>Hamish Fibbins</i>	Production Note: Signature removed prior to publication.	(Date) 9/25/2022
<i>Elisa Rossimel</i>	Production Note: Signature removed prior to publication.	(Date) 9/27/2022
<i>Oscar Lederman</i>	Production Note: Signature removed prior to publication.	(Date) 9/25/2022

Table of contents

Table of Contents

Title page	i
Certificate of original authorship	ii
Acknowledgements	iii
Statement of format of thesis	v
Publications arising from this research	vi
Statement of contribution of authors	viii
Table of contents	xii
List of tables and figures	xvi
Glossary	xvii
Abbreviations	xix
Abstract	xx
Chapter 1	1
Introduction	1
Background to problem	1
Severe mental illness	1
Antipsychotic treatment	1
Premature mortality	2
Psychosocial impacts of poor physical health	2
Factors leading to poor cardiometabolic health outcomes	3
Pharmacological treatment.....	3
Lifestyle factors	4
SMI factors	5
Health care practices.....	5
Interventions to improve metabolic health in people experiencing SMI within mental health services	6
Health screening	6
Medication choice.....	6
Lifestyle interventions.....	7
Barriers to delivering metabolic screening and lifestyle interventions in mental health care	9
Individual level	9
Interpersonal level	9
Organisational level	10
Community level	10

Public policy	10
Structure of thesis	11
Chapter 2.....	13
Methodology.....	13
Research aim and objectives.....	13
Project significance	16
Overview of research	16
My positioning as a researcher	20
Research philosophical perspective	20
Research methods	22
Keeping the body in mind: A qualitative analysis of the experiences of people experiencing first-episode psychosis participating in a lifestyle intervention programme (Ch 3).....	23
The Validity and reliability characteristics of the M-BACK Questionnaire to assess the Barriers, attitudes, confidence, and Knowledge of Mental health staff regarding Metabolic health of Mental health service Users (Ch 4).....	24
Upskilling Mental Health Nurses to Address the Burden of Poor Metabolic Health: A mixed method evaluation (Ch 5).....	25
Tackling change in mental health service delivery: A qualitative evaluation of a lifestyle program targeting mental health staff–Keeping our Staff in Mind (Ch 6)	26
Ethical considerations	27
Keeping the body in mind: A qualitative analysis of the experiences of people experiencing first-episode psychosis participating in a lifestyle intervention programme (Ch 3).....	28
The Validity and reliability characteristics of the M-BACK Questionnaire to assess the Barriers, attitudes, confidence, and Knowledge of Mental health staff regarding Metabolic health of Mental health service Users (Ch 4).....	29
Upskilling Mental Health Nurses to Address the Burden of Poor Metabolic Health: A mixed method evaluation (Ch 5).....	30
Tackling change in mental health service delivery: A qualitative evaluation of a lifestyle program targeting mental health staff–Keeping our Staff in Mind (Ch 6)	30
Theoretical framework	31
Chapter 3.....	34
<i>A qualitative analysis of people experiencing first-episode psychosis participating in a lifestyle intervention programme</i>	<i>34</i>
Chapter preface	34
Publication	35
Chapter summary	48
Chapter 4.....	49
<i>The validity and reliability of the M-BACK questionnaire to assess the barriers, attitudes, confidence, and knowledge of mental health staff regarding metabolic health of mental health service users (M-BACK validation study)</i>	<i>49</i>

Chapter preface	49
Publication	49
Chapter summary	61
Chapter 5.....	62
<i>Upskilling mental health nurses to address the burden of poor metabolic health: A mixed method evaluation</i>	62
Chapter preface	62
Publication	63
Chapter summary	87
Chapter 6.....	88
<i>Tackling change in mental health service delivery: A qualitative evaluation of a lifestyle program targeting mental health staff – Keeping our staff in mind (KoSiM).....</i>	88
Chapter preface	88
Publication	89
Chapter Summary.....	99
Chapter 7.....	100
Conclusions and recommendations.....	100
Introduction	100
Individual (intrapersonal) level	103
Barriers.....	103
How studies addressed the barriers	104
Interpersonal level.....	106
Barriers.....	107
How studies addressed the barriers	107
Organisational level	109
Barriers.....	109
How studies addressed the barriers	110
Community level.....	114
Barriers.....	114
How studies addressed the barriers	116
Interrelationships of SEM levels.....	117
Strengths and limitations	118
Recommendations for policy, practice and research	119
Conclusion	121
References.....	122
Appendix 1A – Copyright permission for Chapter 3.....	142

<i>Appendix 1B – Copyright permission for Chapter 5</i>	<i>143</i>
<i>Appendix 2 – Physical health book chapter.....</i>	<i>144</i>
<i>Appendix 3 – Evaluating an individualised lifestyle and life skills intervention to prevent antipsychotic-induced weight gain in first episode psychosis.....</i>	<i>199</i>
<i>Appendix 4 – Changing health workforce attitudes to promote improved physical health in mental health service users: Keeping our Staff in Mind (KoSiM).</i>	<i>210</i>
<i>Appendix 5A – Ethics approvals for Chapter 3.....</i>	<i>219</i>
<i>Appendix 5B – Ethics approval for Chapters 4 and 5</i>	<i>222</i>
<i>Appendix 5C – Ethics approval for Chapter 6</i>	<i>223</i>
<i>Appendix 6 – Participant information sheet for chapter 3.....</i>	<i>225</i>
<i>Appendix 7 – Course outline Physical Health Care in Mental Health</i>	<i>230</i>

List of tables and figures

<i>Table 2.1 Research objectives, methods, and publications promotion.....</i>	<i>14</i>
<i>Figure 2.1 Flow between studies in the thesis.....</i>	<i>19</i>
<i>Figure 2.2 SEM theory of health promotion and publication placement.....</i>	<i>32</i>
<i>Figure 7.1 Barriers in the context of the SEM theory of health promotion.....</i>	<i>102</i>

Glossary

Diagnostic overshadowing	Attributing physical symptoms to a mental health condition
Dyslipidaemia	Abnormally elevated cholesterol of fats in the blood, which increases the risk for cardiovascular disease
Glucose abnormalities	Presence of excess glucose in the blood that heightens the risk of developing type 2 diabetes
Hypertension	Elevated blood pressure that increases the risk of cardiovascular disease
Individual level	The level of the socioecological model that characterises an individual's qualities, including their attitudes, knowledge, and behaviours
Interpersonal level	The level of the socioecological model that comprises the individual's relationships, such as family, peers, and health care providers
Community level	Refers to the level of the socioecological model where organisations interact with each other
Keeping the Body in Mind (KBIM)	A metabolic screening and lifestyle intervention program provided by a specialist team within mental health services for people experiencing a severe mental illness
Keeping our Staff in Mind (KoSiM)	A lifestyle intervention program targeted at mental health clinicians
Lifestyle intervention	Interventions designed to support a person to improve their quality of life by changing habits and behaviours
Medicare	Publicly funded universal health insurance scheme in Australia
Mental health consumer	A person who has a lived experience of a mental illness or mental disorder (= service user)
Metabolic syndrome	A cardiometabolic risk profile that features abdominal weight gain, dyslipidaemia, hypertension and glucose abnormalities
Negative symptoms	Features of psychotic illness that cause a reduction or absence of normal behaviours related to motivation, interest or expression
Organisational level	The level of the socioecological model that describes characteristics and operations of social institutions
Person experiencing a severe mental illness	A person diagnosed with a mental illness with psychotic features such as schizophrenia or bipolar disorder
Positive symptoms	Features of psychotic illness that reflect an excess or distortion of normal functioning
Public policy level	The level of the socioecological model concerned with state and federal laws and policies
Service user	A person who has a lived experience of a mental illness or mental disorder (= mental health consumer)

Socioecological model (SEM) of health behaviour	A framework that provides a comprehensive approach used to understand the multifaceted effects of environmental and personal factors that determine behaviour
---	---

Abbreviations

GP	General Practitioner
HREC	Human Research and Ethics Committees
KBIM	Keeping the Body in Mind
KoSiM	Keeping our Staff in Mind
M-BACK	Metabolic-Barriers, Attitudes, Confidence and Knowledge
NSW	New South Wales
SEM	Socioecological Model of Health Promotion
SMI	Severe Mental Illness
UTS	University of Technology, Sydney
WHO	World Health Organization

Abstract

Background

People diagnosed with severe mental illness experience significantly reduced life expectancies driven primarily by preventable health conditions. While lifestyle interventions have been shown to be successful in reducing these risk factors in this population, numerous barriers exist to the implementation of these interventions in mental health services.

Aim

The research aimed to find ways to lower the multi-level barriers to delivering metabolic screening and lifestyle interventions within mental health care services.

Methods

This body of research employed a variety of methods. Qualitative semi-structured interviews were conducted in Sydney, Australia with participants in lifestyle interventions programs – both people experiencing severe mental illness and clinicians to determine their acceptability and impact. Mixed-method research was then conducted to develop, validate and assess the reliability of an assessment instrument to measure the outcomes of training clinicians in metabolic health screening and interventions. This instrument, a quantitative questionnaire with open-ended qualitative questions, was then used to evaluate a metabolic health skills workshop. The results were mapped against the barriers to improving metabolic health care for people experiencing a severe mental illness within the levels of the socioecological model of health promotion.

Findings

At the individual level of the socioecological model, lifestyle interventions delivered by a specialist metabolic health team were found to improve motivation and health knowledge amongst people experiencing severe mental illness. The same intervention improved social isolation and practical support at the interpersonal level. At the organisational level, interventions targeted at clinical staff members improved knowledge, confidence and attitudes towards metabolic health care and change in organisational culture to be more inclusive of

delivering metabolic health care. At the community level, provision of a reliable measurement tool was found to reduce fragmentation of metabolic health care delivery.

Conclusion

The novel findings in this research will help mental health services to incorporate metabolic health screening and lifestyle interventions. It adds to the literature by demonstrating practical ways to remove or lower barriers across multiple levels of the SEM framework. Metabolic health care in mental health services should incorporate a multilevel approach that addresses clinician knowledge and confidence levels and workplace culture and include placement of specialist metabolic teams that can link effectively with primary health care. Future research should investigate scalability of interventions in this thesis to inform public policy in this area.

Chapter 1

Introduction

The premature mortality of people diagnosed with severe mental illness (SMI) is a substantial public health concern and should be a priority for both governments and health care organisations (1). The inability of health services to close the life expectancy gap between the general population and people experiencing SMI has resulted in multiple calls to introduce interventions to improve metabolic health care within mental health services (2, 3, 4, 5, 6, 7, 8, 9). Lifestyle interventions have proven to be successful in reducing cardiometabolic risk profiles for people experiencing SMI (10), but their implementation has proved difficult, with multiple barriers to their introduction identified (11). In the research described in this thesis, I explored ways to overcome the barriers to metabolic health screening and lifestyle interventions being implemented as a part of core mental health service delivery to people experiencing SMI.

Background to problem

Severe mental illness

The term ‘severe mental illness’ encompasses illnesses with psychotic features, such as schizophrenia and bipolar disorder. Both schizophrenia and bipolar disorder are persistent conditions that can cause acute exacerbation of psychotic symptoms (12). Psychotic features can include ‘positive’ symptoms, including hallucinations and delusions, and ‘negative’ symptoms, such as amotivation, anhedonia and cognitive impairment (13).

Antipsychotic treatment

The use of antipsychotic medications is usually considered essential in the treatment of SMI when psychotic features are present (14). Antipsychotic treatment generally enables management of acute symptoms of severe mental illness, but does not cure these conditions (15). Repeated acute episodes of psychotic illness are associated with a decline in functioning, and reduce the likelihood of making a psychosocial recovery (16). The continued use of antipsychotics plays an

important preventative role to reduce the risk of re-emergence of acute exacerbations, and is generally recommended (17).

Premature mortality

There is an extensive amount of evidence from large cohort studies in Western countries demonstrating that people diagnosed with SMI have a life expectancy shortfall of 15–20 years relative to the general population (18, 19, 20, 21). While deaths by accident and suicide occur at a higher rate in the SMI population (22), physical health conditions remain the primary cause of premature death in people experiencing SMI (23), and account for around 7 in 10 deaths overall (24). Most deaths are associated with cardiometabolic and respiratory disease (25, 26). The cause of respiratory disease is generally linked to the high smoking rates observed in people experiencing SMI (27). However, the causes of cardiometabolic disease in this population are influenced by multiple factors that arise from experiencing SMI and its treatment (28).

In recent decades, the life expectancy gap between people diagnosed with SMI and the general population has widened. While the life expectancy of the general population has improved over time in line with advancements in health care, for people experiencing SMI it has remained largely static (19). People diagnosed with SMI have a 1.6-fold increased risk of mortality over matched general population controls for the same physical health conditions (22). These statistics are suggestive that people experiencing SMI may not be benefiting from the improved physical health treatments available to the general population (29). A broader discussion of physical health care of people diagnosed with a mental illness is detailed in Appendix 2.

Psychosocial impacts of poor physical health

Whilst poor physical health causes premature mortality, it also reduces quality of life in people experiencing SMI (30, 31, 32). People experiencing multi-morbidity, SMI plus physical health conditions, are more likely to have difficulty self-managing these conditions (30). Multi-morbidity complicates life beyond the symptoms of the illness, it also harms psychosocial outcomes due to both the physical and emotional aspects of living with chronic illness (32).

These factors create further challenges for recovery from SMI, restricting the ability of people to work, socialise and be self-empowered (31).

Factors leading to poor cardiometabolic health outcomes

A multifaceted interplay of influences affects the cardiometabolic outcomes of people diagnosed with SMI. The implications of experiencing SMI and the psychosocial disadvantage that stem from its symptomatology have adverse implications for cardiometabolic health (33). Poor metabolic outcomes are associated with antipsychotic treatment, health care practices, and several lifestyle factors, including physical activity, diet and smoking (2).

Pharmacological treatment

Unfortunately, antipsychotics have undesirable side effects (34), particularly adverse metabolic outcomes (35). Whilst there are differences in the side effect profiles of antipsychotic medications (36), clinically significant weight gain (>7%) is a well-documented adverse effect of almost all of them (37). Antipsychotic use is also strongly associated with the development of lipid and glucose abnormalities (35).

The process of metabolic change commences on initiation of antipsychotics, as people experience an increase in appetite and rapid weight gain (34). Clinically significant weight gain occurs within weeks of commencing treatment, and an average weight gain of 12 kg is observed after two years of treatment (38). Weight gain continues to increase with a longer duration of illness, and often progresses to obesity (39). This increase in adiposity is frequently disproportionately stored centrally (40), where it is more likely to cause insulin resistance and dyslipidaemia than fat stored in other areas of the body (41, 42). Antipsychotics can also exert a direct influence on elevating triglycerides and development of insulin resistance independent of any weight gain (43, 44). As insulin resistance increases it is likely to cause pancreatic beta cell failure, leading to pre-diabetes and then diabetes (45). The development of diabetes is associated with greatly increased risk of cardiovascular disease and early death (46).

Lifestyle factors

Many of the factors that lead to poor cardiometabolic health outcomes are considered preventable because they are related to unhealthy lifestyle behaviours. Poor diet, smoking and physical inactivity are associated with increased incidence of cardiometabolic disease (47). Even prior to antipsychotic treatment, people who have an ultra-high risk for the development of psychosis have higher smoking rates, poorer dietary intake and more sedentary behaviour than age-matched controls (48). As the illness progresses, lifestyle risk behaviours occur at higher rates and diverge further from those seen in the general population (49).

Diet

The dietary intake of people living with SMI has been reported to be of poorer quality than the general population, and well outside established dietary guidelines (50). The diet of people experiencing SMI is typically low in fruit and vegetables, but high in sodium, fat, sugar and overall energy intake (51, 52). Diet characteristics such as these are associated with an increased risk of the development of cardiometabolic diseases (53). There are quality concerns associated with studies reviewing nutritional intake of this population, including a lack of a consistent assessment tool and largely self-report data collection, which may lead to misreporting (51). One study found little difference between dietary intake of people living with SMI and controls (54). Despite this, higher-quality studies utilising more accurate dietary intake monitoring protocols have consistently demonstrated lower-quality dietary intake amongst people living with SMI (51).

Physical activity

People experiencing SMI engage in less physical activity than the general population (55, 56). Several high-quality systematic reviews and meta-analyses of research on physical activity in people with SMI have been published (55, 56, 57, 58, 59). These reviews found that people diagnosed with SMI are sedentary for more than 12 hours per day (55, 58), and are unlikely to meet guidelines on physical activity (55, 56). Low levels of physical activity are linked to the development of cardiometabolic disease and premature mortality (60).

Smoking

Tobacco smoking is common in people who experience SMI, with more than half of this group being current smokers (61); this rate is at least five times higher than in the general Australian population (62). People diagnosed with SMI are more likely to be heavier smokers, using greater amounts of tobacco and more heavily addicted to nicotine (63, 64).

SMI factors

Cardiometabolic abnormalities are believed to be an inherent risk of SMI. Lifestyle choices described in the paragraphs above are influenced by psychiatric illness due to the noted negative symptoms of SMI, such as amotivation, impairments in global functioning, and disorganisation (2). Poor metabolic outcomes are seen in this population, whether or not they are receiving antipsychotic treatment (65). Metabolic disturbances are associated with stress-related disorders (like SMI), and are likely to contribute to the disruption of the hypothalamic-pituitary-adrenal axis that increases visceral fat accumulation (66). In addition, evidence exists of common genetic markers being linked to vulnerability of developing both metabolic diseases and schizophrenia (67). There is also increasing evidence of gut microbiome abnormalities in people diagnosed with SMI (68); these can cause metabolic dysfunction (69).

Health care practices

Although the heightened risk of cardiometabolic disorders has been clearly established for people with a diagnosis of SMI and treated with antipsychotics, metabolic screening rates in mental health services are frequently poor (70, 71). A low rate of screening reduces the ability to identify emerging cardiometabolic problems and apply appropriate intervention strategies. A systematic review and meta-analysis of people with a diagnosis of SMI and cardiovascular disease concluded that they are less likely to receive technical screening in the general medical system, and if they are treated are likely to receive a lower quality of treatment than those in the general population with the same cardiometabolic condition (72).

Interventions to improve metabolic health in people experiencing SMI within mental health services

The metabolic health outcomes of people living with SMI must and can be improved, given that many of the risk factors are modifiable (2, 10). Mental health services are well placed to provide interventions to improve poor physical health outcomes via screening, antipsychotic choices, and lifestyle interventions (2).

Health screening

Interventions to improve metabolic monitoring rates in mental health services have been evaluated in several systematic reviews (73, 74, 75). Metabolic monitoring of people diagnosed with SMI aims to preserve the physical health of consumers being treated with antipsychotics and other psychotropic medications (74). This is particularly crucial in the initial stages of illness, when metabolic health can change rapidly (71, 73, 75).

Guidelines on physical health care in mental health services have provided generally consistent advice for metabolic monitoring across jurisdictions in Australia (76). However, low monitoring rates indicate the existence of a guideline–practice gap (71). The quality of research into improving metabolic monitoring rates in mental health is considered moderate at best, due to methodological limitations such as lack of control or consideration of confounding factors and a scarcity of controlled research designs (74). Despite this, and the heterogeneous approaches used (e.g., audits, education, clinical leadership, and managerial support or some mixture of these elements), most strategies have improved monitoring rates (74). Strategies to improve metabolic monitoring rates are more successful if they take a multifaceted approach (75) and achieve workplace culture change (73, 74).

Medication choice

Several antipsychotic options can be used when treating SMI. Large-scale systematic reviews and meta-analyses have demonstrated gradual rather than discrete differences in the efficacy of antipsychotic treatments on acute psychotic illness, except for clozapine, which is designated as a third-line treatment due to its risk of agranulocytosis and other serious medical comorbidities (36, 77). However, studies have unambiguously revealed significant differences in the side effect

profiles of antipsychotic treatments, particularly regarding metabolic health outcomes (35, 36, 77, 78). It has been recommended that treatment guidelines reflect these findings and that the metabolic effects of medications be considered when prescribing antipsychotics (35, 36, 77).

Lifestyle interventions

Lifestyle interventions for people experiencing SMI have been the subject of extensive research interest, with several meta-analyses completed on this topic (3, 4, 79, 80, 81, 82, 83, 84, 85, 86, 87). Improvements in metabolic health outcomes are evident across anthropometric (3, 4, 82), physical activity (88, 89) and dietary (84) outcomes. All meta-analyses demonstrated statistically significant improvements in cardiometabolic outcomes with lifestyle activities across at least one domain. One meta-analysis demonstrated a statistically significant but clinically insignificant weight reduction (85); this conflicted with other research findings, including a meta-review of research on this topic that found a small but clinically significant effect for weight loss and a wide range of improvements in other metabolic parameters (10).

Physical activity

Physical activity is seen as a pillar of cardiometabolic health prevention in the general population, and many studies have shown that targeted lifestyle and behavioural interventions can increase physical activity levels for people experiencing SMI (10, 88, 89, 90, 91, 92). Increasing levels of physical activity – even with low-intensity activity such as walking – can reduce weight and body fat in people experiencing SMI (93). Cardio-respiratory fitness is a measure of lifestyle change, and is an important measure of cardio-metabolic health even in the absence of weight loss, and has been shown to improve with lifestyle interventions for people experiencing SMI (89). Physical activity interventions are most successful when conducted by an exercise professional (94).

Nutrition interventions

Nutrition interventions have been shown to have a moderate positive effect on a variety of metabolic health measures (10, 84, 90, 95, 96). Dietary modification has been successful in reducing the quantity and improving the quality of food and drink intake (96). Interventions focused on restriction of energy consumption significantly improved a range of metabolic health measures (97). Dietary interventions have generated reductions in glucose levels and diastolic

blood pressure that are not observed in other types of lifestyle interventions (10). Nutrition interventions have also demonstrated reductions in weight and waist circumference in people experiencing SMI (10, 81, 84). Nutritional interventions are shown to have the most efficacious outcomes when they are delivered by a dietitian and include an individualised approach to counselling (84).

Features of successful lifestyle interventions

Lifestyle interventions are more effective when exercise and dietary interventions are delivered together (10). The effectiveness of interventions is improved when they are delivered by multidisciplinary teams, combining specialist clinicians such as dietitians and exercise physiologists with mainstream mental health staff such as nurses and psychologists (94). In research to date, multimodal delivery of these interventions incorporating education, counselling, goal setting and practical programs tended to have better outcomes than if one or more of these elements was missing (81, 98). Including a motivational component in interventions is considered to be important due to the amotivation, social withdrawal and avolition often experienced by people diagnosed with SMI (94, 99). Health coaching, goal setting and motivational interviewing have been explored and show promise in improving metabolic health outcomes in people living with SMI (100).

Individually tailored lifestyle intervention programs have advantages over group-based interventions in terms of metabolic health improvement (10). It is worth noting that group settings offer benefits that are not realised in individual treatment, because peer support and group learning have potent effects (94). It has been suggested that a group setting that incorporates individually tailored care may achieve the best results, but evidence is currently scarce (10).

There is good evidence for the impact of metabolic health screening and lifestyle interventions, and this has driven recommendations for implementation of these initiatives for people that experience SMI (1, 2, 101). Despite this, lifestyle interventions and metabolic screening are not part of core service delivery in most mental health settings (2). Several barriers prevent

successful implementation of metabolic screening and lifestyle interventions (59, 75, 102, 103), as discussed below.

Barriers to delivering metabolic screening and lifestyle interventions in mental health care

Barriers to the successful implementation of screening and interventions required for people experiencing SMI (11) exist at individual, interpersonal, organisational, community and public policy levels.

Individual level

Making lifestyle changes at the individual level is hard due to the experience of SMI and its treatment. Symptoms of illness include low motivation, apathy and anhedonia, which are associated with low autonomous motivation to engage in lifestyle activities (104). The development of cognitive deficits and lower literacy among people experiencing SMI reduces their ability to understand and retain healthy lifestyle information (105, 106).

Prominent side-effects of many antipsychotic treatments include sedation, weight gain and low energy, which can reduce the desire to make lifestyle changes (59). The stigma experienced by those diagnosed with SMI often leads to low confidence and self-esteem, along with social anxiety (107). This represents a further barrier to participation in lifestyle interventions, especially if group-based activities are involved (108).

Interpersonal level

Lack of support from a social network is the most commonly cited barrier to undertaking lifestyle changes (59). An unhealthy lifestyle environment, in which individuals are exposed to poor role modelling from family, carers and/or health practitioners, means individuals are less likely to make positive lifestyle changes (102). People experiencing SMI are likely to have smaller support networks than the general population, with few friends and disconnection from family supports (109). This results in relationships with health professionals taking on a higher level of importance with respect to influencing healthy lifestyle change (110).

Stigma amongst mental health professionals towards people experiencing SMI causes misconceptions about this population being unable to afford to eat healthily, or unable to make positive lifestyle changes (111). A false belief amongst some clinicians is that discussing antipsychotic-induced metabolic effects leads to medication non-adherence (111). A lack of support or knowledge from a mental health clinician is likely to be dispiriting and detrimental to an individual experiencing SMI who is attempting to make lifestyle changes (108).

Organisational level

Mental health workforces generally lack knowledge and experience of screening and managing cardiometabolic risk factors (76, 112, 113). Public mental health services usually view their primary role as management and prevention of acute symptomatology of SMI (6, 114, 115, 116, 117). This work culture results in metabolic screening and lifestyle interventions being viewed as a relatively low priority. This low-level priority is reflected in managerial attitudes, resulting in a lack of associated coordination and support (103, 118). Lack of financial investment in resources, low support for education, and insufficient staff time to undertake metabolic health care are additional barriers that have been identified within mental health services (103, 119, 120).

Community level

The fragmentation of health care, especially the disconnection between mental health services and mainstream medicine, leads to low rates of screening and intervention for cardiovascular risk factors in people with SMI (121, 122). There is a lack of clarity about which health care organisation has responsibility for various aspects of metabolic health care and lifestyle intervention, which often results in missed opportunities for monitoring and care (75). A further problem relates to diagnostic overshadowing, which involves physical health concerns being attributed to mental illness and inadequately investigated or managed (123).

Public policy

World Health Organization (WHO) guidelines recommend metabolic monitoring and lifestyle intervention for people experiencing SMI to prevent cardiometabolic disease (1). These recommendations are echoed at both Australian national and state levels via consensus statements and guidelines (124, 125). However, these statements and guidelines have only

partially translated into policy; as a result, there is no mandate to provide metabolic screening and lifestyle interventions as preventative cardiometabolic health measures for people experiencing SMI (126). Inadequate and insufficient policy has important implications for both financing and provision of information systems that support cardiometabolic health outcomes (127). Financing of both mental health services and Medicare-funded services is currently unable to support the creation of prevention services to meet the cardiometabolic needs of people experiencing SMI (124). Additionally, information systems are not set up in ways that enable people experiencing SMI to be monitored across health settings (128).

The integration of screening and evidence-based lifestyle interventions within routine mental health care is a challenging adjustment (11). The translation and maintenance of lifestyle interventions into real-world settings, after efficacy has been established in controlled research environments, has proved difficult (129, 130). Translational research in this area can identify the key ingredients of a program, and assist in overcoming barriers to implementation into routine mental health service delivery (11).

Structure of thesis

The thesis consists of seven chapters.

- Chapter 1 provides a background to the problem of poor physical health care in people experiencing a SMI, and the barriers to implementing change in this area.
- Chapter 2 presents the methodology of the research included in this thesis, including the philosophical stance, researcher positioning and ethical considerations.
- Chapter 3 presents the findings of a qualitative study of the experiences of people diagnosed with early psychosis who participated in a community-based lifestyle intervention program designed to improve their metabolic health care. Chapter 3 is published in the *International Journal of Mental Health Nursing*.
- Chapter 4 presents the development of a tool to assess the barriers, attitudes, confidence and knowledge of mental health staff regarding the metabolic health of people experiencing SMI. Chapter 4 describes the reliability and validity of this tool and is published in *Frontiers in Public Health*.

- Chapter 5 presents a mixed-methods study of the effect of a metabolic health training workshop on mental health nurses. Chapter 5 is published in *Issues in Mental Health Nursing*.
- Chapter 6 presents the findings of a qualitative study of a lifestyle intervention program designed to improve health, activate culture change and raise the capability of clinical mental health staff to improve metabolic care within their services. Chapter 6 is published in the *Journal of Health Promotion*.
- Chapter 7 presents a synthesis of the findings, utilising the theoretical framework of the SEM. The chapter concludes with recommendations for policy, practice and future research.

Chapter 2

Methodology

Research aim and objectives

The overarching aim of my research was to explore ways to overcome the multi-level barriers to delivering metabolic screening and lifestyle interventions within mental health care services. The objectives aim were to:

1. Explore the subjective experiences of people diagnosed with early psychosis who participated in a community-based lifestyle intervention program designed to improve their metabolic health care,
2. Develop a valid and reliable measurement tool that evaluates the effectiveness of educational interventions in changing mental health clinicians' perceived barriers, knowledge, attitudes, and confidence in delivering metabolic health care,
3. Evaluate the effectiveness of a metabolic health care training workshop in changing attitudes, knowledge, and confidence in mental health nurses, and explore their plans for implementing metabolic health initiatives in their workplace, and
4. Explore the effects of a lifestyle intervention program designed to improve staff health, activate culture change, and boost the capability of clinical mental health staff to improve metabolic care within their services.

Each of these objectives relates specifically to the publications that are presented in the thesis in Chapters 3–6, as shown in table 2.1.

Table 2.1 Research objectives, methods, and publications

Chapter	Research objectives	Method	Publication
3	1.Explore the experiences of people diagnosed with early psychosis participating in the KBIM lifestyle intervention program.	Participant interview study <ul style="list-style-type: none"> - Qualitative, descriptive, semi-structured interviews - Thematic analysis 	Watkins A , Denney-Wilson E, Curtis J, Teasdale S, Rosenbaum S, Ward PB, Stein-Parbury, J. Keeping the body in mind: A qualitative analysis of the experiences of people experiencing first-episode psychosis participating in a lifestyle intervention programme. International Journal of Mental Health Nursing. 2020;29(2):278-89.
4	2.Develop a measurement tool to determine the effectiveness of interventions to improve the knowledge, attitude and confidence of mental health clinicians in delivering metabolic health care.	Scale development <ul style="list-style-type: none"> - Content validation - Pilot testing (qualitative) - Instrument reliability (quantitative) 	Watkins A , Rosenbaum S, Ward PB, Patching J, Denney-Wilson E, Stein-Parbury J. The validity and reliability characteristics of the M-BACK Questionnaire to assess the barriers, attitudes, confidence, and knowledge of mental health staff regarding metabolic health of mental health service users. Frontiers in Public Health. 2017; 5:321.

5	<p>3.Evaluate the efficacy of a training workshop on metabolic health care in mental health for nurses.</p> <p>4.Describe the planned implementation of metabolic health initiatives post completion of metabolic health workshop.</p>	<p>Education workshop evaluation</p> <ul style="list-style-type: none"> - Mixed method (quantitative and qualitative) 	<p>Watkins A, Stein-Parbury J, Denney-Wilson E, Ward PB, Rosenbaum S. Upskilling mental health nurses to address the burden of poor metabolic health: A mixed method evaluation. Issues in Mental Health Nursing. 2020;41(10):925-31</p>
6	<p>5.Explore the impact on clinicians and workplace culture changes following the KoSiM staff-based lifestyle intervention program.</p>	<p>Participant interview study</p> <ul style="list-style-type: none"> - Qualitative, descriptive, semi-structured interviews - Thematic analysis 	<p>Watkins A, Stein-Parbury J, Curtis J, Poole J, Teasdale S, Fibbins H, Rossimel E, Lederman O, Ward PB, Rosenbaum S, Denney-Wilson E. Tackling change in mental health service delivery: A qualitative evaluation of a lifestyle program targeting mental health staff–Keeping our Staff in Mind (KoSiM). Health Promotion Journal of Australia. 2022. doi: 10.1002/hpja.633</p>

Project significance

The poor metabolic outcomes endured by people experiencing a serious mental illness (SMI) have been detailed in the background literature of this thesis (Ch 1). Although these details have been known for decades, there has been no real improvement in the health outcomes experienced by the population experiencing a SMI. This lack of progress in metabolic health outcomes comes despite evidence demonstrating marked improvements in health outcomes from targeted interventions (2). In the literature, there is recognition of the layers of barriers experienced by the population with a diagnosis of SMI in relation to their physical health care. The significance of the body of research in this thesis lies in demonstrating effective interventions to overcome the barriers to improve the metabolic health care outcomes for individuals experiencing a SMI. By investigating interventions designed to eliminate barriers to the delivery of metabolic screening and lifestyle interventions within mental health services, this research reveals how it is possible to improve the cardiometabolic health outcomes and life expectancy of people diagnosed with SMI in a real-world setting.

Overview of research

The work presented in this thesis explores how barriers to delivering better metabolic health care within mental health services can be addressed. It represents part of a broader body of research that investigated metabolic health care improvements that were undertaken in South Eastern Sydney Local Health District (SESLHD). The research contained in this thesis developed organically and opportunistically from this larger body of research into the Keeping the Body in Mind (KBIM) program in SESLHD.

KBIM is a dedicated lifestyle intervention program originally targeted at youth experiencing early psychosis in order to attenuate metabolic weight gain and therefore potentially reduce the risk of metabolic sequelae from developing (131) (Appendix 3). The program proved successful in attenuating weight gain. Therefore, it was worthwhile to understand how and why the KBIM intervention program was viewed by participants. The resultant study, reported in **Chapter 3, ‘Keeping the Body in Mind: A qualitative analysis of the experiences of people experiencing first-episode psychosis participating in a lifestyle intervention program’**, demonstrated the KBIM program was highly acceptable and the benefits to participants extended

beyond physical health benefits to include a broad range of positives for mental health recovery. The results of this study provided an opportunity to understand the acceptability and essential elements that might be transferred to other settings to see how larger scale programs may be implemented.

When the results of studies investigating the KBIM program (Appendix 3 and Ch 3) were presented to mental health nursing staff they indicated that they felt ill-equipped with knowledge and confidence to deliver a KBIM style intervention to mental health consumers. This perception is reflected in the literature that identified that mental health nurses required training and education in this area (132). The literature relating to metabolic health care training for mental health nurses had been criticised for lacking evaluation of its efficacy (112). Therefore, prior to conducting education and training to address mental health nurses' lack of knowledge and confidence, it was essential to have a means of appraising the success of educational activities. A means of measuring changes pre- and post-metabolic education activities for mental health nurses was required. The research presented in **Chapter 4, 'The validity and reliability characteristics of the M-BACK Questionnaire to assess the barriers, attitudes, confidence, and knowledge regarding metabolic health of mental health service users'**, demonstrated the Metabolic-Barriers, Attitudes, Confidence and Knowledge (M-BACK) to be a valid and reliable instrument to evaluate training and education in metabolic health care for mental health care.

With an established tool shown to be both reliable and valid for metabolic health training, a two-day workshop course was developed, delivered and evaluated utilising the M-BACK tool.

Chapter 5, 'Upskilling Mental Health Nurses to Address the Burden of Poor Metabolic Health: A mixed method evaluation', demonstrated that this training was effective in improving their knowledge of metabolic health, their skill levels regarding screening and intervention, improved attitudes toward metabolic health care and a decrease in perceived barriers to providing metabolic care. Furthermore, participants planned to implement new interventions to incorporate metabolic health care on return to their workplace.

The effectiveness of the KBIM program led to increased clinical funding to deliver the program to a much larger adult cohort with established mental illness. In order to do so, training a large

number of clinicians, both nursing, and allied health was required. The Keeping our Staff in Mind (KoSiM) program (Appendix 4) aimed to provide a means to fulfill this training need. KoSiM is a novel intervention that utilises practical interventions with specialised nursing and allied health team to promote healthy lifestyle behaviours amongst mental health staff (133). There is evidence that health workers who engage in healthy lifestyle behaviours are more likely to promote these behaviours to consumers they work with. KoSiM provides a five-session evidence-based assessment and intervention lifestyle program. The training was informed by the KBIM program delivery (Appendix 3 and Ch 3), and the ‘Upskilling Mental Health Nurses to address the burden of poor metabolic health: A mixed method evaluation’ (Ch 5). The program was evaluated utilising the M-BACK tool (Ch 4).

The KoSiM program demonstrated positive quantitative results on the M-BACK, improving knowledge, attitudes and confidence on metabolic health care among mental health clinicians (133). It also demonstrated quantitative changes to diet and exercise patterns and a reduced waist circumference. To give further insight and understanding of these results a qualitative evaluation of participants experiences was undertaken. Chapter 6 ‘Tacking change in mental health service delivery: A qualitative evaluation of a lifestyle program targeting mental health staff – Keeping our Staff in Mind (KoSiM)’, described the positive changes that occurred to the culture of the mental health service and the approach mental health staff took in working with mental health consumers to be more inclusive physical health care. The KoSiM program was also viewed as highly acceptable to participants who valued that they also received a personal benefit from participating in the program.

Chapter 7, the concluding chapter to this thesis, utilises the socio-ecological model (SEM) to crystallise the results from the preceding studies. It describes the importance of changes at multiple levels to address the complex interplay between individual, interpersonal, organisational and community level of the SEM. It discusses how these results can be integrated into mental health service delivery and makes a number of recommendations for practice and further research.

Figure 2.1 provides a diagrammatical representation of the flow between studies in the thesis and the larger Keeping the Body in Mind program



My positioning as a researcher

Addressing these barriers and improving clinical practice in relation to the physical health care of people with SMI is a passion for me as a clinician. In my clinical work, I have observed first-hand the negative metabolic consequences of commencing antipsychotic treatment. I realised I had found an area of care in which a major inequity exists, and I wanted to make a difference in improving practice. I never set out to become a researcher, although over time I saw the value that research offered. Research provided a vehicle for improving the health outcomes of people experiencing SMI; this is what led to my enrolment in a PhD research program.

I undertook an undergraduate nursing degree with plans to become a clinician. During the course, I was drawn to mental health because it was a dynamic and interesting field, and nurses seemed to play a larger role in decision-making than in other clinical settings I had experienced during practicums. Most importantly, I observed that people diagnosed with SMI often experienced poor psychosocial outcomes, and I believed that I could make a difference in this area.

I have now been a mental health nurse for over 20 years, and still see high value in clinical service delivery. I am a national ambassador for Equally Well, an organisation working under the umbrella of the National Mental Health Commission, striving for better physical health outcomes for people who experience mental illness. I have lost count of the number of presentations I have delivered on the broad topic area of physical health care in people who experience SMI (well in excess of a hundred). I have co-authored over 30 publications on physical health care in people experiencing SMI and remain involved in several ongoing research projects on the topic.

Research philosophical perspective

The paradigm or philosophical beliefs used in research has been described as ‘a way of thinking about and making sense of the complexities of the real world’ (134p.69). Each paradigm has a different perspective on the methodology, rhetoric, axiology, epistemology, and ontology of research (135). Unlike constructivists, who suggest that knowledge is relative, and reality is too complicated, and positivistic researchers, who assert an objective data set gained by investigating empirical evidences and hypothesis testing, pragmatists believe that the process of acquiring

knowledge is on a spectrum rather than two divergent and mutually exclusive extremes of either subjectivity or objectivity (136). Thus, pragmatism is situated somewhere in the middle of the paradigm spectrum in terms of modes of examination. Pragmatism is a worldview that asserts to bridge the breach between the traditional positivistic methods that rely on empirical evidence and structuralist orientation of traditional approaches and the naturalistic methods and less restricted orientation of more recent approaches (136). As a research paradigm pragmatism is centred on the premise that researchers should use the methodological and/or philosophical approach that works best for the particular research problem that is being investigated (137).

Pragmatism was the philosophical approach applied to this project due to the complex and multifaceted nature of the overarching research question in this thesis, to explore ways to overcome the multi-level barriers to delivering metabolic screening and lifestyle interventions within mental health care services. A pragmatic approach allows the possibility of choosing the appropriate research methods from the wide range of qualitative and/or quantitative methods, and this pluralism is a recognised strength of pragmatism (135). Given this, having a flexible approach to comprehensively answer this question is a high priority and therefore lends itself to a pragmatic paradigm.

The research utilised in this thesis informed the process of its further research development. Having the flexibility to mould methodologies to answer and develop research framework was essential. Pragmatism enabled me to conduct research in dynamic and innovative ways that assists in finding solutions to a research problem. Pragmatism values practical functioning and both investigates and interrogates ideas and beliefs (138). It enabled research design to incorporate ‘a what will work best?’ approach to decisions in finding answers to operational questions. In adopting this stance, I was able to select the research design and the methodology that are most appropriate to address the research question as it evolved.

At its core, addressing metabolic health care for people experiencing SMI is a social justice issue. Pragmatism is typically associated with abductive reasoning that moves back and forth between deduction and induction (135). In this way, the researcher is actively involved in creating data as well as theories that has several advantages for research that involves social

justice issues (139). Pragmatism sets an inclusive framework of inquiry that supports interdisciplinary and cooperative research about social injustices (140). It has also been found to be particularly useful as a methodology for viewing organisational and social change processes, due to its ability to deal with dynamic and complex social processes (138).

Research methods

Pragmatism assumes an independence of methods and is often associated with mixed-methods or multiple-methods, where the focus is on the consequences of research and on the research questions rather than on the methods (136). It may employ both formal or informal rhetoric (135). A mixed-method approach provides both quantitative and qualitative data in an individual study or a sequence of studies (141). The central premise of using more than one approach is that doing so will provide a better understanding of a research problem than a single approach (141). This thesis organically grew out of a larger body of work being completed with the Keeping the Body in Mind (KBIM) team. It is both informed by and has contributed to the development of other KBIM studies that took place outside of this thesis.

Qualitative and quantitative approaches are seen as having contrasting advantages and drawbacks. Quantitative research can gather data from larger populations and its results can potentially be applied to other groups and settings (137). However, it can be critiqued for not understanding the unique and contextual experiences of research participants. Conversely, qualitative research explores individual experiences and circumstances, but for this reason it has the disadvantage of a lack of generalisability of its results (137). Applying a mixed method methodology has the potential to draw the best qualities out of both quantitative and qualitative approaches.

The methods of each study are described within each of the published works contained in this thesis. Due to the breadth of my objectives, I employed a variety of research methodologies. Four studies are presented in the thesis that each contributed valuable data to the overall research, which are integrated in the concluding chapter (Ch 7), in a mixed method design that was multiphase. Multiphase mixed method designs have the ability to combine sequential and/or

concurrent quantitative and qualitative data over multiple study phases (135). Each new phase of data collection informs the development and employment of the later phases. This is an important attribute to answering a research question that may evolve over time as more evidence comes to light.

Keeping the body in mind: A qualitative analysis of the experiences of people experiencing first-episode psychosis participating in a lifestyle intervention programme (Ch 3)

Chapter 3, The Keeping the Body in Mind (KBIM) qualitative study is a mixed-method sequential explanatory design. It is part of a larger piece of work on the KBIM program and is linked to a quantitative study (Appendix 4) with the same participants. This design was chosen because it was important to gain a deeper understanding of the research outcomes than could be provided by the quantitative results alone. In this model, the qualitative data helped to explain and interpret the quantitative results (142). Understanding the experiences of consumer participants in the program provided an in-depth understanding of why the program worked. It was important to be able to distil the elements of the program that could be harnessed to develop education, training and interventions in other settings.

A qualitative descriptive design was used for the research reported in Chapter 3. This method allows for a better understanding of the who, what, and where of people's experiences participating in the KBIM program (143). All 16 participants in the quantitative study of KBIM (Appendix 4) were provided with a participant information sheet and invited to join the qualitative component of the study. 11 people participated in semi-structured interviews. Semi-structured interviews were utilised to allow for the development of questions for replication with others, while retaining the opportunity for elaboration and clarification questions. This approach facilitates more detailed information in the participants' own words (144). Data were audio recording and written notes were made, and transcription was completed by a professional transcription service. Thematic analysis was used to detect and assemble codes, classify and develop categories. Transcripts were read and re-read independently by three authors to develop coding who then discussed coding to arrive at a consensus. This multiple coding approach reduces the risk of investigator bias.

The Validity and reliability characteristics of the M-BACK Questionnaire to assess the Barriers, attitudes, confidence, and Knowledge of Mental health staff regarding Metabolic health of Mental health service Users (Ch 4)

Chapter 4, The Metabolic-Barriers, Attitudes, Confidence and Knowledge (M-BACK) study required different approaches for various stages of development of the instrument. Development occurred in phases, starting with a literature review that provided a theoretical basis for the development of domains and questionnaire items, and a qualitative processes that transformed the theoretical points to a practical form (145).

The second phase of content validation was completed via a Delphi-style method employing subject experts. The Delphi method is a technique used for structuring group communication processes that deal with complex problems using an iterative process (146). Seven experts representing a variety of health professionals who had published experts in metabolic health care were recruited to participate in the Delphi survey. All seven experts participated in the first Delphi round seeking feedback on the clarity, relevance and importance of each question. Based on the feedback from this Delphi round revisions were to the questionnaire were made and sent for a second Delphi round where consensus on the questions were reached.

Piloting the structured qualitative questions with the target population (145) was completed with a group of nursing students undertaking a metabolic training course. This process allowed for identification of questions that may have been confusing or difficult to answer so they can be modified (147). The results of the completed the questionnaires of 31 undergraduate nursing students, administered seven days apart, were analysed as Intra-class correlation coefficients to determine the test-retest reliability of the instrument items (148).

Upskilling Mental Health Nurses to Address the Burden of Poor Metabolic Health: A mixed method evaluation (Ch 5)

The upskilling nurses study (Ch 5) was an educational evaluation that utilised a mixed methods approach in a concurrent nested design. The rationale for using this design was that a nested analysis can provide an ability to address sub-topics that require different methods within the same study (149). This allowed the quantitative evaluation of the course to occur, while in parallel collecting qualitative data on different aspects of student experience and needs.

This study used a validated tool the M-BACK (Ch 4) to determine training efficacy with a quantitative approach. The M-BACK tool was collected pre- and post-completion of a two-day metabolic health workshop for mental health nurses. The M-BACK, a 16-item Likert style scale, was used to measure the effectiveness of education and training to improve the attitudes, confidence, and knowledge of mental health nursing staff in relation to metabolic health and changes in perceptions of barriers to delivery of metabolic health care.

In addition to this, a qualitative approach was applied, with open-ended questions to provide information on needs, expectations and plans of participants. The purpose of the qualitative evaluation was to provide opportunities for participants' self-expression and thinking that went beyond standardised quantitative enquiry methodology (144). Three open-ended questions were asked of participants two pre-course commencement and one post.

The first of the pre-questionnaire qualitative questions 'What barriers might prevent you from addressing metabolic health with metabolic consumers?' was to explore which barriers were perceived by mental health nurses, to help inform future directions of policy, practice and research might be able to address these barriers. The second of the pre-questionnaire qualitative questions 'What do you hope to gain from participating in this course?' was to determine whether mental health nurses perceived needs in providing metabolic care incorporate in future education and training.

The third question ‘What screening and intervention changes do you plan to implement in your workplace following this workshop?’ was posed post-completion of the course. Some triangulation of the quantitative results was sought with this qualitative question, especially in relation to attitudinal change. The focus of this question was to elicit further information about how the course might result in changes to clinical practice.

Tackling change in mental health service delivery: A qualitative evaluation of a lifestyle program targeting mental health staff—Keeping our Staff in Mind (Ch 6)

Chapter 6, The Keeping our Staff in Mind (KoSiM) qualitative study was a mixed-method sequential explanatory design. It was part of a larger piece of work on the KoSiM program and is linked to a quantitative study (Appendix 4) with the same participants. This design was chosen because it was important to gain a fuller understanding of the program impacts on staff of participating in KoSiM than could not be provided with quantitative only data. Specifically, the study was to determine whether the program met its stated goals to improve staff health, instigate changes regarding the importance of the physical health of people with a lived experience of SMI, and increase the capability of mental health staff to deliver physical health assessments and interventions. In this model, the qualitative data helped to explain, interpret and build on the quantitative results (142).

The reporting of this research follows the Standards for Reporting Qualitative Research, a list of 21 items that support transparent reporting of qualitative research (150). The sampling approach was to collect data from as many participants as possible who met the inclusion criteria in order to reach data adequacy (151). Data collection was deemed to be complete when thematic saturation had been reached as determined by three researchers, as indicated by additional data generating minimal or no new knowledge to address the experiences.

The interviews were semi-structured, open ended, with looping and probing questions used throughout the interviews to garner the specific experiences of participants involvement. Conducting the interviews in this manner promoted more comprehensive information in the

interviewees' own language (144). Interviews included follow-up questions and clarifications about their involvement and its influences on their clinical interactions and personal life.

Thematic analysis was chosen for analysing the data as it provides precision and consistency and is also an exhaustive process (152). Thematic analysis is a commonly used method to explore the outcomes of lifestyle interventions and provides an appropriate level of data to ascertain the credibility and validity of the process (153). The data were processed according to the method set out by the six phases of thematic analysis described by Braun and Clarke (154).

The data were analysed by three researchers, to ensure the data was interpreted with appropriate rigor. The process involved a six phase approach: familiarisation with the data through transcription, generating initial codes, searching for themes, reviewing themes, defining and naming themes and producing the final written output (154). These themes were developed by using a constant comparison technique (155).

Ethical considerations

Undertaking research with human participants always requires careful ethical consideration. The Australian National Statement on Ethical Conduct in Human Research specifies that the risks and benefits of research must always be considered, and participants' consent must always be obtained (156). The major ethical concerns for the studies in this project were to ensure participants experienced no psychological harm, that informed consent was gained which was free from any coercion and the privacy and confidentiality of participants was maintained. A review of the ethical implications of the studies was undertaken as part of the process of submissions to the Human Research and Ethics Committee (HREC) of South Eastern Sydney Local Health District and/or the University of Technology, Sydney (UTS). All studies were approved as low/negligible risk. HREC research ratification letters are shown in Appendix 5.

Keeping the body in mind: A qualitative analysis of the experiences of people experiencing first-episode psychosis participating in a lifestyle intervention programme (Ch 3)

A number of ethical considerations required consideration for KBIM qualitative study. The participants under evaluation were young people experiencing early psychosis. Research of people experiencing mental illness is held to a higher standard, because this cohort is recognised as having greater vulnerability to coercion or psychological harm during research.

There remains a strong social stigma that is associated with mental illness, this makes the principle of confidentiality of even greater importance, than the high standards already expected of it in research. All data were stored securely in password protected files, and pseudonyms were utilised to protect the identity of participants. The transcription of interviews was completed only after a confidentiality agreement was signed. All copies of the interviews and related notes (the primary material) were destroyed except for a singular copy securely stored, and will be kept and destroyed in line with National Health and Medical Research Council (NHMRC) guidelines (157).

It was vital to ensure voluntary consent for participants that was received, and no coercion was present or perceived by participants. As part of the informed consent process a plain language participant information sheet (Appendix 6) was provided to all potential participants that emphasised that there were no ramifications for participating or not participating in the study, that withdrawal from the study could take place at any stage without needing to provide a reason, and all questions in the interview were optional to answer. Written informed consent was received from all participants.

The risk of participants in the study being influenced in their answers by members of staff that were involved in the ongoing care of participants was mitigated by the interviews being conducted by a researcher external to the program. Although a member of the clinical team was present during the interviews as a source of comfort and familiarity to the participant, at the end

of each interview this person left the room to allow for any information that might have been withheld due to a staff members presence to be added by the participant.

With these mitigating strategies in place the South Eastern Sydney Local Health District Human Research Ethics Committee approved the study as low/negligible risk as the posed questions were deemed as not invasive and non-threatening. Ethics approval number was Reference No. 13/040; LNR/13/POWH/85 and is included in Appendix 5A.

The Validity and reliability characteristics of the M-BACK Questionnaire to assess the Barriers, attitudes, confidence, and Knowledge of Mental health staff regarding Metabolic health of Mental health service Users (Ch 4)

Chapter 4, the M-BACK validation and reliability study needed to consider ethical aspects for all people involved in the different aspects of the study. Firstly, the expert panel involved in the content validation, secondly, pilot testing participant's and finally nursing students involved in instrument reliability. Each group was considered separately for the purpose of ethical issues.

The expert panel were invited to participate in validating the content in the questionnaire via email. The panel was comprised of clinicians with published expertise in physical health care in people experiencing a severe mental illness. Consent was implied by acceptance of the invitation to participate. No coercion or incentives were included in the invite. Panel members details have not been published and the details of their correspondence is kept in a password protected file and will be kept and destroyed in line with NHMRC guidelines (157).

Participants involved in pilot testing of the M-BACK were attending the metabolic education programs. Participants were provided the pilot testing version of the M-BACK, all forms were filled out anonymously with no means of retracing results to individual participants. Participants were made aware of the pilot testing procedure and consent was assumed with completion of survey.

The instrument reliability testing involved using the M-BACK questionnaire delivered 7-days apart. The participants were undergraduate nursing students in a speciality mental health subject.

Participation was voluntary and signed consent forms were completed. Confidentiality of participants was ensured through participants generating their own code for linking the two time points of the questionnaire and all demographic data was kept separately to questionnaire responses.

Ethical approval for the study was granted by University of Technology, Sydney Human Research Ethics Committee as a low/negligible risk study -HREC 2013000749 and appears at Appendix 5B.

Upskilling Mental Health Nurses to Address the Burden of Poor Metabolic Health: A mixed method evaluation (Ch 5)

The ethical issues arising from this study primarily related to maintaining confidentiality of participants responses to the M-BACK questionnaire. Several measures were put in place to maintain this confidentiality. Firstly, all survey responses are kept in a password protected that is securely stored, and maintained and destroyed in line with NHMRC guidelines (157). Responses were not identifiable to researchers as participants were asked to generate their own codes to link the pre- and post-testing responses. All potentially identifying demographic data was kept separate from M-BACK responses and qualitative question responses from participants. Participants were made aware that their non-identifiable responses would be used in a research study and completing the voluntary questionnaires assumed consent.

The study was approved by the University of Technology Human Research Ethics Committee and endorsed for use in the workshop by the Australian College of Nursing board. The HREC approval number is 2013000749 and it appears in Appendix 5B.

Tackling change in mental health service delivery: A qualitative evaluation of a lifestyle program targeting mental health staff—Keeping our Staff in Mind (Ch 6)

The ethical considerations in this study related to mental health staff members providing answers to interview questions after participating in a lifestyle intervention run by the health service. This posed two aspects to be considered; firstly, that the questions may draw personal

health information about a participant or their family and, secondly, such questioning has the potential for participants to provide positive feedback that they believe were desirable for the health service. They were assured that their responses would not affect their current or future employment. To negate any potential feelings of vulnerability among participants confidentiality and consent were of utmost importance.

Fully informed consent was provided both prior to the intervention and again prior to interviews post completion of the intervention. Written informed consent was provided by all participants. All data collected from participants was de-identified and stored on a password protected server. Raw data were only accessible to the research team, and published material used pseudonyms and contained no identifying features. Data will be retained and destroyed in line with NHMRC guidelines (157).

Theoretical framework

The barriers to improving metabolic health care for people experiencing SMI are inherently related to their social, cultural, and environmental contexts. Therefore, addressing these barriers requires big picture ‘systems thinking’ (158). One such example of this type of systems approach is the socioecological model (SEM) of health promotion (159). The SEM is a theoretical framework (see Figure 2.2) that views individual health-related behaviours as being influenced by factors at multiple levels (160, 161). The model promotes an understanding of the interrelationships between personal and environmental factors, and assists with understanding complex systems and how various levels of influence affect and transform each other in relation to health-related behaviours (161). Within the SEM influences and interventions are viewed as both enhancing the capacity of the individual and changing the expectations or characteristics of the environment or context (161). The model has a diverse range of usage, including in public health and lifestyle medicine (162). The Center for Disease Control and Prevention has utilised this model to inform its health promotion programs (163).

Figure 2.2 *SEM theory of health promotion and publication placement*



The SEM describes how individual, interpersonal, organisational, community and public policy factors influence the health outcomes of populations (161). The individual level of the SEM characterises a person's individual qualities, including their attitudes, knowledge and behaviours (160). Every individual bears some responsibility for their health; there is generally an option to participate in preventative lifestyle behaviours that can improve the biological, psychological and social aspects of health and wellness (164). The interpersonal level comprises the individual's relationships, such as with family, peers and health care providers (165). The organisational level of the SEM describes the influence of the characteristics and operations of social institutions, including health care facilities, on both health and health-related behaviours of individuals, including health care professionals (160). The community level of the SEM refers to the relationships between organisations with which individuals may interact. The public policy level is shaped by state and federal laws and policies and affects access to and utilisation of health services, including the adoption of healthy lifestyle behaviours (160).

In this research project, the SEM provided a theoretical framework for the synthesis of findings that are discussed in Chapter 6. Reducing the physical health inequalities experienced by those with SMI is an intricate issue that requires a multi-level approach; this positions the SEM as an excellent theoretical framework for viewing the problem and its potential solutions. For individuals experiencing SMI, the challenges of illness, its treatments, and environmental contexts often make it difficult or unfeasible to reduce their own metabolic health risks. Rather than placing sole responsibility on the individual, the SEM emphasises the need to create conditions and policies that make it possible and practical for an individual to achieve better metabolic health outcomes (161).

Chapter 3

A qualitative analysis of people experiencing first-episode psychosis participating in a lifestyle intervention programme

Chapter preface

The development of the Keeping the Body in Mind (KBIM) program occurred through many years of clinical practice and research. Rapid changes were being observed in the body shapes of young people newly diagnosed with psychosis within months of entering mental health care. These changes were concerning, and not well understood at the time; this led to Eastern Suburbs Early Psychosis Program (South East Sydney Local Health District) reviewing the level of metabolic health monitoring in its clinical population (166). The results of this review led to the development and implementation of a comprehensive screening protocol, which was later adopted across New South Wales (NSW).

Routine screening of metabolic measures in the Eastern Suburbs Early Psychosis Program allowed further research to be completed, which demonstrated what had been anecdotally observed: that despite it being a young cohort (16–27 years), over one third of the group exhibited metabolic syndrome or a metabolic abnormality early in their psychosis treatment (167). Further qualitative research with this group demonstrated that the impacts of metabolic changes were more than just physiological (168). The realisation that the seeds of future poor health and premature mortality sprouted early in treatment spurred the provision of support and interventions to reduce the impact of the metabolic health burden on mental health consumers.

The development of the KBIM program involved exploratory research and then a trial of lifestyle interventions (169). Building upon the ongoing metabolic screening, preventative interventions were implemented, including encouraging a healthier lifestyle via health coaching and both group and individually tailored sessions on exercise and nutrition (170). This work gained NSW Ministry of Health funding to examine the effectiveness of lifestyle interventions and allowed the formation of a specialist KBIM team targeting metabolic health within the mental health

service. The KBIM program demonstrated that weight gain typically associated with early psychosis treatment could be attenuated with lifestyle interventions (131).

This chapter describes my research on the subjective experiences of people diagnosed with early psychosis who participated in the KBIM intervention program. This study follows on from the KBIM parent study (see Appendix 3), which quantitatively demonstrated statistically, and clinically significant outcomes compared to the control group on both weight and waist circumference. Chapter 3 presents the results of qualitative research, giving a deeper understanding of the process by which, these outcomes were achieved.

Ethics approval was by the Southern Eastern Sydney Local Health District Human Research Ethical Committee (reference no 13/040; LNR/13/POWH/85) on 7th August 2014 (see Appendix 5A).

Permission has been granted to include this publication in this PhD thesis (see Appendix 1A)


Publication

Watkins A, Denney-Wilson E, Curtis J, Teasdale S, Rosenbaum S, Ward PB, Stein-Parbury J. Keeping the body in mind: A qualitative analysis of the experiences of people experiencing first-episode psychosis participating in a lifestyle intervention programme. *International Journal of Mental Health Nursing* 2020;29(2):278-289.



ORIGINAL ARTICLE

Keeping the body in mind: A qualitative analysis of the experiences of people experiencing first-episode psychosis participating in a lifestyle intervention programme

Andrew Watkins,^{1,2}  Elizabeth Denney-Wilson,³ Jackie Curtis,^{1,4} Scott Teasdale,^{1,4} Simon Rosenbaum,⁴ Philip B. Ward^{4,5} and Jane Stein-Parbury²

¹Keeping the Body in Mind Program, The Bondi Centre, South Eastern Sydney Local Health District, Bondi Junction, ²Faculty of Health, University of Technology, Sydney, ³Faculty of Medicine and Health, University of Sydney, Sydney, ⁴School of Psychiatry, University of New South Wales, Sydney, Sydney, and ⁵Schizophrenia Research Unit, Ingham Institute for Applied Medical Research, Liverpool Hospital, South Western Sydney Local Health District, Bondi Junction, New South Wales, Australia

ABSTRACT: *The life expectancy gap experienced by people living with severe mental illness is primarily a result of cardiometabolic disease that is often exacerbated by side effects of antipsychotic medication. Commencement of atypical antipsychotic medication is commonly associated with weight gain. The Keeping the Body in Mind programme has demonstrated that early intervention with lifestyle activities can attenuate this weight gain and potentially improve long-term health outcomes. The aim of this study was to explore the experiences of young people who participated in the Keeping the Body in Mind programme, a targeted lifestyle intervention programme. A qualitative approach was used employing a semi-structured interview format. The interview schedule included questions related to four topics: aspects of the programmes that were useful, attributes of staff members that influenced the programme, changes in attitudes towards their own physical health, and suggestions for programme improvements. Interviews were recorded with duration ranging from 40 to 65 min. Thematic analysis was used to detect and assemble codes. These were then synthesized and classified into themes. Eleven participants were interviewed (seven males), aged between 18 and 25 years. Thematic analysis revealed four main themes: the role of physical health in mental health recovery; the importance of staff interactions; the value of peer interaction; and graduation to a sustainable healthy lifestyle. Study participants reported that they valued the programme for both their physical health and mental health recovery.*

KEY WORDS: *antipsychotic agents, cardiovascular diseases, health promotion, lifestyle, Mental health, mental health recovery, metabolic diseases, qualitative research.*

Correspondence: Andrew Watkins, Keeping the Body in Mind Program, 26 Llandaff St, Bondi Junction, NSW 2022, Australia. Email: Andrew.Watkins@health.nsw.gov.au

Authors' Contributions: AW, JSP, JC, SR, and ST constructed interview questions. JSP and AW conducted interviews. AW, JSP, and EDW categorized data. PW provided support around study design. AW drafted the original manuscript. AW, JSP, EDW, PW, JC, ST, and SR revised all versions of the manuscript and contributed to data analysis. All authors substantially contributed to the conception or design of the work, or the acquisition, analysis, or interpretation of the data for the work; drafted the work or revised it critically for important intellectual content; gave final approval of the version to be published; and provided agreement to be accountable for all aspects of the work

in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

Declaration of conflict of interest: The authors declare no financial or personal conflicts of interest that would cause bias in this manuscript.

Andrew Watkins, MN.
Elizabeth Denney-Wilson, PhD.
Jackie Curtis, PhD.
Scott Teasdale, PhD.
Simon Rosenbaum, PhD.
Philip B. Ward, PhD.
Jane Stein-Parbury, PhD.
Accepted November 18 2019.

BACKGROUND

People who experience a severe mental illness (SMI) have a life expectancy gap of up to 20 years compared with the general population (Lawrence *et al.* 2013). The primary reason for this premature mortality is cardiovascular disease, which is precipitated by underlying risk factors such as of diabetes, hyperlipidaemia, obesity, and hypertension. Weight gain and metabolic changes have been consistently associated with use of atypical antipsychotics that are frequently prescribed for people with a SMI (Almandil *et al.* 2013; Alvarez-Jimenez *et al.* 2008; Tek *et al.* 2016). These circumstances not only result in a reduced life expectancy, but also negatively impact quality of life (Awad & Voruganti 2004). Young people in particular experience rapid increases in weight within the first three months of commencing antipsychotic medication (Correll *et al.* 2009). This weight tends to be centrally deposited around the abdomen, which increases the risk of metabolic disorders including diabetes and cardiovascular disease (Newcomer 2007).

Young people who are admitted to an inpatient mental health unit hold attitudes towards their own physical health that are similar to their peers without mental illness in their desire to be fit and healthy; however, they identified that illness and treatment had impacted negatively on their physical health, especially in relation to weight gain (McCloughen *et al.* 2016). It has also been found that young people with psychosis often lack motivation to manage their physical health needs (Watkins *et al.* 2012). They require structure and support to assist them in physical health management and to overcome a lack of coping strategies, sedentary behaviour, reduced energy, and limited health literacy (McCloughen *et al.* 2016).

Health promotion lifestyle interventions have been successful in reducing the cardiometabolic risk factors of people with SMI (Fernández-San-Martín *et al.* 2014). Lifestyle interventions are now recognized as first-line treatment for both treating and protecting living with a mental illness and endorsed by WHO (Firth *et al.* 2019; WHO 2018). Recent large randomized controlled trials have utilized group-based lifestyle interventions to improve dietary intake and increase physical activity (Bartels 2015; Daumit *et al.* 2013; Green *et al.* 2015), with the addition of health coaching support in two of these studies (Bartels 2015; Daumit *et al.* 2013). While these programmes have been successful in reducing cardiometabolic risk, they have focussed on reversing metabolic health problems rather

than prevention. The Keeping the Body in Mind (KBIM) programme targets young people in the early stages of antipsychotic treatment and is one of the few lifestyle interventions in this area that has taken a preventative approach. Evaluation of the KBIM programme that included $n = 16$ intervention participants and $n = 12$ controls has been previously published (see Curtis *et al.* (2016)), demonstrating successful attenuation of weight gain in the first 3 months of antipsychotic treatment. These results reflected changes to participants' lifestyles in which energy intake was markedly reduced, and self-reported physical activity and aerobic fitness were improved (Curtis *et al.* 2016).

While these are important findings, quantitative methods provide an understanding of what happened, but do not shed light on how or why it happened, in contrast to qualitative modes of enquiry. This qualitative study explores the experiences of young people with a first episode of psychosis who participated in the KBIM programme. Using qualitative methods to understand the experiences of individual KBIM participants affords additional insight into the process of engaging young people with SMI to make changes in their health behaviours, to understand the acceptability and applicability of intervention components, and to adapt the programme in future (Gross *et al.* 2016).

METHODS

Aim

The aim of this study was to explore the personal experiences of KBIM participants, in particular the aspects of the programme that they perceived to be helpful in achieving physical health and other improvements.

Design

The study design utilized qualitative descriptive methods. Qualitative descriptive studies employ the principles of naturalistic enquiry or investigating a phenomenon as much as possible in its natural state (Sandelowski 2010; Vaismoradi *et al.* 2013). A qualitative descriptive design allows for an understanding of the *who*, *what*, and *where* of events or experiences (Sandelowski 2010).

Participants

All study participants were service users who were among the first cohort to participate in the KBIM intervention as part of treatment for first-episode psychosis. DSM diagnoses included schizophreniform ($n = 7$), bipolar affect

disorder ($n = 3$), depression with psychotic features ($n = 1$), and schizophrenia ($n = 1$), and all participants were receiving atypical antipsychotic treatment. Programme inclusion criteria were clinical diagnosis of first-episode psychosis and treatment with antipsychotic medication. Exclusion criteria were an inability to speak or read the English language. Willingness and capacity to provide informed consent and participate in an interview were additional inclusion criteria for this study.

Recruitment

All 16 participants in the original KBIM intervention were provided with a participant information sheet and invited to participate in the qualitative interviews. Those who gave their consent and permission had their names provided to the research team. The research team contacted eligible participants and provided information about the study.

Context

The primary goal of the KBIM 12-week lifestyle intervention programme was to prevent weight gain and deterioration in metabolic health that frequently occurs following commencement of treatment with antipsychotic medications. There are three interrelated components: health coaching, dietetic advice, and exercise support (Curtis *et al.* 2016). A clinical nurse consultant (AW) provided health coaching to assist participants with goal identification and motivational interviewing to encourage engagement and participation in the programme. A dietitian (ST) offered weekly consultations and group activities aimed at nutritional skill acquisition via shopping tours and cooking classes. An exercise physiologist (SR) offered individualized exercise intervention plans, and participants had access to a supervised gym, and weekly group sports activities.

Data collection

Data were collected during semi-structured interviews. A key feature of the semi-structured interview is the development of questions that allow for replication with others, while retaining the opportunity for elaboration and clarification questions (Pope *et al.* 2000). The primary advantage of these types of interviews is that they provide more detailed information in the participants' own words. Standardization of some questions increases comparative analysis; non-standardized spontaneous questions provide opportunities for participants' self-expression (Pope *et al.* 2000).

The interview schedule (Fig. 1) included questions related to four topics: aspects of the programmes that were useful, attributes of staff members that influenced the programme, changes in attitudes and behaviour towards personal physical health, and suggestions for programme improvements. Follow-up questions were included to elicit more detail by probing and clarifying initial responses (Holloway & Galvin 2016).

Interviews were conducted by JSP (female), an experienced qualitative interviewer, with AW (male) in attendance to manage recording equipment and ask clarification questions at the conclusion of the interview. The primary interviewer (JSP) was not involved in the KBIM programme and was unknown to participants prior to the interviews. AW was known to the participants, and his presence was designed to reduce the anxiety of participants by providing a familiar face. Participants were offered an opportunity to add comments while AW was not present, in an effort to reduce the risk that participants felt obliged to only offer positive comments about KBIM. They took place during July 2014, 5 months after the intervention had been concluded. The interviews lasted between 40 and 65 min and were audiotaped and transcribed verbatim. Time was made available for casual conversation prior to the interview to help participants feel more comfortable speaking to the interviewer and answering questions. Following the interview, participants were given an opportunity to reflect on issues that may have arisen during the interview process.

Ethical considerations

Participants were advised of the nature of the study and that involvement was voluntary, that it would not impact on any future care the mental health service may provide, and that they could withdraw at any time. The participants were also assured of confidentiality, all data were coded, and pseudonyms would be used in any reports that arose from the study. Once participants understood the details of the study, written informed consent was obtained prior to the interviews commencing. The study was approved by the South Eastern Sydney Local Health District Human Research Ethics Committee (Reference No. 13/040; LNR/13/POWH/85).

Data analysis

Interviews were audio-recorded, and written notes were made during the interview process to identify common or prominent themes. Audio recordings were

transcribed by a professional transcription service after a confidentiality agreement was signed. Thematic analysis was used to analyse the transcripts (Braun & Clarke 2006). Thematic analysis is the methodical inductive examination of text by detecting and assembling themes and coding, classifying, and developing categories (Vaismoradi *et al.* 2013). AW, JSP, and EDW independently read and re-read the transcripts and interview notes, to develop detailed notes. From the data, broad codes were inductively developed from these reviews and refined and synthesized to produce categories. This multiple coding approach was utilized to reduce the risk of investigator bias (Whitley & Crawford 2005). Following discussion, the authors agreed on the major themes described below.

RESULTS

Eleven participants were interviewed: seven males and four females, aged 18–25 years. DSM-IV diagnoses were performed for seven participants with schizophreniform disorder, three participants with bipolar affective disorder, and one participant with major depression with psychosis. There were five people in the original KBIM intervention cohort who did not participate in the interviews. The reasons for their non-participation were as follows: two had moved away from the local area and two had full-time work commitments, and one person declined, not stating a reason.

Data analysis revealed four main themes: the role of physical health in mental health recovery; the

importance of staff interactions; the value of peer interaction; and graduation to a sustainable healthy lifestyle.

The role of physical health in mental health recovery

Participants emphasized the importance of the link between physical health and mental health. They recognized that engaging with the KBIM service had a beneficial effect on their mental health recovery. Participants identified improved self-esteem, a renewed sense of hope, an improved mood, and increased motivation as elements that were enriched by focussing on physical health improvement through participation in KBIM.

Self-esteem

All participants described that the KBIM interventions improved their self-esteem. Weight gain associated with antipsychotic use was a source of distress to participants, and being able to moderate this had benefits in terms of self-worth. Many participants reported that participating in physical health interventions assisted with restoring the lost belief and certainty in themselves that occurred as a result of having a psychotic episode.

I think before I came up here my self-esteem was low because I wasn't happy with my life or my body. I was worried about not being able to study and putting on

Summary of interview schedule

What were your experiences like with the KBIM team?

Did your lifestyle change as a result of attending the KBIM program? If so what changed?

Can you describe for me your interactions with the KBIM staff?

Did you feel like you could discuss concerns about physical health and side-effects of medication with KBIM staff?

What was your experience with the KBIM group activities like?

How did you feel about your physical health being screened?

Do you feel like your physical health has any link to improving your mental health?

Would you recommend this program to someone in a similar circumstance to you?

Are there any aspects of the KBIM program that you feel should be changed or improved?

FIG. 1: Interview schedule.

weight. Since I've been exercising and eating better, I've lost the weight and got back to study, I think my self-esteem and my confidence have built up by coming to the gym and groups. Soli (age 18)

The big one is more my self-esteem and confidence has really improved. My physical health has improved heaps but I'd probably say my confidence has built up even more coming to the gym and groups. Angela (age 23).

Hope

Many of the participants felt a sense of hopelessness before entering the KBIM programme. The diagnosis of psychosis was perceived as a traumatic event. Participants identified the benefit of the structure and activity that attending the KBIM programme had on their recovery in that it instilled hope for their future. The structure of the programme provided a sense of purpose when things felt hopeless.

I really love the KBIM gym, and the gym was actually a really good place for me to come when I first got out of hospital. I felt hopeless coming out of hospital and didn't really see the point in life. KBIM really got me back on my feet with my mental health and it was something to do as well. It definitely made me feel a lot better in myself. Nadya (age 20).

I felt that, whilst I was riding on the exercise bike, physically exercising my body, I'd sort of think of things in my mind that were pleasant in terms of my life, the future and how I'll get to those goals. Mark (age 24).

Improved mood

Improvement in mood was a theme all participants mentioned by participants. Participants stated that their sense of achievement and control over their physical health helped them not only feel better about themselves but also improved their general outlook on life. For many participants, the KBIM programme provided an anchor when the rest of life felt in disarray.

When I first got unwell, I felt really lost and questioned whether life was worth living. Having the KBIM program to go to was certainly a welcome distraction. It gave me goals to focus on, it was like I was doing something worthwhile and not just sitting at home as that can be a really depressing experience. The structure was really important I stopped being so focussed on the psychosis itself. I'm now more physically active and take care of myself in terms of physical activity

and nutrition, it has improved my mood, my enthusiasm and my focus on things Angela (age 23).

I've started working out up here that's really improved. Even my general mood - since I've come up here it's been a lot more stable. I think it'd probably come back down to the structure thing, but it's definitely made me more stable. I'm just generally feeling happier and more motivated. David (age 20).

Overcoming a lack of motivation

KBIM provided participants with structure, encouragement, and support that allowed participants to regain motivation that was lost during their illness. Increasing motivation was not something that changed immediately on commencing in the KBIM intervention; rather, it required continual effort. KBIM activities made participants feel like they were doing something productive, gave them a sense of purpose, and increased their enthusiasm for life in general.

Going to the gym, the group and eating better just gave me a positive feeling, maybe like a healthy sort of feeling. Yeah, just like a happy, productive feeling. I suppose, yeah. I suppose if you're sort of more physically active and take care of yourself in terms of physical activity, it just improves your mood, your enthusiasm and your focus on things, yeah, rather than if you were lazy and just didn't care about wellbeing. Mark (age 24).

It was very comforting, it was comfort as well because when I got out of hospital, obviously I lost my job and other things because of being in there. It gave me somewhere to go and something to do, and something to get up for. Ivan (age 25).

Staff interactions: Support, encouragement, and positive change

Interactions with KBIM staff members were discussed in detail by the majority of participants. These interactions highlighted the support and encouragement experienced during their interactions with KBIM staff. In order to assist making changes to participant's physical health, goal setting and metabolic screening were a core part of the programme that was embraced by participants.

Support

Participants were positive about their interactions with staff members in the KBIM programme. Participants

felt that they were understood and appreciated, and a non-judgemental space had been created. Staff were considered to be flexible, friendly, and knowledgeable. Participants felt staff were approachable and available to discuss a wide range of topics including medication side effects.

I found the workers here so supportive and inspiring. They were always so encouraging and easy to talk to, I felt like I could talk to them about anything, it was more than just diet and exercise stuff, I spoke to them about mental health, side-effects and just how things were going in my life, I never felt judged.

Mohammad (age 21).

They always found a way to look for the good things in my life. I think as a result I am much more upbeat and happy in my own attitude and accepting of my mental health.

Grace (age 24).

Encouragement

The participants acknowledged the importance of staff encouragement that came from utilizing a strength-based treatment approach that focussed on enhancement of individual abilities. Participants strongly attributed their own motivation and resulting health improvements to the encouraging support provided by staff.

I suppose maybe that there is encouragement in the form of somebody who really knows about those physical health areas and help you make changes in those areas. They always found a way to encourage me positively and dwell on a positive aspect of my life. Even though I felt unhealthy they helped me believe that I could still make a change.

Grace (age 24).

I wasn't feeling enthusiastic about making changes to my diet or increasing my exercise when I first came to the program. The staff gave me the support and encouragement to make changes that I don't think I would have done on my own. Even though I was pushed I still felt like I was going at my pace.

Brad (age 22).

Goal setting

Participants identified that staff helped create awareness of the impact of lifestyle choices had on their physical health. There was a variety of opinions as to the degree of encouragement they received to reach their goals. Some participants perceived nothing other than gentle prodding, while others felt they were firmly

pushed towards their goals. Despite the focus of the programme on goal attainment, participants felt ownership over the goals set. Participants unanimously stated that the staff attitude towards goal achievement was not overbearing and always viewed these attitudes as a positive contribution towards making progress.

I wasn't feeling enthusiastic about making changes to my diet or increasing my exercise when I first came to the program. The staff gave me the support and encouragement to make changes that I don't think I would have done on my own. Even though I was pushed I still felt like I was going at my pace and working on things I wanted to work on.

Brad (age 22).

We planned a goal and then planned how we would achieve it, and if it was achievable or not. Then the next week I'd go out and do the goal. If I succeeded then we'd pick a new one, or we'd still work on the old one if I hadn't succeeded.

Soli (age 18).

Physical health screening

Regular screening of physical health measures such as weight, waist circumference, and blood pressure was key element of the KBIM programme. Some participants felt awkward or confronted when staff first initiated these measures. However, even those who were ambivalent at first about having these physical health measures taken by staff perceived the benefits and were willing to participate in the screening process.

With the measurements I suppose I felt, embarrassed, and maybe there was also some unhappiness about my body. Once they explained to me what the measurements were for and I understood them, it was fine. Now I really like the measurements and I always ask for them to be done so I can see my progress.

Zaha (age 19).

The value of peer interaction: A sense of belonging

The KBIM programme provided many intervention elements in a group format, which allowed for a high level of interaction between participants. The resulting peer support that occurred during these groups was highly valued by participants. The peer activities created empathy and respect between participants and provided perceived benefits that included increased confidence, empowerment, social inclusion, coping skills, and teamwork. The three main themes that emerged in the domain of peer interaction were a reduction in social isolation, shared learning, and reduction in stigma.

Reduction of social isolation

The KBIM programme was viewed as a place where fun was experienced and supportive friendships developed. Participants expressed the importance of peer interactions as assisting with their recovery and increasing their social connectedness. Many participants reported that attending KBIM activities was their sole social interaction for the day.

One of the things I really looked forward to when coming into the activities was meeting up with the other young people there and having a chat. It was often my only social interaction for that day. I feel more confident to interact with people. David (age 20).

Shared learning

Learning to work together with others to achieve a common goal was identified by participants as being important. Co-operation and working together were seen as core elements that occurred when cooking a meal together or completing a group workout. These activities were described as not only enjoyable but also produced a sense of achievement for themselves and as part of the bigger group.

The co-operation in cooking group is very satisfying, being able to get together in cooking group and make a meal that we can all sit down and eat together is very nice. The food is very good and feel like I have accomplished something with the group. Mohammad (age 21).

Stigma reduction

Spending time with other young people in circumstances similar to themselves was viewed as particularly beneficial in reducing the stigma that is commonly experienced by those experiencing psychotic disorders. Participants reported feeling a greater level of acceptance of themselves from others and found that they were better able to relate to others. This resulted in an increased perception of support and a 'sense of belonging'.

I guess knowing that there are other people my age going through things like me with my mental health, it gave me a sense of belonging. I knew that there were other people I could talk to and they could understand what it was like to experience what I had experienced, I didn't feel isolated. Soli (age 18).

The graduation to a sustainable healthy lifestyle

Participants in the programme all conveyed that they had made modifications to their lifestyle that they believed had made them healthier. Dietary and physical activity improvements were most commonly identified as key change elements. Participants believed that they had now the knowledge to live a healthy lifestyle, that the changes they had made could be sustained, and that their capacity to make lifestyle changes in the future was enhanced.

Education

All participants commented on their development of greater knowledge about what living a healthy lifestyle entailed. Participants felt they knew much more about what constituted a good diet and an appropriate level of physical activity. Not only was knowledge increased but they also perceived that the knowledge that they had gained would allow them to continue to make positive lifestyle changes in the future.

I learnt how to follow a recipe, I can read nutritional labels, I've learnt a whole heap of exercises I can do without equipment. So I feel like all the skills I now have, I can stay healthy in the future, even if I'm not coming into the Bondi Centre. Brad (age 22).

Positive Habit Development

Participants identified the challenges of staying healthy, especially while taking antipsychotic medication. They identified the programme as helping them with their self-discipline, allowing them to get into healthy lifestyle habits that they could maintain. They believed that they could independently achieve their health goals moving forward without specialist health input.

I always wanted to be healthier and I would be for a while but I couldn't keep consistency. At the centre I made a plan with the staff that was manageable. I was then able to develop a routine, so I could stick to it. I have been able to change the plan independently and stick to this too. Angela (age 23).

Confidence

Participants described that attending the programme helped them achieve goals. Upon achieving these goals, participants stated that they believed that they could achieve more. Participants reported that they would be able to succeed in meeting future goals related to

physical health and also conveyed a greater capacity for making changes in other aspects of their lives such as gaining employment and creating new relationships.

I've benefitted in terms of getting fitter physically and weight management. I've achieved goals with eating healthy and being disciplined with regard to food. Also going to the gym has helped and contact with the exercise physiologist. I've been more enthusiastic about approaching other things in my life like activities and things or challenging myself. I feel confident that I can achieve them.
Sunan (age 25).

DISCUSSION

The present study aimed to describe the experiences of young adults with psychosis participating in the 'Keeping the Body in Mind' lifestyle intervention delivered by a multidisciplinary team comprising a clinical nurse consultant, exercise physiologist, dietitian, and peer support worker. Through participating in the KBIM programme, young people participants in this study related how they had improved their skills and knowledge about what constitutes a healthy lifestyle and adopting new behaviours. In previous research, young adult mental health consumers identified that they lacked knowledge and motivation to address the considerable negative impact on their physical health that accompanied development of a mental illness (McCloughen *et al.* 2016). The present study showed that providing young adults with a lifestyle intervention was an enabling factor for them to take control of their physical health.

Further to managing physical health issues, lifestyle interventions have also been demonstrated to have benefits for mental health recovery. First-episode psychosis is commonly associated with low levels of self-esteem and confidence that may not be addressed by standard care (Romm *et al.* 2011). The noted improvement of self-esteem and confidence from participants is reflective of previous studies that explored the impact of lifestyle interventions for people experiencing mental illness (Soundy *et al.* 2014). Young adults who engaged in lifestyle activities received a boost in self-esteem and confidence through experiencing a sense of pride in accomplishment (Hedlund & Gyllensten 2013), a sense of purpose (Leutwyler *et al.* 2014), and a daily structure that reduces boredom (Roberts & Bailey 2013).

Social interactions have been identified as an important part of health in general (Umberson & Karas Montez 2010) and in particular mental health recovery (Topor *et al.* 2011). Social connection has been

specifically identified as important in first-episode psychosis (Cotton *et al.* 2011), and the current study demonstrated strongly the importance of receiving support, especially from peers. A key feature of the current intervention involved group work and shared experiences. These interactions fostered a sense of belonging, enhanced social interactions, and increased motivation, in line with a previous study of the experiences of adults with SMI who participated in a healthy lifestyle programme (Park *et al.* 2017). Group lifestyle interventions for people with mental illness have been demonstrated to facilitate positive behaviour change and engagement via increasing cohesion and relatedness among individuals (Leutwyler *et al.* 2014), and reducing anxiety in group environments (Johnstone *et al.* 2009). Not only are group lifestyle activities important in fostering connection with others but they also provide motivation to individuals and the potential to become a medium for modelling behaviours (Roberts & Bailey 2013).

Social support in the current study was identified as coming from staff members in addition to that of peers. Social support is often described as having three domains: instrumental, informational, and emotional (Tay *et al.* 2013). Participants in this study identified all three: instrumental support was evident in the form of assisting with physical exercise and food preparation; informational support was provided in the form of education about nutrition and exercise; and emotional support was experienced in the form of empathy, warmth, and acceptance. In a review of lifestyle intervention studies, Soundy *et al.* 2014, reported that encouragement and motivation have been the most frequently observed form of supportive behaviour for people who experience mental illness. Emotional support, a key finding in this study, has been found to be particularly important in facilitating social confidence in people experiencing SMI (Corrigan & Phelan 2004; McCorkle *et al.* 2008). However, it is worth noting that instrumental support and informational support were also identified as valuable with knowledge acquisition and access to an on-site gym and kitchen greatly valued by participants.

Participants identified their relationships with staff members as key with staff described as being approachable and friendly. This is notable when considering another study involving a similar cohort completing a group education lifestyle intervention; while many successes were identified, participants reported that they needed more individualized support to implement lifestyle changes (Rönnngren *et al.* 2017).

The findings in the current study align with Roberts and Bailey's (2013) findings that staff connection with people experiencing mental illness provided an incentive for engagement in lifestyle activities.

The results achieved in the current study, related to improving the knowledge and skills of lifestyle intervention, are consistent with previous research that has shown improvements in these areas (Fogarty & Happell 2005; Hedlund & Gyllensten 2013; Johnstone *et al.* 2009; Leutwyler *et al.* 2014; Park *et al.* 2017; Rönngren *et al.* 2017; Shiner *et al.* 2008; Wärdig *et al.* 2015). A notable finding from the current study was the participants' perception that lifestyle changes were sustainable. This view and its relationship have been borne out by longer-term quantitative follow-up of participants, as two-year outcome data from this cohort have shown weight and waist circumference stability (Curtis *et al.* 2018).

Self-determination theory indicates that humans have three fundamental needs – relatedness, autonomy, and competence – which in turn promote well-being and motivation (Baumeister & Leary 1995). Self-initiated lifestyle interventions were encouraged in the current study and promoted the autonomy of participants. Group work interventions promoted mutual peer engagement and relationship-building. This suggests that benefits of these lifestyle interventions may go beyond the physical health and basic psychological benefits usually associated with lifestyle interventions. The value of the group processes, individual support, and promotion of self-initiated lifestyle interventions promote self-determination.

LIMITATIONS

Because there were only positive comments about the programme and its staff, a limitation of this study was that a member of the KBIM team (AW) was present during the interviews. While all participants were offered an opportunity to comment further while AW was not present, they may have been reluctant to do so as this could have signalled they wished to make negative comments. Although data saturation had been reached, the applicability of this study to other settings is a limitation as the 11 participants were all young people in the initial stages of treatment for a first-episode psychosis. In order to better understand the impact of lifestyle interventions, future studies should include a qualitative analysis of experiences of the families and carers of participants and of that of staff members.

CONCLUSION

Evaluations of lifestyle programmes designed to attenuate antipsychotic weight gain are rare, and this is the first to utilize a qualitative approach. This qualitative evaluation adds an important dimension to better understanding the benefits of providing lifestyle interventions to consumers experiencing early psychosis. The KBIM model has demonstrated that the effects of lifestyle interventions extend beyond physical health benefits to include a wide spectrum of benefits for mental health recovery. Lifestyle intervention programmes are highly valued by young people experiencing early psychosis and should be a core focus of early psychosis service delivery.

RELEVANCE FOR CLINICAL PRACTICE

This study underlines the importance of lifestyle intervention programmes to incorporate both group and individual components, where peer support and clinician rapport can be deployed, enabling sustained benefits from a short-term intervention. Future clinical interventions in people with SMI should incorporate these key components.

REFERENCES

- Almandil, N. B., Liu, Y., Murray, M. L., Besag, F. M., Aitchison, K. J. & Wong, I. C. (2013). Weight gain and other metabolic adverse effects associated with atypical antipsychotic treatment of children and adolescents: A systematic review and meta-analysis. *Pediatric Drugs*, *15*, 139–150.
- Alvarez-Jimenez, M., Gonzalez-Blanch, C., Crespo-Facorro, B. *et al.* (2008). Antipsychotic-induced weight gain in chronic and first-episode psychotic disorders. *CNS Drugs*, *22*, 547–562.
- Awad, A. G. & Voruganti, L. N. (2004). Impact of atypical antipsychotics on quality of life in patients with schizophrenia. *CNS Drugs*, *18*, 877–893.
- Bartels, S. (2015). Can behavioral health organizations change health behaviors? The STRIDE study and lifestyle interventions for obesity in serious mental illness. *The American Journal of Psychiatry*, *172*, 9.
- Baumeister, R. F. & Leary, M. R. (1995). The need to belong: desire for interpersonal attachments as a fundamental human motivation. *Psychological Bulletin*, *117*, 497.
- Braun, V. & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, *3*, 77–101.
- Correll, C. U., Manu, P., Olshanskiy, V., Napolitano, B., Kane, J. M. & Malhotra, A. K. (2009). Cardiometabolic risk of second-generation antipsychotic medications during

- first-time use in children and adolescents.[see comment]. *JAMA*, 302, 1765–1773.
- Corrigan, P. W. & Phelan, S. M. (2004). Social support and recovery in people with serious mental illnesses. *Community Mental Health Journal*, 40, 513–523.
- Cotton, S. M., Luxmoore, M., Woodhead, G., Albiston, D. D., Gleeson, J. F. & McGorry, P. D. (2011). Group programmes in early intervention services. *Early Intervention in Psychiatry*, 5, 259–266.
- Curtis, J., Watkins, A., Rosenbaum, S. et al. (2016). Evaluating an individualized lifestyle and life skills intervention to prevent antipsychotic-induced weight gain in first-episode psychosis. *Early Intervention in Psychiatry*, 10, 267–276.
- Curtis, J., Watkins, A., Teasdale, S. et al. (2018). 2-year follow-up: Still keeping the body in mind. *The Australian and New Zealand journal of psychiatry*, 52, 602.
- Daumit, G. L., Dickerson, F. B., Wang, N.-Y. et al. (2013). A behavioral weight-loss intervention in persons with serious mental illness. *New England Journal of Medicine*, 368, 1594–1602.
- Fernández-San-martín, M. I., Martín-López, L. M., Masa-Font, R. et al. (2014). The effectiveness of lifestyle interventions to reduce cardiovascular risk in patients with severe mental disorders: Meta-analysis of intervention studies. *Community Mental Health Journal*, 50, 81–95.
- Firth, J., Siddiqi, N., Koyanagi, A. et al. (2019). The Lancet Psychiatry Commission: A blueprint for protecting physical health in people with mental illness. *The Lancet Psychiatry*, 6, 675–712.
- Fogarty, M. & Happell, B. (2005). Exploring the benefits of an exercise program for people with schizophrenia: A qualitative study. *Issues in Mental Health Nursing*, 26, 341–351.
- Green, C. A., Yarborough, B. J. H., Leo, M. C. et al. (2015). The STRIDE weight loss and lifestyle intervention for individuals taking antipsychotic medications: A randomized trial. *American Journal of Psychiatry*, 172, 71–81.
- Gross, J., Vancampfort, D., Stubbs, B., Gorczynski, P. & Soundy, A. (2016). A narrative synthesis investigating the use and value of social support to promote physical activity among individuals with schizophrenia. *Disability and Rehabilitation*, 38, 123–150.
- Hedlund, L. & Gyllensten, A. L. (2013). The physiotherapists' experience of Basic Body Awareness Therapy in patients with schizophrenia and schizophrenia spectrum disorders. *Journal of Bodywork and Movement Therapies*, 17, 169–176.
- Holloway, I. & Galvin, K. (2016). *Qualitative Research in Nursing and Healthcare*. Hoboken: John Wiley & Sons.
- Johnstone, R., Nicol, K., Donaghy, M. & Lawrie, S. (2009). Barriers to uptake of physical activity in community-based patients with schizophrenia. *Journal of Mental Health*, 18, 523–532.
- Lawrence, D., Hancock, K. J. & Kisely, S. (2013). The gap in life expectancy from preventable physical illness in psychiatric patients in Western Australia: Retrospective analysis of population based registers. *BMJ*, 346, f2539.
- Leutwyler, H., Hubbard, E. M., Slater, M. & Jeste, D. V. (2014). "It's good for me": Physical activity in older adults with Schizophrenia. *Community Mental Health Journal*, 50, 75–80.
- McCloughen, A., Foster, K., Kerley, D., Delgado, C. & Turnell, A. (2016). Physical health and well-being: Experiences and perspectives of young adult mental health consumers. *International Journal of Mental Health Nursing*, 25, 299–307.
- McCorkle, B. H., Rogers, E. S., Dunn, E. C., Lyass, A. & Wan, Y. M. (2008). Increasing social support for individuals with serious mental illness: Evaluating the compeer model of intentional friendship. *Community Mental Health Journal*, 44, 359.
- Newcomer, J. W. (2007). Antipsychotic medications: metabolic and cardiovascular risk. *The Journal of Clinical Psychiatry*, 68, 8–13.
- Park, T., Foster, K. & Usher, K. (2017). Participants' voices from within a healthy lifestyle group. *Issues in Mental Health Nursing*, 38, 107–112.
- Pope, C., Ziebland, S. & Mays, N. (2000). Qualitative research in health care: analysing qualitative data. *BMJ: British Medical Journal*, 320, 114.
- Roberts, S. H. & Bailey, J. E. (2013). An ethnographic study of the incentives and barriers to lifestyle interventions for people with severe mental illness. *Journal of Advanced Nursing*, 69, 2514–2524.
- Romm, K. L., Rossberg, J. I., Hansen, C. F., Haug, E., Andreassen, O. A. & Melle, I. (2011). Self-esteem is associated with premorbid adjustment and positive psychotic symptoms in early psychosis. *BMC Psychiatry*, 11, 136.
- Rönngren, Y., Björk, A., Kristiansen, L., Haage, D., Enmarker, I. & Audulv, Å. (2017). Meeting the needs? Perceived support of a nurse-led lifestyle programme for young adults with mental illness in a primary health-care setting. *International Journal of Mental Health Nursing*, 27, 390–399.
- Sandelowski, M. (2010). What's in a name? Qualitative description revisited. *Research in Nursing & Health*, 33, 77–84.
- Shiner, B., Whitley, R., van Citters, A. D., Pratt, S. I. & Bartels, S. J. (2008). Learning what matters for patients: Qualitative evaluation of a health promotion program for those with serious mental illness. *Health Promotion International*, 23, 275–282.
- Soundy, A., Freeman, P., Stubbs, B., Probst, M., Coffee, P. & Vancampfort, D. (2014). The transcending benefits of physical activity for individuals with schizophrenia: A systematic review and meta-ethnography. *Psychiatry Research*, 220, 11–19.
- Tay, L., Tan, K., Diener, E. & Gonzalez, E. (2013). Social relations, health behaviors, and health outcomes: A survey and synthesis. *Applied Psychology: Health and Well-Being*, 5, 28–78.

- Tek, C., Kucukgoncu, S., Guloksuz, S., Woods, S. W., Srihari, V. H. & Annamalai, A. (2016). Antipsychotic-induced weight gain in first-episode psychosis patients: A meta-analysis of differential effects of antipsychotic medications. *Early Intervention in Psychiatry*, 10, 193–202.
- Topor, A., Borg, M., di Girolamo, S. & Davidson, L. (2011). Not just an individual journey: Social aspects of recovery. *International Journal of Social Psychiatry*, 57, 90–99.
- Umberson, D. & Karas Montez, J. (2010). Social relationships and health: A flashpoint for health policy. *Journal of Health and Social Behavior*, 51, S54–S66.
- Vaismoradi, M., Turunen, H. & Bondas, T. (2013). Content analysis and thematic analysis: Implications for conducting a qualitative descriptive study. *Nursing & Health Sciences*, 15, 398–405.
- Wärdig, R., Bachrach-Lindström, M., Hultsjö, S., Lindström, T. & Foldemo, A. (2015). Persons with psychosis perceptions of participating in a lifestyle intervention. *Journal of Clinical Nursing*, 24, 1815–1824.
- Watkins, A., Webster, S. & Curtis, J. (2012). The double whammy: Psychosis and weight gain. Can we meet this challenge with early intervention? Of course we can! b6. *Early Intervention in Psychiatry*, 6, 68.
- Whitley, R. & Crawford, M. (2005). Qualitative research in psychiatry. *The Canadian Journal of Psychiatry*, 50, 108–114.
- WHO 2018. Management of physical health conditions in adults with severe mental disorders: WHO guidelines.

APPENDIX 1: KBIM Interview Schedule

GROUND RULES

Confidentiality – Participants agree that all issues raised by other participants remain confidential and are not discussed again after leaving the room.

Respect – Participants respect each other's viewpoints and do not talk over, mock, or otherwise intentionally cause distress to other participants in the room.

These rules will be highlighted prior to the interviews commencing and verbal agreement obtained.

INTERVIEWEE DISTRESS

Although we do not anticipate the content of the interviews will cause any distress to participants, counselling will be available with members of the Early Psychosis Program who are independent from the research team. Participants have an existing rapport with these team members, and they are suitably qualified (Registered Nurses, Clinical Psychologists, Social Workers, Psychiatrists) to work with participants should they become distressed during or after the interview process.

© 2019 Australian College of Mental Health Nurses Inc.

CONDUCT OF THE INTERVIEW

Participants will be offered a choice of an individual or group interview.

Interviews will be conducted at the Bondi Centre. Participants are familiar with the centre as it is the site at which their usual clinical interventions are delivered.

Sessions will be audio-recorded and later transcribed.

SAMPLES OF PROPOSED INTERVIEW QUESTIONS

Opening

(Establish Rapport) [shake hands] My name is Jane Stein-Parbury and this is Andrew Watkins and we are from the University of Technology, Sydney. You have agreed to be interviewed around your experiences in the Keeping the Body in Mind program. Is that correct?

(Purpose) I would like to ask you some questions about some experiences you have had while participating in the Keeping the Body in Mind program, and also regarding your physical health.

(Motivation) We hope to use this information to better understand any benefits or problems that you have experienced during your time in the Keeping the Body in Mind program. We hope that this will improve the experience for people attending the service in the future.

(Time Line) The interview should take about 30–60 min. Are you available to respond to some questions at this time?

Body

(The interview will begin with a question to ease the participant/s into the process.)

Can you describe to me your favourite health related activity?

Gym and exercise physiology services

During your time at the Bondi Centre have you utilised the gym and the exercise physiology service?

Did you find this a useful process?

What was helpful about having access to a gym at the Bondi Centre?

Tell me about your experiences with the exercise physiology services at the Bondi Centre?

Did your level of exercise increase as a result of having the gym and exercise physiology services available? How so?

Why do you think this was the case?

Were there any benefits to attending the gym and utilising the exercise physiology services? What were they?

Is there anything that could be done differently to get you to increase your attendance at the gym or utilise the exercise physiology services more often?

Is there anything else that prevented you from attending the gym or utilising the exercise physiology services as much as you wanted to?

Dietitian and cooking group

During your time at the Bondi Centre have you seen the dietitian or attended cooking group at the Bondi Centre?

Did you find this a useful process?

What was helpful about having access to the cooking group at the Bondi Centre?

How did this help you? What aspects in particular were helpful (prompts on cooking technique, shopping tours, food budgeting, nutrition education during group)?

Tell me about your experiences with the dietitian at the Bondi Centre?

Did your diet change as a result of seeing the dietitian at the Bondi Centre?

What did you change?

Was this helpful?

Is there anything that could be done differently to get you to attend the cooking group or utilise the dietitian services more often?

Is there anything else that prevented you from attending the cooking group or utilising the dietitian services as much as you wanted to?

Interaction with KBIM staff

How did you feel about staff screening your physical health? (eg. was it helpful/intrusive/irrelevant)

Can you describe for me what your interactions with the KBIM staff were like?

Was there anything that was helpful? What were these things?

Was there anything that was unhelpful? What were these things?

Did the KBIM staff help you to create health goals for yourself?

Did you feel like KBIM staff encouraged you to achieve your goals?

Did you ever feel as if KBIM staff pushed you too hard towards your health goals? Can you describe how this was the case?

Did you feel like you could discuss your concerns about physical health and side effects of medication with staff (including doctors)? Did you feel like you were taken seriously?

Would you have found it helpful to have more interaction with youth peer support workers (Young people with lived experience of mental illness in a paid role)? How so?

Do you feel like the KBIM staff was available to you when you needed them?

Attitudes towards physical health

Can you tell me how important your physical health is to you?

(Follow up prompt) Why this is the case?

Do you believe looking after your physical health has any link to improving your mental health?

(Follow up prompt) What in your opinion is that link?

Do you feel like medication and medical treatment has had any impact on your physical health?

(Follow up prompt) How has this affected you and do you feel it is manageable?

Do you feel like you have a better knowledge of your physical health since attending the Bondi Centre?

(Follow up prompt) What knowledge have you gained?

Would you recommend the program to another person that was in a similar circumstance to you?

Are there any aspects of the KBIM program that you feel should be changed or improved?

Are there any other benefits to the program that you have not yet had a chance to mention?

Closing

(Summarize) You have said that you find _____ useful parts of the KBIM program. You have also said that _____ were not so helpful parts of the KBIM program

(Maintain Rapport) I appreciate the time you took for this interview. Is there anything else you think would be helpful for me to know so that I can more fully understand your experience of KBIM.

Chapter summary

The KBIM qualitative study, set out the experiences of young people who participated in the KBIM lifestyle intervention program as part of their early psychosis treatment program. The chapter explains the implications of providing physical health lifestyle interventions as a core part of mental health service provision. Four areas were highlighted as being significant areas of impact were reported, firstly, in relation to physical health care and three further areas that extended beyond physical health care benefits, namely, improved mental health, and the importance of peer interactions and staff interactions.

The value of the KBIM program was detailed by participants as improving physical health in a sustainable manner through increasing knowledge and confidence of implementing a healthy lifestyle. In addition to physical health benefits of the program participants reported the KBIM program assisted their mental health recovery, highlighting improvements in self-esteem, mood, hope and motivation. A positive impact was also noticed by participants on their relationships with both their peers and mental health staff, which was noted to improve engagement, social interactions and normalisation of life.

The broad range of benefits from the KBIM program delivery for participants highlights the value of incorporating lifestyle interventions into mental health clinical services. This type of intervention is not currently part of standard mental health care and will require skilling mental health clinicians to be able to support consumers of mental health services to engage in lifestyle interventions. Therefore, one implication from the study is that practical training for mental health staff on metabolic health screening and lifestyle interventions should be developed to be able to deliver these services.

Chapter 4

The validity and reliability of the M-BACK questionnaire to assess the barriers, attitudes, confidence, and knowledge of mental health staff regarding metabolic health of mental health service users (M-BACK validation study)

Chapter preface

The results of the KBIM qualitative study in Chapter 3 indicated that metabolic health interventions delivered within a mental health service are feasible and valuable to people who experience SMI in the clinical setting. Lifestyle interventions could be offered in other mental health settings with appropriate training and education for clinicians. However, past training initiatives in this area have been criticised for lacking effective evaluation (112). The evaluation of such training has been limited by the lack of a fit-for-purpose measurement tool. Chapter 4 describes the development and validation of a measurement tool for evaluating the effectiveness of training and education for metabolic health care.

Ethical approval was granted for the study by University of Technology, Sydney Research Committee -HREC 2013000749 (Appendix 5B).

This article was published in an open access journal and inclusion in this thesis is permissible under creative commons license.

Publication

Watkins A, Rosenbaum S, Ward PB, Patching J, Denney-Wilson E, Stein-Parbury J. The validity and reliability characteristics of the M-BACK questionnaire to assess the barriers, attitudes, confidence, and knowledge of mental health staff regarding metabolic health of mental health service users. *Frontiers in Public Health* 2017; 5:321. doi:10.3389/fpubh.2017.00321



The Validity and Reliability Characteristics of the M-BACK Questionnaire to Assess the Barriers, Attitudes, Confidence, and Knowledge of Mental Health Staff Regarding Metabolic Health of Mental Health Service Users

Andrew Watkins^{1,2*}, Simon Rosenbaum³, Philip B. Ward^{3,4}, Joanna Patching⁵, Elizabeth Denney-Wilson² and Jane Stein-Parbury²

OPEN ACCESS

Edited by:

Tien K. Khoo,
Griffith University, Australia

Reviewed by:

Angela J. Grippo,
Northern Illinois University,
United States
Gillian Bartlett,
McGill University, Canada

*Correspondence:

Andrew Watkins
andrew.watkins@health.nsw.gov.au

Specialty section:

This article was submitted to
Family Medicine and Primary Care,
a section of the journal
Frontiers in Public Health

Received: 20 June 2017

Accepted: 14 November 2017

Published: 11 December 2017

Citation:

Watkins A, Rosenbaum S, Ward PB,
Patching J, Denney-Wilson E and
Stein-Parbury J (2017) The Validity
and Reliability Characteristics of the
M-BACK Questionnaire to Assess the
Barriers, Attitudes, Confidence, and
Knowledge of Mental Health Staff
Regarding Metabolic Health of Mental
Health Service Users.
Front. Public Health 5:321.
doi: 10.3389/fpubh.2017.00321

¹ Keeping the Body in Mind Program, The Bondi Centre, South Eastern Sydney Local Health District, Sydney, NSW, Australia, ² Faculty of Health, University of Technology Sydney, Sydney, NSW, Australia, ³ School of Psychiatry, University of New South Wales, Sydney, NSW, Australia, ⁴ Schizophrenia Research Unit, Ingham Institute for Applied Medical Research, Liverpool, NSW, Australia, ⁵ School of Nursing, University of Notre Dame, Sydney, NSW, Australia

Background: Addressing the burden of poor physical health and the subsequent gap in life expectancy experienced by people with mental illness is a major priority in mental health services. To equip mental health staff with the competence to deliver evidence-based interventions, targeted staff training regarding metabolic health is required. In order to evaluate the effectiveness of staff training regarding metabolic health, we aimed to develop a succinct measure to determine the barriers, attitudes, confidence, and knowledge of health practitioners through the development and test-retest reliability of the Metabolic-Barriers, Attitudes, Confidence, and Knowledge Questionnaire (M-BACK).

Methods: The M-BACK questionnaire was developed to evaluate the impact of specialized training in metabolic health care for mental health nurses. Content of the M-BACK was developed from a literature review and refined by an expert review panel and validated via a piloting process. To determine the test-retest reliability of the M-BACK, 31 nursing students recruited from the University of Notre Dame, Sydney completed the questionnaire on two separate occasions, 7 days apart. Intraclass correlation coefficients (ICCs) were calculated for the total score, as well as each of the four domains.

Results: Pilot testing was undertaken with a sample of 106 mental health nurses with a mean age 48.2, ranging from 24 to 63 years of age, who participated in six training courses. Questionnaire development resulted in a 16-item instrument, with each item is scored on a five-point Likert scale ranging from “strongly disagree” to “strongly agree.” Test-retest reliability of the M-BACK was completed by 30 of 31 nursing students recruited, ICCs ranged from 0.62 to 0.96.

Conclusion: The M-BACK is a reliable measure of the key elements of practitioner perceptions of barriers, and their knowledge, attitudes, and confidence regarding metabolic monitoring in people with mental illness. It can be used to assess the effectiveness of interventions aimed at increasing uptake of metabolic monitoring, a key component of programs to reduce the life expectancy gap in people living with severe mental illness.

Keywords: severe mental illness, physical health, education, training, evaluation tool, service delivery, health outcomes, metabolic syndrome

INTRODUCTION

People with mental illness have poorer physical health outcomes in comparison to the general population. Severe mental illness (SMI), including schizophrenia and related psychotic disorders, bipolar disorder, and major depressive disorder, are associated with a reduced life expectancy of between 10 and 20 years (1, 2), primarily due to preventable cardiometabolic diseases. People with these disorders are more likely than the general population to meet criteria for metabolic syndrome (MetS) (3), a cluster of risk factors including abdominal obesity, dyslipidaemia, hypertension, and insulin resistance (4).

The Second Australian National Survey of Psychosis study reported that 60.8% of people who experienced psychosis had MetS, which is two to three times that of the general Australian population (5). People with a serious mental illness (SMI) have other risk factors including rates of smoking more than twice that of the general public, higher rates of obesity, and lower levels of physical activity than the general population (5–7). While the advent of second-generation antipsychotics has reduced some side effects of their first-generation predecessors, the metabolic profile of these medications has led to increasing rates of MetS in people prescribed these medications (8, 9).

Metabolic health disorders that commonly occur with second-generation antipsychotics have not been well managed by mental health services (5). There is a general lack of expertise, confidence, and practical experience in addressing physical health care among all mental health professionals (10, 11). As a result of diagnostic overshadowing, mental health nurses in particular have traditionally focused on addressing mental illness symptomatology, while the physical health care needs of service users have often been a lower priority (12).

Mental health nurses are well positioned to play a key role in providing metabolic health care to people who experience mental illness (13). While mental health nurses acknowledge that they have a role in addressing physical health needs (14), they may not have the skills or knowledge to identify and manage the metabolic complications experienced by service users, prompting recommendations for specific training in this area (15–17). Barriers to mental health professionals proactively tackling the high burden of poor physical health include: a lack of time, poor knowledge,

and a lack of confidence regarding metabolic screening and the provision of interventions aimed at reducing metabolic risk (18, 19). However, there is evidence that brief training can lead to improvements in rate of metabolic monitoring in inpatient settings (20).

In addition to metabolic monitoring, there is increasing evidence demonstrating the effectiveness of lifestyle interventions for preventing and treating cardiometabolic disease among people with SMI (21–24) in line with exhortation to “*don't just screen, intervene*” (25). Drawing on literature from the general population, the essential components of effective lifestyle interventions are well established (22, 26), including the need for a multidisciplinary approach incorporating physical activity and nutritional components along with health coaching. Evidence for the role of lifestyle interventions in reducing overall cardiometabolic risk and obesity among people with SMI has been described as overwhelming, with gaps in service delivery considered an “implementation gap,” as opposed to a “knowledge gap” (23).

Two clinical tools that measure the effectiveness of metabolic health care have been evaluated in mental health professionals. The first of these is the Physical Health Attitude Scale (PHASe) (27), a 28-item measure that assesses attitudes of mental health nurses toward physical health care of mental health service users. The PHASe tool has primarily been used to obtain a cross-sectional snapshot of the perceptions and practices of mental health nurses regarding the general physical health of service users (14, 28, 29). However, this tool does not measure knowledge change, which is a key training goal, and is not specifically focused on the area of metabolic health care. Stanton et al (30) recently developed a questionnaire [the Exercise in Mental Illness Questionnaire—Health Professionals Version (*EMIQ-HP*)] to investigate the knowledge, attitudes, beliefs, and behaviors of health professionals regarding exercise in the treatment of mental illness. The *EMIQ-HP* demonstrated excellent test–retest reliability. While valuable, its focus is limited to one modifiable risk factor, physical activity, and therefore is not ideal to assess changes regarding metabolic health education more broadly.

Physical health care incorporates a broad and diverse range of health specialties. While there are many domains of physical health care for people experiencing SMI that warrant careful attention (5), metabolic health is an area of particular concern (31). Specialized training for mental health nurses in metabolic health screening and interventions is therefore a priority. The ability to measure the effectiveness of this type of training for mental health nurses is critical.

Abbreviations: M-BACK, metabolic barriers, attitudes, confidence, and knowledge; SMI, severe mental illness; MetS, metabolic syndrome; ICC, intraclass correlations.

The objectives of the study were to (1) create a succinct tool that could measure changes in perceived barriers, attitudes, confidence, and knowledge of nurses related to metabolic health care in mental health service users, (2) ensure that tool contain valid content, and (3) the instrument has reliability as to be sensitive to change to determine the effectiveness of training, education, or other initiative to improve the delivery of metabolic health care by mental health clinicians.

MATERIALS AND METHODS

The development of the M-BACK commenced with a review of the literature to identify the training needs, barriers, and enablers associated with metabolic monitoring and the delivery of lifestyle interventions by mental health nurses, psychiatrists, and other allied mental health staff. Findings from that review indicated that the attitudes of clinical staff toward providing metabolic health care in mental health settings was integral to the successful delivery of such services (14, 15, 19, 27, 28). Another common finding was a low level of confidence among mental health staff in carrying out recommended metabolic health monitoring and delivering interventions (15, 16, 18, 32), in addition to a lack of knowledge in this area (15, 33, 34). Other consistent barriers to staff delivering metabolic care were workload, concerns regarding medication adherence, perceived apathy on the part of a service user or a sense of hopelessness from a staff member (15, 16, 18, 19, 27, 28, 33–35).

Content Validation

Twenty questions were developed based upon four themes that were identified in the literature: barriers, attitudes, confidence, and knowledge of metabolic health care. The questionnaire was then reviewed by a panel of seven people with specialist expertise in the delivery of metabolic health care to mental health service users including clinicians, educators and researchers. Experts were chosen based upon criteria requiring them to be published experts in the field of metabolic health care of mental health service users along with clinical and/or teaching experience in this area. There was also a desire for the panel to be representative of the major disciplines in mental health care. Therefore, the panel included members from mental health nursing, psychiatry and psychology. In addition, the panel featured an exercise physiologist and dietitian that work in mental health care. Each expert reviewer was sent a copy of the questionnaire and an explanation as to the purpose of the instrument and asked to comment on the applicability, clarity, and simplicity of each item. Reviewers were also encouraged to provide comment on the overall layout and design of the questionnaire. After written feedback, six of the expert panel met to cull and refine the questions. At the conclusion of the expert consensus review 16 Likert-type questions were produced across four domain areas: barriers to delivering metabolic health care, attitudes toward metabolic health care, confidence in delivering metabolic health care, and knowledge of metabolic health care.

Pilot Testing

The 16-item M-BACK tool was pilot tested in 2013 on participants completing a training course, in order to ascertain

their understanding of the statements employed in the questionnaire. The training consisted of a 2-day workshop on metabolic health care for people with a mental illness and delivered at the Australian College of Nursing. The training was designed and delivered by lead author (Andrew Watkins) with the aim of improving participants' knowledge and confidence in providing metabolic health care screening and interventions. Training included both educational and practical elements on topics such as: how to screen for metabolic health (e.g., taking blood pressure, waist circumference), nutritional interventions (e.g., conducting a basic dietetic assessment and providing nutritional advice), exercise interventions (e.g., assessing physical activity levels and prescribing exercise), and pharmacological interventions (e.g., medications that can be used to reduce metabolic risk factors).

The pilot testing was undertaken with a sample of 106 mental health nurses with a mean age 48.2, ranging from 24 to 63 years of age over six separate courses. Participants undertook pre and post testing of the M-BACK questionnaire. There was space provided below each question and instructions provided for participants to make comments if they found the question confusing or ambiguous. Feedback from participants was circulated to the expert panel, who were given 2 weeks to provide comment. Expert group comments were collated by lead author (Andrew Watkins). The expert panel met on two occasions during the piloting phase and made refinements to several of the questions to remove any identified ambiguity that had been identified in the pretesting phase. The refined questions were reviewed at two subsequent meetings, in order to reach agreement on the question content.

The penultimate version that was then piloted with the last cohort of workshop of 19 participants who did not offer any negative feedback in relation to confusion or ambiguity of the questions. The final version incorporated numeric coding (responses included numbers) to allow for ease of scoring and facilitate statistical analysis. This version achieved approval by all authors and the expert panel.

Instrument Overview

The M-BACK (see Image S1 in Supplementary Material) is a 16-item instrument separated into four domains: knowledge, confidence, attitudes, and practice barriers in relation to metabolic health. Each item is a five-point Likert type scale ranging from Strongly Disagree (scoring 1) to Strongly Agree (scoring 5). Each domain is composed of four items and scored out of 20, with a minimum score of four and a maximum score of 20. Total score for the questionnaire is 80, with a minimum of 16 (see Image S2 in Supplementary Material).

Domain 1: Barriers

Items 1–4 address barriers to metabolic screening and intervention, including, workload, service user interest, conflict with mental health goals, and inability to effect change. These questions are negatively posed with the scoring reversed. Possible scores for this domain range from 4 to 20.

Domain 2: Attitudes

Items 5–8 investigate attitudes, including toward metabolic monitoring, the provision of smoking cessation advice, physical

activity, and nutritional intake. Possible scores for this domain range from 4 to 20.

Domain 3: Confidence

Items 9–12 assess the confidence of respondents in providing interventions to prevent or treat metabolic health including smoking cessation, physical activity and nutritional interventions. Possible scores for this domain range from 4 to 20.

Domain 4: Knowledge

Items 13 through 16 assess knowledge of metabolic health, screening, interpreting pathology reports, and understanding of the metabolic side effects of neuroleptic medication. Possible scores for this domain range from 4 to 20.

Instrument Reliability

The M-BACK questionnaire is intended to assess change over time and to detect change in the items following education or training. Therefore, test–retest reliability to assess the stability of a measure over time was of particular importance for the M-BACK. The test–retest reliability for each question was determined utilizing intraclass correlation coefficients (ICCs) using a two-factor mixed effects model (36). ICC was chosen as the statistical method under the presumption that a Likert-type scale scored items are generally considered as a continuous variable and ICC is the preferred method of assessing test–retest data under these conditions (37). Using ICC will determine the proportion of total variance that occurs between time points (36).

To determine the required sample size a method devised by Walter et al. was utilized to calculate the number of subjects required for a reliability study being measured by ICC (38). This method is based on a functional approximation to earlier exact results and has shown excellent agreement with the exact results. Based on this method, the sample size determined for the 16-item scale was 29.

Thirty-two final year undergraduate nursing students from the University of Notre Dame in Sydney who had elected mental health as a specialty were invited to complete the questionnaire. There were no other exclusion criteria. Students were offered a verbal invitation to complete the questionnaire at the conclusion of a mental health lecture on therapeutic relationships. Student participants were informed of the research nature of completing the M-BACK, informed that participation was completely voluntary and there were no consequences for not participating. All participants completed a signed consent form. All 32 students completed the questionnaire on the first occasion with one person missing for the repeat questionnaire, due to illness. The sample of 31 who completed the questionnaire on the two occasions, 7 days apart had a mean age 23.9 ± 6.6 years and a majority were female (61%).

All survey data were analyzed using SPSS version 23. The data were reviewed to ensure completeness. The person who was missing for the repeated questionnaire was excluded from the analysis. ICCs and 95% confidence intervals (Cis) were calculated for the total score, as well as each of the four domains (barriers, attitudes, confidence, and knowledge). ICCs were calculated and interpreted based on Landis and Koch, with ICCs of below 0.4

(poor to fair), 0.41–0.6 (moderate), 0.61–0.80 (excellent), and 0.81–1 (almost perfect) (39). The questionnaire was analyzed for individual items in addition to the four domain areas.

Ethical Considerations

Ethical approval was granted for the study by University of Technology Sydney Human Research Ethics Committee (HREC 2013000749). The research was deemed by this ethics committee to be of negligible risk and not requiring of formal debriefing strategies for participants. Anonymity was assured by keeping demographic data separate from the completed questionnaires.

RESULTS

Content Validity

The expert panel met to discuss the M-BACK tool (with the exception of overseas participants), followed by several rounds of email correspondence. Comments received from the expert panel were incorporated into the M-BACK instrument. The expert panel contributed to further development of the content in the “attitudes” and “knowledge” sections, and wording in the “confidence” questions. Two reviewers noted that the term “consumer” needed to be used consistently rather than utilizing “client.” A number of items were reworded to make them more specific regarding a nurse’s role. For example, the original item; “Encouraging consumers to increase their level of physical activity is an important part of my role,” was reworded to; “Encouraging consumers to increase their level of physical activity is an important part of my role as a mental health nurse.” Four questions from the original literature review were culled following feedback from the expert panel as they were deemed to be redundant after all the questions were refined.

Pilot testing of the M-BACK tool allowed for feedback from course participants regarding their understanding of the statements employed in the questionnaire. The expert panel met on two occasions during the piloting phase and made refinements to several of the questions to remove ambiguity. The barriers section in particular was reworded in order to clarify that the questions were negatively framed. For example, the original item “There is no point to metabolic health screening for mental health consumers,” was reworded to “Screening for metabolic syndrome and physical health interventions are pointless as poor physical health outcomes are unavoidable.” Similarly, “I’m too busy to do health promotion work with clients” was adjusted to “My workload prevents me doing any health promotion activities with consumers.”

Instrument Reliability

Thirty-one nursing students, mean age 23.9 ± 6.6 years (61% female) participated and completed the M-BACK on two occasions, 7 days apart. ICC correlations for individual items ranged from 0.62 to 0.96 (see **Table 1**).

Total Score

A high degree of reliability was found between the total M-BACK scores at both time points. The single measure ICC was considered

TABLE 1 | Intraclass correlation coefficient items.

Item subscales	Intraclass correlation coefficient	95% CI
Barrier		
<i>My workload prevents me doing any health promotion activities with clients</i>	0.86	0.70–0.93
<i>Consumers with a serious mental illness are not interested in improving their physical health</i>	0.92	0.82–0.96
<i>Informing clients about the possible effects of medications may have on their mental health will increase non-adherence</i>	0.91	0.81–0.96
<i>Screening for metabolic syndrome and physical health interventions are pointless as poor physical health outcomes are unavoidable</i>	0.74	0.46–0.87
Attitudes		
<i>Metabolic health screening is an important part of my role as a mental health clinician</i>	0.93	0.86–0.97
<i>Giving smoking cessation advice is an important part of my role as a mental health clinician</i>	0.81	0.60–0.91
<i>Encouraging consumers to increase their level of physical activity is an important part of my role as a mental health clinician</i>	0.78	0.54–0.89
<i>Discussing nutritional intake is an important part of my role as a mental health clinician</i>	0.82	0.63–0.91
Confidence		
<i>I am confident in my ability to screen for metabolic syndrome</i>	0.92	0.83–0.96
<i>I am confident in providing smoking cessation advice to consumers</i>	0.87	0.73–0.94
<i>I am confident in prescribing exercise interventions to prevent/treat metabolic syndrome</i>	0.82	0.62–0.91
<i>I am confident in using dietary interventions to prevent/treat metabolic syndrome in consumers</i>	0.73	0.44–0.87
Knowledge		
<i>I have a good knowledge of metabolic syndrome</i>	0.87	0.74–0.94
<i>I understand how to screen for metabolic syndrome</i>	0.96	0.91–0.98
<i>I understand how to read pathology reports for lipids and glucose results</i>	0.84	0.66–0.92
<i>I understand the metabolic side-effect profiles of different neuroleptic medication</i>	0.62	0.20–0.82

excellent, 0.87 (95% CI 0.75–0.94). The mean between day variation was 0.54 ± 5.3 .

Barriers

The ICCs for the barrier items ranged from 0.74 (Item 4 “Screening for metabolic syndrome and physical health interventions are pointless as poor physical health outcomes are unavoidable”) to 0.92 (Item 2 “Consumers with a serious mental illness are not interested in improving their physical health”). The mean ICC was 0.71 (95% CI 0.39–0.86).

Attitudes

The ICCs for the attitude items ranged from 0.78 (Item 3 “Encouraging consumers to increase their level of physical activity is an important part of my role as a mental health clinician”) to 0.93 (Item 1 “Metabolic health screening is an important part of my role as a mental health clinician”). The mean ICC was 0.80 (95% CI 0.58–0.90).

Confidence

The ICCs for the confidence items ranged from 0.73 (Item 4 “I am confident in using dietary interventions to prevent/treat metabolic syndrome in consumers”) to 0.92 (Item 1 “I am confident in my ability to screen for metabolic syndrome”). The mean ICC was 0.88 (95% CI 0.75–0.94).

Knowledge

The ICCs for the knowledge items ranged from 0.62 (Item 4 “I understand the metabolic side-effect profiles of different neuroleptic medication”) to 0.96 (Item 2 “I understand how to screen for metabolic syndrome”). The mean ICC was 0.90 (95% CI 0.80–0.96).

DISCUSSION

The article describes the development, content validity, and test–retest reliability of a novel tool, that assesses the attitudes, confidence, knowledge, of mental health nurses in providing metabolic health care to mental health consumers and the barriers perceived in implementing this care.

The fact that metabolic health is a primary driver of premature mortality among people with SMI is well established (25, 40–43). Unfortunately, mental health nurses often feel that they are ill-prepared to be able to screen and intervene for metabolic health and feel that they require training to rectify this (15, 32). The M-BACK may be of assistance in determining the reasons why metabolic screening and interventions are not occurring in clinical practice, so that training and education can be designed in a targeted way.

Despite recognition of the importance of metabolic health training there is a lack of published information on physical health training for mental health nurses and minimal information on its effectiveness (17, 44). This has led to repeated calls in the nursing literature for education and training in physical health to be provided for mental health nurses and for these educational programs to be evaluated (14–16, 32, 44). This M-BACK tool can be employed to meet the identified gap in measuring the effectiveness of training and education for mental health nurses and other initiatives of mental health services to address metabolic health care. It also enables evaluation of the effectiveness of education regarding metabolic health care through pre- and posttraining testing. In a similar way the questionnaire can be used to determine effectiveness of staff-based interventions for mental health professionals.

Content validation of the M-BACK survey was achieved by expert consensus. It enabled the incorporation of the views of researchers, educators and clinicians working in the field to develop a tool that captures pertinent data and facilitates detailed analysis. The M-BACK tool is appropriate to assess current knowledge regarding metabolic health in service users with SMI. Nonetheless, revisions of the M-BACK tool may be required as new knowledge is gained. In addition, the current tool is intended to assess the views of mental health nurses; a version adapted for completion by service users and/or carers would be a valuable addition.

This study also examined the test–retest reliability of the M-BACK. The questionnaire demonstrated acceptable test–retest reliability, with an ICC of 0.87 for the total M-BACK score ranging between 0.61 and 1 for each item.

Test–retest reliability analysis will rarely achieve perfect results (45). Within the domains, the greatest variance was found within the knowledge domain and least variance within the attitudes domain. Item 4 of the knowledge domain (*I understand the metabolic side-effect profiles of different neuroleptic medication*) had the lowest ICC of any item throughout the questionnaire, although this was still classified as excellent according to the criteria of Landis and Koch (39). Possible explanations for why some items in a questionnaire may have greater variability using include changed knowledge or awareness of a participant, perhaps even prompted by having completed the questionnaire previously (45). Given the acceptable test–retest results, it was determined that no changes to questions were required.

Limitations

This validation study of the M-BACK questionnaire is not without limitations. A narrow definition of SMI was utilized in order to focus on service users where the greatest metabolic health risk exists, reflecting the use of antipsychotics in this population. Similarly, we used mental health nurses as the targeted clinicians for this tool, as nurses tend to have the most face-to-face contact with service users. Instrument reliability was examined in nursing students during the final year of their undergraduate training. Although students were not the primary targets of the M-BACK tool, it is unlikely that utilizing students impacted test–retest reliability of the instrument, and its applicability for use with fully qualified clinicians. Further research is needed to determine whether responses vary as a consequence of professional training background, and therefore whether discipline-specific versions of the instrument should be developed. The current version was developed in Australia, utilizing expert consultation with experts from the United Kingdom and Europe.

CONCLUSION

There is a clearly identified need for training and education for nursing staff regarding the metabolic health of mental health service users. The M-BACK tool is a valid and reliable instrument to measure the effectiveness of education and training to improve the attitudes, confidence, and knowledge of mental health nursing staff in relation to metabolic health and changes in perceptions of barriers to delivery of metabolic health care.

Mental health services need to incorporate specific training on metabolic care for service users, and the M-BACK questionnaire will be a useful tool in future studies of training outcomes in mental health clinicians.

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

Written and informed consent was obtained from all research participants. Ethical approval was granted for the study by University of Technology Sydney Research Committee (HREC 2013000749).

AVAILABILITY OF DATA AND MATERIAL

The datasets used and/or analyzed during the current study available from the corresponding author on reasonable request.

ETHICS STATEMENT

Ethical approval was granted for the study by University of Technology Sydney Research Committee (HREC 2013000749).

AUTHOR CONTRIBUTIONS

AW was the study coordinator. He led recruitment, data collection, and data analysis. He drafted the conceptual framework and the manuscript. SR was involved in the conception and design of the study and took the lead in supporting AW revising the manuscript. PW assisted the study coordinator with study design and analysis. PW was also involved in revising the conceptual framework. JP assisted the study coordinator with the recruitment, data collection, and manuscript review. ED-W revised the conceptual framework and the manuscript. JS-P assisted with design and conception of the study. She was involved in revising the conceptual framework and manuscript.

ACKNOWLEDGMENTS

The authors would like to acknowledge the participants from Notre Dame University in this validation study.

FUNDING

This article summarizes research that was independently funded. All authors read and approved the final manuscript.

SUPPLEMENTARY MATERIAL

The Supplementary Material for this article can be found online at <http://www.frontiersin.org/articles/10.3389/fpubh.2017.00321/full#supplementary-material>.

IMAGE S1 | The M-BACK questionnaire.

IMAGE S2 | Scoring for the M-BACK questionnaire.

REFERENCES

- Lawrence D, Hancock KJ, Kisely S. The gap in life expectancy from preventable physical illness in psychiatric patients in Western Australia: retrospective analysis of population based registers. *Br Med J* (2013) 346:f2539. doi:10.1136/bmj.f2539
- Chang CK, Hayes RD, Perera G, Broadbent MTM, Fernandes AC, Lee WE, et al. Life expectancy at birth for people with serious mental illness and other major disorders from a secondary mental health care case register in London. *PLoS One* (2011) 6(5):e19590. doi:10.1371/journal.pone.0019590
- Vancampfort D, Stubbs B, Mitchell AJ, De Hert M, Wampers M, Ward PB, et al. Risk of metabolic syndrome and its components in people with schizophrenia and related psychotic disorders, bipolar disorder and major depressive disorder: a systematic review and meta-analysis. *World Psychiatry* (2015) 14(3):339–47. doi:10.1002/wps.20252
- Zimmet B, Alberti KGM, Kaufman F, Tajima N, Silink M, Arslanian S, et al. The metabolic syndrome in children and adolescents—an IDF consensus report. *Pediatr Diabetes* (2007) 8(5):299–306. doi:10.1111/j.1399-5448.2007.00271.x
- Morgan V, McGrath J, Jablensky A, Badcock J, Waterreus A, Bush R, et al. Psychosis prevalence and physical, metabolic and cognitive co-morbidity: data from the second Australian national survey of psychosis. *Psychol Med* (2014) 44(10):2163–76. doi:10.1017/S0033291713002973
- Brown S, Birtwistle J, Roe L, Thompson C. The unhealthy lifestyle of people with schizophrenia. *Psychol Med* (1999) 29(3):697–701. doi:10.1017/S0033291798008186
- Daumit GL, Goldberg RW, Anthony C, Dickerson E, Brown CH, Kreyenbuhl J, et al. Physical activity patterns in adults with severe mental illness. *J Nerv Ment Dis* (2005) 193(10):641–6. doi:10.1097/01.nmd.0000180737.85895.60
- Correll CU, Manu P, Olshanskiy V, Napolitano B, Kane JM, Malhotra AK. Cardiometabolic risk of second-generation antipsychotic medications during first-time use in children and adolescents. *JAMA* (2009) 302(16):1765–73. doi:10.1001/jama.2009.1549
- De Hert M, Schreurs V, Sweers K, Van Eyck D, Hanssens L, Sinko S, et al. Typical and atypical antipsychotics differentially affect long-term incidence rates of the metabolic syndrome in first-episode patients with schizophrenia: a retrospective chart review. *Schizophr Res* (2008) 101(1):295–303. doi:10.1016/j.schres.2008.01.028
- Hyland B, Judd F, Davidson S, Jolley D, Hocking B. Case managers' attitudes to the physical health of their patients. *Aust N Z J Psychiatry* (2003) 37(6):710–4. doi:10.1080/j.1440-1614.2003.01264.x
- Organ B, Nicholson E, Castle D. Implementing a physical health strategy in a mental health service. *Australas Psychiatry* (2010) 18(5):456–9. doi:10.3109/10398562.2010.506217
- Gray R, Hardy S, Anderson KH. Physical Health and Severe Mental Illness: If We Don't Do Something About It, Who Will? *Int J Ment Health Nurs* (2009) 18(5):299–300. doi:10.1111/j.1447-0349.2009.00640.x
- Happell B, Platania-Phung C, Gray R, Hardy S, Lambert T, McAllister M, et al. A role for mental health nursing in the physical health care of consumers with severe mental illness. *J Psychiatr Ment Health Nurs* (2011) 18(8):706–11. doi:10.1111/j.1365-2850.2010.01666.x
- Robson D, Haddad M, Gray R, Gournay K. Mental health nursing and physical health care: a cross-sectional study of nurses' attitudes, practice, and perceived training needs for the physical health care of people with severe mental illness. *Int J Ment Health Nurs* (2012) 22(5):409–17. doi:10.1111/j.1447-0349.2012.00883.x
- Nash M. Physical care skills: a training needs analysis of inpatient and community mental health nurses: high rates of physical illness among people with severe mental illness are a cause for concern. Michael Nash considers how a training needs analysis can contribute towards the development of an education programme in physical care for nurses working in mental health settings. *Ment Health Pract* (2005) 9(4):20–3. doi:10.7748/mhp2005.12.9.4.20.c1896
- Terry J, Cutter J. Does education improve mental health practitioners' confidence in meeting the physical health needs of mental health service users? A mixed methods pilot study. *Issues Ment Health Nurs* (2013) 34(4):249–55. doi:10.3109/01612840.2012.740768
- Howard L, Gamble C. Supporting mental health nurses to address the physical health needs of people with serious mental illness in acute inpatient care settings. *J Psychiatr Ment Health Nurs* (2011) 18(2):105–12. doi:10.1111/j.1365-2850.2010.01642.x
- Happell B, Platania-Phung C, Scott D. What determines whether nurses provide physical health care to consumers with serious mental illness? *Arch Psychiatr Nurs* (2014) 28(2):87–93. doi:10.1016/j.apnu.2013.11.001
- Happell B, Scott D, Platania-Phung C, Nankivell J. Should we or shouldn't we? Mental health nurses' views on physical health care of mental health consumers. *Int J Ment Health Nurs* (2012) 21(3):202–10. doi:10.1111/j.1447-0349.2011.00799.x
- Rosenbaum S, Nijjar S, Watkins A, Garwood N, Sherrington C, Tiedemann A. Nurse-assessed metabolic monitoring: a field audit of risk factor prevalence and impact of an intervention to enhance measurement of waist circumference. *Int J Ment Health Nurs* (2014) 23(3):252–6. doi:10.1111/inm.12057
- Daumit GL, Dickerson FB, Wang N-Y, Dalcin A, Jerome GJ, Anderson CA, et al. A behavioral weight-loss intervention in persons with serious mental illness. *N Engl J Med* (2013) 368(17):1594–602. doi:10.1056/NEJMoal214530
- Naslund JA, Aschbrenner KA, Scherer EA, Pratt SI, Wolfe RS, Bartels SJ. Lifestyle intervention for people with severe obesity and serious mental illness. *Am J Prev Med* (2016) 50(2):145–53. doi:10.1016/j.amepre.2015.07.012
- Bartels SJ. Can behavioral health organizations change health behaviors? The STRIDE study and lifestyle interventions for obesity in serious mental illness. *Am J Psychiatry* (2015) 172(1):9–11. doi:10.1176/appi.ajp.2014.14101246
- Curtis J, Watkins A, Rosenbaum S, Teasdale S, Kalucy M, Samaras K, et al. Keeping the Body in Mind: an individualised lifestyle and life-skills intervention to prevent antipsychotic-induced weight gain in first episode psychosis. *Early Interv Psychiatry* (2016) 10:267–76. doi:10.1111/eip.12230
- Curtis J, Newall HD, Samaras K. The heart of the matter: cardiometabolic care in youth with psychosis. *Early Interv Psychiatry* (2012) 6(3):347–53. doi:10.1111/j.1751-7893.2011.00315.x
- Ward MC, White DT, Druss BG. A meta-review of lifestyle interventions for cardiovascular risk factors in the general medical population: lessons for individuals with serious mental illness. *J Clin Psychiatry* (2015) 76(4):e477–86. doi:10.4088/JCP.13r08657
- Robson D, Haddad M. Mental health nurses' attitudes towards the physical health care of people with severe and enduring mental illness: the development of a measurement tool. *Int J Nurs Stud* (2012) 49(1):72–83. doi:10.1016/j.ijnurstu.2011.07.011
- Happell B, Platania-Phung C, Scott D. Proposed nurse-led initiatives in improving physical health of people with serious mental illness: a survey of nurses in mental health. *J Clin Nurs* (2014) 23(7–8):1018–29. doi:10.1111/jocn.12371
- Happell B, Platania-Phung C, Scott D. Are nurses in mental health services providing physical health care for people with serious mental illness? An Australian perspective. *Issues Ment Health Nurs* (2013) 34(3):198–207. doi:10.3109/01612840.2012.733907
- Stanton R, Happell BM. An exercise prescription primer for people with depression. *Issues Ment Health Nurs* (2013) 34(8):626–30. doi:10.3109/01612840.2012.758207
- De Hert M, Schreurs V, Vancampfort D, Winkel R. Metabolic syndrome in people with schizophrenia: a review. *World Psychiatry* (2009) 8(1):15–22. doi:10.1002/j.2051-5545.2009.tb00199.x
- Happell B, Platania-Phung C, Scott D. Physical health care for people with mental illness: training needs for nurses. *Nurse Educ Today* (2013) 33(4):396–401. doi:10.1016/j.nedt.2013.01.015
- Nash M. Assessing nurses' propositional knowledge of physical health: a training exercise showed that staff need better education to identify clients at risk of experiencing drug reactions and to recognise undiagnosed physical disorders that may affect treatment, says Michael Nash. *Ment Health Pract* (2010) 14(2):20–3. doi:10.7748/mhp2010.10.14.2.20.c8009
- Hardy S, Hinks P, Gray R. Does training practice nurses to carry out physical health checks for people with severe mental illness increase the level of screening for cardiovascular risk? *Int J Soc Psychiatry* (2014) 60(3):236–42. doi:10.1177/0020764013483721

35. McDonnell MG, Kaufman EA, Srebnik DS, Ciechanowski PS, Ries RK. Barriers to metabolic care for adults with serious mental illness: provider perspectives. *Int J Psychiatry Med* (2011) 41(4):379–87. doi:10.2190/PM.41.4.g
36. Shrout PE, Fleiss JL. Intraclass correlations: uses in assessing rater reliability. *Psychol Bull* (1979) 86(2):420. doi:10.1037/0033-2909.86.2.420
37. Rankin G, Stokes M. Reliability of assessment tools in rehabilitation: an illustration of appropriate statistical analyses. *Clin Rehabil* (1998) 12(3):187–99. doi:10.1191/026921598672178340
38. Walter S, Eliasziw M, Donner A. Sample size and optimal designs for reliability studies. *Stat Med* (1998) 17(1):101–10. doi:10.1002/(SICI)1097-0258(19980115)17:1<101::AID-SIM727>3.0.CO;2-E
39. Landis JR, Koch GG. The measurement of observer agreement for categorical data. *Biometrics* (1977) 33(1):159–74. doi:10.2307/2529310
40. Stewart R. Mental disorders and mortality: so many publications, so little change. *Acta Psychiatr Scand* (2015) 132(5):410–11. doi:10.1111/acps.12476
41. Nielsen RE, Uggerby AS, Jensen SOW, McGrath JJ. Increasing mortality gap for patients diagnosed with schizophrenia over the last three decades – a Danish nationwide study from 1980 to 2010. *Schizophr Res* (2013) 146(1):22–7. doi:10.1016/j.schres.2013.02.025
42. Connolly JG, Toomey TJ, Schneeweiss MC. Metabolic monitoring for youths initiating use of second-generation antipsychotics, 2003–2011. *Psychiatr Serv* (2015) 66(6):604–9. doi:10.1176/appi.ps.201400222
43. Mangurian C, Newcomer JW, Vittinghoff E, Creasman JM, Knapp P, Fuentes-Afflick E, et al. Diabetes screening among underserved adults with severe mental illness who take antipsychotic medications. *JAMA Intern Med* (2015) 175(12):1977–9. doi:10.1001/jamainternmed.2015.6098
44. Hardy S, White J, Deane K, Gray R. Educating healthcare professionals to act on the physical health needs of people with serious mental illness: a systematic search for evidence. *J Psychiatr Ment Health Nurs* (2011) 18(8):721–7. doi:10.1111/j.1365-2850.2011.01722.x
45. Wikman A, Wärneryd B. Measurement errors in survey questions: explaining response variability. *Soc Indic Res* (1990) 22(2):199–212. doi:10.1007/BF00354840

Conflict of Interest Statement: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Copyright © 2017 Watkins, Rosenbaum, Ward, Patching, Denney-Wilson and Stein-Parbury. This is an open-access article distributed under the terms of the Creative Commons Attribution License (CC BY). The use, distribution or reproduction in other forums is permitted, provided the original author(s) or licensor are credited and that the original publication in this journal is cited, in accordance with accepted academic practice. No use, distribution or reproduction is permitted which does not comply with these terms.

Reference code _____

Date _____

The M-BACK Questionnaire

1. My workload prevents me doing any health promotion activities with consumers.

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

2. Consumers with a severe mental illness are not interested in improving their physical health.

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

3. Informing clients about the possible effects medications may have on their physical health will increase non-adherence.

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

4. Screening for metabolic syndrome and physical health interventions are pointless as poor physical health outcomes are unavoidable.

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

5. Metabolic health screening is an important part of my role as a mental health clinician.

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

6. Giving smoking cessation advice is an important part of my role as a mental health clinician.

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

7. Encouraging consumers to increase their level of physical activity is an important part of my role as a mental health clinician.

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

8. Discussing nutritional intake is an important part of my role as a mental health clinician.

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

9. I am confident in my ability to screen for metabolic syndrome.

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

10. I am confident in providing smoking cessation advice to consumers.

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

11. I am confident in prescribing exercise interventions to prevent / treat metabolic syndrome.

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

12. I am confident in using dietary interventions to prevent / treat metabolic syndrome in consumers.

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

13. I have a good knowledge of metabolic syndrome.

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

14. I understand how to screen for metabolic syndrome.

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

15. I understand how to read pathology reports for lipids and glucose results.

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

16. I understand the metabolic side-effect profiles of different neuroleptic medication.

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

Scoring for BACK questionnaire

Attitudes, Confidence and Knowledge (last 12 question) were scored as

Strongly Disagree	1
Disagree	2
Neutral	3
Agree	4
Strongly Agree	5

Scoring was reversed for the Barrier (first 4 questions) questions as they were negatively posed

Strongly Disagree	5
Disagree	4
Neutral	3
Agree	2
Strongly Agree	1

Scoring for each component of BACK (Barriers, Attitudes, Confidence, Knowledge) is out of 20 (with a minimum score of 4)

Total score is out of 80 (with a minimum score of 16)

Chapter summary

Chapter 4 describes the development and validation of a measurement tool to determine the effectiveness of metabolic education and training to mental health nurses. The demonstration of lifestyle interventions being effectively delivered within mental health services (Ch 3) is indicative that, with training and education, mental health nurses could deliver similar interventions to mental health consumers. The M-BACK tool provides a valid and reliable instrument to measure changes in the attitudes, confidence, knowledge and perceived barriers pre- and post-education initiatives in metabolic health care. This tool allows for quantitative evaluation of mental health nursing education, to help determine the efficacy of metabolic education and training and allow for future improvement of education and training initiatives. In this way the M-BACK tool can assist with the improvement of physical health outcomes for people with severe mental illness.

The M-BACK questionnaire evaluated in the research presented in this chapter has been used in studies on four continents (133, 171, 172, 173, 174), and has been translated into Italian (175), French (176), Greek, Norwegian and Standard Chinese (not yet published).

Chapter 5

Upskilling mental health nurses to address the burden of poor metabolic health: A mixed method evaluation

Chapter preface

Presenting at conferences and delivering in-service education in relation to the outcomes of the Keeping Body in Mind KBIM program (Ch 3) led to many conversations with participants. I discovered that many nurses and other mental health professionals lacked confidence in their ability to screen patients for metabolic health disorders and provide lifestyle interventions. This anecdotal finding of a lack of confidence for mental health nurses in delivering metabolic health care is something that has also been noted in the literature(132). With this in mind, I developed a knowledge and skills workshop on metabolic screening and lifestyle interventions for mental health nurses, which I delivered via the Australian College of Nurses in years 2013–2017.

The work presented in Chapter 4 is a validated a measurement tool that can be utilised to evaluate the effectiveness of clinician training in metabolic health care. In Chapter 5, this tool was implemented, alongside a qualitative evaluation, to investigate the efficacy of a training course targeted at upskilling mental health nurses to better manage the metabolic health of people experiencing SMI. An outline of the course content is included at appendix 7

Ethical approval was granted for the study by University of Technology, Sydney Research Committee -HREC 2013000749 (Appendix 5B).

This is an ‘Accepted Manuscript’ of an article published by Taylor & Francis Group in Issues in Mental Health Nursing on 17th June 2020, available online:

<https://www.tandfonline.com/10.1080/01612840.2020.1744204>

Permission to include the accepted manuscript version is include in Appendix 1B

Publication

Watkins A, Stein-Parbury J, Denney-Wilson E, Ward PB, Rosenbaum S. Upskilling mental health nurses to address the burden of poor metabolic health: A mixed method evaluation. *Issues in Mental Health Nursing* 2020;41(10):925-931.

Upskilling mental health nurses to address the burden of poor metabolic health: A mixed method evaluation

Andrew Watkins^{1,2*}, Jane Stein-Parbury², Elizabeth Denney-Wilson³, Philip B Ward^{4,5}, Simon Rosenbaum⁴

¹ Sunshine Coast Mind and Neuroscience - Thompson Institute, University of Sunshine Coast, QLD, Australia

² Faculty of Health, University of Technology, Sydney, NSW, Australia

³ Faculty of Medicine and Health, University of Sydney, NSW, Australia

⁴ School of Psychiatry, UNSW Sydney, Sydney, NSW, Australia

⁵ Schizophrenia Research Unit, Ingham Institute for Applied Medical Research, Liverpool Hospital, South Western Sydney Local Health District, Australia

*Corresponding author:

Andrew Watkins

Sunshine Coast Mind and Neuroscience - Thompson Institute, University of Sunshine Coast. 12 Innovation Parkway, Birtinya, Qld, 4575 Ph: +61 7 5430 1191,

email: awatkins1@usc.edu.au

Upskilling mental health nurses to address the burden of poor metabolic health: A mixed method evaluation.

Abstract

People living with a severe mental illness experience a life expectancy gap compared to the rest of the population that is largely driven by preventable cardiovascular diseases stemming from lifestyle factors, and the side effects of psychotropic medications. Mental health nurses are well positioned to help address gap using lifestyle interventions. However, many nurses don't prioritise delivering such care, or lack the skills and confidence to implement these strategies. This study used a mixed method approach to determine the effectiveness of 2-day metabolic workshops that aimed to provide nurses with the skills to provide lifestyle interventions. The quantitative component compares pre- and post-measures of attitudes, confidence, knowledge and perceived barriers of providing metabolic care using a validated tool (M-BACK) and the qualitative component to elicit more details of the needs, expectations and plans of participants. Fifty-six nurse participants demonstrated statistically significant improvements in M-BACK post scores ($p < 0.001$), with 53 of the 56 participants (95%) achieving improved M-BACK scores. Participants identified three primary barriers to delivering metabolic care, related to individual staff members, consumers, and system issues. Prior to the course participants stated they hoped to improve their knowledge, enhance their practical skills and provide education for others. Following completion of the course participants planned to implement lifestyle education and interventions for consumers, provide education and support to other staff and integrate metabolic health care into clinical reviews and planning. This study demonstrates that education on metabolic health care can be effective in improving the attitudes, confidence, and knowledge of

mental health nursing in providing metabolic health care and a decrease in the perceived barriers to delivering that care.

Introduction

In recent decades mental health nursing has become more focused on mental illness symptomatology. This focus has come at a cost, with physical health care needs of consumers increasingly neglected (Firth et al., 2019). People with severe mental illness have poorer physical health outcomes compared to the general population; indeed, people with an SMI experience a reduced life expectancy of up to 20 years (Hjorthøj et al., 2017). This life expectancy gap is primarily due to cardiovascular disease and the components of metabolic syndrome, that is, abdominal weight gain, dyslipidaemia, hypertension and glucose abnormalities (Correll et al., 2017). Whilst people experiencing SMI have a broad range of physical health issues that warrant careful attention (Daumit et al., 2013), the widespread use of atypical antipsychotics makes metabolic health an area of particular concern (Pillinger et al., 2020).

The advent of atypical antipsychotics has significantly reduced some side effects of their predecessors, such as movement disorders (Sykes et al., 2017). However, atypical antipsychotics are associated with an increased rate of metabolic side effects and this has led to increasing rates of metabolic syndrome amongst people living with SMI (Pillinger et al., 2020).

The “Second Australian National Survey of Psychosis” study reported that people who experienced psychosis had significantly higher rates of metabolic syndrome (60.8%) than the general population (Morgan et al., 2012). People with SMI also have rates of smoking more than twice that of the general public, considerably higher rates of obesity, and much lower levels of physical activity than the general population (Firth et al., 2019) Despite the increased risk of

metabolic health issues, individuals with SMI are less likely to be provided with physical health screening and interventions compared to the general population (Melamed et al., 2019).

Consumers with SMI are at risk of metabolic health problems due to lifestyle choices and the impact of psychotropic medication, but this is exacerbated by the fact they are often marginalised from mainstream health services (Cranwell et al., 2016). The lifestyle factors that pose substantial risk, such as poor diet, reduced physical activity, smoking and alcohol consumption, are all modifiable risk factors, which may be amenable to intervention by health services (Samaras, 2016).

Mental health nurses are well positioned to play a key role in providing metabolic health care to people who experience mental illness (Happell et al., 2019). Screening people with SMI for elevated weight, waist circumference and blood pressure are procedures that nurses are qualified to perform. Nurses are also well positioned to provide opportunistic advice regarding smoking cessation (Dickens et al., 2019). Multiple studies have reported that mental health nurses self-identify a lack of knowledge and skill to deal with metabolic health issues in consumers with SMI (Bressington et al., 2018; Dickens et al., 2019; Yalçın et al., 2019). There have been repeated calls in the nursing literature for further education and training in physical health to be provided for mental health nurses and for these initiatives to be evaluated (Happell et al., 2013; Hennessy & Cocoman, 2018; Wynaden et al., 2016)

There is a distinct lack of published information on physical health training for mental health nurses and only threadbare information on its effectiveness (Hennessy & Cocoman, 2018). A 2011 systematic review on physical health education for mental health clinicians found no papers evaluating their effectiveness (Hardy et al., 2011). A recent systematic, integrative review of

mental health nurses' attitudes, experience, and knowledge across a broad range of physical health care identified 51 studies that have mainly been published since 2010 (Dickens et al., 2019 Atlantis, & Everett, 2019). Most of these studies were cross-sectional surveys, however eight studies that provided pre- and post-testing of an educational intervention were also identified. These eight studies identified improvement in knowledge, and articles that reported on attitudes and confidence also demonstrated significant improvement. Another study demonstrated that mental health nurses increased waist circumference monitoring following a brief education session (Rosenbaum et al., 2014). However, none of these articles used a validated questionnaire to assess these outcomes.

Methods

Aim

The aim of this exploratory study was to determine the effectiveness of a workshop delivered to mental health nurses on their perceived practice barriers, attitudes, confidence, and knowledge of metabolic health.

Design

The authors used a mixed-method design. The quantitative component was conducted as pre- and post-analysis of data gathered from participants in two-day metabolic health care workshops for mental health nurses. Outcomes were assessed immediately before and after the workshop. The qualitative component invited responses from participants at baseline and a further question on completion of the workshop.

Settings and participants

Two-day workshops focused on metabolic health care were administered under the auspices of the Australian College of Nursing. The workshop content outlined the issues underlying poor metabolic health, screening methods and effective interventions, including smoking cessation,

physical activity, nutrition, pharmacological and health coaching. The course provided a hands-on experience of metabolic screening and interventions, in which participants practiced skills on one another to reinforce learning outcomes. Participants either self-selected attending the course or had been nominated by their service manager. Data were collected from four courses held in three Australian states. All participants were nurses working in mental health services.

Quantitative evaluation

The instrument used to measure changes in participants was the Metabolic-Barriers, Attitudes, Confidence and Knowledge Questionnaire (M-BACK) (Watkins et al., 2017).

The M-BACK uses a five-point Likert style scale ranging from 1 ‘Strongly Disagree’ to 5 ‘Strongly Agree’ to assess domains of perceived practice barriers, attitudes, confidence and knowledge about metabolic health care. Four questions are asked in each of these four domains totally 16 questions. Each domain score ranges from 4-20 with total score ranges 16-80. Higher scores represent more positive outcomes in each domain.

Domain 1: Barriers Items addressed barriers to metabolic screening and intervention, including, workload, consumer interest, conflict with mental health goals and inability to change. These questions were negatively posed with scoring reversed.

Domain 2: Attitudes Items five examined attitudes towards metabolic monitoring, the provision of smoking cessation advice, physical activity and nutritional intake.

Domain 3: Confidence Items assessed the confidence of respondents in providing interventions to prevent or treat metabolic syndrome including smoking cessation, physical activity and nutritional interventions.

Domain 4: Knowledge Items assessed knowledge of metabolic syndrome, screening, interpreting pathology reports and understanding of the metabolic side effects of neuroleptic medication.

Scores for each domain ranged from 4 –20.

This survey tool was developed by professionals who had expertise in the area of metabolic health care. Test-retest reliability and validity for the M-BACK was considered excellent. Intra-class correlation coefficients, 0.87 (95% CI 0.75 to 0.94) and has been published previously (Watkins et al., 2017)

Qualitative evaluation

Open-ended questions provide opportunities for participants' self-expression and thinking that went beyond standardised quantitative enquiry methodology (Pope et al., 2000). In this study, additional open-ended questions were included to provide information about the needs, expectations and plans of the participants.

The pre-workshop questionnaire included two additional questions which were open-ended. These questions were 'What barriers might prevent you from addressing metabolic health with metabolic consumers?' and 'What do you hope to gain from participating in this course?' Participants were asked to provide up to three responses to each of the questions.

The post-workshop questionnaire included an additional question with an open-ended response asking, 'What screening and intervention changes do you plan to implement in your workplace following this workshop?' Participants were again invited to provide up to three responses.

Ethical considerations

The study was approved by the University of Technology Research Ethics Committee (2013000749) and endorsed for use in the workshop by the Australian College of Nursing. Participants were provided with a participant information sheet. The pre-questionnaire was administered on day one of the workshop, prior to any content being delivered and the post questionnaire on day two at completion of the workshop. Participants were asked to code their own questionnaire and retain this code for the post-questionnaire; as such they were not identifiable to the researchers. Consent was assumed by completion of the questionnaire.

Data Analysis

Quantitative

Statistical analysis was performed using Statistical Package for Social Sciences 25.0 (SPSS Inc., Chicago, IL, USA). Participant demographics, responses to statements regarding participants' knowledge, confidence, attitudes and practice barriers of metabolic health are reported using descriptive statistics (mean \pm SD, frequencies). Pre-post-test comparisons are reported using Wilcoxon signed-rank tests. Intergroup differences were conducted using the Mann-Whitney U test.

Qualitative

Standard thematic analysis was used to analyse the responses to open-ended questions (Braun & Clarke, 2006). Thematic analysis is the methodical inductive examination of text by detecting and assembling themes and coding, classifying and developing categories (Vaismoradi et al., 2013). AW and SR independently read and re-read the responses and developed detailed notes. Broad codes were developed from these reviews and refined and synthesised to produce categories. This multiple coding approach was utilised to reduce the risk of investigator bias (Whitley & Crawford, 2005). Following discussion, the authors agreed on the major themes described in the results section.

Results

Participants

In total 56 questionnaires were distributed and 56 were returned (response rate 100%). The mean age of participants was 49 (SD \pm 9.2; range, 23-67), all participants were nurses, with 93% were registered nurses and the remainder were enrolled nurses (Diploma of Nursing qualification in Australia). 82% of participants were female and had an average of 24 years (SD \pm 11) experience working as a nurse and 18 years (SD \pm 9.5) experience working in mental health settings. The majority of participants (73%) worked as clinicians in mental health, 16% were mental health

managers and the remainder (11%) were mental health educators. Whilst 70% of participants had a post-graduate education, only a minority (29%) had received metabolic health education prior to attending these workshops.

Quantitative analysis

Overall M-BACK scores improved significantly (see tables 1 and 2). The mean pre-test score of 58.14 (range, 42-73) increased to 69.60 (range, 53-80) at post-testing. ($p < 0.001$). In total, 53 of 56 (95%) participants had positively ranked scores. Statistically significant improvement in each domain of the M-BACK were observed from pre to post-testing (see table 2) including perceived barriers ($p < 0.001$, 42 of 56 positively ranked), attitudes ($p < 0.001$, 33 of 56 positively ranked), confidence ($p < 0.001$, 51 of 56 positively ranked), and knowledge ($p < 0.001$, 49 of 56 positively ranked).

In pre-score testing participants who had undergone prior metabolic health education had higher M-BACK total scores compared to those who had no prior training ($p = 0.02$). Pre-scores in all sub-categories of the M-BACK were significantly higher for those with prior metabolic training in the areas of knowledge ($p < 0.01$) and confidence ($p < 0.04$), whilst no significant changes were seen for attitudes ($p = 0.2$) or perceived barriers ($p = 0.4$). At post testing there were no significant difference between those participants who had completed previous metabolic training to those who had not.

Qualitative analysis

Barriers

In response to the question ‘What barriers might prevent you from addressing metabolic health with mental health consumers?’ three main categories were identified. These categories were i) barriers related to the individual staff members, ii) barriers related to consumers, and iii) a lack of organisational system resources and support.

The primary barriers identified by participants preventing metabolic health delivery were at an individual clinician level. A large majority of participants who responded to this question perceived barriers relating to themselves or other staff members within the mental health service. Participants conceded that there was a lack of both knowledge and skill regarding metabolic health issues for themselves and their colleagues. A common statement was that the specialisation in mental health had negatively impacted their capability for managing metabolic health, an example from one participant stated, *'Working in mental health for so long I have lost the skills in being able to deal with physical health'*.

The motivation of other staff to address metabolic health issues was viewed as a barrier for some: *'it's hard to get other staff on board with consistent metabolic monitoring'* whilst others felt that some individual staff members would ignore metabolic concerns raised, for example, *'the psychiatrist isn't interested in their metabolic health'*.

More than half of participants identified a barrier for addressing metabolic health as being related to the consumer. It was strongly identified by participants that low motivation for lifestyle change was an impediment to assisting consumers with their metabolic health. Some participants identified consumers as being *'unwilling'* or *'not following up on goals'*. Challenges engaging some consumers were identified by participants saying they were *'disinterested'* or *'didn't want to talk about it'*. Some participants identified financial barriers, including that the consumer had to *'purchase nutritious foods'*, especially when consumers had a *'nicotine addiction using most of their disposable income'*. Other participants questioned the capacity of some consumers to discuss metabolic health matters, identifying that some people were *'too acutely unwell'* or *'didn't have insight into their poor physical health'*.

Another set of barriers identified was related to system issues and a lack of organisational

support. Workload and a lack of time to devote to metabolic health issues was clearly identified by participants as being significant issues, with participants stating, *'our service model doesn't allow time to devote to physical health needs'*, *'there is too much paperwork to get through'* and *'safety and acute mental health issues have to be prioritised'*. A lack of equipment, educational resources and managerial support were organisational barriers that were identified. Participants identified lack of equipment; *'I can't even get a set of scales'*, and tools to document data *'we don't have a form to record metabolic monitoring'*. Participants also identified a lack of information resources that provided *'nutritional information'* and *'exercise advice'*. A number of people stated that the lack of managerial support for metabolic health projects was a barrier to implementing metabolic health screening and interventions, with managers not seeing the area of metabolic health as *'core business'*.

Participants hopes regarding benefits from the workshop

Responses to the question 'What do you hope to gain from participating in this course?' fell into three broad categories. These categories were increasing their own knowledge levels, enhancing practical skills to better support and educate consumers, and providing education to other staff members.

A majority of participants stated that they hoped to increase their knowledge base around metabolic health. Participants identified *'understanding metabolic syndrome and its causes'* as a major area of knowledge they would like to gain from the course. How metabolic syndrome related to *'medication side-effects'* and what *'interventions would be helpful'* were highlighted by participants as knowledge domains that would learn more about from the workshop. Other areas where participants desired knowledge was *'where to access resources'*, *'how to read pathology results'* and finally information on how to *'set up a metabolic health program'*.

Participants identified development of practical skills as another area they hoped to address by attending the workshop. A large majority of participant's identified the development of skills regarding screening and/or lifestyle interventions as a key potential outcome after completing the workshop. Participants wanted to learn how to provide lifestyle intervention through dietary interventions, '*how I can teach dietary and nutrition skills*', physical activity interventions '*how to prescribe exercise*' and health coaching skills to '*better support consumers lifestyle choices*'. Participants also hoped to learn about metabolic health screening including '*taking a waist circumference correctly*'.

Being able to provide education to other staff members was another desired outcome for some participants. Participants expressed a desire to '*upskill the local workforce*' and saw the potential to '*share information with others*'. Participants hoped that they could '*build a training package*' in order to '*construct a metabolic health program*'.

Planned implementations

Following the course, participants identified a range of activities and interventions that they planned to implement. The planned activities and intervention are classified into the broad categories of the introduction of lifestyle education and interventions for consumers, the education and support of other staff members, and finally the integration of metabolic health care into clinical reviews and care planning.

A large majority of participants stated that they were intending to implement or re-invigorate education and/or intervention programs in metabolic health for consumers in their service. The area most commonly identified area for implementation was the introduction or re-invigoration of a metabolic screening program. Lifestyle intervention implementation were also a common area identified, offering exercise and dietary interventions as either individual, group or a

combination of both modes of delivery. Another planned area of implementation was building the capacity of the service through exercise physiology and dietetic student placements and working closely with Non-Government Organisation's to provide lifestyle intervention and support. Some participants also identified that they planned to work closely with prescribers to introduce pharmacological intervention, such as metformin, into practice.

Discussion

General Findings

Targeted training for mental health nurses in the provision of metabolic health care is an effective strategy for improving self-reported knowledge of barriers, attitudes, confidence and knowledge in this area. We found a highly significant improvement across all domains of the M-BACK, indicating that participants improved in their attitudes towards delivering metabolic health care to mental health consumers, the confidence and knowledge to measure and deliver those interventions and reducing perceived barriers to delivering metabolic health interventions as a result of participating in metabolic health workshops.

This is contrary to previous evidence that has found targeted education in physical health has not resulted in a statistically significant increase in knowledge of mental health nurses (Hennessy & Cocoman, 2018). Two large-scale randomised controlled trials that have aimed to reduce cardio-metabolic risk in people experiencing SMI found that despite staff training these programs were largely ineffective, although both studies acknowledge limitations including around improved practices in treatment as usual participants (Gaughran et al., 2017; Osborn et al., 2018). It is a consistent finding that increased knowledge levels do not necessarily lead to behaviour change in health care professionals (Grol & Grimshaw, 2003). A systematic review of education interventions with health care professionals that targeted control of cardiometabolic risk factors

did not demonstrate a positive impact on patient outcomes, and that stand alone education should be avoided (Seidu et al., 2016).

Some of the positive M-BACK outcomes that were achieved may be attributable to the hands-on and interactive delivery of the workshop material. The workshop allowed participants to practice screening and intervention techniques, which is likely to lead to better engagement and have a positive impact on participants confidence levels (Cantrell et al., 2017). A recent study that employed lifestyle interventions with mental health staff aimed to achieve culture change regarding physical health care demonstrated that a practical learning environment resulted in statistically significant positive changes, as measured by the M-BACK, both following the intervention and at four-month follow up (Rosenbaum et al., 2020). An interactive, rather than passive, educational setting that allows time for practicing clinical skills reinforces knowledge and contextualises skills, thus increasing the likelihood of achieving practice change (Kolb, 2014).

Consistent with the pre-workshop findings in this study, it is commonplace for mental health nurses to perceive that it is difficult to help consumers follow healthy lifestyle advice (Knight et al., 2017; Wynaden et al., 2016). This is despite evidence that consumers are actually interested in improving their own physical health (Ewart et al., 2016; Wynaden et al., 2016). This misalignment may relate to the manner in which mental health nurses are offering advice and support healthy lifestyle behaviours. In a study by Leyland et al. (2018) over 70% of mental health nurses reported only occasionally or never offering physical health advice to consumers. Mental health nurses can increase their focus on physical health care planning using evidenced based techniques, for example helping consumers to set SMART goals (Happell et al., 2012).

Some of the barriers identified by study participants prior to the education intervention will not be solved by an education intervention. Workplace culture has been reported as an impediment to health care professionals transferring their increased knowledge about physical health care into the practice environment (Hennessy & Cocoman, 2018). Issues such as lack of management support and resources create an environment where it is difficult to implement new skills and knowledge. High workload is frequently cited as factor that leads to the inability of health care professionals to assist with behaviour change (Keyworth et al., 2019). Consistent with the findings of this study, mental health nurses perceive that they had insufficient time to carry out physical health interventions (Stanton et al., 2015). Workload has been identified as a factor contributing to lack of time in delivering physical health (Wynaden et al., 2016). Further to this, a lack of guidelines regarding the provision of physical health care is likely to have a negative impact around the implementation of physical health care (Gray & Brown, 2017).

Responses to the pre-course survey identified a number of barriers that were also reflected in the quantitative M-BACK findings. Many of the barriers identified were external to attendees' control; despite this, there was a marked improvement in M-BACK scores in the barriers section in the post-workshop survey. Given that the barriers themselves would not have changed over the two days of the workshop, the reported improvement indicates that the change was a result of altered perception regarding barriers to implementing metabolic health screening and interventions. It could be that these perceived changes in the identified barriers may be a result of viewing them through a more positive attitudinal lens that no longer considered these barriers as insurmountable, and with increased knowledge and confidence about metabolic health participants may have felt that they could overcome existing barriers.

Participants identified many areas in which they planned to make changes to make changes following completion of the metabolic health workshop, focused on enhanced metabolic screening and intervention delivery. From this information it could be surmised that participants felt engaged by the education and inspired to create improvements in their local clinical practice.

Limitations and future research

Despite the positive findings in this study, they should be considered in light of some methodological limitations. The present study did not include follow-up to examine whether workshop participants were able to translate their new knowledge into changed practice in the work environment. Future research should include longer term follow-up to determine whether education interventions have created a change in practice amongst participants.

Practical implications

These findings have important clinical implications. High on the list of barriers identified preventing clinicians from implementing metabolic care for mental health service consumers were lack of skills, knowledge and confidence. By offering a workshop with both theoretical and practical skill development, participants reported improved attitudes, confidence and knowledge about metabolic health screening and intervention, in addition to a reduction in the barriers they perceived in implementing these activities.

Conclusion

This study has demonstrated that education on metabolic health care for mental health nurses can be effective at improving the knowledge of metabolic health, their skill levels regarding screening and intervention, improved attitudes toward metabolic health care and a decrease in perceived barriers to providing metabolic care. More training should be made available to mental health nurses in an effort to reduce the high premature mortality experienced by people experiencing SMI.

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors. The authors report no conflict of interest.

References

- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative research in psychology*, 3(2), 77-101. <https://doi.org/10.1191/1478088706qp063oa>
- Bressington, D., Badnapurkar, A., Inoue, S., Ma, H. Y., Chien, W. T., Nelson, D., & Gray, R. (2018). Physical health care for people with severe mental illness: the attitudes, practices, and training needs of nurses in three Asian countries. *International Journal of Environmental Research and Public Health*, 15(2), 343.
- Cantrell, M. A., Franklin, A., Leighton, K., & Carlson, A. (2017). The evidence in simulation-based learning experiences in nursing education and practice: an umbrella review. *Clinical Simulation in Nursing*, 13(12), 634-667.
- Correll, C. U., Solmi, M., Veronese, N., Bortolato, B., Rosson, S., Santonastaso, P., Thapa-Chhetri, N., Fornaro, M., Gallicchio, D., & Collantoni, E. (2017). Prevalence, incidence and mortality from cardiovascular disease in patients with pooled and specific severe mental illness: a large-scale meta-analysis of 3,211,768 patients and 113,383,368 controls. *World Psychiatry*, 16(2), 163-180.
- Cranwell, K., Polacsek, M., & McCann, T. V. (2016). Mental health consumers' with medical comorbidity experience of the transition through tertiary medical services to primary care. *International Journal of Mental Health Nursing*. <https://doi.org/10.1111/inm.12174>
- Daumit, G. L., Dickerson, F. B., Wang, N.-Y., Dalcin, A., Jerome, G. J., Anderson, C. A., Young, D. R., Frick, K. D., Yu, A., & Gennusa III, J. V. (2013). A behavioral weight-loss intervention in persons with serious mental illness. *New England Journal of Medicine*, 368(17), 1594-1602. <https://doi.org/10.1056/NEJMoa1214530>
- Dickens, G. L., Ion, R., Waters, C., Atlantis, E., & Everett, B. (2019). Mental health nurses' attitudes, experience, and knowledge regarding routine physical healthcare: systematic, integrative review of studies involving 7,549 nurses working in mental health settings. *BMC Nursing*, 18(1), 16. <https://doi.org/10.1186/s12912-019-0339-x>
- Ewart, S. B., Bocking, J., Happell, B., Platania-Phung, C., & Stanton, R. J. (2016). Mental health consumer experiences and strategies when seeking physical health care: a focus group study. *Global Qualitative Nursing Research*, 3, 2333393616631679.
- Firth, J., Siddiqi, N., Koyanagi, A., Siskind, D., Rosenbaum, S., Galletly, C., Allan, S., Caneo, C., Carney, R., & Carvalho, A. F. (2019). The Lancet Psychiatry Commission: a blueprint for protecting physical health in people with mental illness. *The Lancet Psychiatry*, 6(8), 675-712.
- Gaughran, F., Stahl, D., Ismail, K., Greenwood, K., Atakan, Z., Gardner-Sood, P., Stubbs, B., Hopkins, D., Patel, A., & Lally, J. (2017). Randomised control trial of the effectiveness of an integrated psychosocial health promotion intervention aimed at improving health and reducing substance use in established psychosis (IMPACT). *BMC Psychiatry*, 17(1), 413.

- Gray, R., & Brown, E. (2017). What does mental health nursing contribute to improving the physical health of service users with severe mental illness? A thematic analysis. *International Journal of Mental Health Nursing*, 26(1), 32-40.
- Grol, R., & Grimshaw, J. (2003). From best evidence to best practice: effective implementation of change in patients' care. *The Lancet*, 362(9391), 1225-1230.
- Happell, B., Davies, C., & Scott, D. (2012). Health behaviour interventions to improve physical health in individuals diagnosed with a mental illness: A systematic review. *International Journal of Mental Health Nursing*, 21(3), 236-247. <https://doi.org/10.1111/j.1447-0349.2012.00816.x>
- Happell, B., Platania-Phung, C., & Scott, D. (2013). Physical health care for people with mental illness: training needs for nurses. *Nurse Educ Today*, 33(4), 396-401. <https://doi.org/10.1016/j.nedt.2013.01.015>
- Happell, B., Platania-Phung, C., Watkins, A., Scholz, B., Curtis, J., Goss, J., Niyonsenga, T., & Stanton, R. (2019). Developing an evidence-based specialist nursing role to improve the physical health care of people with mental illness. *Issues in Mental Health Nursing*, 40(10), 832-838. <https://doi.org/10.1080/01612840.2019.1584655>
- Hardy, S., White, J., Deane, K., & Gray, R. (2011). Educating healthcare professionals to act on the physical health needs of people with serious mental illness: A systematic search for evidence. *Journal of Psychiatric and Mental Health Nursing*, 18(8), 721-727. <https://doi.org/10.1111/j.1365-2850.2011.01722.x>
- Hennessy, S., & Cocoman, A. M. (2018). What is the impact of targeted health education for mental health nurses in the provision of physical health care? An integrated literature review. *Issues in Mental Health Nursing*, 39(8), 700-706.
- Hjorthøj, C., Stürup, A. E., McGrath, J. J., & Nordentoft, M. (2017). Years of potential life lost and life expectancy in schizophrenia: a systematic review and meta-analysis. *The Lancet Psychiatry*, 4(4), 295-301.
- Keyworth, C., Epton, T., Goldthorpe, J., Calam, R., & Armitage, C. (2019). 'It's difficult, I think it's complicated': Health care professionals' barriers and enablers to providing opportunistic behaviour change interventions during routine medical consultations. *British Journal of Health Psychology*, 24(3), 571-592.
- Knight, M., Bolton, P., & Kopeski, L. (2017). Providing physical care to persons with serious mental illness: Attitudes, confidence, barriers and psychological empowerment. *Archives of Psychiatric Nursing*, 31(5), 447-453.
- Kolb, D. A. (2014). *Experiential learning: Experience as the source of learning and development*. FT press.
- Leyland, S. D., Currie, A., Anderson, S. D., Bradley, E., & Ling, J. (2018). Offering physical activity advice to people with serious mental illness: The beliefs of mental health professionals. *Mental Health Physical Activity*, 15, 1-6.
- Melamed, O. C., Wong, E. N., LaChance, L. R., Kanji, S., & Taylor, V. (2019). Interventions to Improve Metabolic Risk Screening Among Adult Patients Taking Antipsychotic Medication: A Systematic Review. *Psychiatric Services*, 70(12), 1138-1156.
- Morgan, V. A., Waterreus, A., Jablensky, A., Mackinnon, A., McGrath, J. J., Carr, V., Bush, R., Castle, D., Cohen, M., & Harvey, C. (2012). People living with psychotic illness in 2010:

- The second Australian national survey of psychosis. *Australian and New Zealand Journal of Psychiatry*, 46(8), 735-752. <https://doi.org/10.1177/0004867412449877>
- Osborn, D., Burton, A., Hunter, R., Marston, L., Atkins, L., Barnes, T., Blackburn, R., Craig, T., Gilbert, H., & Heinkel, S. (2018). Clinical and cost-effectiveness of an intervention for reducing cholesterol and cardiovascular risk for people with severe mental illness in English primary care: a cluster randomised controlled trial. *The Lancet Psychiatry*, 5(2), 145-154.
- Pillinger, T., McCutcheon, R. A., Vano, L., Mizuno, Y., Arumuham, A., Hindley, G., Beck, K., Natesan, S., Efthimiou, O., Cipriani, A., & Howes, O. D. (2020). Comparative effects of 18 antipsychotics on metabolic function in patients with schizophrenia, predictors of metabolic dysregulation, and association with psychopathology: a systematic review and network meta-analysis. *Lancet Psychiatry*, 7(1), 64-77. [https://doi.org/10.1016/S2215-0366\(19\)30416-X](https://doi.org/10.1016/S2215-0366(19)30416-X)
- Pope, C., Ziebland, S., & Mays, N. (2000). Qualitative research in health care: analysing qualitative data. *British Medical Journal*, 320(7227), 114. <https://doi.org/10.1136/bmj.320.7227.114>
- Rosenbaum, S., Nijjar, S., Watkins, A., Garwood, N., Sherrington, C., & Tiedemann, A. (2014). Nurse assessed metabolic monitoring: A file audit of risk factor prevalence and impact of an intervention to enhance measurement of waist circumference. *International journal of mental health nursing*. <https://doi.org/10.1111/inm.12057>
- Rosenbaum, S., Ward, P. B., Baldeo, R., Fibbins, H., Jarman, R., Lederman, O., Perram, A., Poole, J., Rossimel, E., Smith, G., Teasdale, S., Wade, T., Watkins, A., White, A., Pearce, D., & Curtis, J. (2020). Changing health workforce attitudes to promote improved physical health in mental health service users: Keeping our Staff in Mind (KoSiM). *Health Promotion Journal of Australia*. <https://doi.org/10.1002/hpja.320>
- Samaras, K. (2016). *Cardiometabolic Risk and Monitoring in Psychiatric Disorders (Cardiovascular Diseases and Depression (pp. 305-331))*. Springer. https://doi.org/10.1007/978-3-319-32480-7_18
- Seidu, S., Walker, N., Bodicoat, D., Davies, M., & Khunti, K. (2016). A systematic review of interventions targeting primary care or community based professionals on cardio-metabolic risk factor control in people with diabetes. *Diabetes research clinical practice*, 113, 1-13.
- Stanton, R., Happell, B., & Reaburn, P. (2015). Investigating the exercise-prescription practices of nurses working in inpatient mental health settings. *International Journal of Mental Health Nursing*, 24(2), 112-120.
- Sykes, D. A., Moore, H., Stott, L., Holliday, N., Javitch, J. A., Lane, J. R., & Charlton, S. (2017). Extrapyrmidal side effects of antipsychotics are linked to their association kinetics at dopamine D 2 receptors. *Nature communications*, 8(1), 1-11.
- Vaismoradi, M., Turunen, H., & Bondas, T. (2013). Content analysis and thematic analysis: Implications for conducting a qualitative descriptive study. *Nursing & health sciences*, 15(3), 398-405. <https://doi.org/10.1111/nhs.12048>
- Watkins, A., Rosenbaum, S., Ward, P. B., Patching, J., Denney-Wilson, E., & Stein-Parbury, J. (2017). The validity and reliability characteristics of the M-BACK Questionnaire to assess

- the barriers, attitudes, confidence, and knowledge of mental health staff regarding metabolic health of mental health service users. *Frontiers in public health*, 5, 321. <https://doi.org/10.3389/fpubh.2017.00321>
- Whitley, R., & Crawford, M. (2005). Qualitative research in psychiatry. *The Canadian Journal of Psychiatry*, 50(2), 108-114. <https://doi.org/10.1177/070674370505000206>
- Wynaden, D., Heslop, B., Heslop, K., Barr, L., Lim, E., Chee, G. L., Porter, J., & Murdock, J. (2016). The chasm of care: Where does the mental health nursing responsibility lie for the physical health care of people with severe mental illness? *International Journal of Mental Health Nursing*, 25(6), 516-525.
- Yalçın, S. U., Bilgin, H., & Özaslan, Z. (2019). Physical Healthcare of People with Serious Mental Illness: A Cross-Sectional Study of Nurses' Involvement, Views, and Current Practices. *Issues in Mental Health Nursing*, 40(10), 908-916.

Table 1. Baseline and post M-BACK scores for n=56 participants

	Mean (SD)	Minimum	Maximum
Total			
pre	58.1 (6.8)	42.00	73.00
post	69.6 (6.8)	53.00	80.00
Barriers			
pre	15.1 (2.3)	8.00	20.00
post	17.0 (2.1)	12.00	20.00
Attitudes			
pre	17.1 (2.0)	12.00	20.00
post	18.1 (2.3)	8.00	20.00
Confidence			
pre	13.6 (2.6)	8.00	19.00
post	17.3 (2.1)	13.00	20.00
Knowledge			
pre	12.5 (3.0)	5.00	18.00
post	17.2 (1.8)	13.00	20.00

Table 2. Baseline and post Wilcoxon signed ranks test for n=56 participants

	Post-test score lower	Post-test score higher	Post-test score equal	z-score	p value
Total scores post – Total scores pre	2	53	1	-6.382†	<.001
Barriers scores post – Barriers scores pre	3	42	11	-5.288†	<.001
Attitudes scores post – Attitudes scores pre	4	33	19	-3.978†	<.001
Confidence scores post – Confidence scores pre	3	51	2	-6.226†	<.001
Knowledge scores post – Knowledge scores pre	0	49	7	-6.108†	<.001

†Based on negative ranks

Chapter summary

Chapter 5 has demonstrated both quantitatively and qualitatively that metabolic health training can assist mental health nurses with theoretical and practical skill development. Quantitatively, the results of the M-BACK (Ch 4), a validated tool of knowledge, attitudes, confidence and perceived barriers in metabolic health, demonstrated significant improvement for mental health nurses post training activity. Qualitatively, mental health nurses who participated in the training articulated specific ways in which they planned to implement change to their own practice and educate others in metabolic health care of consumers with whom they worked.

The findings from this research have important clinical implications. A number of barriers were identified by clinicians prior to the education on delivering metabolic health care in mental health services. Participating in the education workshop demonstrated that a number of these barriers could be overcome with the knowledge, skills, and confidence that was gained. Education of mental health nurses can play an important role in improving the metabolic health of mental health consumers.

Chapter 6

Tackling change in mental health service delivery: A qualitative evaluation of a lifestyle program targeting mental health staff – Keeping our staff in mind (KoSiM)

Chapter preface

The article presented in Chapter 5 demonstrated that a training program targeting mental health nurses can be successful in improving skills and confidence in delivering metabolic health care. Provision of metabolic health care within mental health services is becoming increasingly recognised as important; as such, ensuring mental health clinicians are equipped to provide metabolic health care is similarly important.

Chapter 5 provided a traditional approach to education and training of metabolic health care. Although effective for participants who attended, some barriers may be present to engaging in such training, for example, the course was limited to nurses, had a financial cost and was conducted in a two-day consecutive block. An alternative to such training was developed, prior to the implementation of the Keeping the Body in Mind (KBIM) (Ch 3 and Appendix 3) program across South Eastern Sydney Local Health District. The Keeping our Staff in Mind (KoSiM) staff health program (Appendix 4), was offered to mental health staff working throughout the district. The program consisted of a five-session individualised intervention program delivered by a clinical nurse consultant, dietitian and exercise physiologist.

The study presented in this chapter follows on from the KoSiM parent study (Appendix 4), which quantitatively demonstrated positive outcomes (131). Efficacy of this program was demonstrated to improve attitudes, confidence, knowledge and perceived barriers towards metabolic health care on the M-BACK questionnaire described in chapter 4. In order to understand more about the practical implications and experiences of participants in the KoSiM program a qualitative analysis with semi-structured interviews was undertaken. Chapter 6

describes the qualitative research conducted to evaluate the perceptions of participants of the KoSiM intervention and determine its impacts.

Ethical approval was granted for the study by the South Eastern Sydney Local Health District Human Research Ethics Committee - HREC 15/054 -LNR/15/POWH/107 (Appendix 1C).

This article was published in an open access journal and inclusion in this thesis is permissible under creative commons license.

Publication

Watkins A, Stein-Parbury J, Curtis J, Poole J, Teasdale S, Fibbins H, Rossimel E, Lederman O, Ward PB, Rosenbaum S, Denney-Wilson E. Tackling change in mental health service delivery: A qualitative evaluation of a lifestyle program targeting mental health staff–Keeping our Staff in Mind (KoSiM). *Health Promotion Journal of Australia* 2022. doi: 10.1002/hpja.633

Tackling change in mental health service delivery: A qualitative evaluation of a lifestyle program targeting mental health staff – Keeping our Staff in Mind (KoSiM)

Andrew Watkins^{1,2}  | Jane Stein-Parbury²  | Jackie Curtis^{1,3}  |
Josephine Poole⁴  | Scott Teasdale^{1,3}  | Hamish Fibbins^{1,3}  | Elisa Rossimel⁴  |
Oscar Lederman⁴  | Philip B. Ward³  | Simon Rosenbaum³  |
Elizabeth Denney-Wilson⁵ 

¹Mindgardens Neuroscience Network, Sydney, NSW, Australia

²Faculty of Health, University of Technology Sydney, Sydney, NSW, Australia

³School of Psychiatry, University of New South Wales, Sydney, Australia

⁴Keeping the Body in Mind, South Eastern Sydney Local Health District, Sydney, NSW, Australia

⁵Susan Wakil School of Nursing and Midwifery, University of Sydney, Sydney, NSW, Australia

Correspondence

Andrew Watkins, Mindgardens Neuroscience Network, Sydney, NSW, Australia.
Email: Andrew.Watkins@unsw.edu.au

Funding information

South Eastern Sydney Local Health District

Handling editor: James Smith

Abstract

Issues addressed: People with severe mental illness have adverse health outcomes compared to the general population. Lifestyle interventions are effective in improving health outcomes in this population. Current cultural processes in mental health services do not generally incorporate physical health care practices. Innovative education is required to improve knowledge and confidence of staff in the delivery of preventative health measures.

Methods: The Keeping our Staff in Mind (KoSiM) program delivered a brief lifestyle intervention to mental health staff. A qualitative analysis following the Standards for Reporting Qualitative Research was undertaken. Semi-structured interviews designed to elicit information about the acceptability of the program and the impact of the intervention on participants' personal and professional lives. The interviews were analysed using thematic analysis, with coding independently developed and reviewed by three authors.

Results: Of the 103 eligible participants, 75 were interviewed. Responses revealed four main themes: (i) positive changes in clinician's approach to physical health care, (ii) improvements in attitudes to self-care and family wellbeing, (iii) positive changes in workplace culture associated with physical health care delivery and (iv) high levels of acceptability of the program.

Conclusion: The KoSiM model may be useful in other settings as a means of changing the culture of mental health services to better integrate physical health care as a core part of mental health service provision.

So what? A novel approach using staff focussed lifestyle interventions model may cut through the resistance that is encountered when implementing proven methods of clinical intervention where cultural barriers exist.

This is an open access article under the terms of the [Creative Commons Attribution](https://creativecommons.org/licenses/by/4.0/) License, which permits use, distribution and reproduction in any medium, provided the original work is properly cited.

© 2022 The Authors. *Health Promotion Journal of Australia* published by John Wiley & Sons Australia, Ltd on behalf of Australian Health Promotion Association.

KEYWORDS

cardiovascular disease, health behaviours, health equity, mental health, workforce development

1 | INTRODUCTION

People who experience a severe mental illness (SMI) have a 15-year reduction in life expectancy compared to the general population.¹ The majority of deaths are attributable to preventable cardiovascular disease, which are often exacerbated by antipsychotic use.² Lifestyle interventions targeting modifiable risk factors including diet and sedentary behaviour are effective in improving physical health outcomes for people who experience a SMI.³⁻⁶ Social stigma, poverty, social isolation, low educational attainment and poor psychological health often lead to lower levels of engagement and follow-through with general and preventative health services.⁷ This increases the importance of mental health services targeting the physical health of people who experience a SMI through screening and lifestyle interventions.

Whilst mental health professionals are ideally placed to provide lifestyle interventions,⁸ significant barriers exist to delivering this type of care. Diagnostic overshadowing (attributing physical symptoms to a mental health condition), lack of specialist education, low confidence of staff to deliver interventions, heavy workloads are some of the reasons that mental health organisational cultures that do not embrace physical health care.⁹ There have been repeated calls in the literature to increase the amount of physical health training to mental health professionals to improve health care outcomes for those who experience a SMI. Education and training initiatives can have a positive impact on knowledge of physical health issues in SMI, and the confidence and attitudes of mental health professionals to deliver physical health interventions.¹⁰ However, it has been identified that future research should investigate practice change interventions to increase the delivery of physical health intervention and support.⁹

A healthy workforce is associated with higher levels of staff retention, lower levels of absenteeism, and overall higher rates of productivity amongst health professionals.¹¹ However, health professionals often share similar health concerns to the people they treat.¹² Poor lifestyle habits in clinicians can have a direct impact on the quality of care they provide.¹³ Physical health interventions for staff have been shown to be feasible and acceptable in mental health settings.¹⁴ Furthermore, some of these interventions have been demonstrated to improve staff morale and their inclination to participate in healthy lifestyle activities.¹⁵ Furthermore, the promotion of healthy lifestyle behaviours by health professionals is more likely to occur when health professionals themselves engage in healthy lifestyle behaviours.¹⁶ The physical health of health care professionals themselves is considered important in the acceptance of lifestyle advice, and when health care professionals follow their own advice.¹⁷

The Keeping the Body in Mind (KBIM) program is a real-world intervention delivered as part of standard care within a public mental health service that demonstrated that weight gain could be prevented

in young people commencing antipsychotic treatment.¹⁸ Innovations in health care are more likely to become accepted and become widespread in an organisation if shared values exist and are reinforced by influential team members.¹⁹ To support the scaling-up of the KBIM program to adults who experience SMI, the Keeping our Staff in Mind (KoSiM) program was implemented prior to its launch, as a facilitator for this health care innovation.²⁰ KoSiM provided an intervention to mental health staff that comprised a brief version of the KBIM lifestyle intervention that people with lived experience of SMI received, creating an experiential learning opportunity.²¹ The stated goals of the KoSiM program were improving staff health, instigating culture change regarding the importance of the physical health of people with a lived experience of SMI, and increasing the capability of mental health staff to deliver physical health assessments and interventions. A full description of the KoSiM program and its quantitative outcomes has been published previously.²¹ This report focuses on the qualitative analysis of the KoSiM program, to understand the experiences of staff participants who completed the intervention and comprehend its efficacy and acceptability of its stated goals.

2 | METHODS

A pragmatic single-arm intervention study was conducted in a public mental health service, including inpatient and community settings, in Sydney, Australia. Participants received a five-session individualised lifestyle intervention (delivered over 5 weeks) that incorporated physical activity and nutritional counselling delivered by multidisciplinary teams. An initial assessment was provided to participants which incorporated an exercise physiologist, dietitian and clinical nurse consultant, with a plan formulated. Participants then had access to four weekly sessions with their choice of clinician. The aim of this qualitative study was to investigate the experiences of staff participants including the perceived effect on their own wellbeing as well as the impact on their work practices and families. This qualitative study was initiated and designed by the first author (A.W.). All participants were informed about the study by the interviewer and written informed consent was obtained. The study was approved by the South Eastern Sydney Local Health District Human Research Ethics Committee (HREC 15/054).

The reporting of this research follows the Standards for Reporting Qualitative Research, a list of 21 items that support transparent reporting of qualitative research.²² The sampling approach was to collect data from as many participants as possible who met the inclusion criteria in order to reach data adequacy.²³ Data collection was deemed to be complete when thematic saturation had been reached as determined by three researchers, as indicated by additional data generating minimal or no new knowledge to address the experiences

or impact of the intervention on participants.²⁴ All staff working in a clinical role who completed the KoSiM program met the inclusion criteria and were offered the opportunity to participate at the end of the final session of the KoSiM program. Consent and baseline data for the KoSiM program was completed by $n = 212$ people, of whom $n = 129$ completed the program. Non-clinical staff (admin, patient service assistants and non-clinical management) were excluded ($n = 26$), leaving a total eligible sample of $n = 103$ participants.

Interviews were conducted by Clinical Nurse Consultants (A.W. – male or J.P. – female) who were clinical leads in the KoSiM program at different sites. The interviews were conducted in person and audio recorded at the completion of the final session of the KoSiM program between April 2015 and September 2016. Brief interviews were conducted lasting between 12 and 33 min in duration and were conducted at the participants usual place of employment. The interviews were conducted using narrative inquiry, a research methodology which captures the perspective of participants constructing a narrative of events considering the relationship between their personal experience and cultural context.^{25,26} The interviews were semi-structured, open ended, with looping and probing questions used throughout the interviews to garner the specific experiences of participants involvement. Interviews included follow-up questions and clarifications about their involvement and its influences on their clinical interactions and personal life. The core brief interview questions are contained in Box 1. The interviews were then transcribed by the respective interviewer with identifying information being removed, names were replaced with pseudonyms to assure anonymity.

Thematic analysis was utilised for analysing the collected data. Thematic analysis provides precision and consistency and is also an exhaustive process.²⁷ This approach has been commonly used to examine the impact of lifestyle interventions and provides sufficient detail for the reader to establish the validity and credibility of the process.²⁸ The data was processed according to the method set out by the six phases of thematic analysis described by Braun and Clarke.²⁹ This six phase approach involves: familiarisation with the data through transcription, generating initial codes, searching for themes, reviewing themes, defining and naming themes and producing the final written output.²⁹

The choice of research design, methodology and theoretical framework, were designed to assist with critical reflection during the research process. Among the program designers and implementation clinicians there was a high desire to see the program reflected in a positive light. The research team recognised the potential for bias in the construction of knowledge from the qualitative data. The data were analysed by three of the authors (A.W., J.S.P. and E.D.W.), to ensure the data was interpreted with rigorous research standards J.S.P. and E.D.W. who are experienced qualitative researchers were independent from the design and implementation of the KoSiM program.

The analysis process commenced with familiarisation by reading the transcribed texts several times. The next step involved creating notes and developing preliminary themes via an inductive process performed collaboratively between researchers. These themes were later developed by using a constant comparison technique.³⁰ From this comparison broad themes were created via journaling and meetings

BOX 1 Brief interview questions

How has your experience been with the KoSiM intervention?

What changes (if any) have you made as a result of participating in KoSiM?

Has participating in KoSiM made you give more consideration to the physical health of other people?

Is there anything that you could suggest that would improve the KoSiM program?

Is there anything else you would like to say about the KoSiM program?

between researchers. Initial categories were created and then broadened to develop hierarchies of concepts and themes. A comprehensive list of codes was developed and reviewed, which was used to analyse the data. The authors debriefed throughout the data analysis process, reflecting on understanding and responses to the quotes, and moved back and forth between the phases. The steps used in the analysis were similar to those outlined by Nowell et al.,²⁸ which aimed to establish rigour and trustworthiness in a thematic analysis. The researchers considered the finalised themes and their supporting quotes, any differences were deliberated on and determined by mutual agreement.

3 | RESULTS

Of the 103 eligible participants that completed the KoSiM program 75 partook in qualitative interviews about the program. The high level of participation allowed the findings to achieve data adequacy. Participants ranged in age from 24 to 63 years, most participants were female $n = 49$ (65%). Forty (53%) participants were nurses, 29 (39%) were allied health professionals (psychologist, social worker, occupational therapist) and 6 (8%) were medical staff.

Data analysis revealed four main themes: changes in the approach to working with a lived experience of SMI; changes in attitude to self-care and family wellbeing; observed changes in work culture; and general experiences of the overall program. These themes and their sub-themes are detailed in Table 1.

3.1 | Changes in the approach to working with a lived experience of SMI

Participants expressed that engaging in a wellbeing program for themselves had a flow-on effect in terms of the way they approached their

TABLE 1 Qualitative themes

Primary themes	Sub-themes
<p>Changes in the approach to working with consumers</p> <p>This theme details the changes in the way they approached their practice with mental health consumers to incorporate more physical health.</p>	<p><i>Increased knowledge: "easier to explain"</i></p> <p>Enhanced comprehension of physical health care issues and how to manage them in mental health consumers.</p> <p><i>Increased confidence: "more assured"</i></p> <p>The increased belief that participants had in feeling capable to implement physical health initiatives to mental health consumers.</p> <p><i>Greater awareness: "difficult for consumers"</i></p> <p>Greater recognition of the additional challenges consumers' face in managing their physical health.</p> <p><i>Role modelling: "practice what you preach"</i></p> <p>The importance of participants representing the healthy lifestyle they hope to encourage consumers to achieve.</p> <p><i>Motivation to change: "not just their mental health"</i></p> <p>Explores the changes to practice that clinicians made during the intervention.</p>
<p>Changes in attitude to self-care and family wellbeing</p> <p>This theme explains the alterations in approach to their own health and that of their family members.</p>	<p><i>Self-care: "refocused me"</i></p> <p>The changes that participants made to their own health during the program.</p> <p><i>Healthy families: "flow-on effect"</i></p> <p>Describes the broader effects of the program on participants families.</p>
<p>Observed changes in work culture</p> <p>This theme explores what changes participants observed in their colleagues and workplace in relation to physical health.</p>	<p><i>A healthier workplace: "looking out for each other"</i></p> <p>The impact of the program on the workplace ethos around diet and exercise lifestyle.</p> <p><i>Physical health focus: "a real shift in culture"</i></p> <p>Explores the observed changes in workplace practices incorporating physical health care into the clinical service.</p>
<p>General experiences of the overall program</p>	<p><i>Overall feedback: "It's been wonderful"</i></p> <p>Details the general feedback on the program as a whole.</p> <p><i>Program criticisms: "if there was a refresher"</i></p> <p>Explores how participants felt the program could be improved.</p>

practice with people with a lived experience of SMI. Participants were able to identify a change in the way they approached people with a lived experience of SMI in relation to their physical health. The changes identified stemmed from multiple sources that included: increased knowledge and confidence in discussing physical health issues, a greater understanding and empathy of the experience of the physical health journey for those with a diagnosis of SMI, role modelling healthy behaviours and motivation for clinicians to make changes to clinical practices around physical health care.

Many participants believed there was an increase in knowledge of physical health care issues and how to manage them. Participants identified a diverse range of areas in which they improved their knowledge base; this included a better understanding of why physical health issues arose with such frequency amongst people who experience SMI, and how both the mental health service, and they as individuals, could help people with a lived experience of SMI to manage their physical health challenges with lifestyle interventions.

I now know how to have basic conversations about food and exercising with consumers which in the past I got stuck at (Female, 38).

I learnt about the healthy plate as a way to demonstrate healthy eating, I have used this to talk to consumers about food and it made it easier to explain and talk about nutrition with them (Male, 29).

The increase in perceived knowledge resulted in an increase in participant's stated confidence. It was identified that many participants felt better equipped to provide support, education and interventions to people with a diagnosis of SMI around a healthy lifestyle and managing their physical health.

The program gave me more awareness of lifestyle interventions and I feel far more confident in explaining the importance of physical health, healthy diet and exercise (Female, 26).

As a professional, felt like I had much better understanding of what lifestyle interventions I have to offer consumers and felt increased confidence in incorporating these in my practice (Female, 53).

Taking part in the program gave participants a better insight into how people diagnosed with a SMI might experience physical health screening and interventions. This understanding of people diagnosed with a SMI's experiences and expectations promoted a greater sense of empathy not only about poor physical health outcomes but also the challenges that confront people when they attempt lifestyle change.

It made me think about how difficult it must be for our clients trying to have success with their goals (Male, 43).

I thought it was really useful as an empathy building and understanding experience for what you are asking clients to do. It's really changed how I ask questions and how I frame things, it's increased my sensitivity, around asking questions and being really patient, when discussing lifestyle change (Female, 32).

Several participants in the program expressed a realisation (or understanding) that it is unreasonable to expect people with a lived experience of SMI to follow advice relating to lifestyle change from a clinician who was not prepared to make these changes themselves. Role modelling behaviour change, demonstrating a healthy lifestyle and promoting a healthy culture in the workplace were identified as important actions towards creating a positive influence on people in that service.

The health service needs to spend money on things that make staff healthy like this program. In health we have a lot of unhealthy people working. If you want people to believe in changing their lifestyle staff need to be role models (Female, 61).

I've learnt the practice what you preach mantra, is really important. I used to just say to consumers that they should exercise more. I now go walking or do other physical activities with them, it sounds small but it's really making a difference to how much motivation the consumers I work with have (Female, 24).

Participants emphasised that by completing the KoSiM program, they had an increased awareness of physical health challenges experienced by people with a SMI diagnosis. This, in turn, provided motivation to clinicians to start addressing physical health issues. Participants expressed a wide variety of changes that they had made to their practice to incorporate lifestyle interventions. These included supporting people experiencing a SMI by gathering resources that could be shared, monitoring for physical health, liaising with other health professionals such as general practitioners, offering lifestyle advice and support and engaging in healthy lifestyle activities.

Doing KoSiM prompted me to think about how to ask clients questions around their physical health not just their mental health and to keep it on your radar a little bit more, because when it's on your own personal radar it's also easier to keep it on the radar to check out for your own clients as well (Female, 52).

KoSiM has influenced the way I practice. I have been more proactive in promoting exercise, healthy eating and healthy lifestyle choices, to consumers I work with. I'm incorporating it into my general conversations with consumers, I've learnt that it's actually a part of their mental health care (Male, 25).

3.2 | Changes in attitude to self-care and family wellbeing

Participants also noted that there were benefits to their own health. These benefits were an increase in awareness of their own physical health and making lifestyle changes to improve their overall health. These benefits were also reported to flow on to the participants family members in a similar way to the participants. The program created an increased awareness of physical health issues and with this awareness participants started addressing health issues improving their own self-care and that of their families.

Individual participants stated they made a wide variety of changes to their own self-care that were attributed the program. These reported changes ranged from making minor adjustments to their dietary intake and exercise levels through to more major changes including overhauling sleep hygiene and quitting smoking. Participants framed their changes to their lifestyle in the context of changing their attitude to their own health and prioritising it.

I have made some really significant changes during KoSiM, I have decreased my caffeine intake, reduced my intake of simple carbohydrates, I've also regularly increased my step count and started doing resistance exercise for the first time and am really enjoying it (Female, 48).

I found the program hugely beneficial, on a personal level it did refocused me about having a healthy lifestyle. It got me involved and in being proactive about what my health goals were, how to improve them and learning new information (Male, 57).

Participants also noted the impact of their participation in the program on their immediate family members. The benefits of education and behaviour changes influenced partners and children of program participants. This often resulted in culture change within family units to commence healthy lifestyle initiatives to achieve better health.

I had greater awareness over my diet, and the diet of my kids, and husband. My husband and I joined the gym and are going regularly (Female, 36).

I organised for my family to do more walking, we go out each evening after dinner and started bushwalking on weekends. The kids are now asking if each meal is healthy too which is quite a change. The program has definitely had a flow on effect on my family (Male, 30).

3.3 | Observed changes in work culture

The KoSiM program was observed to have an impact on the overall culture of the workplace. Participants reported that there were

changes to attitudes and activities amongst work colleagues, including a healthier culture among staff members and a greater team focus on addressing physical health with those diagnosed with a SMI in the service.

Program participants witnessed changes in their work colleagues in relation to physical health. Group activities between team members started occurring such as attending the gym after work together, lunchtime walking groups, sharing healthy group lunches and a replacement of unhealthy snacks with healthier options at meetings.

After KoSiM we have been checking in on each other around our health, we comment on each other's lunches, and ask how they are going with exercise. It has been really good for us bonding as a team. I guess it's a shared thing that we are working on, I think it's been a nice change (Female, 52).

Everyone in the office is talking about their nutrition and exercise goals and that makes us even more motivated. No one is buying unhealthy takeaway anymore (Female, 31).

It was also observed by participants that the culture around discussing the physical health of people with a SMI diagnosis became more prominent. This included seeking advice from colleagues on managing physical health issues in people with whom they worked, physical health issues being discussed at clinical review meetings and the commencement of new groups which target physical health.

The program encouraged some conversations in the workplace about consumers physical activity, diet, and other healthy lifestyle which is really good, and we have not had before. Physical health care now gets included in peoples care plans far more often (Female, 62).

I've noticed the attitude to the physical health of consumers really changed after people did KoSiM. It's been really nice to see clinicians organising new physical activity groups and organising a fruit bowl for the waiting room, there has been a real shift in culture (Male, 47).

3.4 | General experiences of the overall program

The overall feedback from participants was very positive and most found the KoSiM program helpful. The program was described as practically-based and personalised to the individual's need.

It was a great opportunity that I've really valued, and I looked forward to the sessions I had with the team. It's been really nice just being able to sit here on the recipient end and have those interventions to help me improve my care of consumers and think much more about my own

health rather than just thinking about other people's health all the time. I was able to implement a lot of it which is great, and I talk about it to family, friends and colleagues all the time (Female, 33).

It's been wonderful, everyone from KoSiM has been very personable and person-centred. It was really lovely to have all the people that I work with go through the program because the camaraderie amongst my colleagues has been great. I felt valued as a participant and it has provided great education for working with consumers as well. I have really valued receiving this opportunity (Female, 48).

The criticisms of the program offered by participants were minimal and these were framed in the form of suggested improvements to the program. These improvements mostly related to having the KoSiM program last longer and be available to more staff members. More focused feedback suggested incorporating group exercise and cooking sessions. One participant also suggested it would be helpful to have practical exercise sessions to see if exercises were being performed in the prescribed manner.

I think it would be really helpful if there was a refresher perhaps at one and 2 months after the interventions and also weekly reminders for people to prompt, for example, are you going to the gym, how's your program been going, what days are you planning to go this week etcetera, because I think it would of helped me stay on track more (Male, 53).

It would have been great to do some group sessions to work with others. I guess with the diet aspect the one on one has been very useful and I did not require a practical session just learning but I feel it would be beneficial to have practical sessions with the exercise physiologist (Female, 39).

Qualitative feedback from the KoSiM program did not vary greatly amongst participants based upon identified gender or age group. No discernible difference was observed between these groups in their commentary on changes to clinical care or work culture. However, participants that identified as female were more likely to comment on the impact of the intervention on their family, whilst participants over the age of 45 were more likely to comment on a changing attitude to their own self-care.

4 | DISCUSSION

This study describes the experiences of participants in a lifestyle intervention targeting mental health staff (KoSiM). We found that the KoSiM program was very well received by interviewed

participants with only limited criticism regarding structure and delivery. Many participants felt valued and appreciated by the organisation because of being able to participate in something “for them,” strengthening the impact of the intervention. The positive data from this study suggested that the program was highly acceptable to participants, who found it beneficial for a multitude of reasons.

Participants felt that they had experienced positive changes in their knowledge, attitudes, and behaviours to their own physical health. This aligns with quantitative results from the KoSiM program that demonstrated significant improvements to dietary and exercise patterns and consequently a reduction in waist circumference of mental health staff that participated.^{21,31,32} This study also found changes in attitude beyond just the individual participant and their own physical health. Participants were more focused on the physical health of their immediate families, their work colleagues, and people experiencing SMI with whom they work. This broader effect increases both the personal and professional value of the interventions to the participants.

Improving the health of staff and their families is an important goal in its own right. However, the benefits also go beyond this and have a direct influence on the quality and credibility of care delivered to those experiencing SMI. There are three pathways for which improved physical health of staff may benefit clinical services. First, health staff who engage in healthy lifestyle activities are more likely to influence positive physical health behaviours in people they work with.³³ Second, feeling valued by an employer with service offerings like KoSiM is likely to lead to greater staff retention and result in a more experienced and consistent workforce.³⁴ Third, reducing health related issues that staff experience improves levels of productivity and reduces absenteeism.³⁵

We found that found that KoSiM participants reported improved attitudes, knowledge and confidence regarding lifestyle interventions for people experiencing SMI. These results compliment previously published quantitative results of the parent study using the M-BACK tool, which demonstrated statistically significant changes across these domains.²¹ The M-BACK is a validated measure of clinician perceptions of barriers, and their knowledge, attitudes and confidence in regard to delivery of metabolic health intervention to people with SMI.³⁶ Participants reported a change in workplace culture that included better integration of physical health care. The primary KoSiM study²¹ found a reduction in perceived barriers to delivering physical health on the M-BACK scale³⁶ despite the intervention not specifically addressing the barriers to care.

The findings of this study indicate that the KoSiM program was an acceptable offering that had multiple impacts in the short-term of the intervention. To truly explore the longer-term impact of the intervention of the program, a follow-up study would be of benefit. However, it is worth postulating what the longer-term impact of the intervention may be. The quantitative measures from the M-BACK questionnaire also demonstrated significant changes at 16-week follow-up in all domains. Of note all scores were further improved from post measures (although not significantly so).²¹ This

quantitatively demonstrates that there was no reduction in the achieved changes of attitudes, confidence and knowledge of metabolic health, and no increase to perceived barriers to implementing metabolic initiatives, 3 months after completing the intervention.

The cultural aspects of an organisation must be purposefully moulded; as they are a vital factor on which improvement focused change such as incorporation of physical health care into mental health services is facilitated.³⁷ Short-term organisational culture change has been observed in this study, via, visible manifestations, shared ways of thinking and deeper shared assumptions. To achieve longer-term practice change in this area it will require authentic participation from staff to promote the prevailing shape of feeling, thinking, discussing and accomplishing that underpin metabolic health practice.³⁸ Maintenance of this culture can not exist without strong leadership from the wider organisation to continue supporting metabolic health care as a priority.³⁹

Improved clinical practices such as implementing physical health care within mental health services are essential to meet the shifting demands of health care, however, implementing these initiatives can be challenging. The sheer number of changes and the pace of change lead to what is often referred to as change fatigue.⁴⁰ The KoSiM program offers a novel approach for achieving change through offering a service to the staff ultimately tasked with delivering screening and intervention of a similar initiative to people they are working with. Training staff through this approach may achieve greater “buy-in” in a shorter time frame for what is a priority area of mental health reform.⁴¹

5 | LIMITATIONS

Data for this study was collected in 2015 and 2016 within a week of each participant completing their five-week intervention. Ideally, this data would have been published in a timelier manner, however, it was held back awaiting publication of the primary quantitative article and then delays from the COVID pandemic. Despite the publication delay the data was analysed within 6 months of the completion of data collection, and we believe remains of high relevance.

This study was subject to several methodological limitations. Although the primary aim was to understand the experiences of participants who completed the program, there are aspects to the KoSiM program that cannot be explored by only interviewing those who successfully completed the intervention. The study missed the opportunity to understand why participants may have dropped out of the intervention or why they chose to not take up the opportunity to participate. To draw conclusions as to the success of the program without considering those who dropped out is unwarranted. By drawing a sample group that caters for maximum variation, it would provide a fairer representation of the entire local mental health workforce.⁴² This information could provide further insights as to whether the KoSiM program is a viable method of implementing physical health care in mental health services more generally.

Another limitation is the potential for bias as interviewers were members of the intervention team. This can lead to problems in two ways, first, participants may feel more inclined to tell the interviewer what they want to hear rather than their true reflections on the program. Secondly, the interviewer is a co-creator of the data and as such could introduce bias into the questioning process.⁴³ Interviewers helped mitigate the issue of instigator bias by using a reflective process and carefully structured non-leading questions.

6 | CONCLUSION

The current study enhances the understanding of offering an individualised lifestyle program to mental health staff members. The qualitative data explored in this study are indicative that a staff-focused lifestyle intervention was a beneficial and acceptable form of intervention and training for mental health staff. The program was effective in creating positive change, including staff members initiating lifestyle changes for themselves and increasing their focus on physical health care when working with people with a SMI. The KoSiM model may be implemented in other settings as a means of changing the culture of mental health services to incorporate physical health care as a core part of mental health service provision.

ACKNOWLEDGEMENTS

The authors would like to acknowledge South Eastern Sydney Local Health District and David Pearce for having the foresight to support and fund the KoSiM program. The authors would also like to thank the two anonymous reviewers whose feedback and insights improved this research article. The KoSiM program received funding from South Eastern Sydney Local Health District. Open access publishing facilitated by University of Technology Sydney, as part of the Wiley - University of Technology Sydney agreement via the Council of Australian University Librarians.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

ORCID

Andrew Watkins  <https://orcid.org/0000-0003-3452-8682>

Jane Stein-Parbury  <https://orcid.org/0000-0002-0018-3236>

Jackie Curtis  <https://orcid.org/0000-0001-6884-0098>

Scott Teasdale  <https://orcid.org/0000-0001-6769-8421>

Hamish Fibbins  <https://orcid.org/0000-0002-2673-7866>

Elisa Rossimel  <https://orcid.org/0000-0002-8250-9489>

Philip B. Ward  <https://orcid.org/0000-0002-5779-7722>

Simon Rosenbaum  <https://orcid.org/0000-0002-8984-4941>

Elizabeth Denney-Wilson  <https://orcid.org/0000-0001-9879-4969>

REFERENCES

- Hjorthøj C, Stürup AE, McGrath JJ, Nordentoft M. Years of potential life lost and life expectancy in schizophrenia: a systematic review and meta-analysis. *Lancet Psychiatry*. 2017;4(4):295–301.
- Vancampfort D, Stubbs B, Mitchell AJ, De Hert M, Wampers M, Ward PB, et al. Risk of metabolic syndrome and its components in people with schizophrenia and related psychotic disorders, bipolar disorder and major depressive disorder: a systematic review and meta-analysis. *World Psychiatry*. 2015;14(3):339–47.
- Teasdale SB, Ward PB, Rosenbaum S, Samaras K, Stubbs B. Solving a weighty problem: systematic review and meta-analysis of nutrition interventions in severe mental illness. *Br J Psychiatry*. 2017;210(2):110–8.
- Firth J, Cotter J, Elliott R, French P, Yung AR. A systematic review and meta-analysis of exercise interventions in schizophrenia patients. *Psychol Med*. 2015;45(7):1343–61.
- Matcham F, McNally L, Vogt F. A pilot randomized controlled trial to increase smoking cessation by maintaining National Health Service Stop Smoking Service attendance. *Br J Health Psychol*. 2014;19(4):795–809.
- Arango C, Diaz-Caneja CM, McGorry PD, Rapoport J, Sommer IE, Vorstman JA, et al. Preventive strategies for mental health. *Lancet Psychiatry*. 2018;5(7):591–604.
- Stewart-Brown S, Samaraweera PC, Taggart F, Kandala N-B, Stranges S. Socioeconomic gradients and mental health: implications for public health. *Br J Psychiatry*. 2015;206(6):461–5.
- Ross A, Bevans M, Brooks AT, Gibbons S, Wallen GR. Nurses and health-promoting behaviors: knowledge may not translate into self-care. *AORN J*. 2017;105(3):267–75.
- Bailey JM, Bartlem KM, Wiggers JH, Wye PM, Stockings EA, Hodder RK, et al. Systematic review and meta-analysis of the provision of preventive care for modifiable chronic disease risk behaviours by mental health services. *Prev Med Rep*. 2019;16:100969.
- Watkins A, Stein-Parbury J, Denney-Wilson E, Ward PB, Rosenbaum S. Upskilling mental health nurses to address the burden of poor metabolic health: a mixed method evaluation. *Issues Ment Health Nurs*. 2020;41:925–31.
- Owusu-Sekyere F. Assessing the effect of physical activity and exercise on nurses' well-being. *Nurs Stand*. 2020;35(4):45–50.
- Perry L, Gallagher R, Duffield C. The health and health behaviours of Australian metropolitan nurses: an exploratory study. *BMC Nurs*. 2015;14:45.
- Crisford P, Winzenberg T, Venn A, Schultz M, Aitken D, Cleland V. Factors associated with physical activity promotion by allied and other non-medical health professionals: a systematic review. *Patient Educ Couns*. 2018;101(10):1775–85.
- Hjorth P, Davidsen AS, Kilian R, Jensen SO, Munk-Jørgensen P. Intervention to promote physical health in staff within mental health facilities and the impact on patients' physical health. *Nord J Psychiatry*. 2016;70(1):62–71.
- Fibbins H, Ward PB, Watkins A, Curtis J, Rosenbaum S. Improving the health of mental health staff through exercise interventions: a systematic review. *J Ment Health*. 2018;27(2):184–91.
- Fie S, Norman IJ, While AE. The relationship between physicians' and nurses' personal physical activity habits and their health-promotion practice: a systematic review. *Health Educ J*. 2013;72(1):102–19.
- Carlier IV, Lamberts RD, Gersons BP. Risk factors for posttraumatic stress symptomatology in police officers: a prospective analysis. *J Nerv Ment Dis*. 1997;185(8):498–506.
- Curtis J, Watkins A, Rosenbaum S, Teasdale S, Kalucy M, Samaras K, et al. Evaluating an individualized lifestyle and life skills intervention to prevent antipsychotic-induced weight gain in first-episode psychosis. *Early Interv Psychiatry*. 2016;10(3):267–76.
- Barnett J, Vasileiou K, Djemil F, Brooks L, Young T. Understanding innovators' experiences of barriers and facilitators in implementation and diffusion of healthcare service innovations: a qualitative study. *BMC Health Serv Res*. 2011;11:342.
- Rosenbaum S, Watkins A, Ward PB, Pearce D, Fitzpatrick K, Curtis J, et al. Psychiatry HeAL thyself! *Aust N Z J Psychiatry*. 2016;50(6):600.

21. Rosenbaum S, Ward PB, Baldeo R, Fibbins H, Jarman R, Lederman O, et al. Changing health workforce attitudes to promote improved physical health in mental health service users: Keeping our Staff in Mind (KoSiM). *Health Promot J Austr.* 2020;31:447–55.
22. O'Brien BC, Harris IB, Beckman TJ, Reed DA, Cook DA. Standards for reporting qualitative research: a synthesis of recommendations. *Acad Med.* 2014;89(9):1245–51.
23. Vasileiou K, Barnett J, Thorpe S, Young T. Characterising and justifying sample size sufficiency in interview-based studies: systematic analysis of qualitative health research over a 15-year period. *BMC Med Res Methodol.* 2018;18(1):148.
24. Guest G, Namey E, Chen M. A simple method to assess and report thematic saturation in qualitative research. *PLoS One.* 2020;15(5):e0232076.
25. Clandinin DJ, Connelly FM. *Narrative inquiry: experience and story in qualitative research.* San Francisco, CA: John Wiley & Sons; 2004.
26. Giacomini MJ. Theory matters in qualitative health research. In: Bourgeault I, Dingwall R, de Vries R, editors. *The SAGE handbook of qualitative methods in health research.* London, UK: SAGE; 2010. p. 125–56.
27. King N. Using templates in the thematic analysis of text. In: Cassell C, Symon G, editors. *Essential guide to qualitative methods in organizational research.* London: SAGE; 2004. p. 256–70.
28. Nowell LS, Norris JM, White DE, Moules NJ. Thematic analysis: striving to meet the trustworthiness criteria. *Int J Qual Methods.* 2017;16(1):1609406917733847.
29. Braun V, Clarke V. Using thematic analysis in psychology. *Qual Res Psychol.* 2006;3(2):77–101.
30. Boeije HJ. A purposeful approach to the constant comparative method in the analysis of qualitative interviews. *Quality Quantity.* 2002;36(4):391–409.
31. Fibbins H, Ward PB, Curtis J, Watkins A, Lederman O, Morell R, et al. Effectiveness of a brief lifestyle intervention targeting mental health staff: analysis of physical fitness and activity in the Keeping our Staff in Mind study. *BMJ Open Sport Exerc Med.* 2020;6(1):e000761.
32. Rossimel E, Teasdale SB, Poole J, Fibbins H, Curtis J, Watkins A, et al. Keeping our Staff in Mind: dietary results of a lifestyle intervention targeting mental health staff. *Health Promot J Austr.* 2021;32(3):451–7.
33. Esposito EM, Fitzpatrick JJ. Registered nurses' beliefs of the benefits of exercise, their exercise behaviour and their patient teaching regarding exercise. *Int J Nurs Pract.* 2011;17(4):351–6.
34. Keyworth C, Epton T, Goldthorpe J, Calam R, Armitage CJ. Delivering opportunistic behavior change interventions: a systematic review of systematic reviews. *Prev Sci.* 2020;21(3):319–31.
35. Letvak S, Ruhm C, Gupta S. Differences in health, productivity and quality of care in younger and older nurses. *J Nurs Manag.* 2013;21(7):914–21.
36. Watkins A, Rosenbaum S, Ward PB, Patching J, Denney-Wilson E, Stein-Parbury J. The validity and reliability characteristics of the M-BACK questionnaire to assess the barriers, attitudes, confidence, and knowledge of mental health staff regarding metabolic health of mental health service users. *Front Public Health.* 2017;5:321.
37. Braithwaite J, Herkes J, Ludlow K, Testa L, Lamprell G. Association between organisational and workplace cultures, and patient outcomes: systematic review. *BMJ Open.* 2017;7(11):e017708.
38. Mannion R, Davies H. Understanding organisational culture for healthcare quality improvement. *BMJ.* 2018;363:k4907.
39. Bradley EH, Brewster AL, McNatt Z, Linnander EL, Cherlin E, Fosburgh H, et al. How guiding coalitions promote positive culture change in hospitals: a longitudinal mixed methods interventional study. *BMJ Qual Saf.* 2018;27(3):218–25.
40. McMillan K, Perron A. Nurses amidst change: the concept of change fatigue offers an alternative perspective on organizational change. *Policy Polit Nurs Pract.* 2013;14(1):26–32.
41. National Mental Health Commission. *Equally well consensus statement: improving the physical health and wellbeing of people living with mental illness in Australia.* Sydney: NMHC; 2016.
42. Seidman I. *Interviewing as qualitative research: a guide for researchers in education and the social sciences.* New York, NY: Teachers College Press; 2006.
43. McGrath C, Palmgren PJ, Liljedahl M. Twelve tips for conducting qualitative research interviews. *Med Teach.* 2019;41(9):1002–6.

How to cite this article: Watkins A, Stein-Parbury J, Curtis J, Poole J, Teasdale S, Fibbins H, et al. Tackling change in mental health service delivery: A qualitative evaluation of a lifestyle program targeting mental health staff – Keeping our Staff in Mind (KoSiM). *Health Promot J Austral.* 2022. <https://doi.org/10.1002/hpja.633>

Chapter Summary

Chapter 6 provides a qualitative analysis of the Keeping our Staff in Mind (KoSiM) program. The program was found to be highly acceptable to participants, and it contributed to several perceived benefits to the individual, their families and clinical practice. Participants described positive changes in their knowledge, attitudes, and behaviour towards their own health care. This also extended to their home environment and family members. The study also described the perceived benefits of the intervention towards mental health clinical care provision, with attitudes, confidence, and knowledge in delivering metabolic health care enhanced post participation.

The study offers a non-traditional means of training via a staff-focussed lifestyle intervention program. The program changed staff behaviour and had a resulting impact upon the care of mental health consumers. This means of intervention provides a means of changing culture within mental health services to be more inclusive of metabolic health care, one of the major iatrogenic effects of antipsychotic treatment.

Chapter 7

Conclusions and recommendations

Introduction

The research in this thesis has demonstrated ways to overcome the multi-level barriers to delivering metabolic screening and lifestyle interventions within mental health care services. The objectives to meet this aim were achieved as follows:

1. Exploration of the subjective experiences of people diagnosed with early psychosis who participated in a community-based lifestyle intervention program designed to improve their metabolic health care;
2. Development of a valid and reliable measurement tool that evaluates the effectiveness of educational interventions in changing mental health clinicians' perceived barriers, knowledge, attitudes, and confidence in delivering metabolic health care;
3. Evaluation of the effectiveness of a metabolic health care training workshop in changing attitudes, knowledge, and confidence in mental health nurses, and explored their plans for implementing metabolic health initiatives in their workplace; and
4. Exploration of the effects of a lifestyle intervention program designed to improve staff health, activate culture change, and boost the capability of clinical mental health staff to improve metabolic care within their services.

The poor physical health of people who experience SMI has been detailed in previous chapters. The reasons for these poor outcomes are complex and multifaceted, and thus require a response that is both detailed and expansive. Previous research has focused on the numerous barriers that impede improvements in physical health for people with SMI. The body of research that has been presented thus far in the thesis outlines how these barriers can be overcome at various levels within a health care organisation.

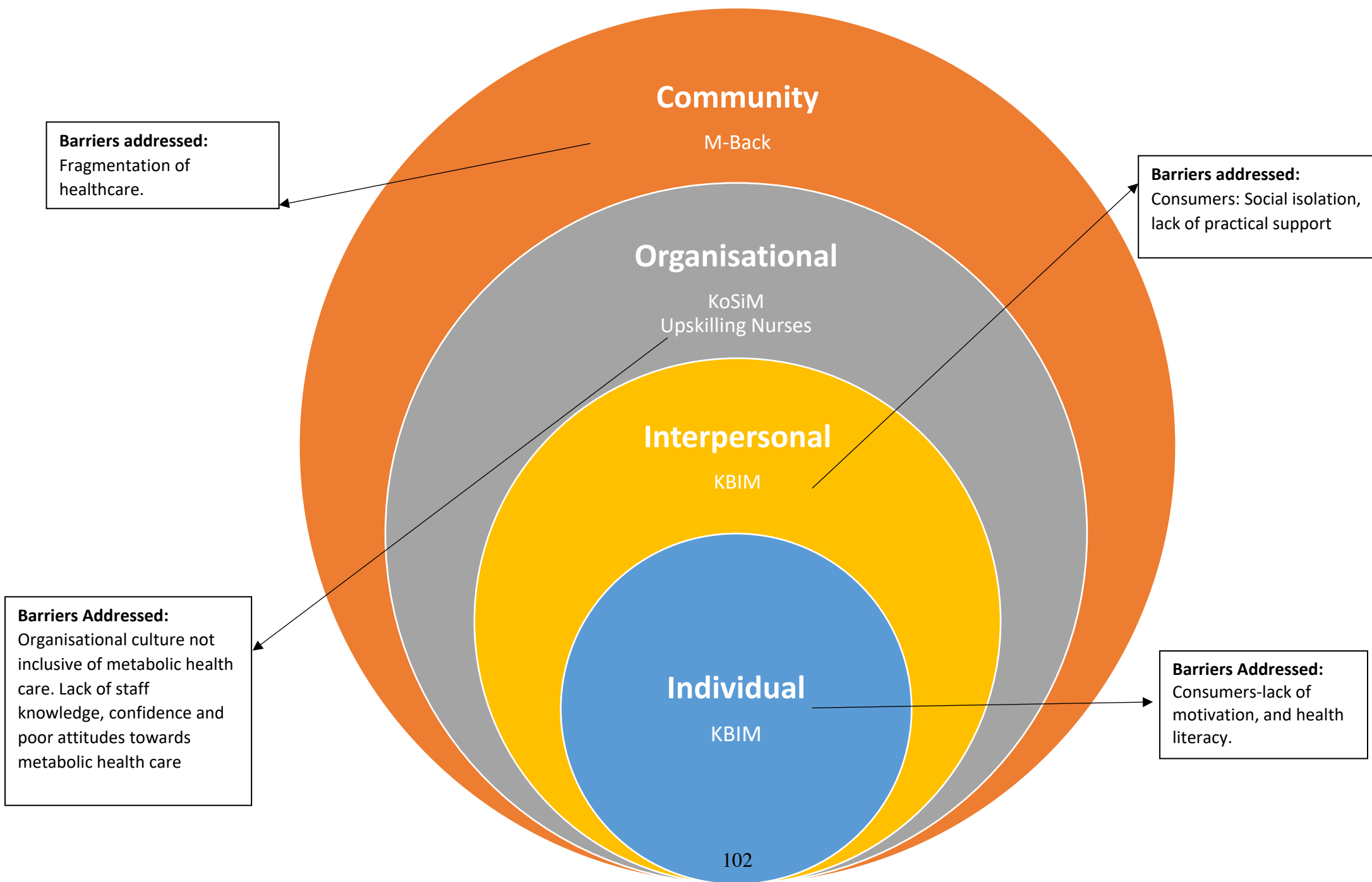
The socioecological model (SEM), introduced in Chapter 2, emphasises that intrapersonal behaviours are not the sole source of health actions and outcomes for individuals. Rather there

are multi-level factors that influence individual behaviour. Thus, the SEM focusses on the interrelationships between the individual and their social, physical, and policy environment (159). The model provides a useful framework to demonstrate how the results of my studies contributed to improvements in many levels of health promotion. The body of research presented herein is unique, because it combined interventions for consumers and interventions for clinical staff to effect a whole-of-systems approach, based on the conviction that single-level interventions are likely to have only short-term benefits (161).

The SEM is a theoretical framework that acknowledges that individual health behaviours are influenced at individual, interpersonal, organisational, community and public policy levels.

In this chapter, the results of the research presented in peer-reviewed publications (Chs. 3–6) are discussed in relation to how barriers have been addressed in the first four levels of SEM theory of health promotion (160), as outlined in Figure 7.1. The fifth layer of the SEM, public policy, while not directly addressed by the research questions in this thesis, and proposals are made for this important layer in the ‘Recommendations for policy, practice and research’ section of this chapter.

Figure 7.1 The SEM theory of health promotion



Each level of the SEM model is presented separately in relation to the barriers identified and how each study presented in the thesis addressed those barriers. The KBIM qualitative study (Ch 2) addressed barriers at the individual (health literacy and motivation) and interpersonal level (social isolation and practical support). The upskilling nurses study (Ch 4) and KoSiM qualitative study (Ch 5) offers lessons as to how mental health services can provide better environments for the delivery of metabolic health interventions for people experiencing SMI by overcoming cultural barriers and workforce knowledge, attitude and confidence shortfalls related to metabolic health care. The M-BACK validation (Ch 3) relates to the community level of the SEM and offers some ways to resolve the fragmentation of health care that prevents improved metabolic health outcomes for people experiencing SMI.

Individual (intrapersonal) level

The KBIM lifestyle intervention program directly influenced the individual level of the SEM. The program had a significant positive impact on individuals who participated. The results of the KBIM qualitative study described in Chapter 3 reveal improvements in participants' knowledge, skills, awareness, attitudes, beliefs and perceptions. These factors are the key components within the individual level of the SEM (160).

Barriers

At the individual level, numerous challenges prevent people from achieving their health goals. Most people who experience early psychosis or an enduring SMI face more barriers than the general population. Two considerable barriers that many people diagnosed with SMI encounter are low health literacy and motivation.

Health literacy

Health literacy refers to an individual's knowledge, skills, motivation and capacity to access, comprehend and utilise information to make effective judgments around health care and take suitable action (177). Not only do people experiencing SMI have lower levels of physical health knowledge than the general population (178), but also are more likely to have a set of social determinants that lead to lower levels of health literacy (106, 179, 180). In addition, this population can experience cognitive issues as a direct result of SMI, making it increasingly difficult to comprehend and act on health information (180, 181). Low health literacy has also

been identified as a significant obstruction to achieving better physical health in both young people experiencing early psychosis and in people with more enduring SMI (182, 183). A lack of knowledge or comprehension of health information can in turn reduce the ability of individuals to make informed decisions about treatment and preventative interventions (178, 184), thereby undermining the level of autonomy and self-determination they can achieve in managing their own health (185).

Motivation

The lack of motivation observed in people experiencing SMI is often linked to the negative symptoms of psychotic illness, such as anhedonia and avolition (186). These symptoms are associated with a lack of drive and desire to set and achieve goals, contributing to poor lifestyle outcomes (182, 187). Negative symptoms of SMI are caused by the illness ‘taking away’ parts of regular functioning, and these symptoms may be further exacerbated by antipsychotic treatment (188), resulting in early clinical outcomes such as low mood, stress and anxiety, low self-esteem and low confidence (189, 190, 191, 192, 193). The presence of negative symptoms of SMI is linked to low intrinsic motivation (186, 194). Intrinsic motivation is important for social functioning and autonomy (195), and low levels of it can lead to people experiencing SMI being less likely to incorporate healthy behaviours into daily life (196).

How studies addressed the barriers

Keeping the body in mind: A qualitative analysis of the experiences of people experiencing first-episode psychosis participating in a lifestyle intervention program (Ch 2)

The KBIM program provided an individualised program that developed and supported the means to initiate lifestyle change at the individual level. Most of the barriers to achieving healthy lifestyles identified above were mentioned by KBIM participants. However, when participants described their experience of the KBIM program, they noted that they were overcoming these barriers, rather than seeing them as ongoing impediments to progress by increased health literacy and improved motivation.

Raising health literacy

The KBIM program promoted an environment that was conducive to the development of many of the components of health literacy. Knowledge gained in the KBIM program was highly

valued. This knowledge included metabolic health issues related to the use of antipsychotics, and the importance of healthy lifestyle behaviours in managing these metabolic side effects. This is an important program feature, given that people experiencing SMI often lack knowledge of psychotropics and their metabolic side effects (197).

Participants in the KBIM qualitative study recognised that knowing how to take care of their physical health was crucial to creating and maintaining a healthy lifestyle. It is considered critical that individuals have an in-depth understanding of how health behaviours affect their current and future health (198). This ability of KBIM participants to link their lifestyle choices with longer term health outcomes was an important motivator to make sustainable lifestyle changes.

Increasing motivation

The importance of intrinsic motivation was emphasised as a key to successful implementation of health behaviour change at the individual level of the SEM (199). The facilitation of intrinsic motivation was considered particularly important in early psychosis, because this type of motivation is likely to wane over time with SMI, making lifestyle changes more difficult for individuals (186).

Although some KBIM participants were not motivated to make lifestyle changes initially, they developed a keen interest in their physical health as a result of participating in the KBIM program. The program helped shape this process by using an ‘opt out’ model and an individualised approach. It was assumed participants would take part in lifestyle interventions unless they indicated otherwise. Taking part in lifestyle interventions can create a positive feedback cycle, whereby the benefits of living a healthy lifestyle (exercise, nutrition and sleep) can overcome many of the negative symptoms of SMI, which further enhances motivation and capability for social engagement (191). The momentum created by participation is important given people that experience SMI are often reluctant to seek out medical care or preventative treatments, so otherwise may not ‘opt in’ (94). Ensuring engagement in lifestyle interventions is of particular importance in early psychosis treatment, where immediate preventative initiatives

are required to mitigate physical health concerns that emerge quickly and compound over time (38).

In order to better engage with individuals in the KBIM program, programs were individualised by co-developing interventions with participants. The importance of an individualised and co-developed approach to lifestyle modification for people experiencing SMI has been emphasised in the literature (200, 201), and is a crucial facilitator of self-determination in this population (189, 202). By customising an intervention individually, the negative symptoms, such as low motivation, low mood, stress and anxiety, low self-esteem and low confidence can be prevented from becoming insurmountable barriers (38).

The KBIM intervention increased the knowledge and motivation of participants. They described how taking part in lifestyle interventions improved their belief in themselves and ability and desire to continue with these interventions. Their descriptions aligned with positive movement along the Self Determination Theory continuum (195) from feeling unmotivated, to pursuing a healthier lifestyle with the extrinsic motivational support and encouragement of program staff members, through to intrinsic motivation with independent goal setting (203).

Interpersonal level

Family, carers and friends are important facilitators of health promotion at the interpersonal level of the SEM. However, these resources are not always readily available to people experiencing SMI (204). The inequalities endured by people who experience SMI (205, 206) at an individual level mean that this group's metabolic health outcomes are influenced powerfully by the interpersonal support and opportunities that surround them (207). Mental health clinicians are well positioned with respect to both the individual experiencing SMI and the health care system to influence metabolic health outcomes (208). Peers within treatment programs also present another opportunity for interpersonal connection.

Barriers

Social isolation

Social isolation is associated with both poor physical and mental health outcomes in young people and people with longer-term SMI (209). Social isolation is linked with reduced levels of physical activity in people experiencing SMI (210) and is a predictor of adverse physical health outcomes and premature death (211). Stigma frequently leads to social isolation (212) and is associated with impaired recovery from SMI that extends to physical health concerns (213).

Practical support

One of the many correlates of social isolation and stigma is a lack of support. People experiencing a SMI often encounter significant challenges to achieving a healthy lifestyle and can experience low self-efficacy in this area (214). There can be a gulf between the desire for support and information of people experiencing SMI and mental health clinicians' provision of metabolic health promotion activities (132, 215, 216, 217, 218). People experiencing SMI report that when mental health clinicians do not provide support, they struggle to resolve their physical health concerns (219, 220). A lack of support for people experiencing SMI has been identified as the most common barrier to improving physical health (59, 84).

How studies addressed the barriers

Keeping the body in mind: A qualitative analysis of the experiences of people experiencing first-episode psychosis participating in a lifestyle intervention program (Ch 3)

My research in the KBIM qualitative study (Ch 3) demonstrated a positive impact on barriers at the interpersonal level of the SEM by reducing social isolation and increasing levels of practical support.

Reducing social isolation

The KBIM program was able to reduce participants' social isolation. Participants highlighted the peer support aspects of the KBIM intervention, and the ability to connect with other young people in similar circumstances was seen as highly beneficial. These benefits were primarily drawn from the group aspects of the program. Group formats enable individuals to share and co-

support (94, 108). In addition, having a person or other people with whom to undertake healthy lifestyle activities can increase motivation (94, 221).

Reducing social isolation is associated with an improvement in overall personal recovery from SMI (222). The KBIM program was able to reduce the amount of social isolation participants experienced, and this change occurred alongside improvements in self-esteem, mood and motivation, as well as improved mental health. Similar outcomes have been found in other lifestyle intervention programs targeting people experiencing SMI (221, 223, 224).

Increasing practical support

KBIM participants described feeling supported and encouraged on their physical health journeys. The individualised support and encouragement offered in the KBIM program were deemed fundamental to managing a challenging time. The supportive KBIM environment was identified as being both necessary and welcome in managing metabolic health. Previous research has reported that a positive staff attitude is an important facilitator of engagement in lifestyle activities for people experiencing SMI (219, 225). Similar results have been found in other interventions in which clinicians create a respectful and supportive environment (215, 226). This type of support and encouragement has been found to help people experiencing SMI to make improve their physical health and set future health goals (190, 192, 201, 223). Conversely, lifestyle education programs that didn't incorporate practical support produced no change in physical health outcomes for people experiencing SMI (91).

Both people experiencing SMI and mental health clinicians have identified the supportive facilitation of lifestyle interventions as important (215, 225). A key component of this support in the KBIM program was the practical support offered to participants in the form of gym and cooking activities. KBIM participants found staff members' knowledge of lifestyle interventions enabled them to develop a healthy lifestyle to minimise the impact of metabolic problems. People experiencing SMI have reported that many mental health clinicians, who may lack a professional knowledge in this area, overlook their metabolic care (216, 227). In contrast the KBIM team is a specialist team, incorporating not only a specialised nursing position but other professions (dietitians and exercise physiologists) that are generally not part of mental health

teams. The research evidence of the KBIM intervention's success reinforces calls in the literature to incorporate such multidisciplinary specialist teams within mental health services to provide better access to their expertise (228, 229).

Organisational level

Barriers

Several organisational-level barriers prevent better metabolic health care for people with SMI. They include mental health service culture and workforce knowledge, attitudes and confidence with respect to metabolic health (117, 218, 225, 230, 231).

Mental health service culture

Mental health services have generally under-prioritised metabolic health because it is not viewed as core business (6, 114, 115, 116, 117). The high workload of mental health services and their unapologetic focus on mental health symptomology and crisis management results in clinicians lacking the time for metabolic health care (208, 231, 232).

There is a lack of leadership regarding metabolic health care in mental health service, with the lack of emphasis on metabolic health care found to be reflected in poor managerial attitudes toward it (6, 115, 216). Organisational frameworks to help clinicians to meet the challenge of poor metabolic health outcomes for people experiencing SMI are also lacking (233). Even when mental health service policies to manage physical health concerns exist, they may not lead to needed practice changes within the organisation (234).

Lack of clear organisational direction creates confusion about responsibility for metabolic health care within an organisation (232, 235) and may contribute to ambivalence about taking action to improve patients' metabolic health (117, 230). The culture and values of mental health services have been shown to create barriers to implementing new knowledge to improve metabolic health care practices (208, 236, 237). For example, attempts to implement new initiatives in metabolic health care may be met with discouragement from workplace peers (216, 218).

Workforce knowledge, attitudes and confidence

It has been reported that mental health clinicians lack knowledge about metabolic health care (76, 112, 113). Clinicians describe themselves as not receiving the education or possessing the skills required to provide metabolic health screening and interventions (132, 238). These deficits constitute a barrier to the implementation of metabolic health measures for people experiencing SMI (239). It has been suggested that specialisation in mental health reduces clinicians' interest in learning about metabolic health assessment and health promotion interventions supporting nutrition and physical activity (215). Mental health clinicians are often not educationally prepared to provide metabolic health care (240, 241). This education gap is heightened among non-medical or nursing professions, including social workers and psychologists, who may have received no training in physical health care at undergraduate level, yet serve as care coordinators in mental health (216).

Metabolic health care has not traditionally been seen as a core aspect of the role of mental health clinicians (231). They feel uncertainty regarding their responsibility to address the metabolic health concerns of people experiencing SMI (76, 132, 208, 242, 243). Mental health clinicians tend to prioritise mental state monitoring and management that has traditionally been seen as the primary business of mental health services (231, 244).

Mental health clinicians may contribute to a culture of stigma in relation to metabolic health (235). The metabolic health of individuals experiencing SMI is sometimes deemed to be a result of lifestyle choices (225). At times, mental health clinicians view people experiencing SMI as individuals with poor lifestyle habits who don't wish to change (216, 231). Such clinician beliefs and attitudes provide a 'rationale' for not taking responsibility and engaging in metabolic health support and lifestyle interventions.

How studies addressed the barriers

Mental health services are well positioned to address the metabolic health concerns of people experiencing SMI through screening and preventative lifestyle interventions. In the upskilling nurses study (Ch 5) and KoSiM qualitative study (Ch 6), I explored interventions that aimed to

eliminate some of the barriers to better metabolic health outcomes at the organisational level of the SEM.

Upskilling mental health nurses to address the burden of poor metabolic health: A mixed method evaluation (Ch 5)

Improving mental health service culture

The upskilling nurses study demonstrated the positive impact that education and training can have on leadership around metabolic health care. Mental health nurses are well positioned to deliver metabolic health care to people experiencing SMI (245). Participants' reported plans to educate colleagues and implement screening and interventions represent an intention to fill the leadership vacuum existing around metabolic health care in mental health services. These planned interventions constitute transformational leadership, an essential element in health care culture change (246).

The upskilling nurses study also demonstrated a change in nurses' perceptions of the barriers to providing metabolic health care within mental health services. Participants were less likely to believe that their existing workloads prevented them from delivering metabolic health care. This positive change in perception is likely to reduce the role confusion and hesitancy often seen in services when dealing with metabolic health issues (117, 208).

Increasing workforce knowledge, attitudes and confidence

The upskilling nurses study was found to be successful in providing effective training and education about metabolic health care in mental health services (117, 216). This is consistent with several studies that have shown improvement in knowledge following training in a diverse range of physical health education initiatives in mental health (113, 236, 237, 239, 247, 248, 249). The upskilling nurses study differs from other initiatives in focusing on screening and prevention of metabolic syndrome and cardiovascular disease associated with anti-psychotic medications. Mental health services have a higher level of responsibility to prevent and manage metabolic health abnormalities due to the known iatrogenic effects of antipsychotic medications (250).

Greater knowledge enables a clinician to screen, identify and intervene in metabolic health concerns (113, 207, 249, 251, 252). The improvements in mental health clinician knowledge on the side effects of psychotropic medication are considered key to overcoming diagnostic overshadowing, whereby psychotropic medication side effects are overlooked due to mental health symptomatology being assessed as their basis (208, 252).

The upskilling nurses study not only demonstrated improved knowledge levels in participants but also improved attitudes on the M-BACK. It is generally recognised that improving clinical knowledge levels correlates with a more positive attitude towards evidence-based practices (253). Similar results have been found in other studies, in which mental health clinician's attitudes improved after training and education in physical health care (237, 239, 254, 255). Importantly, mental health clinicians' attitudes toward their clinical practice are reported to be predictors of implementation outcomes (256). Participants in the upskilling nurses study reported that they intended to incorporate metabolic health care into their practice. Given metabolic health care has not generally been seen as being within the scope of practice of most mental health clinicians (114, 257), these outcomes represent a positive attitudinal change. Prior research has concluded that mental health clinician attitudes needed to improve before physical health practices could be incorporated into mental health settings (236).

The confidence levels of participants in the upskilling nurses study improved in line with both knowledge and attitudes. Mental health clinician knowledge relating to physical health is considered a prerequisite to developing confidence in the assessment of physical health symptoms in people that experience SMI (112, 236, 252, 258). Participants in the upskilling nurses study reported improvements in confidence in both clinical assessment and intervention. The only other study of physical health care with pre-post measures of clinician confidence demonstrated consistent improvements in knowledge levels after education on assessment, but no change in participants' confidence to intervene or provide advice (236). The upskilling study's success in increasing confidence levels might be explained by its focus on metabolic health screening and interventions (as opposed to a broader range of physical health conditions) and a practical skills component.

Tackling change in mental health service delivery: A qualitative evaluation of a lifestyle program targeting mental health staff – Keeping our Staff in Mind (Ch 6)

The Keeping our Staff in Mind (KoSiM) was a novel intervention that differed from standard models of training and education in that it offered a direct benefit to mental health clinicians in relation to their own health. Participants reported that they gained personal benefit for both themselves and their family. Whilst there have been few quality studies of the effectiveness of staff-focused interventions for mental health clinicians (259), they have shown promising outcomes with this type of intervention in positively influencing outcomes for people experiencing SMI (260, 261).

Improving mental health service culture

The KoSiM intervention, undertaken within a busy mental health service, is a clear example of how metabolic health care can be prioritised. It demonstrated the importance of leadership in physical health care at a top managerial level and its impact on health service culture. Fiscal investment in KoSiM sent a clear signal to managers and clinical staff that metabolic health was a priority for the service.

The novel approach of KoSiM training may provide an incentive to participate in metabolic health training. Motivation to participate in training is usually decided by clinicians' perceived needs (262). Many mental health clinicians fail to undertake education in evidence-based practice due to a lack of motivation (263), and 'change fatigue' can be prevalent in health services (264). By offering training that provided tangible personal benefits, the mental health service facilitated greater motivation to participate.

KoSiM demonstrated that, despite heavy workloads in busy mental health services, it is possible to invest in an intervention designed to improve the metabolic health outcomes of people with SMI. Role modelling of clinicians has been shown to be an important facilitator of lifestyle change in recipients of care (265). Mental health clinician BMI reductions were mirrored in people experiencing SMI with whom they worked (260).

Improving workforce knowledge, attitudes and confidence

The KoSiM qualitative study detailed the improved knowledge, attitudes and confidence of mental health staff participants in delivering metabolic health interventions to people experiencing SMI, in line with previously published results from a quantitative study using the M-BACK tool (133). There is a positive correlation between personal health habits and lifestyle counselling in professional clinical practice (265, 266, 267, 268). Mental health clinicians have reported being more likely to promote healthy lifestyles if they feel self-efficacious in their own health behaviours (218).

Participants described lessons from the KoSiM intervention being transferred into pragmatic clinical interventions aimed at metabolic health problems in people experiencing SMI. This is an important finding, given the noted limitations in previous studies of education about physical health care for people experiencing SMI as to whether reported increases in knowledge translate to closing theory-practice gaps (236, 237, 239, 247, 249).

The KoSiM intervention was offered to all members of the mental health service. Clinicians from a variety of professional backgrounds participated in the KoSiM qualitative study and reported an increase in knowledge and skills around metabolic health care. Education programs focusing on physical health care in mental health have primarily targeted nurses (207). However, nurses are just one of several professionals who fulfill the roles of mental health care coordinators; it is essential to broaden the education approach to incorporate the allied health professions. The KoSiM qualitative study demonstrated that this style of training intervention is a well-received and effective mode of education for the multiple professions that work in mental health services.

Community level

Barriers

People diagnosed with SMI frequently experience disadvantage and discrimination in relation to the management of their physical health.

Disadvantage and discrimination

Health care services for people experiencing SMI are highly fragmented in Australia. The care needed to manage metabolic health concerns may involve mental health services, primary care from GPs, general hospital services, community managed organisations and private practice clinicians, among others. There is often ambiguity about the roles and responsibilities of service providers regarding metabolic health care for people that experience SMI (269).

Services delivering metabolic health care are often poorly integrated and coordinated (234, 270, 271). There are multiple causes of this disjointed approach. The historical segregation of mental health and physical health treatment has had a lasting effect, creating a continuing separation of mental and physical health services (270). Services funded by Australian Commonwealth agencies and those funded by state agencies may have different priorities, and often rely on informal collaborations that may contribute to poor communication between services (272).

Stigmatisation of people experiencing SMI occurs across health care and harms physical health care outcomes (273). The bias people with SMI encounter can be both conscious and unconscious (274). Diagnostic overshadowing often occurs for this population when seeking physical health care, because many clinicians do not look beyond mental health symptoms or diagnoses (216, 275). Diagnostic overshadowing arises from many sources, including low awareness of physical health issues and therapeutic pessimism. Many clinicians and services lack awareness of the significantly higher rates and greater severity of metabolic health issues among people with SMI (2). The belief that positive physical health outcomes are unlikely to be achieved for people experiencing SMI may lead to therapeutic pessimism amongst individuals and organisations that subsequently limits attempts to resolve these concerns (273, 276).

Many people with SMI experience significant socioeconomic disadvantage (277). This disadvantage reduces their equity of access to health services and is an important social determinant of health. Challenges include lacking the financial resources to purchase services and the interpersonal skills to navigate options in the health system, and poor local access. These

factors often result in by health services treating people living with SMI as second-class citizens, and inability to access services that are available to others (278).

How studies addressed the barriers

The validity and reliability characteristics of the M-BACK questionnaire to assess the barriers, attitudes, confidence, and knowledge of mental health staff regarding metabolic health of mental health service users (Ch 4)

Reducing disadvantage and discrimination

To successfully integrate mental and physical health care requires clinicians to have the appropriate attitudes and skills (233). Education and training have a central role in effective integration of services for the metabolic health of people experiencing SMI. For example, training can refute the view that responsibility for metabolic and other physical health resides solely with other health service providers, such as GPs (242, 244).

Multiple studies have demonstrated that achieving a positive shift in attitudes through training and education reduces the stigmatisation of people experiencing SMI (69, 249, 279, 280). In other words, educating health professionals is a means of reducing discrimination and disadvantage around metabolic health care. This area warrants special attention because metabolic health conditions are the primary drivers of premature mortality and morbidity in people experiencing SMI, and are often exacerbated by diagnostic overshadowing and antipsychotic treatments (49). As such, metabolic health care for people experiencing SMI requires greater attention. Providing training and education interventions to mental health and general health professionals should be considered vital to reduce these forms of disadvantage and discrimination (273, 278).

Research evidence about training and education in the metabolic health care of people with a SMI is scarce (281). The M-BACK enables succinct, standardised pre- and post-intervention measurement of the effectiveness of training and education on clinician knowledge, attitudes, confidence and perceived barriers to metabolic health care. The ability to measure the efficacy of targeted training programs is essential to determine success and identify where improvements could be made (282). The M-BACK provides a means to review and compare education and

training initiatives and then refine their content and delivery to improve physical health service integration and reduce stigma for people experiencing SMI.

Interrelationships of SEM levels

Overcoming the metabolic health inequalities experienced by people with an SMI is a complex issue that requires a multi-level approach. Influencing all levels of the SEM in an individual project is generally considered impractical; however, intervention studies should target at least two SEM levels of influence, because multi-level interventions are more effective in modifying behaviour (161). The studies in this project address four of the five levels of the health behaviour SEM.

For individuals experiencing SMI, the challenges of illness and treatments, together with environmental contexts, often make it difficult or not feasible to reduce their own metabolic health risks. Rather than placing sole responsibility on the individual, the SEM emphasises the need to create conditions and policies on other levels that make it practical, appealing and affordable to make healthful choices, and then encourage and inform individuals about those choices. People experiencing SMI need support in facilitating these choices.

Mental health clinicians are well placed to support people experiencing SMI through delivering and navigating metabolic health interventions. The required upskilling and support of mental health clinicians requires commitment at an organisational level from mental health services to provide the training, support and capacity to deliver these services.

Mental health service organisations can never counter all the influences on metabolic health outcomes of people experiencing SMI. Meeting the metabolic health needs of people with SMI requires clarity about responsibilities and boundaries of care at the community level. To effectively improve metabolic health requires collaboration and cooperation between health and support organisations operating in the community.

The outermost level of the SEM is the public policy level. Although not addressed directly in the current project, this level is important in that it strongly influences funding and policy decisions,

and therefore all the other levels of the SEM. For example, if mental health services are to incorporate additional metabolic health interventions with specialist teams like those that delivered the KBIM intervention, they will require substantial funding and policy direction.

Strengths and limitations

The studies in this thesis form part of a broader body of work by the members of the KBIM team. This research is primarily translational in nature and focused on improving metabolic health care within mental health services. This thesis demonstrates the early steps that have been taken on a small scale to bring about a change in culture and practice that can improve metabolic health outcomes for people living with SMI.

My research was conducted as a series of real-world studies; this meant control groups for comparison were not feasible, and there was a greater risk of unknown confounding influences than in more constrained (but less realistic) experiments. Implementation science – that is, taking evidence-based interventions and putting them into practice (283) – is an important part of the spectrum of research. The research in this project has provided many insights into the acceptability, feasibility and sustainability of interventions to change mental health service culture to incorporate metabolic health care.

In this thesis, I do not seek to offer a full solution to the challenge of meeting the metabolic health needs of people experiencing SMI. Socioecological models stress that there are many factors that operate within various levels and intersect across levels (161). Although the research in this thesis address barriers at all levels of the SEM, except for the public policy level of the SEM, it is not a complete picture of the research required to inform all the levels.

My research work was conducted with both quantitative and qualitative methodologies. The qualitative research results are not necessarily generalisable to other settings and circumstances, they can be applicable. The mixed-methods and linking of studies in this research somewhat addresses the issue of generalisability. A meta-synthesis of qualitative studies with similar research parameters could better evaluate the generalisability of these qualitative results (284).

Although elements of co-design were incorporated into the planning and implementation of the interventions described in my research, this did not occur in a formalised way. Future research should use co-design research methodology frameworks, in order to avoid this limitation.

Recommendations for policy, practice and research

The findings from the research presented in this thesis enabled the development of multiple recommendations for policy, practice and research.

Train and educate mental health clinicians in metabolic health screening and prevention

Training in metabolic health screening and prevention work should be instituted in all mental health services. This training should be mandatory for all clinicians in community care coordinator (case manager) roles and for inpatient nursing staff. Training should be evidence-based, such as that described in the upskilling nurses study. Ongoing evaluation of this training should occur utilising qualitative feedback and a validated measurement tool such as the M-BACK to enable continued refinement and improvement of training delivery. Researchers should investigate the longer-term impact of metabolic health training, with particular regard to clinical practice changes and the impact on health outcomes for people living with SMI.

Screen and offer interventions for all patients with SMI

Metabolic health screening and implementation of lifestyle interventions should be provided and encouraged for all people with SMI seen by specialist mental health services. Organisational policies should be evidence-based and clinically relevant, existing treatment guidelines and frameworks for metabolic health provide such evidence and should be converted into policy. The benchmarking of metabolic health screening and physical care planning should form part of service accreditation. The benchmarking process should increase accountability at both the organisational (mental health service) and interpersonal (clinician) levels. Future researchers should investigate the impact of metabolic screening with a range of outcome measures including long-term health outcomes, antipsychotic prescribing patterns, physical health care planning.

[Integrate physical health service delivery for people experiencing SMI](#)

Determination of who is responsible for aspects of metabolic care, and how it should be delivered, should be well defined. Funding models should reflect these responsibilities and promote collaborative care planning. Clear pathways between primary care and mental health services need to be developed to improve collaborative planning and to reduce fragmentation of service provision; this should include aligning medical records systems to improve organisational communication. Stigma reduction training and information in relation to the heightened risk of physical health conditions in people experiencing SMI should be made easily accessible throughout the health system. Researchers should explore the impact of training on the specialist physical health needs of people experiencing SMI. To determine if such training positively influences attitudes of clinicians in primary care, and hospitals settings.

[Incorporate specialist metabolic health care into services providing antipsychotic treatment](#)

Specialist metabolic health care should be incorporated into mental health services to manage the iatrogenic effects of antipsychotic treatment. Designated specialist clinicians should be funded to train and support other staff and provide assessments and interventions in mental health treatment settings. Interventions should be largely individually tailored, but group-based interventions to foster peer support are also valuable. Evidence based specialised metabolic health care services should be established within mental health services such as that described in the KBIM intervention. Research into the constitution of these specialist teams, including the incorporation of GPs, should continue.

[Provide health support programs to clinicians and care providers](#)

Staff health programs, such as the KoSiM program, should be introduced to provide direct benefits to staff and flow-on benefits to consumers experiencing SMI. Future researchers should perform fiscal cost–benefit analysis of staff health programs, such as that evaluated in the KoSiM study. Given carers are generally close to and have influence on people with SMI, researchers should evaluate health support programs for this group by tailoring the KoSiM program for this population.

Conclusion

In this doctoral project, I investigated interventions designed to lower the barriers to better metabolic health care for people experiencing SMI. My novel findings include practical ways to remove or lower barriers across multiple levels of the SEM framework. Metabolic health problems in people experiencing SMI can in part be resolved by the provision of metabolic health and screening interventions within mental health services. To implement these interventions, changes in workplace culture and improvements in knowledge, attitudes and confidence are essential. These goals can be achieved through metabolic health training workshops and staff-focused lifestyle interventions. The effectiveness of these interventions can be evaluated with standardised tools. Recommendations for practice and further research include training and education for mental health staff in metabolic health, policy directives for metabolic screening and interventions, incorporation of specialised metabolic health intervention teams within mental health services, funding models that provide clarity of responsibility for different elements of metabolic health care, and further investigation of lifestyle intervention as a means of supporting care providers. It is anticipated that the work described herein will help mental health services to incorporate metabolic health screening and lifestyle interventions and thereby improve the quality and quantity of the lives of people living with SMI.

References

1. WHO. Management of physical health conditions in adults with severe mental disorders: WHO guidelines. 2018.
2. Firth J, Siddiqi N, Koyanagi A, Siskind D, Rosenbaum S, Galletly C, et al. The Lancet Psychiatry Commission: a blueprint for protecting physical health in people with mental illness. *The Lancet Psychiatry*. 2019;6(8):675-712.
3. Bruins J, Jörg F, Bruggeman R, Slooff C, Corpeleijn E, Pijnenborg M. The Effects of Lifestyle Interventions on (Long-Term) Weight Management, Cardiometabolic Risk and Depressive Symptoms in People with Psychotic Disorders: A Meta-Analysis. *PloS one*. 2014;9(12):e112276.
4. Singh VK, Karmani S, Malo PK, Virupaksha H, Muralidhar D, Venkatasubramanian G, et al. Impact of lifestyle modification on some components of metabolic syndrome in persons with severe mental disorders: A meta-analysis. *Schizophrenia Research*. 2018;202:17-25.
5. Stewart R. Mental disorders and mortality: so many publications, so little change. *Acta Psychiatrica Scandinavica*. 2015;132(5):410-1.
6. Bartels S. Can behavioral health organizations change health behaviors? The STRIDE study and lifestyle interventions for obesity in serious mental illness. *The American journal of psychiatry*. 2015;172(1):9.
7. Mitchell A, De Hert M. Promotion of physical health in persons with schizophrenia: can we prevent cardiometabolic problems before they begin? *Acta Psychiatrica Scandinavica*. 2015;132(2):83-5.
8. McGrath J. No mental health without physical health—a call to arms. *Epidemiology and Psychiatric Sciences*. 2016;25(3):195-6.
9. Suetani S, Rosenbaum S, Scott J, Curtis J, Ward P. Bridging the gap: What have we done and what more can we do to reduce the burden of avoidable death in people with psychotic illness? *Epidemiology and psychiatric sciences*. 2016;25(3):205-10.
10. Vancampfort D, Firth J, Correll CU, Solmi M, Siskind D, De Hert M, et al. The impact of pharmacological and non-pharmacological interventions to improve physical health outcomes in people with schizophrenia: a meta-review of meta-analyses of randomized controlled trials. *World Psychiatry*. 2019;18(1):53-66.
11. Deenik J, Czosnek L, Teasdale SB, Stubbs B, Firth J, Schuch FB, et al. From impact factors to real impact: translating evidence on lifestyle interventions into routine mental health care. *Translational behavioral medicine*. 2020;10(4):1070-3.
12. Ruggeri M, Leese M, Thornicroft G, Bisoffi G, Tansella M. Definition and prevalence of severe and persistent mental illness. *British Journal of Psychiatry*. 2000;177(2):149-55.
13. Andreasen NC, Arndt S, Alliger R, Miller D, Flaum M. Symptoms of schizophrenia: Methods, meanings, and mechanisms. *Archives of general psychiatry*. 1995;52(5):341-51.
14. Castle DJ, Galletly CA, Dark F, Humberstone V, Morgan VA, Killackey E, et al. The 2016 Royal Australian and New Zealand College of Psychiatrists guidelines for the management of schizophrenia and related disorders. *Medical Journal of Australia*. 2017;206(11):501-5.

15. Haddad PM, Correll CU. The acute efficacy of antipsychotics in schizophrenia: a review of recent meta-analyses. *Therapeutic advances in psychopharmacology*. 2018;8(11):303-18.
16. Wiersma D, Nienhuis FJ, Slooff CJ, Giel R. Natural course of schizophrenic disorders: a 15-year followup of a Dutch incidence cohort. *Schizophrenia bulletin*. 1998;24(1):75-85.
17. Shimomura Y, Kikuchi Y, Suzuki T, Uchida H, Mimura M, Takeuchi H. Antipsychotic treatment in the maintenance phase of schizophrenia: an updated systematic review of the guidelines and algorithms. *Schizophrenia Research*. 2020;215:8-16.
18. Nordentoft M, Wahlbeck K, Hällgren J, Westman J, Ösby U, Alinaghizadeh H, et al. Excess mortality, causes of death and life expectancy in 270,770 patients with recent onset of mental disorders in Denmark, Finland and Sweden. *PLoS one*. 2013;8(1):e55176.
19. Hayes JF, Marston L, Walters K, King MB, Osborn DP. Mortality gap for people with bipolar disorder and schizophrenia: UK-based cohort study 2000–2014. *The British Journal of Psychiatry*. 2017;211(3):175-81.
20. John A, McGregor J, Jones I, Lee SC, Walters JT, Owen MJ, et al. Premature mortality among people with severe mental illness—New evidence from linked primary care data. *Schizophrenia research*. 2018;199:154-62.
21. Tanskanen A, Tiihonen J, Taipale H. Mortality in schizophrenia: 30-year nationwide follow-up study. *Acta Psychiatrica Scandinavica*. 2018;138(6):492-9.
22. Correll CU, Solmi M, Croatto G, Schneider LK, Rohani-Montez SC, Fairley L, et al. Mortality in people with schizophrenia: a systematic review and meta-analysis of relative risk and aggravating or attenuating factors. *World psychiatry*. 2022;21(2):248-71.
23. Erlangsen A, Andersen PK, Toender A, Laursen TM, Nordentoft M, Canudas-Romo V. Cause-specific life-years lost in people with mental disorders: a nationwide, register-based cohort study. *The Lancet Psychiatry*. 2017;4(12):937-45.
24. Walker ER, McGee RE, Druss BG. Mortality in mental disorders and global disease burden implications: a systematic review and meta-analysis. *JAMA psychiatry*. 2015;72(4):334-41.
25. Piotrowski P, M Gondek T, Królicka-Deręgowska A, Misiak B, Adamowski T, Kiejna A. Causes of mortality in schizophrenia: An updated review of European studies. *Psychiatria Danubina*. 2017;29(2):108-20.
26. Jayatilleke N, Hayes RD, Dutta R, Shetty H, Hotopf M, Chang C-K, et al. Contributions of specific causes of death to lost life expectancy in severe mental illness. 2017;43:109-15.
27. Suetani S, Honarparvar F, Siskind D, Hindley G, Veronese N, Vancampfort D, et al. Increased rates of respiratory disease in schizophrenia: a systematic review and meta-analysis including 619,214 individuals with schizophrenia and 52,159,551 controls. *Schizophrenia Research*. 2021;237:131-40.
28. Nielsen RE, Banner J, Jensen SE. Cardiovascular disease in patients with severe mental illness. *Nature Reviews Cardiology*. 2021;18(2):136-45.
29. Lee EE, Liu J, Tu X, Palmer BW, Eyles LT, Jeste DV. A widening longevity gap between people with schizophrenia and general population: a literature review and call for action. *Schizophrenia research*. 2018;196:9-13.
30. Balogun-Katung A, Carswell C, Brown JV, Coventry P, Ajjan R, Alderson S, et al. Exploring the facilitators, barriers, and strategies for self-management in adults living with severe mental

illness, with and without long-term conditions: A qualitative evidence synthesis. *PloS one*. 2021;16(10):e0258937.

31. Bellass S, Lister J, Kitchen CEW, Kramer L, Alderson SL, Doran T, et al. Living with diabetes alongside a severe mental illness: a qualitative exploration with people with severe mental illness, family members and healthcare staff. *Diabetic Medicine*. 2021;38(7):e14562.
32. Coventry PA, Small N, Panagioti M, Adeyemi I, Bee P. Living with complexity; marshalling resources: a systematic review and qualitative meta-synthesis of lived experience of mental and physical multimorbidity. *BMC family practice*. 2015;16(1):1-12.
33. Luciano M, Sampogna G, Del Vecchio V, Giallonardo V, Palummo C, Andriola I, et al. The impact of clinical and social factors on the physical health of people with severe mental illness: Results from an Italian multicentre study. *Psychiatry Research*. 2021;303:114073.
34. Correll CU, Detraux J, De Lepeleire J, De Hert M. Effects of antipsychotics, antidepressants and mood stabilizers on risk for physical diseases in people with schizophrenia, depression and bipolar disorder. *World psychiatry*. 2015;14(2):119-36.
35. Pillinger T, McCutcheon RA, Vano L, Mizuno Y, Arumham A, Hindley G, et al. Comparative effects of 18 antipsychotics on metabolic function in patients with schizophrenia, predictors of metabolic dysregulation, and association with psychopathology: a systematic review and network meta-analysis. *The Lancet Psychiatry*. 2020;7(1):64-77.
36. Huhn M, Nikolakopoulou A, Schneider-Thoma J, Krause M, Samara M, Peter N, et al. Comparative efficacy and tolerability of 32 oral antipsychotics for the acute treatment of adults with multi-episode schizophrenia: a systematic review and network meta-analysis. *The Lancet*. 2019;394(10202):939-51.
37. Bak M, Fransen A, Janssen J, van Os J, Drukker M. Almost all antipsychotics result in weight gain: a meta-analysis. *PloS one*. 2014;9(4):e94112.
38. Alvarez-Jimenez M, Gonzalez-Blanch C, Crespo-Facorro B, Hetrick S, Rodriguez-Sanchez JM, Perez-Iglesias R, et al. Antipsychotic-induced weight gain in chronic and first-episode psychotic disorders. *CNS drugs*. 2008;22(7):547-62.
39. Mazereel V, Detraux J, Vancampfort D, Van Winkel R, De Hert M. Impact of psychotropic medication effects on obesity and the metabolic syndrome in people with serious mental illness. *Frontiers in endocrinology*. 2020;11:573479.
40. Smith E, Singh R, Lee J, Colucci L, Graff-Guerrero A, Remington G, et al. Adiposity in schizophrenia: a systematic review and meta-analysis. *Acta Psychiatrica Scandinavica*. 2021;144(6):524-36.
41. Tchernof A, Després J-P. Pathophysiology of human visceral obesity: an update. *Physiological reviews*. 2013.
42. Correll CU, Robinson DG, Schooler NR, Brunette MF, Mueser KT, Rosenheck RA, et al. Cardiometabolic risk in patients with first-episode schizophrenia spectrum disorders: baseline results from the RAISE-ETP study. *JAMA psychiatry*. 2014;71(12):1350-63.
43. Teff KL, Rickels MR, Grudziak J, Fuller C, Nguyen H-L, Rickels K. Antipsychotic-induced insulin resistance and postprandial hormonal dysregulation independent of weight gain or psychiatric disease. *Diabetes*. 2013 2013/09//:3232+.

44. Li J, Wang F, Xue R, Si S, Tang F, Xue F. Effects of antipsychotics on triglyceride trajectories and its implications in CVD: A longitudinal cohort study. *EBioMedicine*. 2022;81:104123.
45. Wysham C, Shubrook J. Beta-cell failure in type 2 diabetes: mechanisms, markers, and clinical implications. *Postgraduate Medicine*. 2020;132(8):676-86.
46. Correll CU, Solmi M, Veronese N, Bortolato B, Rosson S, Santonastaso P, et al. Prevalence, incidence and mortality from cardiovascular disease in patients with pooled and specific severe mental illness: a large-scale meta-analysis of 3,211,768 patients and 113,383,368 controls. *World Psychiatry*. 2017;16(2):163-80.
47. Sattar N, Gill JM, Alazawi W. Improving prevention strategies for cardiometabolic disease. *Nature medicine*. 2020;26(3):320-5.
48. Carney R, Cotter J, Bradshaw T, Firth J, Yung AR. Cardiometabolic risk factors in young people at ultra-high risk for psychosis: A systematic review and meta-analysis. *Schizophrenia Research*. 2016;170(2):290-300.
49. Vancampfort D, Stubbs B, Mitchell AJ, De Hert M, Wampers M, Ward PB, et al. Risk of metabolic syndrome and its components in people with schizophrenia and related psychotic disorders, bipolar disorder and major depressive disorder: a systematic review and meta-analysis. 2015;14(3):339-47.
50. van Zonneveld SM, Haarman B, van den Oever EJ, Nuninga JO, Sommer IE. Unhealthy diet in schizophrenia spectrum disorders. *Current opinion in psychiatry*. 2022;35(3):177-85.
51. Teasdale SB, Ward PB, Samaras K, Firth J, Stubbs B, Tripodi E, et al. Dietary intake of people with severe mental illness: systematic review and meta-analysis. *The British Journal of Psychiatry*. 2019;214(5):251-9.
52. Dipasquale S, Pariante CM, Dazzan P, Aguglia E, McGuire P, Mondelli V. The dietary pattern of patients with schizophrenia: a systematic review. *Journal of psychiatric research*. 2013;47(2):197-207.
53. Srour B, Fezeu LK, Kesse-Guyot E, Allès B, Méjean C, Andrianasolo RM, et al. Ultra-processed food intake and risk of cardiovascular disease: prospective cohort study (NutriNet-Santé). *bmj*. 2019;365.
54. Bly MJ, Taylor SF, Dalack G, Pop-Busui R, Burghardt KJ, Evans SJ, et al. Metabolic syndrome in bipolar disorder and schizophrenia: dietary and lifestyle factors compared to the general population. *Bipolar disorders*. 2014;16(3):277-88.
55. Vancampfort D, Firth J, Schuch FB, Rosenbaum S, Mugisha J, Hallgren M, et al. Sedentary behavior and physical activity levels in people with schizophrenia, bipolar disorder and major depressive disorder: a global systematic review and meta-analysis. *World Psychiatry*. 2017;16(3):308-15.
56. Stubbs B, Firth J, Berry A, Schuch FB, Rosenbaum S, Gaughran F, et al. How much physical activity do people with schizophrenia engage in? A systematic review, comparative meta-analysis and meta-regression. *Schizophrenia research*. 2016;176(2-3):431-40.
57. Stubbs B, Koyanagi A, Schuch F, Firth J, Rosenbaum S, Gaughran F, et al. Physical activity levels and psychosis: a mediation analysis of factors influencing physical activity target achievement among 204 186 people across 46 low-and middle-income countries. *Schizophrenia bulletin*. 2017;43(3):536-45.

58. Stubbs B, Williams J, Gaughran F, Craig T. How sedentary are people with psychosis? A systematic review and meta-analysis. *Schizophrenia research*. 2016;171(1-3):103-9.
59. Firth J, Rosenbaum S, Stubbs B, Gorchynski P, Yung AR, Vancampfort D. Motivating factors and barriers towards exercise in severe mental illness: a systematic review and meta-analysis. *Psychological medicine*. 2016;46(14):2869-81.
60. Lear SA, Hu W, Rangarajan S, Gasevic D, Leong D, Iqbal R, et al. The effect of physical activity on mortality and cardiovascular disease in 130 000 people from 17 high-income, middle-income, and low-income countries: the PURE study. *The Lancet*. 2017;390(10113):2643-54.
61. Mallet J, Le Strat Y, Schürhoff F, Mazer N, Portalier C, Andrianarisoa M, et al. Cigarette smoking and schizophrenia: a specific clinical and therapeutic profile? Results from the FACE-Schizophrenia cohort. *Progress in Neuro-Psychopharmacology and Biological Psychiatry*. 2017;79:332-9.
62. Australian Institute of Health and Welfare. National Drug Strategy Household Survey 2019. Canberra: AIHW; 2020.
63. Gilbody S, Peckham E, Bailey D, Arundel C, Heron P, Crosland S, et al. Smoking cessation for people with severe mental illness (SCIMITAR+): a pragmatic randomised controlled trial. *Lancet Psychiatry*. 2019;6(5):379-90.
64. Krishnadas R, Jauhar S, Telfer S, Shivashankar S, McCreadie RG. Nicotine dependence and illness severity in schizophrenia. *Br J Psychiatry*. 2012;201(4):306-12.
65. Penninx BWJH, Lange SMM. Metabolic syndrome in psychiatric patients: overview, mechanisms, and implications. *Dialogues in Clinical Neuroscience*. 2018;20(1):63-73.
66. van Rossum EF, Koper JW, Huizenga NA, Uitterlinden AG, Janssen JA, Brinkmann AO, et al. A polymorphism in the glucocorticoid receptor gene, which decreases sensitivity to glucocorticoids in vivo, is associated with low insulin and cholesterol levels. *Diabetes*. 2002;51(10):3128-34.
67. Malan-Mueller S, Kilian S, van den Heuvel LL, Bardien S, Asmal L, Warnich L, et al. A systematic review of genetic variants associated with metabolic syndrome in patients with schizophrenia. *Schizophrenia research*. 2016;170(1):1-17.
68. Rogers G, Keating DJ, Young RL, Wong M-L, Licinio J, Wesselingh S. From gut dysbiosis to altered brain function and mental illness: mechanisms and pathways. *Molecular psychiatry*. 2016;21(6):738-48.
69. Hemingway S, Rogers M, Elsom S. Measuring the influence of a mental health training module on the therapeutic optimism of advanced nurse practitioner students in the United Kingdom. *Journal of the American Association of Nurse Practitioners*. 2014;26(3):155-62.
70. Jazi S, Ben-Amor L, Abadie P, Menard M-L, Choquette R, Berthiaume C, et al. Long-Term Metabolic Monitoring of Youths Treated with Second-Generation Antipsychotics 5 Years after Publication of the CAMESA Guidelines Are We Making Progress? Surveillance Métabolique à Long Terme des Jeunes Traités par Antipsychotiques de Deuxième Génération, Cinq ans Après la publication des Lignes Directrices Camesa: Faisons-Nous des Progrès? *The Canadian Journal of Psychiatry*. 2021;66(7):645-56.

71. Mead L, Ayres A, Blake JA, Scott JG. Monitoring of metabolic side-effects in children and adolescents prescribed antipsychotic medication: A systematic review. *Australian & New Zealand Journal of Psychiatry*. 2021;55(8):763-71.
72. Solmi M, Fiedorowicz J, Poddighe L, Delogu M, Miola A, Høye A, et al. Disparities in screening and treatment of cardiovascular diseases in patients with mental disorders across the world: systematic review and meta-analysis of 47 observational studies. *American Journal of Psychiatry*. 2021;178(9):793-803.
73. Melamed OC, LaChance LR, O'Neill BG, Rodak T, Taylor VH. Interventions to improve metabolic risk screening among children and adolescents on antipsychotic medication: a systematic review. *Journal of Child and Adolescent Psychopharmacology*. 2021;31(1):63-72.
74. Melamed OC, Wong EN, LaChance LR, Kanji S, Taylor VH. Interventions to improve metabolic risk screening among adult patients taking antipsychotic medication: a systematic review. *Psychiatric Services*. 2019;70(12):1138-56.
75. Chee G-L, Wynaden D, Heslop K. Improving metabolic monitoring rate for young people aged 35 and younger taking antipsychotic medications to treat a psychosis: A literature review. *Archives of Psychiatric Nursing*. 2017;31(6):624-33.
76. Aouira N, Khan S, Heussler H, Haywood A, Karaksha A, Bor W. Practitioners' Perspective on Metabolic Monitoring of Second-Generation Antipsychotics: Existing Gaps in Knowledge, Barriers to Monitoring, and Strategies. *Journal of Child and Adolescent Psychopharmacology*. 2022.
77. Leucht S, Cipriani A, Spineli L, Mavridis D, Örey D, Richter F, et al. Comparative efficacy and tolerability of 15 antipsychotic drugs in schizophrenia: a multiple-treatments meta-analysis. *The Lancet*. 2013;382(9896):951-62.
78. Solmi M, Murru A, Pacchiarotti I, Undurraga J, Veronese N, Fornaro M, et al. Safety, tolerability, and risks associated with first-and second-generation antipsychotics: a state-of-the-art clinical review. *Therapeutics and clinical risk management*. 2017;13:757.
79. Firth J, Cotter J, Elliott R, French P, Yung ARJPM. A systematic review and meta-analysis of exercise interventions in schizophrenia patients. 2015;45(7):1343-61.
80. Pearsall R, Smith DJ, Pelosi A, Geddes J. Exercise therapy in adults with serious mental illness: a systematic review and meta-analysis. *BMC psychiatry*. 2014;14(1):1-17.
81. Bonfioli E, Berti L, Goss C, Muraro F, Burti L. Health promotion lifestyle interventions for weight management in psychosis: a systematic review and meta-analysis of randomised controlled trials. *BMC psychiatry*. 2012;12(1):1-12.
82. Caemmerer J, Correll CU, Maayan L. Acute and maintenance effects of non-pharmacologic interventions for antipsychotic associated weight gain and metabolic abnormalities: a meta-analytic comparison of randomized controlled trials. *Schizophrenia research*. 2012;140(1-3):159-68.
83. Alvarez-Jimenez M, Hetrick SE, Gonzalez-Blanch C, Gleeson JF, McGorry PD. Non-pharmacological management of antipsychotic-induced weight gain: systematic review and meta-analysis of randomised controlled trials. *British Journal of Psychiatry*. 2008;193(2):101-7.
84. Teasdale SB, Ward PB, Rosenbaum S, Samaras K, Stubbs B. Solving a weighty problem: systematic review and meta-analysis of nutrition interventions in severe mental illness. *The British Journal of Psychiatry*. 2017;210(2):110-8.

85. Speyer H, Jakobsen AS, Westergaard C, Nørgaard HCB, Pisinger C, Krogh J, et al. Lifestyle Interventions for Weight Management in People with Serious Mental Illness: A Systematic Review with Meta-Analysis, Trial Sequential Analysis, and Meta-Regression Analysis Exploring the Mediators and Moderators of Treatment Effects. *Psychotherapy and Psychosomatics*. 2019;88(6):350-62.
86. Naslund JA, Whiteman KL, McHugo GJ, Aschbrenner KA, Marsch LA, Bartels SJ. Lifestyle interventions for weight loss among overweight and obese adults with serious mental illness: a systematic review and meta-analysis. *General hospital psychiatry*. 2017;47:83-102.
87. Brown C, Geiszler LC, Lewis KJ, Arbesman M. Effectiveness of interventions for weight loss for people with serious mental illness: A systematic review and meta-analysis. *The American Journal of Occupational Therapy*. 2018;72(5):7205190030p1-p9.
88. Ashdown-Franks G, Williams J, Vancampfort D, Firth J, Schuch F, Hubbard K, et al. Is it possible for people with severe mental illness to sit less and move more? A systematic review of interventions to increase physical activity or reduce sedentary behaviour. *Schizophrenia research*. 2018;202:3-16.
89. Vancampfort D, Rosenbaum S, Schuch F, Ward PB, Richards J, Mugisha J, et al. Cardiorespiratory fitness in severe mental illness: a systematic review and meta-analysis. *Sports Medicine*. 2017;47(2):343-52.
90. Firth J, Solmi M, Wootton RE, Vancampfort D, Schuch FB, Hoare E, et al. A meta-review of “lifestyle psychiatry”: the role of exercise, smoking, diet and sleep in the prevention and treatment of mental disorders. *World Psychiatry*. 2020;19(3):360-80.
91. Nyboe L, Lemcke S, Møller AV, Stubbs B. Non-pharmacological interventions for preventing weight gain in patients with first episode schizophrenia or bipolar disorder: A systematic review. *Psychiatry Research*. 2019;281:112556.
92. Rosenbaum S, Tiedemann A, Sherrington C, Curtis J, Ward PB. Physical activity interventions for people with mental illness: a systematic review and meta-analysis. *J Clin Psychiatry*. 2014;75(9):964-74.
93. Soundy A, Freeman P, Stubbs B, Probst M, Coffee P, Vancampfort D. The transcending benefits of physical activity for individuals with schizophrenia: a systematic review and meta-ethnography. *Psychiatry Research*. 2014;220(1):11-9.
94. De Rosa C, Sampogna G, Luciano M, Del Vecchio V, Poci B, Borriello G, et al. Improving physical health of patients with severe mental disorders: a critical review of lifestyle psychosocial interventions. *Expert Review of Neurotherapeutics*. 2017;17(7):667-81.
95. Lee C, Piernas C, Stewart C, Michalopoulou M, Hajzadeh A, Edwards R, et al. Identifying effective characteristics of behavioral weight management interventions for people with serious mental illness: A systematic review with a qualitative comparative analysis. *Obesity Reviews*. 2022;23(1):e13355.
96. Burrows T, Teasdale S, Rocks T, Whatnall M, Schindlmayr J, Plain J, et al. Effectiveness of dietary interventions in mental health treatment: A rapid review of reviews. *Nutrition & Dietetics*. 2022;79(3):279-90.
97. van Namen M, Prendergast L, Peiris C. Supervised lifestyle intervention for people with metabolic syndrome improves outcomes and reduces individual risk factors of metabolic syndrome: A systematic review and meta-analysis. *Metabolism*. 2019;101:153988.

98. Gurusamy J, Gandhi S, Damodharan D, Ganesan V, Palaniappan M. Exercise, diet and educational interventions for metabolic syndrome in persons with schizophrenia: A systematic review. *Asian Journal of Psychiatry*. 2018;36:73-85.
99. Schimmenti S, Maselli FMC, Tosato S. Targeting Metabolic Abnormalities in Mental Health Prevention Strategies. In: Colizzi M, Ruggeri M, editors. *Prevention in Mental Health : From Risk Management to Early Intervention*. Cham: Springer International Publishing; 2022. p. 225-49.
100. Tumiel E, Wichniak A, Jarema M, Lew-Starowicz M. Nonpharmacological interventions for the treatment of cardiometabolic risk factors in people with schizophrenia—a systematic review. *Frontiers in Psychiatry*. 2019;10:566.
101. Stubbs B, Vancampfort D, Hallgren M, Firth J, Veronese N, Solmi M, et al. EPA guidance on physical activity as a treatment for severe mental illness: a meta-review of the evidence and Position Statement from the European Psychiatric Association (EPA), supported by the International Organization of Physical Therapists in Mental Health (IOPTMH). *European Psychiatry*. 2018;54:124-44.
102. Aschbrenner K, Carpenter-Song E, Mueser K, Kinney A, Pratt S, Bartels S. A Qualitative Study of Social Facilitators and Barriers to Health Behavior Change Among Persons with Serious Mental Illness. *Community Mental Health Journal*. 2013;49(2):207-12.
103. Deenik J, Tenback DE, Tak EC, Blanson Henkemans OA, Rosenbaum S, Hendriksen IJ, et al. Implementation barriers and facilitators of an integrated multidisciplinary lifestyle enhancing treatment for inpatients with severe mental illness: the MULTI study IV. *BMC health services research*. 2019;19(1):1-13.
104. Vancampfort D, De Hert M, Stubbs B, Ward PB, Rosenbaum S, Soundy A, et al. Negative symptoms are associated with lower autonomous motivation towards physical activity in people with schizophrenia. *Comprehensive Psychiatry*. 2015;56:128-32.
105. Way K, Kannis-Dymand L, Lastella M, Lovell GP. Mental health practitioners' reported barriers to prescription of exercise for mental health consumers. *Mental Health and Physical Activity*. 2018;14:52-60.
106. Clausen W, Watanabe-Galloway S, Bill Baerentzen M, Britigan DH. Health literacy among people with serious mental illness. *Community mental health journal*. 2016;52(4):399-405.
107. Dubreucq J, Plasse J, Franck N. Self-stigma in serious mental illness: A systematic review of frequency, correlates, and consequences. *Schizophrenia bulletin*. 2021;47(5):1261-87.
108. Roberts SH, Bailey JE. An ethnographic study of the incentives and barriers to lifestyle interventions for people with severe mental illness. *Journal of Advanced Nursing*. 2013;69(11):2514-24.
109. Drake RE, Whitley R. Recovery and severe mental illness: description and analysis. *The Canadian Journal of Psychiatry*. 2014;59(5):236-42.
110. Green MF, Horan WP, Lee J, McCleery A, Reddy LF, Wynn JK. Social disconnection in schizophrenia and the general community. *Schizophrenia bulletin*. 2018;44(2):242-9.
111. Yarborough BJ, Janoff SL, Stevens VJ, Kohler D, Green CA. Delivering a lifestyle and weight loss intervention to individuals in real-world mental health settings: Lessons and opportunities. *Transl Behav Med*. 2011;1(3):406-15.

112. Hennessy S, Cocoman AM. What Is the Impact of Targeted Health Education for Mental Health Nurses in the Provision of Physical Health Care? An Integrated Literature Review. *Issues in Mental Health Nursing*. 2018;39(8):700-6.
113. Hemingway S, Clifton A, Stephenson J, Edward KL. Facilitating knowledge of mental health nurses to undertake physical health interventions: a pre-test/post-test evaluation. *Journal of Nursing Management*. 2014;22(3):383-93.
114. Gray R, Brown E. What does mental health nursing contribute to improving the physical health of service users with severe mental illness? A thematic analysis. *International journal of mental health nursing*. 2017;26(1):32-40.
115. Dunbar L, Brandt T, Wheeler A, Harrison J. Barriers and solutions to implementing metabolic risk assessment in a secondary mental health service. *Australasian Psychiatry*. 2010;18(4):322-5.
116. Small N, Brooks H, Grundy A, Pedley R, Gibbons C, Lovell K, et al. Understanding experiences of and preferences for service user and carer involvement in physical health care discussions within mental health care planning. *BMC psychiatry*. 2017;17(1):1-12.
117. Happell B, Scott D, Platania-Phung C, Nankivell J. Should we or shouldn't we? Mental health nurses' views on physical health care of mental health consumers. *International Journal of Mental Health Nursing*. 2012;21(3):202-10.
118. Bartels S, Brunette M, Aschbrenner K, Daumit G, editors. Implementation of a system-wide health promotion intervention to reduce early mortality in high risk adults with serious mental illness and obesity. *Implementation Science*; 2015: BioMed Central.
119. Happell B, Scott D, Nankivell J, Platania-Phung C. Screening physical health? Yes! But...: nurses' views on physical health screening in mental health care. *Journal of Clinical Nursing*. 2013;22(15-16):2286-97.
120. Happell B, Scott D, Platania-Phung C, Nankivell J. Nurses' views on physical activity for people with serious mental illness. *Mental Health and Physical Activity*. 2012;5(1):4-12.
121. Baller JB, McGinty EE, Azrin ST, Juliano-Bult D, Daumit GL. Screening for cardiovascular risk factors in adults with serious mental illness: a review of the evidence. *BMC psychiatry*. 2015;15(1):1-13.
122. Hardy S, Hinks P, Gray R. Screening for cardiovascular risk in patients with severe mental illness in primary care: a comparison with patients with diabetes. *Journal of Mental Health*. 2013;22(1):42-50.
123. Molloy R, Brand G, Munro I, Pope N. Seeing the complete picture: A systematic review of mental health consumer and health professional experiences of diagnostic overshadowing. *Journal of Clinical Nursing*. 2021.
124. National Mental Health Commission. Equally Well Consensus Statement: Improving the physical health and wellbeing of people living with mental illness in Australia. Sydney: NMHC; 2016.
125. NSW Ministry of Health. Physical health care for people living with mental health issues. Sydney: NSW Ministry of Health; 2021.
126. Roberts R, Lockett H, Bagnall C, Maylea C, Hopwood M. Improving the physical health of people living with mental illness in Australia and New Zealand. *Australian Journal of Rural Health*. 2018;26(5):354-62.

127. Liu NH, Daumit GL, Dua T, Aquila R, Charlson F, Cuijpers P, et al. Excess mortality in persons with severe mental disorders: a multilevel intervention framework and priorities for clinical practice, policy and research agendas. *World Psychiatry*. 2017;16(1):30-40.
128. Sara G, Chen W, Large M, Ramanuj P, Curtis J, McMillan F, et al. Potentially preventable hospitalisations for physical health conditions in community mental health service users: a population-wide linkage study. *Epidemiology and Psychiatric Sciences*. 2021;30:e22.
129. Lennox L, Maher L, Reed J. Navigating the sustainability landscape: a systematic review of sustainability approaches in healthcare. *Implementation Science*. 2018;13(1):1-17.
130. Koorts H, Eakin E, Estabrooks P, Timperio A, Salmon J, Bauman A. Implementation and scale up of population physical activity interventions for clinical and community settings: the PRACTIS guide. *International Journal of Behavioral Nutrition and Physical Activity*. 2018;15(1):1-11.
131. Curtis J, Watkins A, Rosenbaum S, Teasdale S, Kalucy M, Samaras K, et al. Evaluating an individualized lifestyle and life skills intervention to prevent antipsychotic-induced weight gain in first-episode psychosis. *Early intervention in psychiatry*. 2016;10(3):267-76.
132. Dickens GL, Ion R, Waters C, Atlantis E, Everett B. Mental health nurses' attitudes, experience, and knowledge regarding routine physical healthcare: systematic, integrative review of studies involving 7,549 nurses working in mental health settings. *BMC Nursing*. 2019;18(1):16.
133. Rosenbaum S, Ward PB, Baldeo R, Fibbins H, Jarman R, Lederman O, et al. Changing health workforce attitudes to promote improved physical health in mental health service users: Keeping our Staff in Mind (KoSiM). *Health Promot J Aust*. 2020.
134. Patton MQ. *Qualitative research & evaluation methods: Integrating theory and practice*: Sage publications; 2014.
135. Creswell JW, Clark VLP. *Designing and conducting mixed methods research*: Sage publications; 2017.
136. Creswell JW, Creswell JD. *Research design: Qualitative, quantitative, and mixed methods approaches*. 5th ed. Los Angeles: Sage publications; 2017.
137. Teddlie C, Tashakkori A. Common "core" characteristics of mixed methods research: A review of critical issues and call for greater convergence. *American behavioral scientist*. 2012;56(6):774-88.
138. Kelly LM, Cordeiro M. Three principles of pragmatism for research on organizational processes. *Methodological innovations*. 2020;13(2):2059799120937242.
139. Morgan DL. Paradigms lost and pragmatism regained: Methodological implications of combining qualitative and quantitative methods. *Journal of mixed methods research*. 2007;1(1):48-76.
140. Kaushik V, Walsh CA. Pragmatism as a research paradigm and its implications for social work research. *Social sciences*. 2019;8(9):255.
141. Ivankova NV, Creswell JW, Stick SL. Using Mixed-Methods Sequential Explanatory Design: From Theory to Practice. *Field Methods*. 2006;18(1):3-20.
142. Bowen P, Rose R, Pilkington A. Mixed methods-theory and practice. Sequential, explanatory approach. *International Journal of Quantitative and Qualitative Research Methods*. 2017;5(2):10-27.

143. Sandelowski M. What's in a name? Qualitative description revisited. *Research in nursing & health*. 2010;33(1):77-84.
144. Pope C, Ziebland S, Mays N. Qualitative research in health care: Analysing qualitative data. *BMJ: British Medical Journal*. 2000;320(7227):114.
145. Boateng GO, Neilands TB, Frongillo EA, Melgar-Quiñonez HR, Young SL. Best Practices for Developing and Validating Scales for Health, Social, and Behavioral Research: A Primer. *Frontiers in Public Health*. 2018;6.
146. Niederberger M, Spranger J. Delphi Technique in Health Sciences: A Map. *Frontiers in Public Health*. 2020;8.
147. Willis GB. *Cognitive interviewing: A tool for improving questionnaire design*: sage publications; 2004.
148. Koo TK, Li MY. A guideline of selecting and reporting intraclass correlation coefficients for reliability research. *Journal of chiropractic medicine*. 2016;15(2):155-63.
149. Warfa A-RM. Mixed-methods design in biology education research: Approach and uses. *CBE—Life Sciences Education*. 2016;15(4):rm5.
150. O'Brien BC, Harris IB, Beckman TJ, Reed DA, Cook DA. Standards for reporting qualitative research: a synthesis of recommendations. *Academic medicine*. 2014;89(9):1245-51.
151. Vasileiou K, Barnett J, Thorpe S, Young T. Characterising and justifying sample size sufficiency in interview-based studies: systematic analysis of qualitative health research over a 15-year period. *BMC medical research methodology*. 2018;18:1-18.
152. Cassell C, Symon G. *Essential guide to qualitative methods in organizational research*: sage; 2004.
153. Nowell LS, Norris JM, White DE, Moules NJ. Thematic analysis: Striving to meet the trustworthiness criteria. *International journal of qualitative methods*. 2017;16(1):1609406917733847.
154. Braun V, Clarke V. Using thematic analysis in psychology. *Qualitative research in psychology*. 2006;3(2):77-101.
155. Boeije H. A purposeful approach to the constant comparative method in the analysis of qualitative interviews. *Quality and quantity*. 2002;36:391-409.
156. National Health and Medical Research Council. *National Statement on Ethical Conduct in Human Research 2007 (Updated 2018)*. Canberra: NHMRC; 2018.
157. National Health and Medical Research Council. *Management of Data and Information in Research: A guide supporting the Australian Code for the Responsible Conduct of Research*. Canberra: National Health and Medical Research Council; 2019.
158. Senge PM. *The fifth discipline: The art and practice of the learning organization*: Broadway Business; 2006.
159. Stokols D. Translating social ecological theory into guidelines for community health promotion. *American journal of health promotion*. 1996;10(4):282-98.
160. McLeroy KR, Bibeau D, Steckler A, Glanz K. An ecological perspective on health promotion programs. *Health education quarterly*. 1988;15(4):351-77.
161. Sallis JF, Owen N, Fisher E. Ecological models of health behavior. *Health behavior: Theory, research, and practice*. 2015;5(43-64).

162. Kilanowski JF. Breadth of the socio-ecological model. *Journal of Agromedicine*. 2017;22(4):295-7.
163. Centers for Disease Control Prevention. The social-ecological model: A framework for violence prevention http://www.cdc.gov/violenceprevention/pdf/sem_framework-a.pdf2002 [
164. Short SE, Mollborn S. Social Determinants and Health Behaviors: Conceptual Frames and Empirical Advances. *Curr Opin Psychol*. 2015;5:78-84.
165. Berkman LF. The role of social relations in health promotion. *Psychosomatic medicine*. 1995;57(3):245-54.
166. Kalucy M, Bowrah V, Henry C, Watkins A, Curtis J, O'Donnell M. Compliance with guidelines for the monitoring of metabolic complications of atypical antipsychotics in an early psychosis sample. *Schizophrenia Research*. 2006(86):S129.
167. Curtis J, Henry C, Watkins A, Newall H, Samaras K, Ward PB. Metabolic abnormalities in an early psychosis service: a retrospective, naturalistic cross sectional study. *Early Intervention in Psychiatry*. 2011;5(2):108-14.
168. Watkins A, Webster S, Curtis J. the double whammy: Psychosis and weight gain. Can we meet this challenge with early intervention? Of course we can! *Early Intervention in Psychiatry*. 2012;6:68.
169. Watkins A, Henry C, Curtis J, Albert S, Ward P. Re-turning the blind eye: Addressing metabolic complications in young mental health consumers. *International Journal of Mental Health Nursing*. 2009;18:A26-A.
170. Watkins A, Pilgrim J, Curtis J, Rosenbaum S, Teasdale S, Kalucy M, et al. 'Seeing the Doc at 11am, cooking group at midday, and hitting the gym at 2pm'. Patient and staff perspectives of an embedded lifestyle intervention within an early psychosis programme. *Early Intervention in Psychiatry*. 2014;8:32.
171. Bomboy KT. Does Improved Access to Metabolic Monitoring Forms Increase Provider Adherence to APA Guidelines on Antipsychotic Medication Management? New Castle, Delaware, USA: Wilmington University 2018.
172. Vancampfort D, Watkins A, Ward PB, Probst M, De Hert M, Van Damme T, et al. Barriers, attitudes, confidence, and knowledge of nurses regarding metabolic health screening and intervention in people with mental illness: a pilot study from Uganda. *African Health Sciences*. 2019;19(3):2546-54.
173. Cloete SA, Daniels F. Perceptions of Mental Health Nurses Regarding Metabolic Syndrome at a Public Tertiary Psychiatric Hospital in Western Cape, South Africa. *Africa Journal of Nursing and Midwifery*. 2022;24(1):13 pages- pages.
174. Watkins A, Stein-Parbury J, Denney-Wilson E, Ward PB, Rosenbaum S. Upskilling Mental Health Nurses to Address the Burden of Poor Metabolic Health: A Mixed Method Evaluation. *Issues in Mental Health Nursing*. 2020:1-7.
175. Carraro A, Gobbi E, Solmi M, Watkins A, Ward PB, Rosenbaum S. Test–retest reliability of the Italian version of the M-BACK questionnaire to assess the barriers, attitudes, confidence, and knowledge of mental health staff regarding metabolic health of psychiatric patients. *Brain and Behavior*. 2020;10(2):e01491.

176. Golay P, Calderoni M, Eap CB, Conus P. French validation of the M-Back questionnaire: assessing clinicians' knowledge of metabolic syndrome in psychiatry. *Swiss Archives of Neurology, Psychiatry and Psychotherapy*. 2021;172(5).
177. Organisation for Economic Cooperation Development. *Literacy, numeracy and problem solving in technology-rich environments: Framework for the OECD survey of adult skills*: OECD Publishing Paris; 2012.
178. Kim S-W, Park W-Y, Jhon M, Kim M, Lee J-Y, Kim S-Y, et al. Physical health literacy and health-related behaviors in patients with psychosis. *Clinical Psychopharmacology and Neuroscience*. 2019;17(2):279.
179. Nutbeam D, Lloyd JE. Understanding and Responding to Health Literacy as a Social Determinant of Health. *Annual Review of Public Health*. 2021;42(1):159-73.
180. Santamaría-García H, Baez S, Gómez C, Rodríguez-Villagra O, Huepe D, Portela M, et al. The role of social cognition skills and social determinants of health in predicting symptoms of mental illness. *Translational Psychiatry*. 2020;10(1):165.
181. Amoretti S, Rosa AR, Mezquida G, Cabrera B, Ribeiro M, Molina M, et al. The impact of cognitive reserve, cognition and clinical symptoms on psychosocial functioning in first-episode psychoses. *Psychological Medicine*. 2022;52(3):526-37.
182. McCloughen A, Foster K, Kerley D, Delgado C, Turnell A. Physical health and well-being: Experiences and perspectives of young adult mental health consumers. *International journal of mental health nursing*. 2016;25(4):299-307.
183. Chee GL, Wynaden D, Heslop K. The physical health of young people experiencing first-episode psychosis: Mental health consumers' experiences. *International Journal of Mental Health Nursing*. 2019;28(1):330-8.
184. Fleary SA, Joseph P, Pappagianopoulos JE. Adolescent health literacy and health behaviors: A systematic review. *Journal of adolescence*. 2018;62:116-27.
185. LeDoux J, Mann C. Addressing limitations in health literacy: Greater understanding promotes autonomy and self-determination. *Professional Case Management*. 2019;24(4):219-21.
186. Luther L, Lysaker PH, Firmin RL, Breier A, Vohs JL. Intrinsic motivation and amotivation in first episode and prolonged psychosis. *Schizophrenia Research*. 2015;169(1-3):418-22.
187. Kalinowska S, Trzeźniowska-Drukała B, Kłoda K, Safranow K, Misiak B, Cyran A, et al. The association between lifestyle choices and schizophrenia symptoms. *Journal of Clinical Medicine*. 2021;10(1):165.
188. Stahl SM. *Stahl's essential psychopharmacology: neuroscientific basis and practical applications*: Cambridge university press; 2021.
189. Hui TT, Garvey L, Olasoji M. Improving the physical health of young people with early psychosis with lifestyle interventions: Scoping review. *International Journal of Mental Health Nursing*. 2021;30(6):1498-524.
190. Brooke LE, Gucciardi DF, Ntoumanis N, Lin A. Qualitative investigation of perceived barriers to and enablers of sport participation for young people with first episode psychosis. *Early intervention in psychiatry*. 2020;14(3):293-306.
191. Griffiths C, Walker K, Leathlean C. An exploration of patient experience of sleep, physical activity, and exercise in early psychosis. *Psychosis*. 2022:1-13.

192. Firth J, Carney R, Jerome L, Elliott R, French P, Yung AR. The effects and determinants of exercise participation in first-episode psychosis: a qualitative study. *BMC psychiatry*. 2016;16(1):1-9.
193. Carney R, Cotter J, Bradshaw T, Yung AR. Examining the physical health and lifestyle of young people at ultra-high risk for psychosis: A qualitative study involving service users, parents and clinicians. *Psychiatry Research*. 2017;255:87-93.
194. Tobe M, Nemoto T, Tsujino N, Yamaguchi T, Katagiri N, Fujii C, et al. Characteristics of motivation and their impacts on the functional outcomes in patients with schizophrenia. *Comprehensive Psychiatry*. 2016;65:103-9.
195. Ryan RM, Deci EL. Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American psychologist*. 2000;55(1):68.
196. Martland R, Teasdale S, Murray RM, Gardner-Sood P, Smith S, Ismail K, et al. Dietary intake, physical activity and sedentary behaviour patterns in a sample with established psychosis and associations with mental health symptomatology. *Psychological Medicine*. 2021:1-11.
197. Hardy S, Gray R. Assessing cardiovascular risk in patients with severe mental illness. *Nursing Standard (through 2013)*. 2012;26(45):41.
198. Paterick TE, Patel N, Tajik AJ, Chandrasekaran K, editors. Improving health outcomes through patient education and partnerships with patients. *Baylor University Medical Center Proceedings*; 2017: Taylor & Francis.
199. Walker HM, Calkins C, Wehmeyer ML, Walker L, Bacon A, Palmer SB, et al. A social-ecological approach to promote self-determination. *Exceptionality*. 2011;19(1):6-18.
200. Rönngren Y, Björk A, Kristiansen L, Haage D, Enmarker I, Audulv Å. Meeting the needs? Perceived support of a nurse-led lifestyle programme for young adults with mental illness in a primary health-care setting. *International journal of mental health nursing*. 2018;27(1):390-9.
201. Pedley R, Lovell K, Bee P, Bradshaw T, Gellatly J, Ward K, et al. Collaborative, individualised lifestyle interventions are acceptable to people with first episode psychosis; a qualitative study. *BMC psychiatry*. 2018;18(1):1-9.
202. Fernández-Abascal B, Suárez-Pinilla P, Cobo-Corrales C, Crespo-Facorro B, Suárez-Pinilla M. In-and outpatient lifestyle interventions on diet and exercise and their effect on physical and psychological health: a systematic review and meta-analysis of randomised controlled trials in patients with schizophrenia spectrum disorders and first episode of psychosis. *Neuroscience & Biobehavioral Reviews*. 2021;125:535-68.
203. Gillison FB, Rouse P, Standage M, Sebire SJ, Ryan RM. A meta-analysis of techniques to promote motivation for health behaviour change from a self-determination theory perspective. *Health psychology review*. 2019;13(1):110-30.
204. Kasanova Z, Oorschot M, Myin-Germeys I. Social anhedonia and asociality in psychosis revisited. An experience sampling study. *Psychiatry Research*. 2018;270:375-81.
205. De Hert M, Correll CU, Bobes J, Cetkovich-Bakmas M, Cohen D, Asai I, et al. Physical illness in patients with severe mental disorders. I. Prevalence, impact of medications and disparities in health care. *World psychiatry*. 2011;10(1):52.

206. Lawrence D, Hancock KJ, Kisely S. The gap in life expectancy from preventable physical illness in psychiatric patients in Western Australia: retrospective analysis of population based registers. *BMJ*. 2013;346:f2539.
207. Lerbæk B, Jørgensen R, Aagaard J, Nordgaard J, Buus N. Mental health care professionals' accounts of actions and responsibilities related to managing physical health among people with severe mental illness. *Archives of Psychiatric Nursing*. 2019;33(2):174-81.
208. Wynaden D, Heslop B, Heslop K, Barr L, Lim E, Chee GL, et al. The chasm of care: Where does the mental health nursing responsibility lie for the physical health care of people with severe mental illness? *International Journal of Mental Health Nursing*. 2016;25(6):516-25.
209. Christiansen J, Qualter P, Friis K, Pedersen S, Lund R, Andersen C, et al. Associations of loneliness and social isolation with physical and mental health among adolescents and young adults. *Perspectives in public health*. 2021;141(4):226-36.
210. Vancampfort D, Knapen J, Probst M, Scheewe T, Remans S, De Hert M. A systematic review of correlates of physical activity in patients with schizophrenia. *Acta Psychiatrica Scandinavica*. 2012;125(5):352-62.
211. Holt-Lunstad J, Smith TB, Baker M, Harris T, Stephenson D. Loneliness and social isolation as risk factors for mortality: a meta-analytic review. *Perspectives on psychological science*. 2015;10(2):227-37.
212. Burke E, Wood L, Zabel E, Clark A, Morrison AP. Experiences of stigma in psychosis: A qualitative analysis of service users' perspectives. *Psychosis*. 2016;8(2):130-42.
213. Mueser KT, DeTore NR, Kredlow MA, Bourgeois ML, Penn DL, Hintz K. Clinical and demographic correlates of stigma in first-episode psychosis: the impact of duration of untreated psychosis. *Acta Psychiatrica Scandinavica*. 2020;141(2):157-66.
214. Schnor H, Linderroth S, Midtgaard J. Patient and Mental Health Care Professionals' Perspectives on Health Promotion in Psychiatric Clinical Practice: A Focus Group Study. *Issues in Mental Health Nursing*. 2021;42(9):870-9.
215. Verhaeghe N, De Maeseneer J, Maes L, Van Heeringen C, Annemans L. Health promotion in mental health care: perceptions from patients and mental health nurses. *Journal of Clinical Nursing*. 2013;22(11-12):1569-78.
216. Lerbæk B, McCloughen A, Lauritsen MB, Aagaard J, Nordgaard J, Jørgensen R. Barriers and possible solutions to providing physical health care in mental health care: A qualitative study of Danish key informants' perspectives. *Issues in Mental Health Nursing*. 2021;42(5):463-72.
217. Stanton R, Reaburn P, Happell B. Barriers to exercise prescription and participation in people with mental illness: the perspectives of nurses working in mental health. *Journal of Psychiatric and Mental Health Nursing*. 2015.
218. Romain AJ, Trottier A, Karelis AD, Abdel-Baki A. Do mental health professionals promote a healthy lifestyle among individuals experiencing serious mental illness? *Issues in Mental Health Nursing*. 2020;41(6):531-9.
219. Roberts SH, Bailey JE. Incentives and barriers to lifestyle interventions for people with severe mental illness: a narrative synthesis of quantitative, qualitative and mixed methods studies. *Journal of Advanced Nursing*. 2011;67(4):690-708.

220. Okkels N, Thygesen NB, Jensen B, Munk-Jørgensen P. Evaluation of somatic health care practices in psychiatric inpatient wards. *Australian & New Zealand Journal of Psychiatry*. 2013;47(6):579-81.
221. Larsen LQ, Schnor H, Tersbøl BP, Ebdrup BH, Nordsborg NB, Midtgaard J. The impact of exercise training complementary to early intervention in patients with first-episode psychosis: a qualitative sub-study from a randomized controlled feasibility trial. *BMC psychiatry*. 2019;19(1):1-12.
222. Hendryx M, Green CA, Perrin NA. Social support, activities, and recovery from serious mental illness: STARS study findings. *The journal of behavioral health services & research*. 2009;36(3):320-9.
223. Smith J, Griffiths LA, Band M, Hird-Smith R, Williams B, Bold J, et al. Early intervention in psychosis: effectiveness and implementation of a combined exercise and health behavior intervention within routine care. *Frontiers in Endocrinology*. 2020:825.
224. Firth J, Carney R, Elliott R, French P, Parker S, McIntyre R, et al. Exercise as an intervention for first-episode psychosis: a feasibility study. *Early intervention in psychiatry*. 2018;12(3):307-15.
225. Blanner Kristiansen C, Juel A, Vinther Hansen M, Hansen AM, Kilian R, Hjorth P. Promoting physical health in severe mental illness: patient and staff perspective. *Acta Psychiatrica Scandinavica*. 2015;132(6):470-8.
226. Thompson A, Senders A, Seibel C, Usher C, Borgatti A, Bodden K, et al. Qualitative analysis of the Meals, Mindfulness, & Moving Forward (M3) lifestyle programme: Cultivating a 'safe space' to start on a 'new path' for youth with early episode psychosis. *Early Intervention in Psychiatry*. 2021;15(1):87-95.
227. Lundström S, Ahlström BH, Jormfeldt H, Eriksson H, Skärsäter I. The meaning of the lived experience of lifestyle changes for people with severe mental illness. *Issues in mental health nursing*. 2017;38(9):717-25.
228. Teasdale SB, Ward PB, Rosenbaum S, Watkins A, Curtis J, Kalucy M, et al. A nutrition intervention is effective in improving dietary components linked to cardiometabolic risk in youth with first-episode psychosis. *British Journal of Nutrition*. 2016;115(11):1987-93.
229. Fibbins H, Lederman O, Morell R, Furzer B, Wright K, Stanton R. Incorporating exercise professionals in mental health settings: An Australian perspective. *Journal of Clinical Exercise Physiology*. 2019;8(1):21-5.
230. Lundström S, Jormfeldt H, Hedman Ahlström B, Skärsäter I. Mental health nurses' experience of physical health care and health promotion initiatives for people with severe mental illness. *International journal of mental health nursing*. 2020;29(2):244-53.
231. Bartlem K, Bowman J, Ross K, Freund M, Wye P, McElwaine K, et al. Mental health clinician attitudes to the provision of preventive care for chronic disease risk behaviours and association with care provision. *BMC Psychiatry*. 2016;16(1):57.
232. Happell B, Platania-Phung C, Scott D. What determines whether nurses provide physical health care to consumers with serious mental illness? *Archives of psychiatric nursing*. 2014;28(2):87-93.
233. Rodgers M, Dalton J, Harden M, Street A, Parker G, Eastwood A. Integrated care to address the physical health needs of people with severe mental illness: a mapping review of the

- recent evidence on barriers, facilitators and evaluations. *International Journal of Integrated Care*. 2018;18(1).
234. Clancy R, Lewin TJ, Bowman JA, Kelly BJ, Mullen AD, Flanagan K, et al. Providing physical health care for people accessing mental health services: Clinicians' perceptions of their role. *International Journal of Mental Health Nursing*. 2019;28(1):256-67.
235. Fogarty M, Happell B. Exploring the benefits of an exercise program for people with schizophrenia: a qualitative study. *Issues in mental health nursing*. 2005;26(3):341-51.
236. Terry J, Cutter J. Does Education Improve Mental Health Practitioners' Confidence in Meeting the Physical Health Needs of Mental Health Service Users? A Mixed Methods Pilot Study. *Issues in mental health nursing*. 2013;34(4):249-55.
237. Haddad M, Llewellyn-Jones S, Yarnold S, Simpson A. Improving the physical health of people with severe mental illness in a low secure forensic unit: An uncontrolled evaluation study of staff training and physical health care plans. *International journal of mental health nursing*. 2016;25(6):554-65.
238. Yalçın SU, Bilgin H, Özaslan Z. Physical Healthcare of People with Serious Mental Illness: A Cross-Sectional Study of Nurses' Involvement, Views, and Current Practices. *Issues in Mental Health Nursing*. 2019;40(10):908-16.
239. Hemingway S, Stephenson J, Trotter F, Clifton A, Holdich P. Increasing the health literacy of learning disability and mental health nurses in physical care skills: a pre and post-test evaluation of a workshop on diabetes care. *Nurse Education in Practice*. 2015;15(1):30-7.
240. Ramluggun P, Anjoyeb M, D'Cruz G. Mental health nursing students' views on their readiness to address the physical health needs of service users on registration. *International Journal of Mental Health Nursing*. 2017;26(6):570-9.
241. Nash M. Assessing nurses' propositional knowledge of physical health: a training exercise showed that staff need better education to identify clients at risk of experiencing drug reactions and to recognise undiagnosed physical disorders that may affect treatment. *Mental Health Practice*. 2010;14(2):20-4.
242. Butler J, de Cassan S, Turner P, Lennox B, Hayward G, Glogowska M. Attitudes to physical healthcare in severe mental illness; a patient and mental health clinician qualitative interview study. *BMC Family Practice*. 2020;21(1):1-8.
243. Happell B, Platania-Phung C, Scott D. Proposed nurse-led initiatives in improving physical health of people with serious mental illness: a survey of nurses in mental health. *Journal of clinical nursing*. 2014;23(7-8):1018-29.
244. Kohn L, Christiaens W, Detraux J, De Lepeleire J, De Hert M, Gillain B, et al. Barriers to somatic health care for persons with severe mental illness in Belgium: a qualitative study of patients' and healthcare professionals' perspectives. *Frontiers in Psychiatry*. 2021;12.
245. Happell B, Platania-Phung C, Scott D. Placing physical activity in mental health care: A leadership role for mental health nurses. *International Journal of Mental Health Nursing*. 2011;20(5):310-8.
246. Cleary M, Horsfall J, Deacon M, Jackson D. Leadership and mental health nursing. *Issues in Mental Health Nursing*. 2011;32(10):632-9.

247. Chadwick AL, Withnell N. Developing confidence in mental health students to recognise and manage physical health problems using a learning intervention. *Nurse Education in Practice*. 2016;19:25-30.
248. Rosenbaum S, Nijjar S, Watkins A, Garwood N, Sherrington C, Tiedemann A. Nurse assessed metabolic monitoring: A file audit of risk factor prevalence and impact of an intervention to enhance measurement of waist circumference. *International Journal of Mental Health Nursing*. 2014.
249. White J, Hemingway S, Stephenson J. Training mental health nurses to assess the physical health needs of mental health service users: a pre-and post-test analysis. *Perspectives in Psychiatric Care*. 2014;50(4):243-50.
250. Cooper SJ, Reynolds GP, Wec-a, Barnes T, England E, Haddad P, et al. BAP guidelines on the management of weight gain, metabolic disturbances and cardiovascular risk associated with psychosis and antipsychotic drug treatment. *Journal of Psychopharmacology*. 2016;30(8):717-48.
251. Berry A, Drake RJ, Yung AR. Examining healthcare professionals' beliefs and actions regarding the physical health of people with schizophrenia. *BMC health services research*. 2020;20(1):1-9.
252. Nash M. Diagnostic overshadowing: a potential barrier to physical health care for mental health service users. *Mental Health Practice*. 2013;17(4).
253. Creed TA, Crane ME, Calloway A, Olino TM, Kendall PC, Stirman SW. Changes in Community Clinicians' Attitudes and Competence following a Transdiagnostic Cognitive Behavioral Therapy Training. *Implement Res Pract*. 2021;2.
254. Fernando A, Attoe C, Jaye P, Cross S, Pathan J, Wessely S. Improving interprofessional approaches to physical and psychiatric comorbidities through simulation. *Clinical Simulation in Nursing*. 2017;13(4):186-93.
255. Wynn SD. Improving the quality of care of veterans with diabetes: a simulation intervention for psychiatric nurses. *Journal of psychosocial nursing and mental health services*. 2011;49(2):38-43.
256. Stirman SW, Gutner CA, Langdon K, Graham JR. Bridging the gap between research and practice in mental health service settings: An overview of developments in implementation theory and research. *Behavior therapy*. 2016;47(6):920-36.
257. Blythe J, White J. Role of the mental health nurse towards physical health care in serious mental illness: an integrative review of 10 years of UK literature. *International journal of mental health nursing*. 2012;21(3):193-201.
258. Robson D, Haddad M, Gray R, Gournay K. Mental health nursing and physical health care: A cross-sectional study of nurses' attitudes, practice, and perceived training needs for the physical health care of people with severe mental illness. *International Journal of Mental Health Nursing*. 2013;22(5):409-17.
259. Fibbins H, Ward PB, Watkins A, Curtis J, Rosenbaum SJJomH. Improving the health of mental health staff through exercise interventions: a systematic review. 2018;27(2):184-91.
260. Hjorth P, Davidsen AS, Kilian R, Jensen SO, Munk-Jørgensen PJNjop. Intervention to promote physical health in staff within mental health facilities and the impact on patients' physical health. 2016;70(1):62-71.

261. Forsberg KA, Björkman T, Sandman PO, Sandlund M. Physical health—a cluster randomized controlled lifestyle intervention among persons with a psychiatric disability and their staff. *Nordic Journal of Psychiatry*. 2008;62(6):486-95.
262. Fox RD, Miner C. Motivation and the facilitation of change, learning, and participation in educational programs for health professionals. *Journal of Continuing Education in the Health Professions*. 1999;19(3):132-41.
263. Powell BJ, McMillen JC, Hawley KM, Proctor EK. Mental health clinicians' motivation to invest in training: Results from a practice-based research network survey. *Psychiatric services*. 2013;64(8):816-8.
264. McMillan K, Perron AJP, Politics,, Practice N. Nurses amidst change: the concept of change fatigue offers an alternative perspective on organizational change. 2013;14(1):26-32.
265. Fie S, Norman IJ, While AEJHEJ. The relationship between physicians' and nurses' personal physical activity habits and their health-promotion practice: A systematic review. 2013;72(1):102-19.
266. Lobelo F, de Quevedo IG. The evidence in support of physicians and health care providers as physical activity role models. *American journal of lifestyle medicine*. 2016;10(1):36-52.
267. Frank E, Wright EH, Serdula MK, Elon LK, Baldwin G. Personal and professional nutrition-related practices of US female physicians. *The American journal of clinical nutrition*. 2002;75(2):326-32.
268. Lewis CE, Clancy C, Leake B, Schwartz JS. The counseling practices of internists. *Annals of internal medicine*. 1991;114(1):54-8.
269. Henderson J, Fuller J. 'Problematising' Australian policy representations in responses to the physical health of people with mental health disorders. *Australian Journal of Social Issues*. 2011;46(2):183-203.
270. Edmunds M. Inequitable physical illness and premature mortality for people with severe mental illness in Australia: A social analysis. *Health and Human Rights*. 2018;20(1):273.
271. Laugharne J, Waterreus AJ, Castle DJ, Dragovic M. Screening for the metabolic syndrome in Australia: a national survey of psychiatrists' attitudes and reported practice in patients prescribed antipsychotic drugs. *Australasian Psychiatry*. 2016;24(1):62-6.
272. Hickie IB. The 2010 Rudd plan: will it actually deliver better health services? *Medical Journal of Australia*. 2010;192(9):511.
273. Henderson C, Noblett J, Parke H, Clement S, Caffrey A, Gale-Grant O, et al. Mental health-related stigma in health care and mental health-care settings. *The Lancet Psychiatry*. 2014;1(6):467-82.
274. Knaak S, Mantler E, Szeto A, editors. *Mental illness-related stigma in healthcare: Barriers to access and care and evidence-based solutions*. Healthcare management forum; 2017: SAGE Publications Sage CA: Los Angeles, CA.
275. Tabvuma TS, Stanton R, Browne G, Happell B. Mental health consumers' perspectives of physical health interventions: An integrative review. *International Journal of Mental Health Nursing*. 2022.
276. Knaak S, Patten S, Ungar T. Mental illness stigma as a quality-of-care problem. *Lancet Psychiatry*. 2015;2(10):863-4.

277. Morgan VA, Waterreus A, Jablensky A, Mackinnon A, McGrath JJ, Carr V, et al. People living with psychotic illness in 2010: The second Australian national survey of psychosis. *Australian and New Zealand Journal of Psychiatry*. 2012;46(8):735-52.
278. Ewart SB, Happell B, Bocking J, Platania-Phung C, Stanton R, Scholz B. Social and material aspects of life and their impact on the physical health of people diagnosed with mental illness. *Health Expectations*. 2017;20(5):984-91.
279. Maranzan KA. Interprofessional education in mental health: An opportunity to reduce mental illness stigma. *Journal of interprofessional care*. 2016;30(3):370-7.
280. Corrigan PW, Morris SB, Michaels PJ, Rafacz JD, Rüsçh N. Challenging the public stigma of mental illness: a meta-analysis of outcome studies. *Psychiatric services*. 2012;63(10):963-73.
281. Happell B, Galletly C, Castle D, Platania-Phung C, Stanton R, Scott D, et al. Scoping review of research in Australia on the co-occurrence of physical and serious mental illness and integrated care. *International Journal of Mental Health Nursing*. 2015;24(5):421-38.
282. Urbancová H, Vrabcová P, Hudáková M, Petrů GJ. Effective training evaluation: The role of factors influencing the evaluation of effectiveness of employee training and development. *Sustainability*. 2021;13(5):2721.
283. Proctor E, Silmere H, Raghavan R, Hovmand P, Aarons G, Bunger A, et al. Outcomes for implementation research: conceptual distinctions, measurement challenges, and research agenda. *Administration and policy in mental health and mental health services research*. 2011;38(2):65-76.
284. Sandelowski M, Docherty S, Emden C. Qualitative metasynthesis: Issues and techniques. *Research in Nursing & Health*. 1997;20(4):365-71.
285. Watkins A. Physical health. In: Foster K, Marks P, O'Brien AJ, Raeburn T, editors. *Mental Health in Nursing: Theory and Practice for Clinical Settings*. Sydney, Australia: Elsevier; 2021. p. 345-64.

Appendix 1A – Copyright permission for Chapter 3

JOHN WILEY AND SONS LICENSE TERMS AND CONDITIONS

Aug 18, 2022

This Agreement between Mr. Andrew Watkins ("You") and John Wiley and Sons ("John Wiley and Sons") consists of your license details and the terms and conditions provided by John Wiley and Sons and Copyright Clearance Center.

License Number 5338000516109

License date Jun 29, 2022

Licensed

Content John Wiley and Sons

Publisher

Licensed

Content International Journal of Mental Health Nursing

Publication

Licensed
Content Title Keeping the body in mind: A qualitative analysis of the experiences of people experiencing first-episode psychosis participating in a lifestyle intervention programme

Licensed
Content Author Jane Stein-Parbury, Philip B. Ward, Simon Rosenbaum, et al

Licensed
Content Date Dec 15, 2019

Licensed
Content Volume 29

Licensed
Content Issue 2

Licensed
Content Pages 12

Type of use Dissertation/Thesis

Requestor type Author of this Wiley article

Format Print and electronic

Portion Full article

Appendix 1B – Copyright permission for Chapter 5

**** Will need to use Accepted manuscript version****

Thank you for your correspondence requesting permission to reproduce the above content from our Journal in your thesis to be posted on your University's repository.

Watkins, A., Stein-Parbury, J., Denney-Wilson, E., Ward, P. B., & Rosenbaum, S. (2020). Upskilling mental health nurses to address the burden of poor metabolic health: A mixed method evaluation. *Issues in mental health nursing*, 41(10), 925-931.

We will be pleased to grant permission to reproduce your '**Accepted/Original Manuscript**' (please check the embargo: Open access cost finder - Author Services (taylorandfrancis.com) on the sole condition that you acknowledge the original source of publication.

This is an '**Accepted/Original Manuscript**' of an article published by Taylor & Francis Group in **Issues in Mental Health Nursing** on 17th June 2020, available online: <https://www.tandfonline.com/10.1080/01612840.2020.1744204>

This permission does not cover any third party copyrighted work which may appear in the material requested. Please ensure you have checked all original source details for the rights holder.

Appendix 2 – Physical health book chapter

The following appendix was published as a book chapter in a mental health nursing textbook. The appendix provides broader details of physical health care and its management, in people experiencing a severe mental illness. The appendix discusses cardiometabolic health, respiratory diseases, oral health, sleep and sexual health.

Publication reference

Watkins A. Physical health. In: Foster K, Marks P, O'Brien AJ, Raeburn T, editors. *Mental Health in Nursing: Theory and Practice for Clinical Settings*. Sydney, Australia: Elsevier; 2021. p. 345-64.

Key points

- Maintaining physical health is multifaceted and is essential to wellbeing.
- Nurses play an important role in assessing, treating and preventing physical health issues.
- It is essential to assess and treat mental and physical health issues simultaneously.
- Physical health issues are often overlooked when the person has a mental illness.
- Partnerships and collaboration are key to improving physical and mental health.
- Most premature deaths among people with mental illness are from preventable physical health issues.

Key terms

- Cardiometabolic health
- Cardiovascular disease
- Metabolic screening
- Metabolic syndrome
- Nutrition
- Obesity
- Obstructive sleep apnoea
- Oral health
- Physical activity
- Premature mortality

- Sexual health
- Type 2 diabetes

Learning outcomes

The material in this chapter will assist you to:

- recognise the relationship between mental health and physical health
- identify the physical health issues that are commonly experienced by people with mental illness
- develop an understanding of the experience of people with both physical and mental health issues
- describe the nurse's role in assessing physical health
- describe interventions for improving the physical health of people with mental illness
- explain the importance of assessing physical health
- implement nursing interventions relevant to physical health issues identified.

Introduction

People living with mental illness experience much poorer physical health outcomes compared with the general population. A life expectancy gap of more than 20 years was first shown in consumers with severe mental illness (SMI) such as schizophrenia and bipolar disorder. Now there is clear evidence that individuals across the range of mental disorders have a significantly reduced life expectancy compared with the general population (Firth et al. 2019). In contrast with the commonly held misconception, nearly four in every five of these premature deaths are associated with preventable physical health conditions and not suicide (Correll et al. 2017).

There is a multitude of reasons for high levels of physical morbidity among people with mental illness. Many of the psychotropic medications prescribed to people with SMI are associated with adverse effects on physical health, including weight gain and endocrine changes. In addition, the symptoms of many mental illnesses, like the negative symptoms of schizophrenia, can contribute to withdrawal, isolation and increased likelihood of living a sedentary lifestyle. The Australian National Psychosis survey identified that one in three people with SMI were sedentary and the large majority of the remaining two-thirds engaged in low levels of physical activity (Morgan et al. 2012). People with SMI also have greater susceptibility to other risk factors for chronic illness, including poverty, smoking, alcohol and drug use, homelessness, unemployment, dental disease, sexually transmitted infections, sleep disorders, and a poor-quality diet (Hayes et al. 2017; Jones et al. 2014; Tanskanen et al. 2018).

The World Health Organization (WHO) describes mental health as ‘a state of well-being in which every individual realises his or her own potential, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to her or his community’ (WHO 2013, p. 38). WHO also acknowledges a universal right to health that includes the right to control one's health and body, to be free from interference, also including the right to a system of health protection that gives everyone an equal opportunity to enjoy the highest attainable level of health (WHO 2008). Historically, the physical health care of people with mental illness has been neglected (Thornicroft 2011). In both Australia and New Zealand mental health commissions have made clear calls for the physical health of mental health consumers to be better addressed (Mental Health Commission New Zealand 2012; National Mental Health Commission 2013). In both countries Equally Well has been established with the primary purpose of taking initiatives and creating change to achieve physical health equity for

people experiencing mental health issues. Nurses are well placed to take the lead in ensuring that people with mental illness have their physical health needs considered and adequately addressed from the initial assessment and right through a person's mental health journey. It is therefore vital that nurses practice in a holistic way that incorporates physical health care by 'keeping the body in mind'.

It is beyond the scope of this chapter to address all the physical illnesses that are experienced by people with mental illness. The authors have therefore chosen to focus on physical health issues that negatively impact on life expectancy, which are most prevalent, and those that most markedly affect wellbeing and quality of life. Factors contributing to physical health risks are shown in Fig. 18.1. This chapter will discuss metabolic syndrome, diabetes, cardiovascular disease, respiratory diseases, oral health, sleep and sexual health. These physical health issues require action, and we believe nurses are well positioned to make a difference to the current trends.

Physical health neglect in the mental health system

People with comorbid serious mental and physical illness frequently fall through the gaps between physical and mental health care systems (Lawrence et al. 2013). The health care systems in Australia and New Zealand are often divided between services for physical and mental health care, with a lack of integration. In mental health care systems, clinicians may focus on symptoms of mental illness often to the detriment of other health issues, a phenomenon referred to as 'diagnostic overshadowing' (Thornicroft 2011). Physical health symptoms regularly go unnoticed or are not addressed, even when people with mental illness report them to health professionals (Galletly et al. 2012). Often nurses and others working in mental health do not

consider addressing physical health issues as fundamental to their duty of care or lack the confidence to undertake a physical assessment. In the wider health system, there is often a lack of confidence in working with people who have mental illness. Many services such as medical specialists and allied health services are commonly financially unavailable to this population. Any of these issues can form an extremely challenging obstacle to care for people with complex chronic comorbid conditions such as schizophrenia and diabetes. Therefore, this very vulnerable population can be marginalised from health services that are a human right and essential to attaining wellbeing.

Access and availability are not the only barriers to good health faced by people with SMI. The higher rate of physical illness among people with SMI not only leads to a much shorter life expectancy but also causes a secondary effect of ongoing physical illness on top of a mental illness such as schizophrenia and diabetes. These comorbidities increase the challenge of people being able to actively participate in the workforce and create an increased risk of poverty and welfare dependency. Despite having much higher rates of morbidity than most others in the community, people with SMI are less likely to have their physical health needs met (Morgan et al. 2012). A comorbid physical health issue can put extra demands on family, friends and carers of people with mental illness by expanding this role to include physical health care.

Metabolic syndrome

Obesity is associated with metabolic syndrome, which is a clustering of abnormalities that results in an increased risk of developing type 2 diabetes mellitus and cardiovascular disease (CVD) (Alberti et al. 2005). Metabolic syndrome includes a cluster of abnormal clinical and metabolic findings that are predictive for CVD (Kaur 2014). These abnormal findings include visceral adiposity, insulin resistance, increased blood pressure, elevated triglyceride levels and low-level

high-density lipoprotein (HDL) cholesterol levels (Alberti et al. 2005). The complications of metabolic syndrome involve multiple body systems including the cardiovascular, hepatic, endocrine and central nervous systems. Meeting the criteria for metabolic syndrome causes a fivefold increase in the risk of developing type 2 diabetes and twofold increase in the risk of developing CVD over the next 5–10 years (Kaur 2014). Assertive intervention is therefore required when metabolic syndrome risk factors are present.

According to the 2010 National Survey of People Living with Psychotic Illness in Australia, of more than 1,800 people aged 18–65, three-quarters were overweight or obese, around half had hypertension, 50% had an abnormal lipid profile with low HDL-cholesterol and/or elevated triglycerides, and one in three had elevated fasting glucose level (Galletly et al. 2012). More than half of the people surveyed met criteria for metabolic syndrome (see Table 18.1), a rate two to three times higher than the general population (Morgan et al. 2012). In New Zealand, mental health service users also have higher prevalence of severe chronic physical conditions and an age-adjusted mortality rate twice the rate of the general population, but evidence gaps around Māori and Pacific Islander groups remain (Cunningham et al. 2014; Lockett et al. 2017; Scott et al. 2006).

People with SMI have much higher rates of obesity and abdominal obesity in comparison with the general population. This occurs even in the early phase of illness with or without medication (Correll et al. 2009). Similarly, to the general population obesity in people with SMI is associated with lifestyle factors such as a poor diet and lack of physical activity (Hjorth et al. 2014). There are a number of mental illness–related features such as sedation, amotivation and disorganisation that exacerbate the likelihood of negative lifestyle factors that promote weight

gain (Cimo & Dewa 2018). There is also evidence of medication-induced effects on appetite and food intake (Cuerda et al. 2014).

Weight gain is a well-established side effect of antipsychotic medications. It is most pronounced at the beginning of treatment and generally continues with long periods of treatment (Alvarez-Jiménez et al. 2008). Mental health consumers identify weight gain as the most common distressing antipsychotic side effect (Cooper & Reynolds 2016). Weight gain is usually greatest with clozapine and olanzapine, while quetiapine, risperidone and paliperidone cause a more moderate gain (Bak et al. 2014). Aripiprazole, asenapine and ziprasidone are likely to cause less weight gain (Bak et al. 2014). Without interventions all antipsychotic medications have been found to result in significant weight gain when they are first initiated (De Hert et al. 2011). The Healthy Active Lives declaration (see Box 18.1) sets out standards of physical health expectations for people newly diagnosed with a psychotic illness. This important declaration and the algorithm will help nurses to integrate mind and body nursing care.

Screening for metabolic health

In order to identify metabolic syndrome and allow for early treatment it is vital to screen for the presence of factors that increase the risk of CVD and type 2 diabetes (Gates et al. 2015).

Screening for metabolic syndrome is well within the scope of nurses and should be viewed as an essential activity. Metabolic screening involves taking a person's blood pressure, height and weight, and calculating body mass index (Cooper & Reynolds 2016). The best indicator of metabolic health is waist circumference, and this is the most important measure to screen (Curtis et al. 2012). In addition to these measures, fasting lipids and glucose completes the metabolic screening process (Cooper & Reynolds 2016). Screening should occur every 3 months, with the exception of when someone is starting a new medication or if there are concerns about a person's

health (Curtis et al. 2012). More details about how to undertake a metabolic screen are provided in Box 18.2.

Diabetes

Type 2 diabetes is a progressive condition in which the body becomes resistant to the normal effects of insulin and/or gradually loses the capacity to produce enough insulin in the pancreas (Rathmann et al. 2015). Type 2 diabetes greatly increases the risk of CVD, renal failure, amputation and blindness, lowering life expectancy by 10 or more years (Gordon-Dseagu et al. 2015). The prevalence of type 2 diabetes in people with schizophrenia as well as in people with bipolar disorder is two to three times higher than in the general population (Stubbs et al. 2015). The risk of type 2 diabetes in people with anxiety depression or depressive symptoms is also elevated compared with those without depression (Hasan et al. 2014; Smith et al. 2018).

There are a multitude of reasons for the elevated risk of type 2 diabetes among people with SMI, including lifestyle factors, genetic predisposition and disease- and treatment-specific effects (Stubbs et al. 2015). Antipsychotic medications carry an increased risk of developing type 2 diabetes, with olanzapine and clozapine particularly noted as carrying an increased risk (Holt & Mitchell 2014).

Despite a high prevalence of type 2 diabetes among people with SMI, screening rates remain low. This leads to prolonged periods of raised blood glucose levels, hastening the negative consequences associated with type 2 diabetes (Holt & Mitchell 2014). Once diagnosed, people with SMI are more likely to be suboptimally treated and have poor glycaemic control (Galletly et al. 2012). Even when young, after being diagnosed with type 2 diabetes people with SMI experience a rapid decline in health and premature death (Ribe et al. 2014).

Consumer's story 18.1 Judy

I started taking olanzapine in mid-2008 when I was 20 years old, and within 4 months I had gained over 20 kg! I was shocked. I was starting to recover from a serious episode of psychosis, but I became fat so quickly. I didn't feel at all comfortable with my new body shape and started to avoid people because I was ashamed. I found myself being very hungry nearly all of the time and craving food that was fatty and sugary. No one mentioned to me anything about the fact that I'd feel this hungry or put on this much weight.

Over the next few years I tried to lose the weight I had put on, but I couldn't seem to shift it. In fact, I continued to gain weight, although at a slower rate. In 3 years I put on another 15 kg. This was something that was very strange for me, I'd always been a fit and healthy person, and at that point I'd hit 105 kg, a far cry from the 68 kg I was prior to starting medication. I became resigned to the fact that I was going to be fat and there was nothing I could do about it.

I then met a mental health nurse who spoke to me about what my goals in life were. I had already got back into the workforce full time, so I told her that it was my physical health I wanted to work on. She told me that she'd be very happy to help and measured my weight, took my waist measurement and blood pressure and organised for a blood test. Together we looked at areas that could be improved and she assisted me to find out information on what were the best exercises to do and how I could improve my diet.

My blood test came back and showed a higher than normal cholesterol level. This really had me concerned and I expressed this to my nurse – I was worried that this was going to kill me.

She told me that sometimes medications could cause these problems in addition to weight gain. She reassured me that it was possible to make changes to my health, even though things I'd tried in the past had not worked. She came with me to my next doctor's appointment and helped advocate for a change in medication. The doctor agreed and switched me to aripiprazole.

My nurse then suggested we work on some goals that were short term. We started with trying to stop my weight gain and then developed more goals that increased my fitness levels and improved my nutritional intake. I started to find that I could lose weight. I found this support and encouragement gave me a lot of motivation where I had previously given up.

Two and a half years later I have managed to take off all of that weight and am now about the same as I was before I started seeing mental health services. I feel so much happier and have lots more energy now. My cholesterol has returned to normal and I am not feeling burdened by physical health issues like I was.

Critical thinking challenge 18.1

Imagine you have just gained 20 kg in the past 2 months. Most of the weight gain is around your abdomen. How would you feel?

Consider your current lifestyle. What changes to your life would occur?

Imagine now that you have also been diagnosed with a psychotic disorder. What changes to your life would occur? How might your psychosis and weight gain affect your self-esteem? What might that do to your ability to recover? Would you continue to take medication if you thought that it caused you significant weight gain? Why or why not?

Cardiovascular disease

The term ‘cardiovascular disease’ refers to any disease that affects the heart and blood vessels (Langan & Smith 2014). Coronary heart disease and cerebrovascular disease are the primary components of CVD (Schoepf et al. 2014). The major risk factors for CVD are smoking, obesity, hypertension, raised blood cholesterol and type 2 diabetes (Todd et al. 2014). Other factors that increase the risk include genetic factors, an unhealthy diet, physical inactivity and low socioeconomic status (Ignaszewski et al. 2015).

CVD is the most common cause of death in people with SMI, with prevalence rates approximately twice that of the general population (Correll et al. 2017). In younger people with SMI, CVD rates are three times higher when compared with matched controls (Ringen et al. 2014). People with SMI have significantly higher rates of several of the modifiable risk factors when compared with controls; they are more likely to be overweight or obese, to have type 2 diabetes, hypertension or dyslipidaemia and to smoke (Stubbs et al. 2015).

Despite the high CVD mortality among people with SMI, they receive less of many specialised interventions or circulatory medications (De Hert et al. 2011). Evidence suggests that people with schizophrenia are not being adequately screened and treated for dyslipidaemia and hypertension (Galletly et al. 2012). Depression is also noted as being an independent risk factor for worsening morbidity and mortality in coronary heart disease (Lichtman et al. 2014).

People with SMI have considerably lower rates of surgical interventions such as stenting and coronary artery bypass grafting (Mather et al. 2014). This poorer quality of medical care contributes to excess mortality for people with SMI after heart failure (Schoepf et al. 2014). An

additional significant barrier is the low level of care sought by people with SMI, even during acute cardiovascular events (Reininghaus et al. 2015).

In addition to weight gain and obesity-related mechanisms, there appears to be a direct effect of antipsychotics that contributes to the worsening of CVD risk (Bak et al. 2014). Type 2 diabetes antagonism can be caused by antipsychotics having a direct effect on developing insulin resistance (Stubbs et al. 2015). Higher antipsychotic doses predict greater risk of mortality from coronary heart disease and cerebrovascular incidents (Lin et al. 2014). Most antipsychotics and some antidepressants are associated with a change in the heart's electrical cycle known as QTc prolongation (Erlangsen et al. 2017). A prolonged QTc puts a patient at significant risk of torsade de pointes, ventricular fibrillation and sudden cardiac death (Glassman & Bigger Jr 2014).

Critical thinking challenge 18.2

Who should be responsible for screening and intervention of physical health problems in people with SMI? Consider the registered nurses' scope of practice, competencies and code of professional conduct. How do these standards influence your thoughts and actions on responsibility?

Management of cardiometabolic health

While screening for metabolic health is important, it serves little benefit if no action is taken after problems are identified. It is vital that nurses 'don't just screen but intervene' for metabolic health (Watkins 2014). At the centre of managing cardiometabolic health is lifestyle

interventions. Nurses are well positioned to advise, encourage and implement lifestyle interventions around tobacco cessation (see Nurse's story 18.1), physical activity and healthy nutrition. People with SMI can benefit enormously from even small lifestyle changes. A positive cardiometabolic health algorithm has been developed to help guide clinicians in managing the leading causes of mortality of people with SMI (Curtis et al. 2012). See Fig. 18.2

Critical thinking challenge 18.3

Consider the HeAL declaration (Box 18.1) then use the cardiometabolic algorithm in Fig. 18.2 and the screening for metabolic health information in Box 18.2 to develop a nursing care plan for a young person who has just started taking antipsychotic medications. What information do you need to tailor the plan to the individual? How will you get this information? What do you consider most important? Why?

Core nursing interventions

Tobacco-related illness and smoking cessation

Very high smoking rates are observed among people with SMI. Two in three people with mental illness are tobacco smokers compared with less than 13% of the general Australian population (Galletly et al. 2012; Morgan et al. 2012; 2013). People with mental illness also smoke more cigarettes per day and inhale more deeply than other smokers, achieving higher blood levels of nicotine than smokers without SMIs (Rüther et al. 2014).

Tobacco-related diseases made up approximately half of total deaths seen in people with SMI, and tobacco use represents the highest single factor that contributes to premature death (Brown

et al. 2010; Callaghan et al. 2014). The high smoking rates among people with SMI increases their risk of developing cancer and respiratory diseases. Tobacco smoking may be particularly problematic because it amplifies the increased risk of CVD alongside the centralised weight gain associated with using atypical antipsychotic medications (Gartner & Hall 2015).

The high rate of smoking among people with SMI can be attributed to a high smoking take-up rate that occurs early in life, often before a mental health diagnosis, combined with fewer and less successful quit attempts (Myles et al. 2012, Smith et al. 2014). Addressing tobacco use in people with SMI is a major clinical and public health issue. There is also evidence of positive neurocognitive effects from cigarette smoking in people with schizophrenia, which is linked to stimulation of nicotine receptors (Wing et al. 2012). However, studies have shown improvements in depressed mood when transdermal nicotine patches are used (Mineur & Picciotto 2010). Despite evidence showing positive neurocognitive effects, addressing tobacco use in people with SMI is a major clinical and public health issue, and there is limited clinical attention devoted to tobacco use in these groups (Callaghan et al. 2014).

There is a common misconception that people with SMI do not wish to quit smoking (Lum et al. 2018). Despite this misconception, there is a strong interest in smoking cessation in people with SMI who are motivated for the same reasons as other smokers – to improve their health (Aschbrenner et al. 2015; Morgan et al. 2012). An additional motivation to quit is the substantial financial cost of cigarette smoking for people who often have very low incomes, largely derived from social welfare (Ashton et al. 2013).

Smoking cessation can be successfully delivered within mental health programs for both adult and youth populations successfully (Curtis et al. 2018; Gilbody et al. 2015). Substantial mental health benefits can be gained from quitting smoking, including reduced symptoms of depression

and anxiety (Taylor et al. 2014). Symptoms of mental illness do not appear to deteriorate after quitting smoking (Rüther et al. 2014).

Nurses can play a vital role in smoking cessation, influencing tobacco-related mortality. People with SMI are likely to experience more severe withdrawal symptoms compared with the general population and require extra support during cessation attempts (Rüther et al. 2014). It is important to realise that people with SMI respond to smoking cessation treatment as well as the general population in the short term, although they generally have worse long-term outcomes (Peckham et al. 2017).

A person's current smoking status, nicotine dependency and previous quit attempts should be assessed. Assessing nicotine dependency will help predict the level of withdrawal symptoms the patient is likely to experience upon quitting. Smoking cessation is best initiated when a person is in a stable mental state (Rüther et al. 2014). Consumers should be thoroughly informed on the processes that assist quitting smoking, enabling the person to formulate their individual quit plan and take ownership of their own quit attempt. Involvement in their quit attempt gives people the best chance of quitting successfully (Peckham et al. 2017).

A person should be supported in their quit plan with cessation counselling that includes advice about what to expect with withdrawal symptoms (e.g. depression and restlessness) and how to cope when these symptoms arise (Gartner & Hall 2015). Pharmacological support should be offered and could include nicotine replacement therapy or bupropion when there is even mild tobacco dependence (Rüther et al. 2014). Ceasing tobacco use can affect the way some medications (e.g. olanzapine, clozapine) are metabolised (Peckham et al. 2017). This should not be an impediment to encouraging quitting but requires careful monitoring for potential increases in side effects from psychiatric medication (Rüther et al. 2014).

Along with approaches to illicit drug use, advice on smoking to people with SMIs should also include advice on harm reduction (Gartner & Hall 2015) – for example, reducing the frequency or strength of cigarettes or switching to alternative methods of nicotine delivery (Rüther et al. 2014). This advice is especially relevant for people with SMI who are not yet ready to quit smoking or have faced significant challenges in past quit attempts (Peckham et al. 2017).

Factors such as socioeconomic disadvantage and cognitive impairment are common for people with SMI (Lum et al. 2018). When combined with an absence of social support for abstinence from family and peers, some people will find quitting smoking much more difficult (Gartner & Hall 2015). In some people with schizophrenia, nicotine may be used as self-medication to reduce the negative symptoms of their illness, improve their cognition or ease the side effects caused by antipsychotic medication (Lucatch et al. 2018).

Alongside smoking cessation, exercise should be promoted among people with schizophrenia to combat weight gain and increased metabolic risk. Nurses should carefully monitor patients' medication and fluctuations in weight for a minimum of 6 months after quitting smoking (Gartner & Hall 2015). Helpful advice and support is available via government websites in Australia (www.quitnow.gov.au) and in New Zealand (www.quit.org.nz).

Nurse's story 18.1 Malcolm

Malcolm has been a nurse for 27 years and now works on an acute inpatient mental health unit. He has been leading a project to help people admitted to the mental health unit in dealing with smoking withdrawal and encouraging them to quit.

‘When I first started working as a nurse in mental health, I was a smoker. The senior nurses I was working with at the time told me that a great way to build a relationship with the patients on the unit was to chat to them while we were all having a smoke.’

Malcolm ceased smoking 15 years ago after witnessing his aunt dying from lung cancer.

‘I saw what my aunty was going through and it was horrible. She was in so much pain and distress. I decided at that time I needed to quit for my health. So, I quit. It wasn't easy at all, especially being around people smoking while I was at work. I persisted though and my health has improved out of sight.’

Malcolm decided he wanted to support the patients he was working with to experience the same benefits that he gained after quitting smoking. When he heard about the smoking ban in mental health units, he thought it was an ideal opportunity.

‘I thought to myself: if they are not allowed to smoke while they are on the unit, they may as well use it as a launching pad to quit smoking. The worst part of nicotine withdrawal is the first couple of days, so it would make sense if they could make it through that, why couldn't they quit altogether? So, I got myself skilled up on withdrawal symptoms from nicotine and learnt how to adequately prescribe nicotine replacement therapy.’

As Malcolm built up the intervention, other nurses took an interest and became involved with the program. This led to a much more comprehensive approach to addressing smoking and not just when Malcolm was on shift.

‘The key to the intervention was giving patients who were in nicotine withdrawal support. Nicotine replacement therapy doesn't completely stop the cravings, and talking to patients about how they are going with the withdrawal was really helpful.’

The program has become quite a success, with many people successfully quitting and not taking the habit up again. Malcolm and the program have also been recognised with awards.

‘Just banning smoking is cruel but giving people “smoking leave” from the unit would just restart the withdrawal process again. What's the point in making people withdraw if there is no benefit for the person in the end? What we found was that many people actually wanted to quit and had found it really hard in the past. No one likes withdrawal symptoms, but in hindsight they were often very thankful that we supported them to actually start the quitting process properly.’

Critical thinking challenge 18.4

Discuss the following question: ‘People with mental illness don't have much enjoyment in life, so why would you want to take another enjoyment away and encourage them to quit cigarettes?’

Nutrition

Nutritional therapy in mental health treatment is a rapidly growing area in both the academic and clinical fields, with experts calling for nutritional medicine to be mainstream in mental health services (Sarris et al. 2015). People experiencing SMI have poorer diets when compared with the general population (Firth et al. 2018). This is a significant and, importantly, a modifiable factor that contributes to severe weight gain, subsequent poor cardiometabolic health and mortality gap in this population.

People with SMI commonly have diets lower in fruit and fibre and higher in saturated fat compared with the general population (Teasdale et al. 2019). Studies that assessed caloric intake found higher intakes in those with SMI (Firth et al. 2018), while evidence also demonstrated that the diets of those with SMI are lower in vegetable, legumes and dairy (Teasdale et al. 2019).

People receiving antipsychotic therapy commonly complain of significantly increased hunger and an inability to sense satiety (feeling full), particularly on clozapine and olanzapine (Kraus et al. 2014). These medications can affect ghrelin and leptin hormones, which regulate hunger and satiety (Potvin et al. 2015). The highest increases in leptin levels are seen in patients using antipsychotics that produce the most weight gain (Kraus et al. 2014).

Combining these factors with constant cravings for sugary or processed oily foods, low food preparation skills, low levels of motivation and often-restricted budgets provides a potent mix for weight gain and poor metabolic health. Additionally low mood and depression can also lead to overeating and ‘comfort’ eating (de Wit et al. 2015). Furthermore, people with SMI have lower basal metabolic rate than the general population, contributing to rapid weight gain (Cuerda et al. 2013). Additional dietary considerations for this population include fast-eating syndrome, disordered eating habits such as only eating one main meal per day, constipation and higher levels of dental and coeliac disease (Teasdale et al. 2017).

Given these dietary patterns and nutritional side effects, interventions that aim to reduce caloric intake and improve diet quality by increasing core foods and reducing discretionary foods can be seen as key factors in improving the physical health of those with SMI. Core foods in Australia reflect the five food groups: (1) vegetables, (2) fruit, (3) milk, cheese, yoghurt and alternatives, (4) lean meat, fish, poultry, eggs, seeds and nuts, and (5) grains, with some healthy oils such as olive oil. Discretionary foods reflect those that are high in energy

(kilojoules/calories) and low in nutrients and are generally highly processed and refined foods (National Health and Medical Research Council 2013). Evidence has emerged demonstrating that people following a higher quality diet have better mental health, while those whose diet quality is lower have poorer psychological functioning (Begdache et al. 2019).

An alternative dietary pattern shown to be beneficial for mental health by preventing and/or reducing depressive symptoms is the Mediterranean diet (Parletta et al. 2019). The Mediterranean diet focuses on fruits and vegetables, fish, nuts/seeds, wholegrains, legumes, olive oil, feta cheese and moderate intakes of red wine, particularly with meals. In addition to improvements in mental health, this pattern of eating is protective for both type 2 diabetes and CVD (Estruch et al. 2013).

Key nutrients of concern in SMI include caffeine, omega-3 fatty-acids, folate and magnesium. Caffeine overconsumption is common in patients experiencing schizophrenia – they are twice as likely to consume more than 200 mg (2 cups of coffee) per day (Teasdale et al. 2019). There is currently no acceptable daily intake value for caffeine in Australia; however, a review performed by Food Standards Australia New Zealand suggests increased risk of anxiety at 95 mg (one cup of coffee or two cans of cola) per day for children and 210 mg for adults (Smith et al. 2000). Low levels of omega-3 fatty-acids, folate and magnesium have been linked with depression, with increased intake (oral or supplemented) proving to be an effective part of treatment (Casper 2011; Forsyth et al. 2012).

Nutrition interventions in people with SMI to date have generally been scarce; however, studies have demonstrated that nutrition interventions in both early intervention and longer term illness have reduced health risks (Teasdale et al. 2016; 2017). Although future studies need to assess the long-term impacts on anthropometric, biochemical and lifestyle (nutrition and

exercise) measures, as well as quality of life, mental health symptomatology and readmission rates, there is enough evidence to support the use of nutrition interventions in combination with exercise as core components of mental health services.

Nutritional advice and support should be integrated into routine nursing care. When providing nutrition interventions it is crucial to provide both educational and practical components to ensure adequate knowledge but to also improve shopping, label reading, food safety and culinary (food preparation) skills. With patients particularly vulnerable to increased hunger, reduced satiety and cravings for high caloric convenience foods and drinks with little nutritional value, mindfulness-based activities may also prove to be an adjunctive intervention.

Physical activity

Physical activity can be defined as any bodily movement produced by skeletal muscle resulting in an increased energy expenditure. The term ‘physical activity’ encompasses both structured forms of activity such as exercise and unstructured forms such as incidental activity. People experiencing mental illness are known to be less physically active than the general population and engage in prolonged periods of sedentary behaviour (Schuch et al. 2017; Stubbs et al. 2016). Low levels of physical activity are an established risk factor for cardiometabolic dysfunction including diabetes and obesity. In addition to low levels of physical activity, people with mental illness have poorer cardiorespiratory fitness in comparison with the general population, which is an established risk factor for all-cause mortality and morbidity (Bort-Roig et al. 2019). Given the high rates of premature mortality linked to preventable CVD within this population, evidence-based physical activity interventions aimed at reducing sedentary time, increasing overall activity and increasing moderate–vigorous physical activity participation should be considered part of routine care for people living with mental illness (Vancampfort et al. 2015b).

Physical activity and exercise have been shown to have beneficial effects on psychiatric symptomatology regardless of diagnosis, while a growing body of research has reported on the benefits of exercise for improving cognition (Sommer & Kahn 2015). Longitudinal studies have also highlighted the bidirectional relationship between activity and depressive symptoms (Pinto Pereira et al. 2014), with evidence of a protective effect of being physically active (Mammen & Faulkner 2013; Pinto Pereira et al. 2014).

Evidence-based strategies to increase physical activity among people with mental illness include behavioural techniques such as motivational interviewing, face-to-face and group-based exercise sessions (Rosenbaum et al. 2014). In addition structured exercise prescriptions and individualised interventions reflect individual variations in mood, motivation and access to facilities and resources (Lederman et al. 2017). Exercise is not a one-size-fits-all intervention, and a range of individual factors should be considered when developing individualised exercise interventions. Aside from physical limitations, factors to be considered are severity of psychiatric symptomatology, previous exercise history, motivation and access to services or facilities that may affect the modality and intensity of exercise that individuals are able to undertake (Stubbs et al. 2017).

Exercise is a structured subset of physical activity, and exercise prescriptions are typically described according to the 'FITT' principle (frequency, intensity, time and type) while incorporating appropriate goal-setting strategies. The International Organization of Physical Therapists in Mental Health (IOPTMH) recommends that adults aim for 150 minutes per week of moderate intensity physical activity or 75 minutes of moderate–vigorous activity in addition to muscle strengthening activities on at least 2 days per week (Vancampfort et al. 2012). Further, the IOPTMH advocates that patients should avoid physical inactivity, noting that some level of

physical activity regardless of intensity is better than none (Vancampfort et al. 2012). People with SMI should be supported and encouraged to adhere to physical activity recommendations; however, there is growing consensus that such recommendations may be aspirational and unrealistic for many people living with SMI. Positive messaging around pragmatic goals such as breaking up sitting time throughout the day and aiming to increase short-duration walking should be routinely promoted (Vancampfort et al. 2015a; 2015b). Mental health nurses are well positioned to provide exercise advice and physical activity counselling to mental health consumers (Happell et al. 2014; Stanton et al. 2015). Examples of pragmatic interventions include using objective monitoring devices such as pedometers (or commercially available accelerometers), individualised advice on ways to accumulate greater light physical activity such as rising from a chair and moving during television commercial breaks or adding 5-minute walks at structured and specified points throughout the day. This may include, for example, taking less direct routes while walking to dining rooms within inpatient facilities (Vancampfort et al. 2015b). Although such limited interventions may appear trivial, encouraging small and incremental changes may better position sedentary people with SMI to transition to brief bouts of moderate intensity activity that will help them to achieve guideline-specified targets.

Respiratory diseases

Respiratory diseases were the leading cause of death in psychiatric institutions up until the 1970s (Brown 1997). Today, respiratory diseases are still more prevalent in people with SMI, with approximately one in three people having either restrictive or obstructive lung disease, a rate double the general population prevalence rate (Partti et al. 2015). The likelihood of developing pneumonia is also considerably raised (Partti et al. 2015). Not only are these conditions far more common in people experiencing SMI but they are more likely to lead to mortality (Schoepf et al.

2014). Tobacco smoking is closely associated with an increased risk of respiratory diseases and, in particular, influences chronic obstructive pulmonary disorder in its development and progression as well as mixed forms of asthma (Schoepf et al. 2014).

Respiratory assessment is an essential component of a physical health assessment and nurses should be vigilant and maintain regular and timely screening for respiratory conditions. Additional support and referral may be required, with consideration given to modifiable risk factors such as tobacco smoking, which is closely linked to increased cardiometabolic health risk factors. Physical activity should be promoted, since it might delay decline in lung function (Gartner & Hall 2015). Influenza is a potentially manageable public health issue that can lead to serious respiratory disease and death. Routine influenza vaccination should be encouraged among people with SMI (Partti et al. 2015). Information about influenza vaccination is readily available on government websites in Australia (www.flusmart.org.au) and in New Zealand (www.influenza.org.nz), and nurses need to ensure patients who they work with are vaccinated.

Critical thinking challenge 18.5

You are a nurse working on a busy acute mental health unit who is aware of the importance of influenza vaccination. What strategies could you develop to improve the vaccination rates of the staff and patients on the unit?

Case study 18.1 ‘Keeping the Body in Mind’

The Early Psychosis Program is located at the Bondi Centre in Sydney. It works with young people between the ages of 15 and 25 in the early stages of psychotic illness. The team works with an interdisciplinary model within a community mental health service.

Nurses working with young people experiencing their first episode of psychosis at the Bondi Centre were extremely concerned that, while atypical antipsychotic medications were successful in alleviating people of many of the troubling symptoms of mental illness, they also appeared to be correlated with rapid weight gain and subsequent longer term risks of diabetes and heart disease.

‘We responded to these alarms by developing an assessment tool to measure changes in weight and other metabolic abnormalities. What we found was that young people were all too commonly putting on 10–20 kg and sometimes more within their first year with the service and that alterations in a person's metabolic health deteriorated rapidly with this weight gain. These issues included elevated cholesterol and hypertension. Blood glucose levels in the body may become raised, putting these young people at much higher risk of developing diabetes.’

Nursing staff also noticed that the young people were experiencing increased rates of stigma and poor self-esteem. This was like a ‘double whammy’ because a young person who was dealing with a new mental health diagnosis, and the fact that they have to take psychiatric medication was also trying to deal with transformations to their body image. This affected their personal lives, impacting on work, study and socialisation.

‘We realised that just assessing people's health was inadequate. We actually needed to make a difference and so we adopted a mantra of ‘don't just screen, intervene’.’

Working in conjunction with a multidisciplinary team, nursing staff established a number of lifestyle interventions and a program called ‘Keeping the Body in Mind’ (KBIM). This program aimed to prevent weight gain and the accompanying deterioration in metabolic health that might in future lead to heart disease and diabetes. The program is coordinated by a clinical nurse consultant and utilises an exercise physiologist, a dietitian and a peer support worker. The

lifestyle intervention program encompasses three elements including health coaching, dietetic support and a supervised exercise program, which are delivered with an interconnected approach. Each participant's intervention program is tailored to suit the individual.

The program was recently evaluated in a controlled study comparing it against another early psychosis service. The KBIM program was compared against a similar early psychosis program in Sydney, with the exception of the metabolic intervention. Participants in the KBIM group were provided 12-week individualised lifestyle program, while the comparison group ($n = 12$) received standard care. The evaluation study established that the KBIM group had considerably less weight gain at 12 weeks (an average of 1.8 kg over 12 weeks) compared with standard care (an average of 7.8 kg). Only 13% per cent of the intervention group experienced clinically significant weight gain (greater than 7% of baseline weight) compared with 75% in the non-intervention group.

Source: Curtis et al. 2015

Oral health

Oral health is integral to general health and essential for wellbeing. It influences eating, physical appearance, speech and other social and psychological factors (Moore et al. 2015). Oral health issues include hygiene, dental caries (cavities), periodontal disease, dental trauma and oral cancers (Kisely et al. 2011). Oral health also plays a vital role in cardiometabolic health, with periodontal disease increasing the risk of type 2 diabetes, coronary heart disease and stroke (Moore et al. 2015). People with SMI experience markedly higher rates of oral health problems compared with the general population (McKibbin et al. 2015). The reasons that this population

have poorer oral health outcomes in comparison with the general population are multifaceted (Tang et al. 2015). Many psychotropic medications can reduce the amount of saliva the mouth produces, leading to a dry mouth or xerostomia (McKibbin et al. 2015). Xerostomia is associated with an increase in periodontal disease (Moore et al. 2015). Symptoms of mental illness such as depression, amotivation and cognitive impairment can lead to an apathy around dental hygiene, and considerably lower rates of regular teeth brushing and flossing is observed in people with SMI (McKibbin et al. 2015). People with SMI are also more likely to be smokers and consume sugary carbonated drinks, both of which increase the likelihood of dental disease (Kisely et al. 2015).

Nursing management of oral health

People with SMI are less likely to seek dental treatment than the general population, especially for preventative dental work (Tang et al. 2015). Given the higher risk of dental disease in this population, it is essential that people with SMI attend to dental care more frequently than general public recommendations (Moore et al. 2015). Mental health nurses have a clear role in encouraging and facilitating access to dental services. This is particularly important in Australia and New Zealand where most dental services are private and financially out of reach for many people with SMI; people will often require assistance in accessing public dental schemes. It is also important that nurses use clinical interactions as an opportunity to promote oral health as a vital part of general health. Health promotion that focuses on smoking, diet, alcohol use and dental hygiene should be routinely incorporated into mental health nursing care (Moore et al. 2015).

Critical thinking challenge 18.6

Consider and discuss the social and economic factors that influence an individual's oral health.

Consider what nursing actions/strategies you could develop to change these factors.

Sleep

Good sleep is essential to good physical and mental health. Sleep disturbance is a symptom of almost every mental disorder from anxiety disorders through to mood disorders and psychosis (Spiegelhalder et al. 2013). Though its significance is often under-recognised (Tobin & Tobin 2017), sleep disturbance can be one of the more distressing and persistent symptoms of mental disorder. Sleep disturbance can also present as one of the first signs of mental illness exacerbation (Ruhrmann et al. 2010). Poor sleep can also independently contribute to causing a mental illness and impede recovery from mental illness (Plante & Winkelman 2008).

Recognising and treating sleep disturbances can therefore be critical to the primary or secondary prevention of mental disorders and their treatment.

Sleep disturbance

What is normal sleep? Each person has a different sleep requirement and this changes over the life span. On average, most adults need 7–8 hours; children and adolescents 9–10 hours per night and children 11–13 hours or more, depending on their age (Colten & Altevogt 2006). **Insomnia** is the most common sleep disturbance and is a core feature of mood disorders; it frequently complicates anxiety disorders and psychosis. Anxiety and severe depression are commonly associated with sleep disturbance (Shanahan et al. 2014). In schizophrenia, the sleep cycle is often disturbed, with fragmented sleep throughout the cycle or even reversal of the sleep–wake cycle so that most sleep occurs during the day (Afonso et al. 2014). **Hypersomnia** (excessive

sleep) is less common but can occur in depression and in some cases of bipolar disorder (Kanady et al. 2015). Hypersomnia can also occur secondary to some treatments of mental illness, which have sedative side effects.

Given the high rates of obesity in people with mental disorders, the risk of obstructive sleep apnoea in this population is high, so it is important to screen for and treat this disorder (Kalucy et al. 2013). Obstructive sleep apnoea is the most common form of sleep disorder breathing. Untreated, it is associated with high morbidity and mortality due to increased risks of cardio- and cerebrovascular disease, and worsening of diabetes and hypertension (Carroll et al. 2015)

Critical thinking challenge 18.7

In what ways might poor sleep impede a person's mental health recovery? What nursing strategies can you implement to improve sleep for someone who is experiencing insomnia?

Nursing assessment and intervention of sleep disorders

The most important primary action for nurses is to ask about a person's sleep. Depending on the clinical setting, there may be an option for nurses to take an active role in diagnosing and managing sleep problems. There are a number of useful screening and diagnostic tools, the most simple of which is a sleep diary (freely downloadable from the internet e.g. <http://yoursleep.aasmnet.org/pdf/sleepdiary.pdf>) in which the person documents times spent sleeping and other influential activities such as caffeine and alcohol intake, exercise and sedentary activities such as electronic screen time.

In established sleep disorders, nurses may play an important role in encouraging patients to manage any lifestyle issues that could be contributing to their sleep problems (see Box 18.3). Sedative/hypnotic medications have a place but should not necessarily be the first form of treatment offered. Benzodiazepines have a propensity for addiction and are associated with an increased risk of falls among other serious potential side effects (see Chapter 19 for more about medications and their sedative effects).

Sexual health

Sexuality and sexual health are important aspects of every person's health and wellbeing.

Sexuality is a complex issue that encompasses not only the physical activity of sex but also gender identity, values and beliefs (Urry et al. 2019). Contrary to common belief, most people with SMI show an interest in sex that differs little from the general population (de Boer et al. 2015). High-risk sexual behaviours are more likely to be observed in people with SMI, including unprotected intercourse, multiple partners, involvement in sex work and illicit drug use (Pandor et al. 2015). The rates of blood-borne viruses such as HIV and hepatitis C have been found to be higher among people with SMI (Essock et al. 2014).

Social and interpersonal impairments commonly occur in people with SMI and limit the development of stable sexual relationships. Men with SMI in particular have poorer social outcomes, less frequent (sexual) relationships and fewer offspring than the general population (de Boer et al. 2015). Women with SMI are more likely to have relatively chaotic patterns of sexual behaviours and a higher rate of non-consensual sex than their counterparts without SMI (Pandor et al. 2015). An Australian study indicates that women with SMI were far less likely to use effective contraception methods and had on average three unplanned pregnancies (Hauck et al. 2014).

Another study based in New Zealand identified that mental health nurses don't ask about sex-related topics, with the authors concluding that mental health staff need to commit to being responsive to this important aspect of a person's wellbeing and health (Davison & Huntington 2010). This was echoed in an Australian report that found mental health nurses are reluctant to bring up the topic of sexual health (Quinn et al. 2011). To enable you to feel comfortable and confident to discuss sexual health you will need to identify any personal issues that affect your ability to openly discuss sexual health and increase your knowledge of sexual issues. Common issues that affect a person's sexuality and sexual health include sexually transmitted infections, body image, gender identity, physiological changes, medications and stigma (de Boer et al. 2015).

Critical thinking challenge 18.8

Consider and discuss social, cultural and religious beliefs that influence a person's sexuality.

Consider your own personal beliefs about sexuality. Do you have any preconceived ideas about mental illness and sexuality? Do you have any concerns about conducting a sexual health assessment?

Medication and sex

Medication-induced sexual dysfunction is a common but largely ignored side effect of most psychotropic medications (Urry et al. 2019). Psychotropic medications are linked with sexual dysfunction including low libido, delayed ejaculation, orgasm problems like anorgasmia, and

impaired erection (Bella & Shamloul 2013; de Boer et al. 2015). Medication-induced sexual dysfunctions can lead to issues with relationships, medication adherence and quality of life (Hendry et al. 2018). Despite people with SMI considering sexual health issues to be highly relevant, it is important to remember that it is likely that issues like sexual dysfunction are unlikely to be discussed, often due to the reluctance of health professionals and mental health nurses to talk about sex (Hendry et al. 2018). This often leads to an underestimation of their prevalence and contributing to decreased adherence to treatment (de Boer et al. 2015). Chapter 19 discusses psychotropic medication and its side effects.

Sexual health screening

Health screening includes preventative testing or investigation to prevent or ameliorate future problems. Sexual health screening includes breast, prostate, cervical and sexually transmitted infection screening. Mental health nurses can play an important role in health screening, particularly when access to services is challenging for the person with mental illness. Mental health nurses can refer people directly to a health screening service or they can provide the health assessment. Nurses can offer advice about preventing the contraction and spread of sexually transmitted infections by providing education on safe sex such as the correct use of condoms (Pandor et al. 2015).

Breast, prostate and cervical screening services are generally offered by public health services. Given the vulnerability of clients with SMI around their sexual health, it is essential that nurses include sexual health screening as part of holistic care. Nurses should reflect on any personal attitudes or beliefs that might be creating barriers that impede a thorough sexual health assessment.

When psychiatric symptoms are not a mental illness

Confusion, vision problems, and behaviour changes can be common symptoms for many mental illnesses, but they are also common symptoms of brain tumours, infectious diseases and dehydration. Correct assessment that includes history taking and checking with relatives will lead to correct diagnoses and not missing a physical health issue (see Chapter 7 for more details of accurate assessment). Other medical conditions that may present with psychiatric conditions include Wilson's disease (a hereditary metabolic disorder), Graves' disease and HIV (McKee & Brahm 2016). Chapter 16 discusses the symptom similarities that can occur with depression, delirium and dementia.

Chapter summary

People who experience SMI have far higher rates of morbidity and mortality across nearly all chronic health conditions. This chapter has highlighted the importance of promoting, assessing and maintaining optimum physical health for people with SMI. Specific health assessments have been highlighted – sexual health, oral health, sleep, metabolic syndrome, CVD, diabetes and respiratory disease; however, it is important to remember that a full physical assessment, including routine health screening, is an essential element of holistic mental health care.

The vital role that nurses can play in improving preventable illness and disease is clear. People with SMI have physical health outcomes that are far worse than the general population. If we are to improve the unacceptable life expectancy gap that is currently experienced by those with an SMI, mental health nurses need to address this important issue with primary health messages and interventions. Smoking cessation, diet and exercise advice are core interventions crucially required for preventing premature CVD. Awareness and advocating for the screening and intervention of other areas of physical health, especially respiratory, sexual, oral and sleep, is extremely important to improve overall quality of life. Early intervention and prevention of

physical health conditions is key to improving the outcomes of people with mental illness.

Mental health nurses need to prioritise physical health care as one of their primary responsibilities, and this involves taking the time to listen and support people's needs in a holistic way.

Exercises for class engagement

1. Maintaining optimum physical health is multifaceted and essential to wellbeing, and nurses play an important role in assessing, treating and preventing physical health issues. Working in groups discuss the following statements:
 - Sexual health is a human right.
 - Metabolic syndrome is preventable.
 - Oral health is an important part of overall health.
 - People with schizophrenia are likely to die 20–25 years earlier than the general population.
 - SMI is as much a risk factor of cardiovascular risk as a diagnosis of diabetes.
2. Working with your group, develop nursing interventions and strategies to ensure the issues listed in the statements are assessed, treated and not overlooked. Consider what resources you will need to implement the strategies you have identified. Are there any barriers? How can these barriers be overcome?

Useful websites

Australian Dental Association: <http://www.ada.org.au/>.

Equally Well Australia: <https://www.equallywell.org.au>.

Equally Well New Zealand: <https://www.tepou.co.nz/initiatives/equally-well-physical-health/37>.

International Diabetes Federation: <http://www.idf.org/>.

Keeping the Body in Mind in Youth with Psychosis: <http://www.iphys.org.au/>.

Mental Health Foundation of Australia: <http://www.mhfa.org.au/main.htm>.

Mental Health Foundation of New Zealand: <http://www.mentalhealth.org.nz/>.

New Zealand Dental Association: <http://www.healthysmiles.org.nz/>.

Sexual Health & Family Planning Australia: <http://www.shfpa.org.au/>.

Sleep diary: <http://yoursleep.aasmnet.org/pdf/sleepdiary.pdf>.

The New Zealand Sexual Health Society Incorporated: <http://www.nzshs.org/>.

World Health Organization: <http://www.who.int/en/>.

References

Afonso, P., Figueira, M.L., Paiva, T., 2014. Sleep–wake patterns in schizophrenia patients compared to healthy controls. *World J. Biol. Psychiatry* 15 (7), 517–524.

Alberti, K., Zimmet, P., Shaw, J., 2005. The metabolic syndrome – a new worldwide definition. *Lancet* 366 (9491), 1059–1062.

Alvarez-Jiménez, M., González-Blanch, C., Crespo-Facorro, B., et al., 2008. Antipsychotic-induced weight gain in chronic and first-episode psychotic disorders: a systematic critical reappraisal. *CNS Drugs* 22 (7), 547–562.

Aschbrenner, K.A., Brunette, M.F., McElvery, R., et al., 2015. Cigarette smoking and interest in quitting among overweight and obese adults with serious mental illness enrolled in a fitness intervention. *J. Nerv. Ment. Dis.* 203 (6), 473–476.

Ashton, M., Rigby, A., Galletly, C., 2013. What do 1000 smokers with mental illness say about their tobacco use? *Aust. N. Z. J. Psychiatry* 47 (7), 631–636.

Bak, M., Fransen, A., Janssen, J., et al., 2014. Almost all antipsychotics result in weight gain: a meta-analysis. *PLoS ONE* 9 (4), e94112.

Begdache, L., Chaar, M., Sabounchi, N., et al., 2019. Assessment of dietary factors, dietary practices and exercise on mental distress in young adults versus matured adults: a cross-sectional study. *Nutr. Neurosci.* 22 (7), 488–498.

Bella, A.J., Shamloul, R., 2013. Psychotropics and sexual dysfunction. *Cent. European J. Urol.* 66 (4), 466.

Bort-Roig, J., Briones-Buixassa, L., Felez-Nobrega, M., et al., 2019. Sedentary behaviour associations with health outcomes in people with severe mental illness: a systematic review. *Eur. J. Public Health* 30 (1), 150–157.

Brown, S., 1997. Excess mortality of schizophrenia: a meta-analysis. *Br. J. Psychiatry* 171, 502–508.

Brown, S., Kim, M., Mitchell, C., et al., 2010. Twenty-five year mortality of a community cohort with schizophrenia. *Br. J. Psychiatry* 196 (2), 116–121.

Callaghan, R.C., Veldhuizen, S., Jeysingh, T., et al., 2014. Patterns of tobacco-related mortality among individuals diagnosed with schizophrenia, bipolar disorder, or depression. *J. Psychiatr. Res.* 48 (1), 102–110.

Carroll, J.E., Irwin, M.R., Merkin, S.S., et al., 2015. Sleep and multisystem biological risk: a population-based study. *PLoS ONE* 10 (2), e0118467.

Casper, R.C., 2011. Diet and mental health: an up-to-date analysis. *World Rev. Nutr. Diet.* 102, 98–113.

- Cimo, A., Dewa, C.S., 2018. Symptoms of mental illness and their impact on managing type 2 diabetes in adults. *Can. J. Diabetes* 42 (4), 372–381.
- Colten, H.R., Altevogt, B.M. (Eds.), 2006. *Sleep Disorders and Sleep Deprivation, an Unmet Public Health Problem*. The National Academies Press, Washington, DC.
- Cooper, S.J., Reynolds, G.P., 2016. BAP guidelines on the management of weight gain, metabolic disturbances and cardiovascular risk associated with psychosis and antipsychotic drug treatment. *J. Psychopharmacol. (Oxford)* 30 (8), 717–748.
- Correll, C.U., Manu, P., Olshanskiy, V., et al., 2009. Cardiometabolic risk of second-generation antipsychotic medications during first-time use in children and adolescents. *JAMA* 302 (16), 1765–1773.
- Correll, C.U., Solmi, M., Veronese, N., et al., 2017. Prevalence, incidence and mortality from cardiovascular disease in patients with pooled and specific severe mental illness: a large-scale meta-analysis of 3,211,768 patients and 113,383,368 controls. *World Psychiatry* 16 (2), 163–180.
- Cuerda, C., Velasco, C., Merchan-Naranjo, J., et al., 2014. The effects of second-generation antipsychotics on food intake, resting energy expenditure and physical activity. *Eur. J. Clin. Nutr.* 68 (2), 146–152.
- Cuerda, C., Velasco, C., Merchán-Naranjo, J., et al., 2013. The effects of second-generation antipsychotics on food intake, resting energy expenditure and physical activity. *Eur. J. Clin. Nutr.* 68, 146–152.
- Cunningham, R., Sarfati, D., Peterson, D., et al., 2014. Premature mortality in adults using New Zealand psychiatric services. *N. Z. Med. J.* 127 (1394), 31–41.

Curtis, J., Newall, H.D., Samaras, K., 2012. The heart of the matter: cardiometabolic care in youth with psychosis. *Early Interv. Psychiatry*.

Curtis, J.E., Newall, H., Samaras, K., 2010. Positive cardiometabolic health: an early intervention framework for patients on psychotropic medications. *Early Interv. Psychiatry* 4 (Suppl. 1), 60.

Curtis, J., Watkins, A., Rosenbaum, S., et al., 2015. Evaluating an individualized lifestyle and life skills intervention to prevent antipsychotic-induced weight gain in first-episode psychosis. *Early Interv. Psychiatry* 10 (3), 267–276.

Curtis, J., Zhang, C., McGuigan, B., et al., 2018. y-QUIT: smoking prevalence, engagement and effectiveness of an individualized smoking cessation intervention in youth with severe mental illness. *Front. Psychiatry* 9, 683.

Darnton, R., 1968. *Mesmerism and the End of the Enlightenment in France*. Harvard University Press, Cambridge.

Davison, J., Huntington, A., 2010. ‘Out of sight’: sexuality and women with enduring mental illness. *Int. J. Ment. Health Nurs.* 19 (4), 240–249.

de Boer, M.K., Castelein, S., Wiersma, D., et al., 2015. The facts about sexual (dys) function in schizophrenia: an overview of clinically relevant findings. *Schizophr. Bull.* 41 (3), 674–686.

De Hert, M., Vancampfort, D., Correll, C.U., et al., 2011. Guidelines for screening and monitoring of cardiometabolic risk in schizophrenia: systematic evaluation. *Br. J. Psychiatry* 199 (2), 99–105.

de Wit, L.M., van Straten, A., Lamers, F., et al., 2015. Depressive and anxiety disorders: associated with losing or gaining weight over 2 years? *Psychiatry Res.* 227 (2), 230–237.

Erlangsen, A., Andersen, P.K., Toender, A., et al., 2017. Cause-specific life-years lost in people with mental disorders: a nationwide, register-based cohort study. *Lancet Psychiatry* 4 (12), 937–945.

Essock, S.M., Dowden, S., Constantine, N.T., et al., 2014. Blood-borne infections and persons with mental illness: risk factors for HIV, hepatitis B, and hepatitis C among persons with severe mental illness. *Psychiatr. Serv.* 54 (6), 827–835.

Estruch, R., Ros, E., Salas-Salvadó, J., et al., 2013. Primary prevention of cardiovascular disease with a Mediterranean diet. *N. Engl. J. Med.* 368 (14), 1279–1290.

Firth, J., Siddiqi, N., Koyanagi, A., et al., 2019. The Lancet Psychiatry Commission: a blueprint for protecting physical health in people with mental illness. *Lancet Psychiatry* 6 (8), 675–712.

Firth, J., Stubbs, B., Teasdale, S.B., et al., 2018. Diet as a hot topic in psychiatry: a population-scale study of nutritional intake and inflammatory potential in severe mental illness. *World Psychiatry* 17 (3), 365.

Forsyth, A.K., Williams, P.G., Deane, F.P., 2012. Nutrition status of primary care patients with depression and anxiety. *Aust. J. Prim. Health* 18 (2), 172–176.

Galletly, C.A., Foley, D.L., Waterreus, A., et al., 2012. Cardiometabolic risk factors in people with psychotic disorders: the second Australian national survey of psychosis. *Aust. N. Z. J. Psychiatry* 46 (8), 753–761.

Gartner, C., Hall, W., 2015. Tobacco harm reduction in people with serious mental illnesses. *Lancet Psychiatry* 2 (6), 485–487.

- Gates, J., Killackey, E., Phillips, L., et al., 2015. Mental health starts with physical health: current status and future directions of non-pharmacological interventions to improve physical health in first-episode psychosis. *Lancet Psychiatry* 2 (8), 726–742.
- Gatov, E., Rosella, L., Chiu, M., et al., 2017. Trends in standardized mortality among individuals with schizophrenia, 1993–2012: a population-based, repeated cross-sectional study. *CMAJ* 189 (37), E1177–E1187.
- Gilbody, S., Peckham, E., Man, M.S., et al., 2015. Bespoke smoking cessation for people with severe mental ill health (SCIMITAR): a pilot randomised controlled trial. *Lancet Psychiatry* 2 (5), 395–402.
- Glassman, A.H., Bigger, J.T., Jr., 2014. Antipsychotic drugs: prolonged QTc interval, torsade de pointes, and sudden death. *Am. J. Psychiatry* 158 (11), 1774–1782.
- Gordon-Dseagu, V.L., Mindell, J.S., Steptoe, A., et al., 2015. Impaired glucose metabolism among those with and without diagnosed diabetes and mortality: a cohort study using health survey for England data. *PLoS ONE* 10 (3).
- Happell, B., Stanton, R., Hoey, W., et al., 2014. Cardiometabolic health nursing to improve health and primary care access in community mental health consumers: baseline physical health outcomes from a randomised controlled trial. *Issues Ment. Health Nurs.* 35 (2), 114–121.
- Hasan, S.S., Clavarino, A.M., Mamun, A.A., et al., 2014. Incidence and risk of diabetes mellitus associated with depressive symptoms in adults: evidence from longitudinal studies. *Diabetes Metab. Syndr.* 8 (2), 82–87.

- Hauck, Y., Nguyen, T., Frayne, J., et al., 2014. Sexual and reproductive health trends among women with enduring mental illness: a survey of Western Australian community mental health services. *Health Care Women Int.* 36 (4), 499–510.
- Hayes, J.F., Marston, L., Walters, K., et al., 2017. Mortality gap for people with bipolar disorder and schizophrenia: UK-based cohort study 2000–2014. *Br. J. Psychiatry* 211 (3), 175–181.
- Hendry, A., Snowden, A., Brown, M., 2018. When holistic care is not holistic enough: the role of sexual health in mental health settings. *J. Clin. Nurs.* 27 (5–6), 1015–1027.
- Hjorth, P., Davidsen, A., Kilian, R., et al., 2014. A systematic review of controlled interventions to reduce overweight and obesity in people with schizophrenia. *Acta Psychiatr. Scand.* 130 (4), 279–289.
- Holt, R.I., Mitchell, A.J., 2014. Diabetes mellitus and severe mental illness: mechanisms and clinical implications. *Nat. Rev. Endocrinol.* 11 (2), 79–89.
- Ignaszewski, M., Yip, A., Fitzpatrick, S., 2015. Schizophrenia and coronary artery disease. *B. C. Med. J.* 57 (4), 154–157.
- Jones, D.R., Macias, C., Barreira, P.J., et al., 2014. Prevalence, severity, and co-occurrence of chronic physical health problems of persons with serious mental illness. *Psychiatr. Serv.* 55 (11), 1250–1257.
- Kalucy, M.J., Grunstein, R., Lambert, T., et al., 2013. Obstructive sleep apnoea and schizophrenia: a research agenda. *Sleep Med. Rev.* 17 (5), 357–365.
- Kanady, J., Soehnera, A.M., Harvey, A.G., 2015. A retrospective examination of sleep disturbance across the course of bipolar disorder. *J. Sleep Disord. Ther.* 4 (2), 193.

- Kaur, J., 2014. A comprehensive review on metabolic syndrome. *Cardiol. Res. Pract.* 943162. doi:10.1155/2014/943162. [Epub 2014 Mar 11].
- Kisely, S., Baghaie, H., Lalloo, R., et al., 2015. A systematic review and meta-analysis of the association between poor oral health and severe mental illness. *Psychosom. Med.* 77 (1), 83–92.
- Kisely, S., Quek, L.H., Pais, J., et al., 2011. Advanced dental disease in people with severe mental illness: systematic review and meta-analysis. *Br. J. Psychiatry* 199 (3), 187–193.
- Kraus, T., Haack, M., Schuld, A., et al., 2014. Body weight and leptin plasma levels during treatment with antipsychotic drugs. *Am. J. Psychiatry* 156 (2), 312–314.
- Langan, J., Smith, D.J., 2014. Cardiovascular morbidity and mortality in schizophrenia: implications for primary care. *Prim. Care Cardiovasc. J.* 7 (1), 23.
- Lawrence, D., Hancock, K.J., Kisely, S., 2013. The gap in life expectancy from preventable physical illness in psychiatric patients in Western Australia: retrospective analysis of population based registers. *BMJ* 346, f2539.
- Lederman, O., Suetani, S., Stanton, R., et al., 2017. Embedding exercise interventions as routine mental health care: implementation strategies in residential, inpatient and community settings. *Australas. Psychiatry* 25 (5), 451–455.
- Lichtman, J.H., Froelicher, E.S., Blumenthal, J.A., et al., 2014. Depression as a risk factor for poor prognosis among patients with acute coronary syndrome: systematic review and recommendations a scientific statement from the American Heart Association. *Circulation* 129 (12), 1350–1369.

- Lin, S.T., Chen, C.C., Tsang, H.Y., et al., 2014. Association between antipsychotic use and risk of acute myocardial infarction: a nationwide case-crossover study. *Circulation* 130 (3), 235–243.
- Lockett, H., Bagnall, C., Cunningham, R., et al., 2017. Cardiovascular disease risk and management in people who experience serious mental illness. *Int. J. Integr. Care* 17 (3), A158.
- Lucatch, A.M., Lowe, D.J.E., Clark, R., et al., 2018. Neurobiological determinants of tobacco smoking in schizophrenia. *Front. Psychiatry* 9, 672.
- Lum, A., Skelton, E., Wynne, O., et al., 2018. A systematic review of psychosocial barriers to smoking cessation in people living with schizophrenia. *Front. Psychiatry* 9, 565.
- Malcolm, A., 2005. The nurse role in managing and treating sleep disorders. *Nurs. Times* 101 (23), 34–37.
- Mammen, G., Faulkner, G., 2013. Physical activity and the prevention of depression: a systematic review of prospective studies. *Am. J. Prev. Med.* 45 (5), 649–657.
- Manderbacka, K., Arffman, M., Lumme, S., et al., 2018. The effect of history of severe mental illness on mortality in colorectal cancer cases: a register-based cohort study. *Acta Oncol. (Madr)* 57 (6), 759–764.
- Mather, B., Roche, M., Duffield, C., 2014. Disparities in treatment of people with mental disorder in non-psychiatric hospitals: a review of the literature. *Arch. Psychiatr. Nurs.* 28 (2), 80–86.
- McKee, J., Brahm, N., 2016. Medical mimics: differential diagnostic considerations for psychiatric symptoms. *Ment. Health Clin.* 6 (6), 289–296.

- McKibbin, C.L., Kitchen-Andren, K.A., Lee, A.A., et al., 2015. Oral health in adults with serious mental illness: needs for and perspectives on care. *Community Ment. Health J.* 51 (2), 222–228.
- Mental Health Commission New Zealand, 2012. *Blueprint II. improving mental health and wellbeing for all New Zealanders. How things need to be.* Wellington, MHCNZ.
- Mineur, Y.S., Picciotto, M.R., 2010. Nicotine receptors and depression: revisiting and revising the cholinergic hypothesis. *Trends Pharmacol. Sci.* 31 (12), 580–586.
- Montejo, A.L., Montejo, L., Baldwin, D.S., 2018. The impact of severe mental disorders and psychotropic medications on sexual health and its implications for clinical management. *World Psychiatry* 17 (1), 3–11.
- Morgan, V., McGrath, J., Jablensky, A., et al., 2013. Psychosis prevalence and physical, metabolic and cognitive co-morbidity: data from the second Australian national survey of psychosis. *Psychol. Med.* 44 (10), 2163–2176.
- Morgan, V.A., Waterreus, A., Jablensky, A., et al., 2012. People living with psychotic illness in 2010: the second Australian national survey of psychosis. *Aust. N. Z. J. Psychiatry* 46 (8), 735–752.
- Moore, S., Shiers, D., Daly, B., et al., 2015. Promoting physical health for people with schizophrenia by reducing disparities in medical and dental care. *Acta Psychiatr. Scand.* 132 (2), 109–121.
- Myles, N., Newall, H.D., Curtis, J., et al., 2012. Tobacco use before, at, and after first-episode psychosis: a systematic meta-analysis. *J. Clin. Psychiatry* 73 (4), 468–475.

National Health and Medical Research Council, 2013. Australian dietary guidelines.

Canberra: NHMRC. Available from:

https://www.nhmrc.gov.au/_files_nhmrc/file/publications/n55_australian_dietary_guideli.

National Mental Health Commission, 2013. A contributing life: the 2013 national report card on mental health and suicide prevention. Sydney, NMHC.

Pandor, A., Kaltenthaler, E., Higgins, A., et al., 2015. Sexual health risk reduction interventions for people with severe mental illness: a systematic review. *BMC Public Health* 15 (1), 138.

Parletta, N., Zarnowiecki, D., Cho, J., et al., 2019. A Mediterranean-style dietary intervention supplemented with fish oil improves diet quality and mental health in people with depression: a randomized controlled trial (HELFIMED). *Nutr. Neurosci.* 22 (7), 474–487.

Partti, K., Vasankari, T., Kanervisto, M., et al., 2015. Lung function and respiratory diseases in people with psychosis: population-based study. *Br. J. Psychiatry* 1, 9.

Peckham, E., Brabyn, S., Cook, L., et al., 2017. Smoking cessation in severe mental ill health: what works? an updated systematic review and meta-analysis. *BMC Psychiatry* 17 (1), 252.

Pinto Pereira, S.M., Geoffroy, M., Power, C., 2014. Depressive symptoms and physical activity during 3 decades in adult life: bidirectional associations in a prospective cohort study. *JAMA Psychiatry* 71 (12), 1373–1380.

Plante, D.T., Winkelman, J.W., 2008. Sleep disturbance in bipolar disorder: therapeutic implications. *Am. J. Psychiatry* 165 (7), 830–843.

Potvin, S., Zhornitsky, S., Stip, E., 2015. Antipsychotic-induced changes in blood levels of leptin in schizophrenia: a meta-analysis. *Can. J. Psychiatry* 60 (3 Suppl. 2), S26.

- Quinn, C., Happell, B., Browne, G., 2011. Talking or avoiding? Mental health nurses views about discussing sexual health with consumers. *Int. J. Ment. Health Nurs.* 20 (1), 21–28.
- Rathmann, W., Pscherer, S., Konrad, M., et al., 2015. Diabetes treatment in people with type 2 diabetes and schizophrenia: retrospective primary care database analyses. *Prim. Care Diabetes* 10 (1), 36–40.
- Reilly, S., Olier, I., Planner, C., et al., 2015. Inequalities in physical comorbidity: a longitudinal comparative cohort study of people with severe mental illness in the UK. *BMJ Open* 5 (12), e009010.
- Reininghaus, U., Dutta, R., Dazzan, P., et al., 2015. Mortality in schizophrenia and other psychoses: a 10-year follow-up of the æsop first-episode cohort. *Schizophr. Bull.* 41 (3), 664–673.
- Ribe, A.R., Laursen, T.M., Sandbæk, A., et al., 2014. Long-term mortality of persons with severe mental illness and diabetes: a population-based cohort study in Denmark. *Psychol. Med.* 44 (14), 3097–3107.
- Ringen, P.A., Engh, J.A., Birkenaes, A.B., et al., 2014. Increased mortality in schizophrenia due to cardiovascular disease – a non-systematic review of epidemiology, possible causes, and interventions. *Front. Psychiatry* 5, 137.
- Rosenbaum, S., Tiedemann, A., Sherrington, C., et al., 2014. Physical activity interventions for people with mental illness: a systematic review and meta-analysis. *J. Clin. Psychiatry* 75 (9), 964–974.
- Ruhrmann, S., Schultze-Lutter, F., Salokangas, R.K., et al., 2010. Prediction of psychosis in adolescents and young adults at high risk: results from the prospective European prediction of psychosis study. *Arch. Gen. Psychiatry* 67 (3), 241–251.

Rüther, T., Bobes, J., De Hert, M., et al., 2014. EPA Guidance on tobacco dependence and strategies for smoking cessation in people with mental illness. *Eur. Psychiatry* 29 (2), 65–82.

Sarris, J., Logan, A.C., Akbaraly, T.N., et al., 2015. Nutritional medicine as mainstream in psychiatry. *Lancet Psychiatry* 2 (3), 271–274.

Schoepf, D., Uppal, H., Potluri, R., et al., 2014. Physical comorbidity and its relevance on mortality in schizophrenia: a naturalistic 12-year follow-up in general hospital admissions. *Eur. Arch. Psychiatry Clin. Neurosci.* 264 (1), 3–28.

Schuch, F., Vancampfort, D., Firth, J., et al., 2017. Physical activity and sedentary behavior in people with major depressive disorder: a systematic review and meta-analysis. *J. Affect. Disord.* 210, 139–150.

Scott, K.M., Oakley Browne, M.A., McGee, M.A., et al., 2006. Mental-physical comorbidity in Te Rau Hinengaro: the New Zealand Mental Health Survey. *Aust. N. Z. J. Psychiatry* 40 (10), 882–888.

Shanahan, L., Copeland, W.E., Angold, A., et al., 2014. Sleep problems predict and are predicted by generalized anxiety/depression and oppositional defiant disorder. *J. Am. Acad. Child Adolesc. Psychiatry* 53 (5), 550–558.

Smith, K., Deschênes, S.S., Schmitz, N., 2018. Investigating the longitudinal association between diabetes and anxiety: a systematic review and meta-analysis. *Diabet. Med.* 35 (6), 677–693.

Smith, P.H., Mazure, C.M., McKee, S.A., 2014. Smoking and mental illness in the US population. *Tob. Control* 23 (e2), e147–e153.

Smith, P.F., Smith, Andrew, Miners, John, et al., 2000. Safety Aspects of Dietary Caffeine – Report from the Expert Working Group. Australia and New Zealand Food Authority. 20-3.

- Sommer, I.E., Kahn, R.S., 2015. The magic of movement: the potential of exercise to improve cognition. *Schizophr. Bull.* 41 (4), 776–778.
- Spiegelhalter, K., Regen, W., Nanovska, S., et al., 2013. Comorbid sleep disorders in neuropsychiatric disorders across the life cycle. *Curr. Psychiatry Rep.* 15 (6), 364.
- Stanton, R., Reaburn, P., Happell, B., 2015. Barriers to exercise prescription and participation in people with mental illness: the perspectives of nurses working in mental health. *J. Psychiatr. Ment. Health Nurs.* 22 (6), 440–448.
- Stubbs, B., Firth, J., Berry, A., et al., 2016. How much physical activity do people with schizophrenia engage in? A systematic review, comparative meta-analysis and meta-regression. *Schizophr. Res.* 176 (2–3), 431–440.
- Stubbs, B., Koyanagi, A., Schuch, F., et al., 2017. Physical activity levels and psychosis: a mediation analysis of factors influencing physical activity target achievement among 204 186 people across 46 low-and middle-income countries. *Schizophr. Bull.* 43 (3), 536–545.
- Stubbs, B., Vancampfort, D., De Hert, M., et al., 2015. The prevalence and predictors of type two diabetes mellitus in people with schizophrenia: a systematic review and comparative meta-analysis. *Acta Psychiatr. Scand.* 132 (2), 144–157.
- Tang, L.R., Zheng, W., Zhu, H., et al., 2015. Self-reported and interviewer-rated oral health in patients with schizophrenia, bipolar disorder, and major depressive disorder. *Perspect. Psychiatr. Care* 52 (1), 4–11.
- Tanskanen, A., Tiihonen, J., Taipale, H., 2018. Mortality in schizophrenia: 30-year nationwide follow-up study. *Acta Psychiatr. Scand.* 138 (6), 492–499.
- Taylor, G., McNeill, A., Girling, A., et al., 2014. Change in mental health after smoking cessation: systematic review and meta-analysis. *BMJ* 348, g1151.

Teasdale, S.B., Ward, P.B., Samaras, K., et al., 2019. Dietary intake of people with severe mental illness: systematic review and meta-analysis. *Br. J. Psychiatry* 214 (5), 251–259.

Teasdale, S.B., Ward, P.B., Rosenbaum, S., et al., 2017. Solving a weighty problem: systematic review and meta-analysis of nutrition interventions in severe mental illness. *Br. J. Psychiatry* 210 (2), 110–118.

Teasdale, S.B., Ward, P.B., Rosenbaum, S., et al., 2016. A nutrition intervention is effective in improving dietary components linked to cardiometabolic risk in youth with first-episode psychosis. *Br. J. Nutr.* 115 (11), 1987–1993.

Thornicroft, G., 2011. Physical health disparities and mental illness: the scandal of premature mortality. *Br. J. Psychiatry* 199 (6), 441–442.

Tobin, T., Tobin, M.L., 2017. Staying awake and aware: the importance of sleep in psychiatric nursing practice. *Issues Ment. Health Nurs.* 38 (11), 924–929.

Todd, R.A., Lewin, A.M., Bresee, L.C., et al., 2014. Coronary artery disease in adults with schizophrenia: anatomy, treatment and outcomes. *Int. J. Cardiol. Heart Vessel.* 4, 84–89.

Urry, K., Chur-Hansen, A., Khaw, C., 2019. ‘It’s just a peripheral issue’: a qualitative analysis of mental health clinicians’ accounts of (not) addressing sexuality in their work. *Int. J. Ment. Health Nurs.* 28 (6), 1278–1287.

Vancampfort, D., Correll, C.U., Galling, B., et al., 2016. Diabetes mellitus in people with schizophrenia, bipolar disorder and major depressive disorder: a systematic review and large scale meta-analysis. *World Psychiatry* 15 (2), 166–174.

Vancampfort, D., Stubbs, B., Ward, P.B., et al., 2015a. Why moving more should be promoted for severe mental illness. *Lancet Psychiatry* 2 (4), 295.

Vancampfort, D., Stubbs, B., Ward, P., et al., 2015b. Integrating physical activity as medicine in the care of people with severe mental illness. *Aust. N. Z. J. Psychiatry* 49 (8), 681–682.

Vancampfort, D., De Hert, M., Skjerven, L., et al., 2012. International Organization of Physical Therapy in Mental Health consensus on physical activity within multidisciplinary rehabilitation programmes for minimising cardio-metabolic risk in patients with schizophrenia. *Disabil. Rehabil.* 34 (1), 1–12.

Watkins, A., 2014. Keeping the body in mind. *Aust. Nurs. Midwifery J.* 21 (11), 44–45.

Wing, V.C., Wass, C.E., Soh, D.W., et al., 2012. A review of neurobiological vulnerability factors and treatment implications for comorbid tobacco dependence in schizophrenia. *Ann. N. Y. Acad. Sci.* 1248 (1), 89–106.

World Health Organization (WHO), 2013. *Mental health Action Plan 2013–2020*, WHO, Geneva.

World Health Organization (WHO), 2008. *The right to health: fact sheet no. 31*. Geneva:

WHO. https://www.who.int/hhr/activities/Right_to_Health_factsheet31.pdf?ua=1.

Figure 18.1 Factors that may contribute to physical health risks in people with severe mental illness People with serious mental illness are: *Courtesy of National Women’s Health Information Center*

Figure 18.2 Positive cardiometabolic health algorithm *Source: Curtis et al. 2010*

TABLE 18.1 International Diabetes Federation Metabolic Syndrome Criteria

Central obesity (waist circumference in centimetres)			Plus any two of:	
Ethnicity	Male	Female	Triglycerides	≥ 1.7 mmol/L

Central obesity (waist circumference in centimetres)			Plus any two of:	
Europid	≥ 94	≥ 80	HDL	< 1.03 (males) mmol/L < 1.29 (females)
S/SE Asian Japanese	≥ 90	≥ 80	Blood pressure	≥ 130/85 mmHg
Central and South America	≥ 90	≥ 80	Fasting blood sugar	≥ 5.6 mmol/L

Adapted from Alberti et al. 2005

Box 18.1 Healthy Active Lives declaration

A group of clinicians, service users, family members and researchers from more than 10 countries joined forces to develop an international consensus statement on improving the physical health of young people with psychosis. The statement, called Healthy Active Lives (HeAL), aims to reverse the trend of people with SMI dying early by tackling risks for future physical illnesses proactively. Compared with their peers who have not experienced psychosis, young people with psychosis face a number of preventable health inequalities including:

- a lifespan shortened by about 15–20 years
- two to three times the likelihood of developing CVD, making it the single most common cause of premature death (more so than suicide)
- two to three times the likelihood of developing type 2 diabetes
- three to four times the likelihood of being a smoker.

The HeAL statement reflects international consensus on a set of key principles, processes and standards. It aims to combat the stigma, discrimination and prejudice that prevent young people experiencing psychosis from leading healthy active lives and to confront the perception that poor physical health is inevitable. It does this by:

- being tailored to each person

- having a longer duration, with more frequent face-to-face contact
- using multidisciplinary teams (including allied health practitioners).

The HeAL declaration sets out 5-year targets aimed to reduce future cardiovascular risk in youth with psychosis.

HeAL can be downloaded free of charge at <http://www.iphys.org.au/>

Box 18.2 Screening for metabolic health

Weight

- First ask the person to remove their shoes, any items from their pockets and bulky clothing.

Height

- With their shoes removed, make sure feet are flat on floor and the person is looking straight ahead.

Body mass index

- Calculate by dividing the person's weight by their height squared (normal range 18.5–25):

$$\frac{\text{weight}}{\text{height}(m)^2}$$

- A useful online calculator is available at <http://www.heartfoundation.org.au/healthy-eating/Pages/bmi-calculator.aspx>

Waist circumference

Waist measurements should be taken after exhaling. Consumers should be encouraged to relax and to not contract any abdominal muscles. Align the tape measure at the level of the belly button and circle the whole way around the body and back to the starting point.

- Make sure the tape is parallel to the ground and not twisted.
- The tape should be snug, without compressing the skin.

- Ask the person to breathe in and out twice and measure on the second out-breath.

Blood pressure

- Ensure the correct cuff size.
- Measure the person when they are relaxed.
- Measure with their arm resting at the height of their heart.

Pathology

- Ensure the person has fasted. Test for:
 - o lipid profile (including HDL/LDL)
 - o glucose
 - o liver function.

Box 18.3 Principles of sleep hygiene

- Go to sleep and wake up at roughly the same time each day.
- Maintain regular meal times.
- Avoid daytime naps.
- Don't eat a big meal or exercise within 2 hours of going to bed.
- Avoid caffeinated drinks after midday.
- Minimise alcohol and cease smoking.
- Ensure the bedroom is comfortable, dark, quiet and safe and used for only sleep and sex.
- Engage in exercise (avoid this at night) and exposure to bright outside light each day, preferably in the morning.
- Do not share the bed with children or pets.
- If sleep is not achieved within 20–30 minutes of going to bed, get up and do something relaxing for a few minutes and then try again when feeling sleepy.

- Ensure medications are taken as directed because some can cause sedation or arousal.
- Avoid stimulating activities before bedtime such as watching a violent TV program or exposure to the blue light emitted by computer or tablet screens.

Adapted from Malcolm 2005

Appendix 3 – Evaluating an individualised lifestyle and life skills intervention to prevent antipsychotic-induced weight gain in first episode psychosis

This is the ‘parent’ study related to chapter 6. It includes detail around the intervention and quantitative results from the study.

Publication reference

Curtis, J., Watkins, A., Rosenbaum, S., Teasdale, S., Kalucy, M., Samaras, K. and Ward, P.B., 2016. Evaluating an individualized lifestyle and life skills intervention to prevent antipsychotic-induced weight gain in first-episode psychosis. *Early intervention in psychiatry*, 10(3), pp.267-276.



Early Intervention in the Real World

Evaluating an individualized lifestyle and life skills intervention to prevent antipsychotic-induced weight gain in first-episode psychosis

Jackie Curtis,^{1,2} Andrew Watkins,^{1,3} Simon Rosenbaum,^{1,2,4} Scott Teasdale,^{1,2} Megan Kalucy,^{1,2} Katherine Samaras^{5,6} and Philip B. Ward^{2,7}

¹Early Psychosis Programme, The Bondi Centre, South Eastern Sydney Local Health District, ²School of Psychiatry, University of New South Wales, ³Faculty of Health, University of Technology Sydney, ⁴Musculoskeletal Division, The George Institute for Global Health, School of Public Health, Sydney University, Sydney, ⁵Department of Endocrinology, St. Vincent's Hospital, ⁶Diabetes and Obesity Program, Garvan Institute of Medical Research, Darlinghurst, and ⁷Schizophrenia Research Unit, South Western Sydney Local Health District, Liverpool, New South Wales, Australia

Corresponding author: Associate Professor Philip B. Ward, School of Psychiatry, University of New South Wales, 26 Llandaff Street, Bondi Junction, NSW 2022, Australia.
Email: p.ward@unsw.edu.au

Received 31 July 2014; accepted 19 December 2014

Abstract

Aim: Initiating antipsychotic medication frequently induces rapid, clinically significant weight gain. We aimed to evaluate the effectiveness of a lifestyle and life skills intervention, delivered within 4 weeks of antipsychotic medication initiation, in attenuating weight gain in youth aged 14–25 years with first-episode psychosis (FEP).

Methods: We undertook a prospective, controlled study in two early psychosis community services. Intervention participants ($n = 16$) received a 12-week individualized intervention delivered by specialist clinical staff (nurse, dietician and exercise physiologist) and youth peer wellness coaches, in addition to standard care. A comparison group was recruited from a similar service and received standard care ($n = 12$).

Results: The intervention group experienced significantly less weight

gain at 12 weeks compared to standard care (1.8 kg, 95% CI –0.4 to 2.8 vs. 7.8 kg, 4.8–10.7, $P < 0.001$). Thirteen per cent (2/16) of the intervention group experienced clinically significant weight gain (greater than 7% of baseline weight), while 75% (9/12) of the standard care group experienced this level of weight gain. Similar positive effects of the intervention were observed for waist circumference.

Conclusions: A lifestyle and life skills intervention delivered as part of standard care attenuated antipsychotic-induced weight gain in young people with FEP. The intervention was acceptable to the young people referred to the service. Such interventions may prevent the seeding of future disease risk and in the long-term help reduce the life expectancy gap for people living with serious mental illness.

Key words: first-episode psychosis, lifestyle intervention, weight gain.

INTRODUCTION

People with severe mental illness suffer from a 20-year shortfall in life expectancy.¹ This disparity in life expectancy is largely due to premature cardiovascular disease (CVD), underpinned by metabolic disorders including diabetes and hyperlipidaemia. This disparity in life expectancy has been termed a scandal for countries embracing the notion of equity in access and quality of medical attention for

all citizens.¹ Moreover, the mortality gap has widened, suggesting this population has not gained the health benefits experienced by the general population from improved CVD treatment and health initiatives to reduce CVD risk and reduce smoking.²

The antecedents to CVD appear early in the course of treatment with antipsychotic medications. Young people with first-episode psychosis (FEP) commencing antipsychotic medications can

Keeping the body in mind

experience weight gain and obesity, hyperlipidaemia, insulin resistance, hypertension and metabolic syndrome, which often develop rapidly, within 12 weeks of commencing antipsychotic medications.³⁻⁵ Such changes are also observed in children and adolescents prescribed second-generation antipsychotics.⁶

Weight gain in young people with FEP is a major factor mediating the adverse cardiometabolic health in this population. Prevention of weight gain following initiation of antipsychotic medication, if achievable, would mitigate heightened cardiometabolic risk and future disease seeding.^{4,6,7} Despite increased awareness of the cardiometabolic sequelae of antipsychotic treatment in youth with FEP, and the recent development of screening and monitoring tools,^{8,9} there have been few trials that have demonstrated positive results in youth with FEP recently commenced on antipsychotic medications.^{3,10,11} For example, a healthy living intervention for users of early psychosis services with a body mass index (BMI) of 25 or above, comprising both motivational and behavioural components with minimal face-to-face contact (nine sessions), did not significantly reduce BMI at 12 months.¹² However, strong evidence for the efficacy of lifestyle interventions in established illness was provided by a recent large-scale study in obese patients with serious mental illness that found sustained weight loss over 18 months using a behavioural intervention.¹³

Whether antipsychotic-induced weight gain can be prevented among young people with FEP remains unclear. To address this question, the present study examined the efficacy of the Keeping the Body in Mind (KBIM) programme, a holistic, individualized lifestyle and life skills intervention for the prevention of weight gain in youth with FEP recently commenced on antipsychotic medications. Results from those who completed the 12-week intervention were compared with results obtained in another sample recruited from a FEP service that offered guideline-based best-practice care, but did not offer additional lifestyle and life skills interventions.

METHODS

Design

The study was conducted across two community-based FEP services in Sydney, Australia, and received ethical approval from the South Eastern Sydney Local Health District Human Research Ethics Committee (Reference No. 13/040; LNR/13/

POWH/85). The study was conducted between February 2013 and February 2014. Referral into the KBIM intervention was offered to all FEP youth treated at the Bondi Centre (South Eastern Sydney Local Health District). The second site, based at the Liverpool Mental Health Centre (South Western Sydney Local Health District), provided guideline-based best-practice standard care for FEP, without specific programmes or resources targeting healthy lifestyle. Only routine clinical measures were obtained at the comparison site and hence only these measures could be compared across both sites.

Participants

Figure 1 shows the enrolment process. A total of 53 clients were referred to the two FEP services during the recruitment period. Baseline and 12-week follow-up data were obtained for 28 clients across both community-based early psychosis treatment programmes. Inclusion criteria were: (i) diagnosis of FEP, defined as schizophreniform psychosis, schizophrenia, schizoaffective disorder, delusional disorder, brief psychotic disorder, bipolar affective disorder, or depression with psychotic features according to DSM-IV-TR (Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Text Revision) criteria; and (ii) treatment with antipsychotic medication for less than 4 weeks prior to baseline assessment. Exclusion criteria were: (i) medically unfit to exercise as determined by treating clinician and (ii) previous antipsychotic medication treatment for longer than 4 weeks.

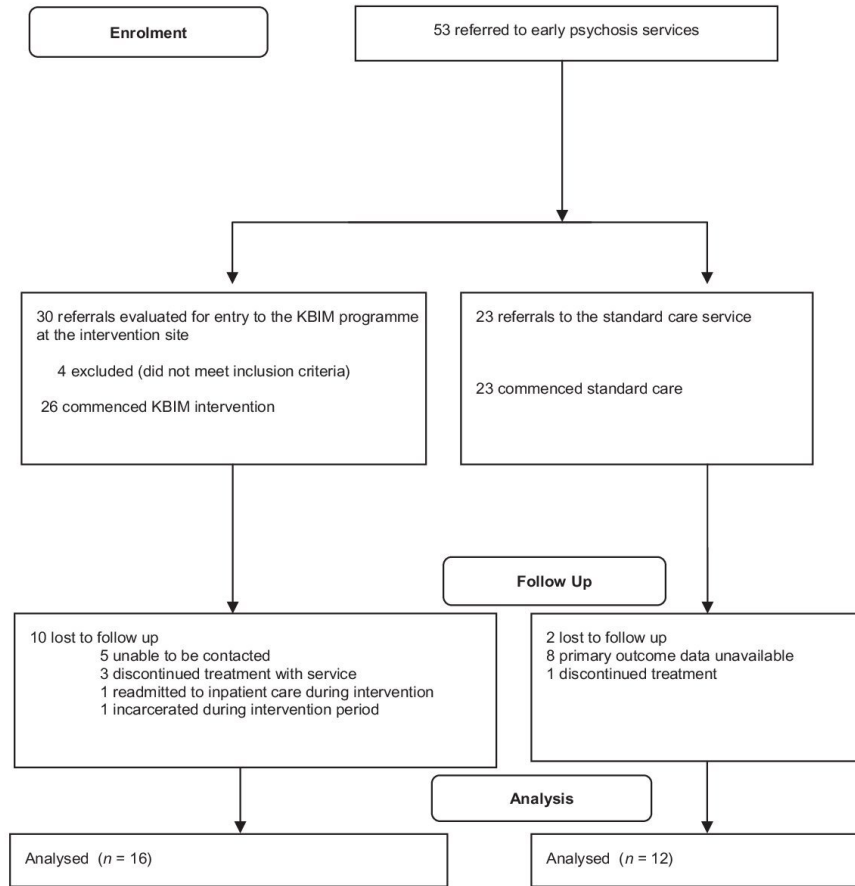
Intervention

A team that included a clinical nurse consultant, a dietician, an exercise physiologist and youth peer wellness coaches delivered the KBIM intervention. Psychiatrists (JC and MK) and an endocrinologist (KS) provided additional medication review and advice. The intervention comprised three interrelated components including health coaching, dietetic support and supervised exercise prescription, and was individualized based on best-practice recommendations in order to maximize adherence.

Health coaching

The clinical nurse consultant provided a motivational framework to assist clients with adherence. Specifically, this involved goal identification and structured motivational interviewing to maximize

FIGURE 1. Study profile.



attendance and increase motivation to participate in the intervention programme.¹⁴

Dietetic support

Weekly dietetic consultations based on the Australian Dietary Guidelines¹⁵ were offered. These focused on nutritional adequacy and energy balance to ensure requirements for key nutrients were met, while promoting energy intake restraint to prevent weight gain. The individual consultations also included education modules focused on weight management, food quality, portion control, nutrition labels, shopping lists, setting up a healthy kitchen and cooking skills. The dietician, in conjunction with a caseworker, also modelled the key skills needed to choose, purchase ingredients and

prepare healthy meals via weekly shopping tours and cooking classes held at the community health centre.

Exercise programme

The World Health Organization’s recommendations for physical activity participation¹⁶ and the American College of Sports Medicine resistance training guidelines¹⁷ were used to specify exercise programming for the KBIM intervention group. The exercise physiologist tailored individual programmes, utilizing results of baseline fitness testing, and taking into account variations in motivation, individual goals and fluctuations in psychiatric symptomatology.¹⁸ The aim of the exercise intervention was to increase physical activity participation in line with the

Keeping the body in mind

Australian Physical Activity guidelines. Given the wide range of physical activity participation at baseline assessment, interventions were tailored to ensure that the intensity and volume were challenging while maximizing enjoyment and taking into account the goals of individual participants (e.g. 60–75% of VO_2 peak for aerobic and moderate to high intensity resistance training). KBIM participants had access to a supervised gym within the community health centre, with access to treadmills, stationary bikes and resistance training equipment.

Youth peer wellness coaches

Two young people with lived experience of the impact of antipsychotic-induced weight gain participated in cooking classes and attended exercise sessions in the gym. They were both able to act as positive role models for KBIM participants, and provided motivation and encouragement for participants to maintain their engagement with the programme.

Antipsychotic medication switching

In addition to usual psychiatric care, medical staff in the intervention group reviewed clients who gained more than 5 kg following the initiation of antipsychotic treatment to consider switching to more weight neutral medication.¹⁹ At the same time, consideration was given as to whether metformin should be prescribed in addition to the KBIM-structured lifestyle intervention, according to emerging treatment recommendations,^{20,21} and whether any antipsychotic polypharmacy should be rationalized.²²

Standard care

The comparison group received standard care involving individual mental health case management with medical assessment and antipsychotic prescription based on standard clinical guidelines.²³

Outcome measures

Data were collected at baseline (upon referral to the service) and after 12 weeks of care. Body weight was measured with clients barefoot and in light street clothes to the nearest 0.1 kg. Height was measured with a stadiometer to the nearest 1 cm and BMI was calculated (weight/height squared, kg/m^2). Waist circumference was measured to the nearest 1 cm, midway between 12th rib and iliac crest. Blood pressure was measured with a sphygmomanometer with the client in the seated position and after 10-min

rest (mm Hg). Blood was collected following a 10-h overnight fast, and fasting lipid profile (high-density lipoprotein, low-density lipoprotein, triglycerides, total cholesterol) and fasting blood glucose were analysed. Blood and anthropometric measures were obtained on the same day at the standard care site. At the intervention site, blood measures were taken as soon as practicable after anthropometry, or else the most recently obtained pathology results obtained during inpatient admission were utilized.

The KBIM intervention site also administered a limited battery of clinically relevant measures including: the Rosenberg Self-Esteem Scale,²⁴ Pittsburgh Sleep Quality Index (PSQI),²⁵ Global Assessment of Functioning (GAF),²⁶ Health of Our Nation Outcome Scale (HoNOS),²⁷ Medication Adherence Rating Scale (MARS),²⁸ a food frequency questionnaire assessing nutrition status (including micro- and macronutrient intake),²⁹ and exercise capacity, including sub-maximal oxygen consumption (VO_2max)³⁰ and self-reported physical activity levels (IPAQ-SF).³¹

Statistical analyses

The impact of the KBIM intervention versus standard care on weight, BMI, waist circumference and biochemical measures was examined using repeated measures ANCOVA with between-group factor (site) and within-subject factor (time), using baseline measures as a covariate. Pearson chi-square analyses were undertaken for categorical variables. Paired-sample *t*-tests were used to compare pre- and post-intervention scores for continuous variables assessed at the intervention site only. Analyses were conducted using SPSS version 22 software package (Chicago, IL, USA). Partial eta-squared (η_p^2) effect sizes were calculated for the site by time interaction effect for the primary outcome measures.³²

RESULTS

The final sample consisted of 28 participants (17 men, 11 women) with a mean age of 20.7 years ($\text{SD} = 2.2$, range 17–25). Baseline characteristics were similar for participants at the intervention and standard care sites (Table 1), although the proportion of female participants in the intervention group was greater than in the standard care group (56% vs. 17%, $P = 0.04$). The intervention group reported tobacco use well below the rates observed in recent systematic reviews in this population,³³ while tobacco use in the standard care group was similar

TABLE 1. Baseline characteristics of 28 participants; *N* (%)

		KBIM (<i>n</i> = 16)	Standard care (<i>n</i> = 12)	Statistical test	<i>P</i> -value
Demographic					
Age	Mean (SD)	20.0 (2.3)	21.7 (1.9)	<i>T</i> = 2.1	0.05
Female		9 (56)	2 (17)	$\chi^2 = 4.5$	0.04
Ethnicity	<i>n</i> (%)				
Asian		4 (25)	5 (42)		
Indigenous		2 (13)	2 (16)	$\chi^2 = 8.2$	0.22
Caucasian		10 (62)	5 (42)		
Smoking	<i>n</i> (%)	2 (13)	5 (42)	$\chi^2 = 1.8$	0.18
DSM-IV diagnoses					
Schizophreniform	<i>n</i> (%)	9 (56)	5 (42)		
Bipolar affective disorder		4 (25)	5 (42)	$\chi^2 = 1.0$	0.79
Major depression with psychosis		2 (13)	1 (8)		
Schizophrenia		1 (6)	1 (8)		
Psychotropic medications					
Mood stabilizer	<i>n</i> (%)				
Lithium		3 (19)	1 (8)	$\chi^2 = 0.6$	0.42
Sodium valproate		1 (6)	6 (50)	$\chi^2 = 7.0$	0.01
Antipsychotic					
Risperidone		4 (25)	8 (67)	$\chi^2 = 4.9$	0.03
Quetiapine		5 (31)	0 (0)	$\chi^2 = 4.6$	0.04
Olanzapine		4 (25)	3 (25)	$\chi^2 = 0.0$	0.67
Aripiprazole		1 (6)	1 (8)	$\chi^2 = 0.0$	0.68
Paliperidone		2 (13)	0 (0)	$\chi^2 = 1.6$	0.32
Antidepressant (all classes)		4 (25)	3 (25)	$\chi^2 = 0.0$	0.67
Anthropometric and metabolic measures					
Weight (kg)	Mean (SD)	68.8 (13.6)	75.8 (18.8)	<i>T</i> = 1.2	0.26
Body mass index (BMI) (kg m ⁻²)	<i>n</i> (%)				
Normal (18.5–24.9)		10 (63)	7 (59)	$\chi^2 = 1.4$	0.5
Overweight (25–29.9)		6 (38)	4 (33)		
Obese (>30)		0 (0)	1 (8)		
Waist circumference (cm)	Mean (SD)	84.3 (10.8)	83.7 (9.1)	<i>T</i> = 0.33	0.74
'At risk' waist circumference†	<i>n</i> (%)	9 (56)	0 (0)	$\chi^2 = 9.9$	0.002
Time in service prior to baseline assessment (days)	Mean (range)	12.1 (1–24)	16.8 (4–31)	<i>T</i> = 1.5	0.15
Elevated systolic BP (≥130 mm Hg)	<i>n</i> (%)	2 (13)	4 (36) (<i>n</i> = 11)	$\chi^2 = 2.1$	0.16
Elevated diastolic BP (≥85 mm Hg)	<i>n</i> (%)	1 (6)	2 (18) (<i>n</i> = 11)	$\chi^2 = 0.9$	0.36
Low HDL (<1.03 mmol/L male; <1.29 female)	<i>n</i> (%)	4 (25)	1 (10) (<i>n</i> = 10)	$\chi^2 = 0.9$	0.34
Elevated LDL (>4.0 mmol/L)	<i>n</i> (%)	0 (0)	1 (10) (<i>n</i> = 10)	$\chi^2 = 1.7$	0.39
Elevated triglycerides (≥1.7 mmol/L)	<i>n</i> (%)	0 (0)	2 (18) (<i>n</i> = 11)	$\chi^2 = 3.1$	0.16
Impaired fasting BSL (>7.0 mmol/L)‡	<i>n</i> (%)	0 (0)	0 (0) (<i>n</i> = 10)	–	–

†Female ≥80 cm, male ≥90 cm for SE Asian, Japanese, Central or South American or ≥94 cm for Europid.

‡Missing data for *n* = 1.

BMI, body mass index; BP, blood pressure; BSL, Blood sugar level; HDL, high-density lipoprotein; IDF MetS, International Diabetic Federation metabolic syndrome; KBIM, Keeping the Body in Mind programme; LDL, low-density lipoprotein.

to that usually reported among FEP youth. At the intervention site, a minority of referrals to the community-based service were made following an inpatient admission (6/16: 38%). In contrast, the majority of referrals to the standard care service had been hospitalized prior to beginning specialized community-based care (9/12: 75%; $\chi^2 = 3.9$, *P* = 0.05), reflecting differing pathways to care in the two services.

Psychotropic medication use at baseline is shown in Table 1. Risperidone was most commonly pre-

scribed (43%, *n* = 12), followed by sodium valproate (26%, *n* = 7), olanzapine (26%, *n* = 7), quetiapine (19%, *n* = 5) and lithium (15%, *n* = 4). Site differences were evident: sodium valproate was prescribed more frequently in the standard care participants, consistent with higher rates of bipolar disorder among this group (50% vs. 6%, respectively, $\chi^2 = 7.0$, *P* = 0.01). There was more frequent prescription of quetiapine in the intervention participants (31% vs. 0%, $\chi^2 = 4.6$, *P* = 0.04) and risperidone in the standard care participants (67%

vs. 25%, $\chi^2 = 4.9$, $P = 0.03$); however, these two antipsychotics have similar propensity for weight gain¹⁹ and their differential use at the two sites was unlikely to influence the primary outcomes. Only limited changes in antipsychotic medication prescribing were documented in the KBIM intervention participants during the 12-week intervention. Eight participants (50%) had no change in medication, and one participant was switched from olanzapine to risperidone at week 5 due to lack of efficacy for psychotic symptoms. Changes in antipsychotic dosage occurred in the remaining participants (25% decreased, 19% increased) during the course of the intervention. There was no antipsychotic polypharmacy at either site during the 12-week follow-up period.

Baseline weight, waist circumference and BMI were similar in the intervention and standard care groups (Table 1). Baseline BMI was normal in the majority of participants; however, 32% had waist circumferences that met the International Diabetes Federation at-risk criteria,³⁴ all of whom were in the intervention group. Mean participation rates in the individual components of the KBIM intervention were 8 dietary sessions (range = 5–10) and 11 supervised exercise sessions (range = 3–25).

The KBIM intervention resulted in substantially lower weight gain compared to standard care (1.8 kg (95% CI -0.4 to 2.8) vs. 7.8 kg (4.8–10.7), Site \times Time interaction, $F(1, 25) = 19.6$, $P < 0.001$, $\eta_p^2 = 0.44$) (see Table 2). There was no significant change in BMI in the KBIM intervention group (0.4 kg m⁻² (-0.1–0.9)) while there was a significantly greater increase in BMI with standard care (2.6 kg m⁻² (1.6–3.6), Site \times Time interaction, $F(1, 25) = 23.3$, $P < 0.001$, $\eta_p^2 = 0.48$). There was a non-significant increase in waist circumference of 0.1 cm (-2.1 to 2.2) in the KBIM intervention group; in contrast, there was a significant waist circumference increase with standard care (7.1 cm (4.8–10.7), Site \times Time interaction, $F(1, 25) = 22.4$, $P < 0.001$, $\eta_p^2 = 0.47$).

The rate of clinically significant weight gain, defined as >7% of baseline weight, was 13% in the KBIM intervention, compared to 75% in standard care ($\chi^2 = 11.2$, $P = 0.001$). Figure 2 illustrates the individual patterns of weight change in all participants. As sodium valproate prescribing was significantly more frequent in the standard care group, and has been linked with increased weight in youth with FEP,³⁵ we addressed the potential impact of the use of valproate on this measure by examining individual changes in weight among those prescribed sodium valproate compared to the rest of the sample in which this medication was not used. This demonstrated that the significant weight increase

TABLE 2. Mean within-group change and repeated measures ANOVA

Mean (SD)	KBIM (n = 16)				Standard care (n = 12)				Repeated measures ANCOVA	
	Pre		Post		Pre		Post		Mean within-group change (95% CI)	Site \times Time interaction
	Pre	Post	Pre	Post	Pre	Post	Pre	Post		
Weight (kg)	68.8 (13.6)	69.9 (13.9)	1.8 (-0.4 to 2.8)	75.8 (18.8)	83.6 (19.0)	7.8 (4.8–10.7)**	$F(1, 25) = 19.6$ ($P < 0.001$)			
BMI (kg m ⁻²)	23.5 (3.2)	23.9 (3.2)	0.4 (-0.1 to 0.9)	24.8 (3.3)	27.4 (3.1)	2.6 (1.6–3.6)**	$F(1, 25) = 23.3$ ($P < 0.001$)			
Waist circumference (cm)	84.3 (10.8)	84.4 (10.3)	0.1 (-2.1 to 2.2)	83.0 (9.1)	90.1 (9.4)	7.1 (4.8–9.4)**	$F(1, 25) = 22.4$ ($P < 0.001$)			
Systolic blood pressure (mm Hg)	116.8 (11.6)	116.1 (5.8)	-0.6 (-6.1 to 4.8)	*	*	-	-			
Diastolic blood pressure (mm Hg)	73.9 (7.7)	70.8 (5.3)	-3.1 (-6.5 to 0.3)	*	*	-	-			
HDL cholesterol (mmol/L)	1.4 (0.2)	1.4 (0.4)	0.1 (-0.1 to 0.2)	1.4 (0.4)†	1.3 (0.3)†	-0.1 (-0.3 to 0.2) NS	$F(1, 22) = 1.4$			
LDL cholesterol (mmol/L)	2.7 (0.9)	2.7 (0.9)	0.0 (-0.3 to 0.3)	2.5 (1.0)†	2.6 (0.9)†	0.0 (-0.6 to 0.7) NS	$F(1, 22) = 0.0$			
Triglyceride (mmol/L)‡	0.85 (0.3)	0.86 (0.4)	0.0 (-0.2 to 0.2)	1.1 (0.7)§	1.4 (1.1)§	0.3 (-0.5 to 1.0) NS	$F(1, 23) = 1.6$			
Total cholesterol (mmol/L)	4.4 (1.1)	4.5 (1.1)	0.1 (-0.3 to 0.6)	4.3 (1.0)§	4.5 (1.1)§	0.2 (-0.2 to 0.7) NS	$F(1, 23) = 0.1$			
Glucose (mmol/L)	4.8 (0.4)¶	4.8 (0.4)¶	-0.1 (-0.3 to 0.2)	4.7 (0.4)¶	5.1 (0.8)¶	0.4 (-0.2 to 0.9) NS	$F(1, 23) = 2.5$			

*Data not available for post-test blood pressure in the standard care group, so both pretest and post-test data on blood pressure are omitted. ** $P < 0.001$.

† $n = 9$.

‡Site $F(1, 23) = 7.9$, $P = 0.01$; when covaried for baseline weight, the group difference for triglycerides was no longer statistically significant ($P = 0.12$).

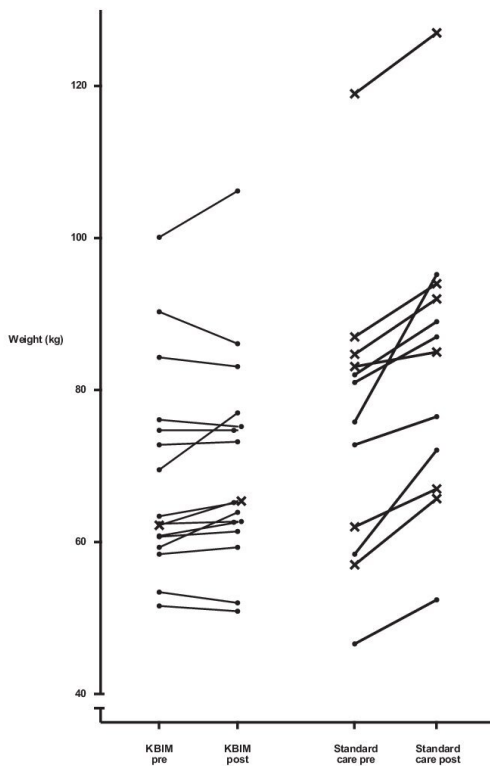
§ $n = 10$.

¶ $n = 15$.

‡‡ $n = 11$.

BMI, body mass index; HDL, high-density lipoprotein; LDL, low-density lipoprotein; NS, non-significant.

FIGURE 2. Individual scatter plot for weight at baseline and 12-week follow up for KBIM (left panel) and standard care (right panel) participants. (X) Participant prescribed sodium valproate. [Correction added on 22 May 2015, after first online publication: Figure 2 has been corrected to show the accurate number of participants who received sodium valproate at both KBIM and standard care sites.]



that was observed in the standard care group was evident across the entire cohort, not only in those participants who were prescribed sodium valproate. Metformin was not prescribed for any of the KBIM intervention participants.

There was no significant change in fasting lipids or glucose in either group, despite the standard care group experiencing clinically significant weight and waist circumference gains.

Additional outcome measures in KBIM participants

Table 3 reports the pre-, post- and mean within-group change for outcomes assessed only at the KBIM site. Significant improvements in functional and clinical outcome measures were observed (GAF: 16.1 (12.3–19.8); $P < 0.001$; HoNOS: -3.8 (-7.1

to -0.5); $P < 0.05$) along with improved self-reported sleep quality (PSQI: -1.6 (3.1 to -0.1); $P < 0.05$). There was a clinically significant reduction in energy consumption (-507.9 kcal/day (95% CI -751.6 to -264.2); $P < 0.001$), while aerobic capacity (VO_2 max; 4.2 mL kg⁻¹ min⁻¹ (1.3–7.2); $P < 0.01$) and self-reported minutes of physical activity per week (IPAQ-SF: 1239.2 min/week (243.7–2234.6); $P < 0.05$) increased significantly. No statistically significant changes were observed for self-rated self-esteem (Rosenberg Self-Esteem Scale) or medication adherence (MARS).

DISCUSSION

The KBIM intervention was effective in attenuating weight gain in youth receiving antipsychotic medication for FEP over 12 weeks, with only 13% of the participants experiencing clinically significant weight gain. In contrast, the majority (75%) of participants who received standard care gained a clinically significant amount of weight and had markedly increased waist circumference over the same time period, consistent with results seen in previous studies of FEP youth receiving standard care.³ Despite the relatively small numbers of participants for whom follow-up data were available at both sites, the magnitude of the intervention effect was large, as indicated by the substantial percentage of variance in primary outcome measures that was accounted for by the significant Site \times Time interactions (44–48%). The KBIM intervention, while it included individualized education and advice for healthy eating and physical activity, additionally supported lifestyle change through life skills acquisition. For example, we employed group-based cooking and shopping activities that demonstrated how to purchase and prepare meals using healthy, affordable ingredients.

There was no significant change in fasting lipids or glucose in either group at 12 weeks, despite clinically significant weight and waist circumference increases occurring in the standard care participants. Our findings differ from prior studies that show early glucose homeostasis dysregulation and blood glucose and/or blood lipid changes after short-term antipsychotic treatment with second-generation antipsychotic medications.^{6,36} The absence of such changes in our data may reflect lower sensitivity to the metabolic effects of antipsychotics in a youth sample compared to a younger cohort,⁶ and/or the less frequent use of antipsychotics with greater weight gain propensity (e.g. olanzapine) in the current study.

TABLE 3. Additional outcome measures only assessed in the KBIM group (*n* = 16)

	Mean (SD)		Mean change (95% CI)	Paired samples <i>t</i> -test
	Pre	Post		
Global Assessment of Functioning (GAF)	54.6 (7.8)	70.7 (9.9)	16.1 (12.3–19.8)	<i>t</i> (15) = 9.0***
Health of our Nation Outcome Scale (HoNOS)	9.9 (3.4)	6.1 (5.4)	–3.8 (–7.1 to –0.5)	<i>t</i> (15) = 2.5*
PSQI Sleep Quality (0–21)	7.7 (3.6)	6.1 (2.3)	–1.6 (–3.1 to –0.1)	<i>t</i> (15) = 2.3*
Energy intake (kcal/day)	2015.7 (535.8)	1507.8 (471.5)	–507.9 (–751.6 to –264.2)	<i>t</i> (15) = 4.4***
VO ₂ (relative) (mL kg ^{–1} min ^{–1})	30.6 (6.5) [%]	34.9 (9.1) [%]	4.2 (1.3–7.2)	<i>t</i> (13) = 3.1**
MET min/week [%] (IPAQ-SF)	788.4 (655.0)†	2027.6 (1740.0)†	1239.2 (243.7–2234.6)	<i>t</i> (14) = 2.7*
Rosenberg Self-Esteem Scale (0–30)	18.4 (6.9)	19.1 (5.4)	0.7 (–1.4 to 2.8)	<i>t</i> (15) = 0.7
Medication adherence (MARS: 0–10)	7.9 (1.9)	8.3 (1.8)	0.4 (–0.4 to 1.2)	<i>t</i> (15) = 0.3

P* < 0.05; *P* < 0.01; ****P* < 0.001.

†*n* = 15 due to one man having physical injury limiting PA participation.

[%]*n* = 14 due to one man having physical injury limiting PA participation and one woman not completing follow-up VO₂ assessment.
KBIM, Keeping the Body in Mind programme.

The KBIM participants also experienced significant improvements in the specific outcomes targeted by the intervention: total energy intake was significantly reduced, while improvements were seen in aerobic fitness and self-reported physical activity. The improvement in self-reported sleep quality is consistent with studies in other populations that found a significant impact of exercise on sleep quality³⁷; however, the pragmatic ‘real-world’ nature of this evaluation does not enable us to attribute this improvement to the specific elements of the KBIM intervention.

Limited changes in psychotropic medication use occurred during the KBIM intervention, suggesting that such changes were unlikely to account for the non-significant weight gain at the intervention site. There was no significant change in the relatively high levels of medication adherence recorded at baseline and follow-up assessments, so that variation in adherence was unlikely to have contributed to the positive outcomes in the intervention group.

As a real-world study, the use of antipsychotics at both sites reflected the practice of the prescribers. While clinicians in the specialist community-based FEP services aimed to avoid the use of antipsychotic medications with a high potential for weight gain, young people were frequently commenced on antipsychotic, mood stabilizer and antidepressant drug regimens with high weight gain potential while admitted to acute inpatient units. The rate of antidepressant prescription was similar across both sites, and it is unlikely that the use of antidepressants made a substantial contribution to the differential outcomes for weight, waist circumference and BMI described in the manuscript.

Higher rates of overweight and obesity have been observed in women compared with men with FEP;³⁸ so that a greater propensity for weight gain in the

KBIM intervention sample, where the proportion of women was higher than in the standard care group, may have been predicted. This was not the case, with only one female and one male KBIM participant experiencing clinically significant weight gain during the 12-week follow-up period. Attrition rates were similar for the two sites (KBIM intervention: 62%; standard care: 52%), and reflect the challenges frequently experienced in establishing and maintaining engagement during FEP treatment.³⁹

The current study was a pragmatic evaluation of a novel intervention, delivered in one service setting, with comparison data obtained from another early intervention service providing guideline-based best-practice standard care without the additional specialist lifestyle intervention components. It is possible that sociodemographic differences exist between the populations from which each service drew its clients, which may have impacted the results obtained. It is important to note that the anthropometric changes observed at 12 weeks in those receiving standard care were consistent with results seen in previous systematic reviews.⁴⁰

Early weight gain and increased cardiometabolic risk factors will seed future poor health outcomes in youth with psychosis^{4,6,7} unless effective interventions are implemented. International initiatives to achieve parity in physical health expectations for young people with psychosis have been developed and outlined in the Healthy Actives Lives (HeAL) declaration (<http://www.iphys.org.au>). The HeAL declaration specifies targets that address antipsychotic-induced weight gain, poor nutrition, low levels of physical activity and high rates of tobacco use. It is notable that the low rate of clinically significant weight gain in the KBIM intervention sample at 12 weeks (13%) exceeds the target proposed in the HeAL declaration for weight gain

over the first 2 years of treatment (25% or less). Questions that need to be addressed in further longitudinal follow-up studies include how to minimize weight gain over the longer term, and what intensity of lifestyle intervention support is needed to maintain positive cardiometabolic health in youth with FEP.

Additional resources were required to deliver the KBIM; however, the benefits that were obtained were not limited to the primary and secondary outcomes described in this evaluation. The greater degree of engagement with the service that participants described and mental health staff confirmed⁴¹ should translate into better outcomes in terms of symptom control and psychosocial functioning.

In summary, a 12-week combined lifestyle and life skills intervention attenuated antipsychotic-induced weight gain in youth with FEP. Asking mental health clinicians to provide information about diet and exercise may be insufficient to prevent the substantial weight gain and decline in cardiometabolic health associated with antipsychotic use. Implementing effective lifestyle and life skills interventions from the initiation of treatment as part of routine care in youth with FEP may be a critical step in reducing the life expectancy gap for people living with serious mental illness.

CONTRIBUTORS

JC, KS and PBW obtained funding. JC, KS and PBW designed the study with input from AW, SR and ST. JC, MK and KS provided clinical supervision. AW, SR and ST collected data. SR, ST and PBW analysed the data. JC, KS and PBW led data interpretation. JC, KS and PBW led manuscript preparation with input from SR, AW and ST. All authors contributed to successive drafts.

ACKNOWLEDGEMENTS

The authors would like to acknowledge Ida-Marie Samuel, Tim Mar, Ramesh Vannitamby and the Liverpool-Fairfield Early Psychosis Intervention Program, South Western Sydney Local Health District, for their support in collecting data from the standard care site, and Julio de la Torre and Janelle Abbott for their participation as peer wellness coaches in the Keeping the Body in Mind intervention programme. Funding was provided by a research grant from the Mental Health and Drug & Alcohol Office (MHDAO), Ministry of Health, NSW, North Sydney, Australia.

REFERENCES

1. Thornicroft G. Premature death among people with mental illness. *BMJ* 2013; **346**: f2969.
2. Brown S, Kim M, Mitchell C, Inskip H. Twenty-five year mortality of a community cohort with schizophrenia. *Br J Psychiatry* 2010; **196**: 116–21.
3. Alvarez-Jimenez M, Hetrick SE, Gonzalez-Blanch C, Gleeson JF, McGorry PD. Non-pharmacological management of antipsychotic-induced weight gain: systematic review and meta-analysis of randomised controlled trials. *Br J Psychiatry* 2008; **193**: 101–7.
4. Foley DL, Morley KI. Systematic review of early cardiometabolic outcomes of the first treated episode of psychosis. *Arch Gen Psychiatry* 2011; **68**: 609–16.
5. Perez-Iglesias R, Martinez-Garcia O, Pardo-Garcia G et al. Course of weight gain and metabolic abnormalities in first treated episode of psychosis: the first year is a critical period for development of cardiovascular risk factors. *Int J Neuropsychopharmacol* 2014; **17**: 41–51.
6. Correll CU, Manu P, Olshansky V, Napolitano B, Kane JM, Malhotra AK. Cardiometabolic risk of second-generation antipsychotic medications during first-time use in children and adolescents. *JAMA* 2009; **302**: 1765–73.
7. Mitchell AJ, Vancampfort D, De Herdt A, Yu W, De Hert M. Is the prevalence of metabolic syndrome and metabolic abnormalities increased in early schizophrenia? A comparative meta-analysis of first episode, untreated and treated patients. *Schizophr Bull* 2013; **39**: 295–305.
8. Curtis J, Newall HD, Samaras K. The heart of the matter: cardiometabolic care in youth with psychosis. *Early Interv Psychiatry* 2012; **6**: 347–53.
9. Pringsheim T, Panagiotopoulos C, Davidson J, Ho J, Group Cg. Evidence-based recommendations for monitoring safety of second generation antipsychotics in children and youth. *J Can Acad Child Adolesc Psychiatry* 2011; **20**: 218–33.
10. Abdel-Baki A, Brazzini-Poisson V, Marois F, Letendre E, Karelis AD. Effects of aerobic interval training on metabolic complications and cardiorespiratory fitness in young adults with psychotic disorders: a pilot study. *Schizophr Res* 2013; **149**: 112–5.
11. Alvarez-Jiménez M, Martínez-García O, Pérez-Iglesias R, Ramírez ML, Vázquez-Barquero JL, Crespo-Facorro B. Prevention of antipsychotic-induced weight gain with early behavioural intervention in first-episode psychosis: 2-year results of a randomized controlled trial. *Schizophr Res Treatment* 2010; **116**: 16–9.
12. Lovell K, Wearden A, Bradshaw T et al. An exploratory randomized controlled study of a healthy living intervention in early intervention services for psychosis: the INTERvention to encourage ACTivity, improve diet, and reduce weight gain (INTERACT) study. *J Clin Psychiatry* 2014; **75**: 498–505.
13. Daumit GL, Dickerson FB, Wang N-Y et al. A behavioral weight-loss intervention in persons with serious mental illness. *NEJM* 2013; **368**: 1594–602.
14. Rollnick S, Miller WR. What is motivational interviewing? *Behav Cogn Psychoth* 1995; **23**: 325–34.
15. National Health and Medical Research Council. *Australian Dietary Guidelines*. Canberra: National Health and Medical Research Council (Australia), 2013. Contract No.: Document Number.
16. World Health Organization. *Global Recommendations on Physical Activity for Health*. Geneva: World Health Organization, 2010.
17. Ratamess NA, Alvar BA, Evetoch TK et al. ACSM position stand: progression models in resistance training for healthy adults. *Med Sci Sports Exer* 2009; **41**: 687–708.

Keeping the body in mind

18. Rosenbaum S, Tiedemann A, Sherrington C, Curtis J, Ward PB. Physical activity interventions for people with mental illness: a systematic review and meta-analysis. *J Clin Psychiatry* 2014; **75**: 964–74.
19. Leucht S, Cipriani A, Spineli L et al. Comparative efficacy and tolerability of 15 antipsychotic drugs in schizophrenia: a multiple-treatments meta-analysis. *Lancet* 2013; **382**: 951–62.
20. Curtis J, Newall H, Myles N, Shiers D, Samaras K. Considering metformin in cardiometabolic protection in psychosis. *Acta Psychiatr Scand* 2012; **126**: 302–3.
21. Taylor D. Metformin for schizophrenia. *Acta Psychiatr Scand* 2012; **126**: 233–4.
22. Correll CU, Gallego JA. Antipsychotic polypharmacy: a comprehensive evaluation of relevant correlates of a long-standing clinical practice. *Psychiatr Clin N Am* 2012; **35**: 661–81.
23. Early Psychosis Guidelines Writing Group. *Australian Clinical Guidelines for Early Psychosis*, 2nd edn. Melbourne, Vic: Orygen, 2010.
24. Rosenberg M. Rosenberg self-esteem scale (RSE). 1965: 61.
25. Buysse DJ, Reynolds CF, Monk TH, Berman SR, Kupfer DJ. The Pittsburgh Sleep Quality Index: a new instrument for psychiatric practice and research. *Psychiatry Res* 1989; **28**: 193–213.
26. Hall RC. Global assessment of functioning: a modified scale. *Psychosomatics* 1995; **36**: 267–75.
27. Wing JK, Beevor AS, Curtis RH, Park SB, Hadden S, Burns A. Health of the Nation Outcome Scales (HoNOS). Research and development. *Br J Psychiatry* 1998; **172**: 11–8.
28. Thompson K, Kulkarni J, Sergejew A. Reliability and validity of a new Medication Adherence Rating Scale (MARS) for the psychoses. *Schizophr Res* 2000; **42**: 241–7.
29. Ireland P, Jolley D, Giles G et al. Development of the Melbourne FFQ: a food frequency questionnaire for use in an Australian prospective study involving an ethnically diverse cohort. *Asia Pac J Clin Nutr* 1994; **3**: 19–31.
30. Balady GJBK, Golding LA, Gordon NF, Mahler DA, Myers JN. *ACSM's Guidelines for Exercise Testing and Prescription*. Philadelphia, PA: Lippincott Williams & Wilkins, 2000.
31. Craig C, Marshall A, Sjoström M et al. International physical activity questionnaire: 12-country reliability and validity. *Med Sci Sports Exer*. 2003; **35**: 1381–95.
32. Cohen J. *Statistical Power Analysis for the Behavioral Sciences*. New York: Lawrence Erlbaum, 1988.
33. Myles N, Newall HD, Curtis J, Nielsens O, Shiers D, Large M. Tobacco use before, at, and after first-episode psychosis: a systematic meta-analysis. *J Clinical Psychiatry* 2012; **73**: 468–75.
34. Alberti KG, Zimmet P, Shaw J, Inskip H. The metabolic syndrome – a new worldwide definition. *Lancet* 2005; **366**: 1059–62.
35. Correll CU, Carlson HE. Endocrine and metabolic adverse effects of psychotropic medications in children and adolescents. *J Am Acad Child Adolesc Psychiatry* 2006; **45**: 771–91.
36. Wu RR, Zhao JP, Liu ZN et al. Effects of typical and atypical antipsychotics on glucose-insulin homeostasis and lipid metabolism in first-episode schizophrenia. *Psychopharmacology (Berl)* 2006; **186**: 572–8.
37. Youngstedt SD Effects of exercise on sleep. *Clin Sports Medic* 2005; **24**: 355–65.
38. Verma S, Liew A, Subramaniam M, Poon LY. Effect of treatment on weight gain and metabolic abnormalities in patients with first-episode psychosis. *Aust N Z J Psychiatry* 2009; **43**: 812–7.
39. Doyle R, Turner N, Fanning F et al. First-episode psychosis and disengagement from treatment: a systematic review. *Psych Serv* 2014; **65**: 603–11.
40. Alvarez-Jimenez M, Gonzalez-Blanch C, Crespo-Facorro B et al. Antipsychotic-induced weight gain in chronic and first-episode psychotic disorders: a systematic critical reappraisal. *CNS Drugs* 2008; **22**: 547–62.
41. Watkins APJ, Curtis J, Rosenbaum S et al. 'Seeing the Doc at 11am, cooking group at midday, and hitting the gym at 2pm'. Patient and staff perspectives of an embedded lifestyle intervention within an early psychosis programme. *Early Interv Psychiatry* 2014; **8**: 32.






Appendix 4 – Changing health workforce attitudes to promote improved physical health in mental health service users: Keeping our Staff in Mind (KoSiM).

This is the ‘parent’ study related to chapter 6. It includes detail around the intervention and quantitative results from the study.

Publication reference

Rosenbaum S, Ward PB, Baldeo R, Fibbins H, Jarman R, Lederman O, Perram A, Poole J, Rossimel E, Smith G, Teasdale S. Changing health workforce attitudes to promote improved physical health in mental health service users: Keeping our Staff in Mind (KoSiM). *Health Promotion Journal of Australia*. 2020 Sep;31(3):447-55.

Changing health workforce attitudes to promote improved physical health in mental health service users: Keeping our Staff in Mind (KoSiM)

Simon Rosenbaum^{1,2}   | Philip B. Ward^{2,3}  | Rishi Baldeo¹ | Hamish Fibbins¹ |
Rebecca Jarman¹ | Oscar Lederman¹ | Amy Perram¹ | Josephine Poole¹ |
Elisa Rossimel¹ | Gabriella Smith¹ | Scott Teasdale^{1,2}  | Tammy Wade¹ |
Andrew Watkins¹ | Annette White¹ | David Pearce⁴ | Jackie Curtis^{1,2,4} 

¹Keeping the Body in Mind Program, South Eastern Sydney Local Health District, Sydney, NSW, Australia

²School of Psychiatry, UNSW, Sydney, NSW, Australia

³Schizophrenia Research Unit, Ingham Institute of Applied Medical Research, Liverpool, NSW, Australia

⁴District Mental Health, South Eastern Sydney Local Health District, Kogarah, NSW, Australia

Correspondence

Jackie Curtis, Clinical Director, Youth Mental Health, South Eastern Sydney Local Health District, The Bondi Centre, 26 Llandaff Street, Bondi Junction, 2022 NSW, Australia.
Email: jackie.curtis@health.nsw.gov.au

Funding information

This project was funded by the District Mental Health program; South Eastern Sydney Local Health District, Sydney.

Handling Editor: Jenni Judd

Abstract

Issue addressed: People living with mental illness die on average 15 years earlier than the general population, primarily due to preventable and premature cardiovascular disease. Lifestyle interventions can be effective in reducing cardiovascular risk, yet mental health services do not routinely provide targeted lifestyle interventions. Exposing mental health staff to lifestyle interventions prior to targeting patients may be critical to changing culture and improving patient outcomes. This study aimed to improve the physical health of mental health staff through a targeted lifestyle intervention.

Methods: A pragmatic single-arm intervention study was conducted in a public mental health service, including inpatient and community settings, in Sydney, Australia. Participants in this study were $n = 212$ clinical and non-clinical staff. A five-session individualised lifestyle intervention (delivered over 5 weeks) incorporating physical activity and nutritional counselling was delivered by multidisciplinary teams. Participants were assessed at baseline, following the intervention, and at follow-up (mean = 16.7 weeks). The primary outcome was the barriers, attitudes, knowledge and confidence regarding screening, promoting and intervening to improve physical health outcomes of patients (M-BACK questionnaire). Secondary outcomes included anthropometric measures, cardiorespiratory fitness, sedentary time and nutritional intake. Repeated measures ANCOVAs were performed.

Results: A total of 212 staff (79% female) participated in this study. M-BACK total score significantly increased from baseline to follow-up ($P < .001$). Waist circumference,

Human Rights: All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards. Ethical approval: The study protocol was approved by the South Eastern Sydney Local Health District Human Research Ethics Committee (HREC 15/054).

Informed Consent: Informed consent was obtained from all individual participants included in the study.

This article does not contain any studies with animals performed by any of the authors.

sedentary time and total energy intake all significantly decreased (all P 's < .001) and cardiorespiratory fitness significantly increased (P < .001).

Conclusion: A brief lifestyle intervention for staff of a public mental health service may increase the capability of the participants to improve their own physical health.

So what? Improving staff health may be an important strategy in improving the uptake and/or the effectiveness of lifestyle interventions targeting mental health service users.

KEYWORDS

health workforce wellness, lifestyle intervention, mental health staff, mental illness, physical health, staff

1 | INTRODUCTION

People with severe mental illness (SMI) have a two-fold increased risk of metabolic syndrome and are at significantly higher risk of cardiovascular disease (CVD) and CVD-related mortality.^{1,2} Clearly, this vulnerable population are failing to benefit from advancements in CVD detection, prevention and treatment equating to a mortality rate 3.5 times that of the general population³ or 14.5 years of lost life.⁴

The cause is multifactorial, involving multiple modifiable risk factors, including antipsychotic medication, smoking, unhealthy dietary intake and low levels of physical activity.⁵ Recognition of this *scandal of premature mortality*⁶ has led to multiple "calls-to-action" regarding the need for novel interventions,⁷ including a recent Lancet Commission on protecting the physical health of people with mental illness.⁵

The evidence for lifestyle interventions including diet⁸ and exercise⁹ is increasingly clear, yet the number of real-world effectiveness/implementation studies remains limited.¹⁰ Bartels and colleagues (2015) identified major barriers within mental health services to implementing interventions aiming to reduce premature mortality, citing funding, competing priorities and lack of integration of health promotion into routine practice.¹¹ Leadership buy-in, staff interest, high service user demand and organisational culture were among the key facilitators to successful implementation.¹¹

Staff culture regarding health promotion appears to be critical, with the evidence that health professionals personally engaged in healthy lifestyle behaviours (such as physical activity) are more likely to promote such behaviour among service users.¹² This inherent relationship between staff physical health and the promotion of positive lifestyle behaviours among service users makes interventions targeting the physical health of mental health staff a novel target for intervention with potential implications for improving service user outcomes. A 2018 systematic review investigated whether staff-focused physical health interventions were feasible and acceptable within mental health settings.¹³ The review identified a dearth of high-quality research, yet concluded that there was reason to be

optimistic regarding the utility of staff-focused interventions.¹³ A 2008 cluster randomised controlled trial (RCT) conducted in Sweden found a modest impact of a combined staff and patient intervention,¹⁴ and concluded that health professionals who are in regular contact with service users play a key role in promoting awareness of healthy lifestyles and the positive impact on cardiometabolic health.¹⁴ A subsequent cluster RCT found that a 1 body mass index (BMI) unit change in staff BMI was associated with a 0.94 BMI unit change in patients.¹⁵ Based on these preliminary studies, initiatives to improve staff health may impact staff behaviour and attitudes regarding the efficacy of lifestyle interventions. This may then lead to changes in therapeutic practice, prioritising discussion and education regarding positive lifestyle behaviours, and the introduction of formal and non-formal interventions like regular walking groups for patients in their care.

We previously demonstrated that antipsychotic-induced weight gain in young people with first episode psychosis could be attenuated through an individualised lifestyle and life-skills interventions ("Keeping the Body in Mind program"¹⁶). Prior to expanding this clinical program throughout the mental health service, and given the established importance of staff culture¹⁷ and well-being on patient outcomes, we evaluated the impact of a targeted lifestyle intervention offered to all mental health service staff. The project, called "Keeping our Staff in Mind" (KoSiM), engaged staff in an individualised lifestyle intervention, prior to the roll out of the program to patients of the mental health service. Therefore, the aim of this study was to determine whether a lifestyle intervention provided to mental health staff and comparable to that provided to patients would (a) improve staff attitudes, knowledge and confidence regarding lifestyle interventions for patients and (b) improve staff physical health.

2 | METHODS

A single-arm, open trial with assessments pre-post (5-week) and follow-up (16-week) was conducted across three mental health treatment settings in Sydney, Australia. The study was approved by

the South Eastern Sydney Local Health District Human Research Ethics Committee (HREC 15/054). All participants provided written informed consent.

2.1 | Procedures and participants

Recruitment to the study occurred through an online staff survey. All mental health staff ($n = 702$) (including clinical and non-clinical staff) received two separate email invitations from the Director of Operations, District Mental Health, inviting them to complete the voluntary online survey. The survey assessed staff physical health, their knowledge and confidence in providing physical health interventions for patients, as well as perceived barriers to delivering physical health interventions. Responses were anonymous; however, staff had the opportunity at the end of the survey to self-refer to the KoSiM intervention. Those indicating willingness to participate were followed-up by the research team to obtain written informed consent and arrange baseline assessment. The first wave of recruitment for the intervention study began in April 2015, with participant recruitment concluding in October 2015. Interventions were delivered by three clinical teams, each comprising a clinical nurse consultant (CNC) with metabolic expertise, an exercise physiologist and a dietitian.

A second wave of recruitment occurred when a fourth clinical team, also comprising a CNC with metabolic expertise, an exercise physiologist and a dietitian, was appointed in 2016. These clinicians were tasked with repeating the KoSiM intervention with mental health staff who had not participated in wave 1 of the study. As a result, the intervention was delivered to participants by different clinicians in wave 1 and wave 2.

2.2 | Intervention

Staff who consented to participate were offered a five-session, individualised lifestyle program delivered by a CNC, dietitian and an exercise physiologist. Staff participants completed an initial consultation with a clinician from each of the three disciplines and participated in an individualised lifestyle and goal-setting intervention in line with best-practice, evidence-based interventions.¹⁸⁻²⁰

Clinical nurse consultant initial assessments consisted of a brief introduction to the KoSiM program, goal setting and motivational interviewing. Anthropometric measures including height, waist circumference, body weight and blood pressure were measured by the CNC, and participants completed the Pittsburgh Sleep Quality Index, Fagerstrom Test for Nicotine Dependence and Metabolic-Barriers, Attitudes, Confidence and Knowledge Questionnaire.

Initial assessment with the dietitian included a comprehensive nutrition assessment using 7-day food diary or diet history followed by individualised education and goal setting. An initial assessment with the exercise physiologist comprised a comprehensive physical activity history that included goal setting and

tailored education. Current physical activity levels were recorded and baseline exercise capacity was assessed. To exclude any potential participants with exercise contraindications, all participants completed the Physical Activity Readiness Questionnaire (PAR-Q) before completing the exercise assessment. Following initial assessment, staff participants were offered four weekly follow-up consultations of up to 60 minutes with the exercise physiologist or dietitian, depending on their personal choice and identified needs (participants could combine/alternate their appointments based on their preference).

2.3 | Outcome measures

The primary outcome (M-BACK), body weight and waist circumference were assessed at baseline, following the completion of the intensive intervention (approximately 5 weeks after the baseline assessment), and at follow-up assessment scheduled to occur approximately 16 weeks after the baseline assessment. Secondary outcomes including dietary intake, self-reported physical activity levels and exercise capacity were assessed at baseline and follow-up only.

2.3.1 | Metabolic-barriers, attitudes, confidence, and knowledge questionnaire (M-BACK)

The primary outcome measure was the M-BACK questionnaire, which was designed specifically for use in mental health settings to determine health professionals' views on metabolic monitoring and interventions. The questionnaire comprises 16-items separated into four domains (barriers, attitudes, confidence and knowledge). Each item is scored on a 5-point Likert scale ranging from "Strongly Disagree" to "Strongly Agree". Each domain is composed of four items and scored out of 20, with a minimum score of 4 and a maximum score of 20. Total score for the questionnaire is 80, with a minimum of 16. The M-BACK has been found to be a valid and reliable tool.²¹

2.3.2 | Cardiometabolic health assessments

Body weight, BMI, waist circumference and blood pressure were assessed at all three time points. Waist circumference was measured at the level of the umbilicus. Blood pressure was taken with the participant in a seated position using a calibrated sphygmomanometer.

2.3.3 | Dietary intake

The Dietary Questionnaire for Epidemiological Studies (DQES), a validated semi-quantitative Food Frequency Questionnaire assessing dietary intake over the prior 3 months, was self-completed at baseline and at 16 weeks for wave 1 participants.²² The Nutritional

Assessment Office, Cancer Council of Victoria, undertook analysis of DQES forms.

For wave 2, the dietitian assessed baseline dietary intake via a comprehensive diet history,²³ a recognised acceptable method accounting for usual intake and variation. A food checklist was included to ensure all food categories were evaluated. Diet histories provided information on the frequency, and amount, of intake of various foods, including the typical makeup of meals.²⁴ Diet histories were completed in a private consulting room, conducive to individualised assessment, lasting approximately 30-60 minutes. Participants from both waves were also requested to complete 7-day food diaries prior to the initial assessment to further assist nutrition assessment.

2.3.4 | Physical activity levels

The International Physical Activity Questionnaire (IPAQ)-short form²⁵ was used to assess self-reported levels of physical activity. The IPAQ asks participants to recall duration of vigorous-intensity activity, moderate-intensity activity, walking and sedentary or sitting time over the previous 7 days.

2.3.5 | Exercise capacity

The Astrand-Ryhming Test is a single-stage cycle ergometer test designed to elicit a steady state heart rate over a 6-minute period, following a 3-minute warm-up.

Initial workload was determined according to the Astrand test loading wattage table, and heart rate was recorded at every minute interval as per the Astrand protocol using a Monkark chest strap heart rate monitor. Oxygen uptake (VO₂) was estimated using the Astrand-Ryhming gender-sensitive nomogram.²⁶ Results were then normalised to age.

2.4 | Data analysis

Baseline characteristics are reported in Table 1 and Chi-square statistics were used to examine differences in demographic characteristics between waves. Repeated measures ANCOVAs were performed to examine the effects of the intervention on the outcome measures, using baseline measures as a covariate, with partial eta squared calculated to estimate the magnitude of the effect size for each of the outcome measures. Wave was included as an independent group factor for all analyses with the exception of the measures of dietary intake. As different assessment measures were employed for the two waves of assessment, separate repeated measures ANCOVAs were conducted for dietary intake data for each wave. Only available data were analysed and imputation methods were not employed.

Estimated energy intake (EEI), average daily number of serves of fruit and vegetables consumed and discretionary food intake were derived from kilojoule values and standard serving sizes assigned to food groups described in the national dietary guidelines.²⁷ A continuous indicator for physical activity was calculated as a sum of

	Wave 1 (n = 106)	Wave 2 (n = 106)	Total (n = 212)	P-value
Age band				
18-24 years	10 (9)	6 (6)	16 (8)	
25-34 years	33 (31)	29 (27)	62 (29)	
35-44 years	32 (30)	24 (23)	56 (27)	
45-54 years	21 (21)	25 (24)	46 (22)	
≥55-64 years	10 (9)	22 (20)	32 (14)	.13
Sex				
Male	24 (23)	21 (20)	45 (21)	
Female	82 (77)	85 (80)	167 (79)	.61
Work setting				
Inpatient acute	17 (16)	15 (14)	32 (15)	
Inpatient non-acute	9 (9)	20 (19)	29 (14)	
Community	71 (66)	64 (61)	135 (64)	
Administration	9 (9)	7 (6)	16 (8)	.1
Staff role				
Nurse	20 (19)	33 (31)	53 (25)	
Allied health	62 (58)	41 (39)	103 (48)	
Medical	4 (4)	8 (7)	12 (6)	
Non-clinical	20 (19)	24 (23)	44 (21)	.04*

TABLE 1 Demographic information - n (%)

*Significant difference between staff roles recruited for each wave.

weekly metabolic equivalent (MET)-minutes per week of physical activity. The MET energy expenditure was estimated by weighting the reported minutes per week by a MET energy expenditure estimate for each type of activity (low, moderate and vigorous-intensity physical activity). The weighted MET minutes per week were calculated as duration frequency per week MET intensity, which were then summed to produce a weighted estimate of the total physical activity from all reported activities per week as per the IPAQ scoring protocol.

3 | RESULTS

All 702 staff of the Mental Health Service were invited to participate, initially through the online survey and subsequently in the intervention. In total, 212 (31% of total) staff participants provided consent and completed baseline testing.

3.1 | Demographic data

Descriptive data for the participants recruited in wave 1 and wave 2 are provided in Table 1. The majority of participants (92%) were aged between 25 and 64 years, and most were female (79%). The majority

were working in community service settings (64%), and most were either nursing or allied health clinicians (psychologists, social workers, occupational therapists). There was a greater proportion of medical staff in wave 2 compared to wave 1 (8 vs 4) and there were no other significant differences in any of the demographic variables for participants recruited in wave 1 and wave 2.

3.2 | Primary outcome measures – M-BACK total and domain scores

M-BACK scores were obtained from all clinically qualified participants (See Table 2). Some non-clinical staff completed the M-BACK; however, these scores were excluded from the analysis. Complete pre-, post- and follow-up M-BACK data were available for 49% of the clinically qualified participants in wave 1, while complete M-BACK data were available for 74% of wave 2 participants. There were no significant differences between completers and non-completers at baseline and follow-up on any outcome (all P 's > .05).

Significant time effects were found for total M-BACK and all domain scores ($F(2,99) = 11.7-56.6$). For M-BACK total and Knowledge and Confidence domain scores, significant differences were found for each pairwise comparison, with the largest increases in scores occurring for measures obtained at pre-intervention vs those

TABLE 2 Pre-, post- and follow-up M-BACK scores by wave

	Wave 1 (n = 42)	Wave 2 (n = 61)	Total (n = 103)	Time effect $F(2,99)$	Partial η^2
Barriers					
Pre	15.3 (2.0)	15.9 (2.3)	15.6 (2.2)		
Post	15.8 (1.9)	16.6 (2.5)	16.3 (2.3)		
Follow-up	15.9 (2.1)	16.8 (2.7)	16.4 (2.5)	10.7***	0.18
Attitudes					
Pre	16.1 (2.5)	16.5 (3.2)	16.3 (2.9)		
Post	16.8 (2.3)	17.2 (2.7)	17.0 (2.5)		
Follow-up	16.9 (2.2)	17.4 (2.8)	17.2 (2.6)	11.7***	0.19
Confidence					
Pre	12.6 (2.8)	12.9 (4.0)	12.8 (3.5)		
Post	14.2 (2.7)	14.4 (3.6)	14.3 (3.2)		
Follow-up	14.7 (2.7)	15.5 (3.2)	15.1 (3.0)	46.5***	0.48
Knowledge					
Pre	11.3 (3.9)	11.4 (4.5)	11.4 (4.2)		
Post	12.5 (5.2)	14.0 (4.1)	13.4 (3.9)		
Follow-up	13.6 (3.7)	14.6 (3.7)	14.2 (3.7)	56.0***	0.53
Total					
Pre	55.3 (8.7)	56.7 (11.0)	56.1 (10.1)		
Post	59.4 (7.7)	62.2 (10.4)	61.1 (9.5)		
Follow-up	61.1 (8.2)	64.2 (9.9)	62.9 (9.4)	56.6***	0.53

Note: Unadjusted means.

*** $P < .001$.

obtained at follow-up (all P 's < .003). The pairwise comparisons between post-intervention and follow-up scores were not significant for Barriers and Attitudes domain scores (P 's = .53 and .39 respectively). All other pairwise comparisons were increased significantly across time (all P 's < .001). The main between-subject effect of wave was not significant for M-BACK total score, or the Barriers, Attitudes and Confidence domain scores. There was a significant wave main effect for Knowledge domain scores ($F(1,100) = 6.91$, $P = .01$). Wave 2 participants had significantly higher scores than wave 1 participants. There were no significant wave by time effects for total M-BACK or any of the domain scores.

3.3 | Secondary outcome measures

3.3.1 | Waist circumference

There was a statistically significant reduction in waist circumference, with no significant effect of wave or wave by time interaction

($P < .001$ – see Table 3). The mean reduction in waist circumference from baseline to post-intervention assessment was 1.3 cms. The mean reduction in waist circumference from baseline to follow-up assessment was 2.2 cms. Both of these pairwise differences were statistically significant ($P < .001$).

3.3.2 | Weight

Fifty-one per cent of the participants were overweight or obese at baseline (108/212). In the sample as a whole, there was no statistically significant reduction in weight over time ($P = .055$ – see Table 3). The mean weight decrease was 0.30 kg from baseline to post-intervention, and 0.47 kg from baseline to follow-up. There was no significant effect of wave or wave by time interaction.

In those who were overweight or obese at baseline, there was a statistically significant reduction in weight over time ($F(2,63) = 9.8$, $P < .001$). The mean weight decrease from baseline to post-intervention was 0.82, and 1.10 kg from baseline to follow-up. For those who

	Wave 1	Wave 2	Total	Time effect	Partial ϵ^2
Waist (cm)	N = 57	N = 70	N = 127		
Pre	89.2 (12.9)	91.8 (14.2)	90.7 (13.6)		
Post	87.6 (12.8)	91.0 (13.6)	89.5 (13.3)		
Follow-up	86.8 (12.7)	89.9 (13.5)	88.5 (13.2)	$F(1,123) = 41.8^{***}$	0.41
Weight (kg)	N = 57	N = 72	N = 129		
Pre	72.8 (15.7)	72.9 (15.2)	72.8 (15.4)		
Post	72.5 (15.2)	72.5 (14.9)	72.5 (15.0)		
Follow-up	72.4 (15.2)	72.3 (14.7)	72.4 (14.9)	$F(1,125) = 2.98$	0.05
VO ₂ (ml/kg/min)	N = 51	N = 76	N = 127		
Pre	39.3 (7.7)	32.3 (9.6)	34.1 (9.6)		
Follow-up	41.4 (8.3)	35.0 (11.3)	36.7 (11.0)	$F(1,79) = 10.9^{***}$	0.12
Sedentary time (mins)	N = 53	N = 76	N = 129		
Pre	531 (182)	525 (162)	528 (170)		
Follow-up	455 (163)	415 (136)	431 (148)	$F(1,126) = 62.2^{***}$	0.33
Energy intake (kJ/day)	N = 38	N = 75	N = 113		
Pre	8186 (5434)	7853 (1954)	7786 (3516)		
Follow-up	6792 (3262)	7343 (1276)	7158 (2159)	$F(1,110) = 45.9^{***}$	0.29
Discretionary food intake (kJ/day)	N = 38	N = 75	N = 113		
Pre	3619 (2859)	1340 (884)	2106 (1978)		
Follow-up	2624 (1978)	868 (821)	1465 (1501)	$F_n = 55.3^{***}$	0.33

Note: Unadjusted means.

*** $P < .001$.

TABLE 3 Changes in anthropometry and secondary outcome measures

were normal weight at baseline, there was no significant effect of time ($F(2,58) = 0.30$ NS).

3.3.3 | Dietary intake

For wave 1, there was a statistically significant reduction in reported energy intake (-1393 kJ, $P < .001$). For wave 2, the reduction in reported energy intake was smaller in magnitude, but remained statistically significant (-240 kJ, $P < .05$). There was a statistically significant decrease in energy intake from discretionary food for both wave 1 (-976 kJ, $P < .001$) and wave 2 (-472 kJ, $P < .001$). There was no statistically significant change in the average daily number of serves of fruits consumed (1.67–1.72, $P = .635$); however, there was a statistically significant increase in the average daily number of serves of vegetables consumed (2.99–3.65, $P < .001$).

3.3.4 | Cardiorespiratory fitness

There was a statistically significant increase in VO_2 from baseline to follow-up ($P = .001$ – see Table 3). There was a mean increase in VO_2 of 2.5 ml/kg/min, a clinically meaningful increase of 7% over the baseline estimate. There was no significant effects of wave, and the wave by time interaction was not significant.

3.3.5 | Sedentary time

Sedentary time decreased significantly from baseline to follow-up ($P < .001$ – See Table 3). There was a mean decrease in sedentary time of 97 minutes. The main effect of wave and the wave by time interaction were not statistically significant.

4 | DISCUSSION

This study demonstrated the beneficial effects of a staff-focused lifestyle intervention on staff attitudes, confidence and knowledge about metabolic health. We found a highly significant large effect for improved confidence and knowledge of mental health staff regarding metabolic health. We also found smaller, statistically significant increases in scores for barriers and attitudes towards metabolic health issues, indicating that staff participants perceived fewer barriers to, and had more positive attitudes towards, metabolic monitoring. In total, 31% of potential participants responded to the online survey and subsequently completed baseline testing. This is consistent with typical response rates to online surveys.²⁸

We also observed a highly significant reduction in waist circumference at 16-week follow-up, averaging 2.2 cms. In addition, we found a statistically significant 97-minute reduction in

sedentary time and a 30% reduction in dietary energy intake from discretionary foods and drinks, both of which can be considered as meaningful changes. The weight reduction in the sample as a whole was relatively modest, but exploratory analysis indicated greater weight reduction in those who were overweight or obese at baseline. While this study was not designed to be a weight loss intervention, weight loss of clinicians may also be beneficial for patients, as the body weight of health professionals can influence their attitudes towards weight management and their weight management practices.²⁹

Our findings have important implications in light of recent results from large-scale RCTs targeting patients. Firstly, the PRIMROSE trial aimed to reduce cholesterol and cardiovascular risk for people with severe mental illness in primary care.³⁰ No effect of the intervention was found, in which primary care professionals attended 2-day training on delivering cardiovascular disease reduction interventions for patients. Secondly, the IMPACT trial evaluated an integrated psychosocial health promotion intervention for people with psychosis, and concluded that staff training and supervision alone may be insufficient to change practice among front-line mental health workers and reverse cardiometabolic risk indicators in their patients.³¹ Enhancing such training programs with a specific focus on staff health could potentially enhance the effect of such interventions in future trials.

Based on the results of this study, staff interventions appear to be feasible, and may lead to positive changes in both key attitudinal and objective measures. Given that staff attitudes towards and engagement in healthy lifestyle behaviours are associated with the interventions they provide to their patients, it is reasonable to hypothesise that improving staff health may be an important strategy in facilitating the implementation of lifestyle interventions within mental health services.

4.1 | Limitations

While the strengths of this study include the large sample of mental health staff participants from a diverse multidisciplinary background and use of a scalable and replicable intervention, the results should be interpreted in light of methodological limitations. These include: potential sampling bias, in that staff who volunteered to participate may not be representative of the broader staff population, the potential for social desirability bias to have influenced outcomes for self-reported measures of diet and physical activity, the lack of an objective measure of metabolic health (eg serum cholesterol), no control group or comparison data, a lack of a quantified “dose” of the intervention precluding sensitivity analysis and a lack of cost data regarding the intervention, which required specialised allied health clinicians and permission from management for staff participants to receive the intervention during work time and therefore taking staff participants away from usual clinical duties. It is also possible that given the time between waves, staff attitudes and views may have changed over time following the first

wave of the intervention. Furthermore, given the pragmatic nature of this evaluation, which was conducted within a busy mental health service where patient care remained the priority, we had high rates of missing data due in part to difficulty in scheduling follow-up assessments while staff were on shift. This is particularly relevant for the secondary outcome measures which required staff attend a face-to-face assessment. Finally, we did not publish an a priori protocol or undertake a sample size calculation given the opportunistic nature of the study, which was linked to the implementation of a service-wide program.

5 | CONCLUSION

A lifestyle intervention targeting staff working in a mental health service significantly increased the capability of the staff participants to improve their own physical health. We found changes in attitudes, knowledge and confidence of clinical staff towards improving metabolic health outcomes in the people they care for. Although it remains to be seen if changes in staff behaviour result in changes in patient outcomes, improving staff health, attitudes, confidence and knowledge is likely to help lay the foundation for changes in clinical care towards interventions capable of improving patient outcomes.

ORCID

Simon Rosenbaum  <https://orcid.org/0000-0002-8984-4941>

Philip B. Ward  <https://orcid.org/0000-0002-5779-7722>

Scott Teasdale  <https://orcid.org/0000-0001-6769-8421>

Jackie Curtis  <https://orcid.org/0000-0001-6884-0098>

TWITTER

Simon Rosenbaum  @simon_rosenbaum

REFERENCES

- Vancampfort D, Stubbs B, Mitchell AJ, De Hert M, Wampers M, Ward PB, et al. Risk of metabolic syndrome and its components in people with schizophrenia and related psychotic disorders, bipolar disorder and major depressive disorder: a systematic review and meta-analysis. *World Psychiatry*. 2015;14(3):339–47.
- Correll CU, Solmi M, Veronese N, Bortolato B, Rosson S, Santonastaso P, et al. Prevalence, incidence and mortality from cardiovascular disease in patients with pooled and specific severe mental illness: a large-scale meta-analysis of 3,211,768 patients and 113,383,368 controls. *World Psychiatry*. 2017;16(2):163–80.
- Olfson M, Gerhard T, Huang C, Crystal S, Stroup TS. Premature mortality among adults with schizophrenia in the United States. *JAMA Psychiatry*. 2015;72(12):1172–81.
- Hjorthøj C, Stürup AE, McGrath JJ, Nordentoft M. Years of potential life lost and life expectancy in schizophrenia: a systematic review and meta-analysis. *The Lancet Psychiatry*. 2017;4(4):295–301.
- Firth J, Siddiqi N, Koyanagi A, Siskind D, Rosenbaum S, Galletly C, et al. The Lancet Psychiatry Commission: a blueprint for protecting physical health in people with mental illness. *The Lancet Psychiatry*. 2019;6:675–712.
- Thornicroft G. Physical health disparities and mental illness: the scandal of premature mortality. *Br J Psychiatry*. [Editorial]. 2011;199(6):441–2.
- Suetani S, Whiteford HA, McGrath JJ. An urgent call to address the deadly consequences of serious mental disorders. *JAMA Psychiatry*. 2015;72(12):1166–7.
- Teasdale SB, Ward PB, Rosenbaum S, Samaras K, Stubbs B. Solving a weighty problem: systematic review and meta-analysis of nutrition interventions in severe mental illness. *Br J Psychiatry*. 2017;210(2):110–8.
- Stubbs B, Vancampfort D, Hallgren M, Firth J, Veronese N, Solmi M, et al. EPA guidance on physical activity as a treatment for severe mental illness: a meta-review of the evidence and Position Statement from the European Psychiatric Association (EPA), supported by the International Organization of Physical Therapists in Mental Health (IOPTMH). *European Psychiatry*. 2018;54:124–44.
- Bartels SJ. Can behavioral health organizations change health behaviors? The STRIDE study and lifestyle interventions for obesity in serious mental illness. *Am J Psychiatry*. 2015;172(1):9–11.
- Bartels S, Brunette M, Aschbrenner K, Daumit G. Implementation of a system-wide health promotion intervention to reduce early mortality in high risk adults with serious mental illness and obesity. *Implement Sci*. 2015;10(Suppl 1):A15.
- Fie S, Norman IJ, While AE. The relationship between physicians' and nurses' personal physical activity habits and their health-promotion practice: a systematic review *Health Education Journal*. 2013;72:102–19.
- Fibbins H, Ward PB, Watkins A, Curtis J, Rosenbaum S. Improving the health of mental health staff through exercise interventions: a systematic review. *J Ment Health*. 2018;27(2):184–91.
- Forsberg KA, Bjorkman T, Sandman PO, Sandlund M. Physical health - A cluster randomized controlled lifestyle intervention among persons with a psychiatric disability and their staff. *Nord J Psychiatry*. 2008;62(6):486–95.
- Hjorth P, Davidsen AS, Kilian R, Jensen SOW, Munk-Jørgensen P. Intervention to promote physical health in staff within mental health facilities and the impact on patients' physical health. *Nord J Psychiatry*. 2016;70:62–71.
- Curtis J, Watkins A, Rosenbaum S, Teasdale S, Kalucy M, Samaras K, et al. Evaluating an individualized lifestyle and life skills intervention to prevent antipsychotic-induced weight gain in first-episode psychosis. *Early Interv Psychiatry*. 2016;10(3):267–76.
- Rosenbaum S, Watkins A, Ward PB, Pearce D, Fitzpatrick K, Curtis J, et al. Psychiatry HeAL thyself!. *Aust N Z J Psychiatry*. 2016;50(6):600.
- Ward MC, White DT, Druss BG. A meta-review of lifestyle interventions for cardiovascular risk factors in the general medical population: lessons for individuals with serious mental illness. *J Clin Psychiatry*. 2015;76(4):e477–e486.
- Vancampfort D, Firth J, Correll CU, Solmi M, Siskind D, De Hert M, et al. The impact of pharmacological and non-pharmacological interventions to improve physical health outcomes in people with schizophrenia: a meta-review of meta-analyses of randomized controlled trials. *World Psychiatry*. 2019;18(1):53–66.
- Diabetes Prevention Program Research Group. The Diabetes Prevention Program (DPP) description of lifestyle intervention. *Diabetes Care*. 2002;25(12):2165–71.
- Watkins A, Rosenbaum S, Ward PB, Patching J, Denney-Wilson E, Stein-Parbury J. The validity and reliability characteristics of the M-BACK questionnaire to assess the barriers, attitudes, confidence, and knowledge of mental health staff regarding metabolic health of mental health service users. *Front Public Health*. 2017;5:321.
- Giles G, Ireland P. Dietary questionnaire for epidemiological studies (version 2). Melbourne: The Cancer Council Victoria, 1996.

Appendix 5A – Ethics approvals for Chapter 3



Health
South Eastern Sydney
Local Health District

HUMAN RESEARCH ETHICS COMMITTEE

Room G71 East Wing
Edmund Blacket Building
Prince of Wales Hospital
RANDWICK NSW 2031
Tel: 02 9382 3587 Fax: 02 9382 2813
RSESLHD@SESLIHS.HEALTH.NSW.GOV.AU
<http://www.seslhd.health.nsw.gov.au/POWH/researchsupport/default.asp>

7 August 2014

Dr Jackie Curtis
Bondi Junction Community Mental Health Service
South Eastern Sydney Local Health District
26 Llandaff Street
BONDI JUNCTION NSW 2022
Attention: Andrew Watkins

Dear Dr Curtis

HREC ref no: 13/040 (LNR/13/POWH/85)
Project title: Keeping the Body in Mind: evaluation of a 12 week lifestyle intervention for youth with psychosis

Thank you for your amendment request dated 28 July 2014 to the Human Research Ethics Committee (HREC). The Executive Committee reviewed your request on 5 August 2014.

Ethical approval has been given for the following:

- Amendment Form, dated 28 July 2014.
- Participant Information Sheet and Consent Form, master version 1, dated 25 July 2014
- Project outline, not dated
- Interview Schedule, not dated
- Poster, not dated

Ethical approval is valid for the following site(s):

- Bondi Health Centre
- Liverpool Hospital

This amendment has also been reviewed by the Research Governance Officer at SESLHD. Further authorisation of the above approved documents is not required

Prince of Wales Hospital
Community Health Services
Barker Street
Randwick NSW 2031

for any site that has the Research Governance conducted by the SESLHD Research Support Office. Implementation of this amendment can now proceed.

For multi-site projects reviewed by the HREC after 1 January 2011 a copy of this letter must be forwarded to all Principal Investigators at every site approved by the SESLHD HREC for submission to the relevant Research Governance Officer along with a copy of the approved documents.

Should you have any queries, please contact the Research Support Office on (02) 9382 3587. The HREC Terms of Reference, Standard Operating Procedures, membership and standard forms are available from the Research Support Office website: <http://www.seslhd.health.nsw.gov.au/POWH/researchsupport/default.asp>

Please quote HREC ref no 13/040 in all correspondence.

Yours sincerely

Production Note:
Signature removed prior to publication.

Deborah Adrian
Executive Officer, Human Research Ethics Committee

This HREC is constituted and operates in accordance with the National Health and Medical Research Council's (NHMRC) *National Statement on Ethical Conduct in Human Research (2007)*, NHMRC and Universities Australia *Australian Code for the Responsible Conduct of Research (2007)* and the *CPMP/ICH Note for Guidance on Good Clinical Practice*.

7 September 2017

Emeritus Professor Jane Stein-Parbury
Faculty of Health
UNIVERSITY OF TECHNOLOGY, SYDNEY

Dear Jane,

UTS HREC ETH17-1652 – “Keeping the Body in Mind: evaluation of a 12week lifestyle intervention for youth with psychosis” [External Ratification: South Eastern Sydney Local Health District Human Research Ethics Committee HREC approval – 13/040 (LNR/13/POWH/85) – 20 March 2013 - 20 March 2018]

At its meeting held on 5 September 2017 the UTS Human Research Ethics Expedited Review Committee reviewed your application and I am pleased to inform you that your external ethics approval has been ratified.

Your UTS approval number is UTS HREC REF NO. ETH17-1652
Approval will be for the period specified above and subject to the provision of annual reports and evidence of continued support from the above-named Committee.

Please note that the ethical conduct of research is an on-going process. The National Statement on Ethical Conduct in Research Involving Humans requires us to obtain a report about the progress of the research, and in particular about any changes to the research which may have ethical implications. This report form must be completed at least annually, and at the end of the project (if it takes more than a year). The Ethics Secretariat will contact you when it is time to complete your first report. You must also provide evidence of continued approval from the Human Research Ethics Committee you originally received approval from.

I also refer you to the AVCC guidelines relating to the storage of data, which require that data be kept for a minimum of 5 years after publication of research. However, in NSW, longer retention requirements are required for research on human subjects with potential long-term effects, research with long-term environmental effects, or research considered of national or international significance, importance, or controversy. If the data from this research project falls into one of these categories, contact University Records for advice on long-term retention.

If you have any queries about your ethics approval, or require any amendments to your research in the future, please do not hesitate to contact the Ethics Secretariat at the Research and Innovation Office, on 02 9514 9772.

Yours sincerely,

Production Note:
Signature removed prior to publication.

Professor Beata Bajorek
Chairperson
UTS Human Research Ethics Committee

Appendix 5B – Ethics approval for Chapters 4 and 5

From: Research.Ethics@uts.edu.au
To: [Research Ethics; Jane Stein-Parbury](#)
Subject: UTS HREC Letter of Noting
Date: Wednesday, 19 February 2014 1:44:28 PM

Dear Applicant,

The Faculty has considered your Nil/Negligible Risk Declaration Form for your project titled, "Evaluation of knowledge and confidence of metabolic screening after a 2-day training course", and agree your research does not require review from the UTS Human Research Ethics Committee. Please keep a copy of your Declaration form on file to show you have considered risk.

For tracking purposes, you have been provided with an ethics application number, which is UTS HREC 2013000749.

I also refer you to the AVCC guidelines relating to the storage of data, which require that data be kept for a minimum of 5 years after publication of research. However, in NSW, longer retention requirements are required for research on human subjects with potential long-term effects, research with long-term environmental effects, or research considered of national or international significance, importance, or controversy. If the data from this research project falls into one of these categories, contact University Records for advice on long-term retention.

You should consider this your official letter of noting.

Instructions for saving the declaration form can be downloaded from:

<http://www.research.uts.edu.au/policies/restricted/human/forms.html#instructions>

To access this application, please follow the URLs below:

* if accessing within the UTS network: <http://rmprod.itd.uts.edu.au/RMENet/HOM001N.aspx>

* if accessing outside of UTS network: <https://remote.uts.edu.au>, and click on "RMENet - ResearchMaster Enterprise" after logging in.

If you or anyone connected with this research have any queries please do not hesitate to contact Research.Ethics@uts.edu.au

Yours sincerely,

Professor Marion Haas
Chairperson
UTS Human Research Ethics Committee
C/- Research & Innovation Office
University of Technology, Sydney
T: (02) 9514 9772
F: (02) 9514 1244
E: Research.Ethics@uts.edu.au
I: <http://www.research.uts.edu.au/policies/restricted/ethics.html>
P: PO Box 123, BROADWAY NSW 2007
[Level 14, Building 1, Broadway Campus]
CB01.14.08.04

REF: E28

Appendix 5C – Ethics approval for Chapter 6



Health
South Eastern Sydney
Local Health District

HUMAN RESEARCH ETHICS COMMITTEE

Room G71 East Wing
Edmund Blacket Building
Prince of Wales Hospital
RANDWICK NSW 2031
Tel: 02 9382 3587 Fax: 02 9382 2813
RSOSESJHD@SESLHNSW.HEALTH.NSW.GOV.AU
<http://www.seslhd.health.nsw.gov.au/POWH/researchsupport/default.asp>

30 March 2015

Dr Simon Rosenbaum
The Bondi Centre
26 Llandaff Street
BONDI JUNCTION NSW 2022

Dear Dr Rosenbaum

HREC ref no: 15/054 (LNR/15/POWH/107)

Project title: Keeping our Staff in Mind (KoSIM): lifestyle screening and advice for mental health staff

Thank you for submitting the above Low/Negligible Risk (LNR) Application for review by the Human Research Ethics Committee (HREC). Based on the information you have provided and in accordance with the NHMRC guidelines [National Statement 2007 – Section 5 Institutional Responsibilities and “*When does quality assurance in health care require independent ethical review?*” (2003)], this project has been assessed as low risk and is therefore exempt from full HREC review.

The project was first considered by the LNR Committee on 17 March 2015.

I am pleased to advise that ethical approval has been granted for this project to be conducted at the following site(s):

- Bondi Community Centre
- St George Hospital
- The Sutherland Hospital

The following documentation has been approved:

- Low/negligible risk application, submission code AU/6/1C5D19, dated 25 February 2015
- Letter of Invitation, Version 1.1 dated March 2015
- Response Email dated 24 March 2015

Conditions of approval

1. This approval is valid for 5 years from the date of this letter.

Prince of Wales Hospital
Community Health Services
Barker Street
Randwick NSW 2031

2. Annual reports must be provided on the anniversary of approval.
3. A final report must be provided at the completion of the project.
4. Proposed changes to the research protocol, conduct of the research, or length of approval will be provided to the Committee.
5. The Principal Investigator will immediately report matters which might warrant review of ethical approval, including unforeseen events which might affect the ethical acceptability of the project and any complaints made by study participants.

For NSW Public Health sites only: You are reminded that this letter constitutes ethical approval only. You must not commence this research project until you have submitted your Site Specific Assessment (SSA) to the Research Governance Officer of the appropriate institution and have received a letter of authorisation from them.

Should you have any queries, please contact the Research Support Office on (02) 9382 3587. The HREC Terms of Reference, Standard Operating Procedures, membership and standard forms are available from the Research Support Office website:
<http://www.seslhd.health.nsw.gov.au/POWH/researchsupport/default.asp>.

Please quote HREC ref no: **15/054** in all correspondence.

We wish you every success in your research.

Yours sincerely

Production Note:
Signature removed prior to publication.

Amanda Idan
Acting Executive Officer, Human Research Ethics Committee

This HREC is constituted and operates in accordance with the National Health and Medical Research Council's (NHMRC) *National Statement on Ethical Conduct in Human Research (2007)*, NHMRC and Universities Australia *Australian Code for the Responsible Conduct of Research (2007)* and the *CPMP/ICH Note for Guidance on Good Clinical Practice*.

Appendix 6 – Participant information sheet for chapter 3



Bondi Community Health Centre

PARTICIPANT INFORMATION SHEET AND CONSENT FORM

Participant Experiences of Keeping the Body in Mind (KBIM) Program

Invitation

You are invited to participate in a research study into understanding participant experiences of the KBIM program.

The study is being conducted by
Mr. Andrew Watkins (PhD candidate)
Prof. Jane Stein-Parbury (PhD supervisor)
A/Prof. Philip Ward (PhD co-supervisor)
A/Prof. Robyn Gallagher (PhD co-supervisor)
Dr Jackie Curtis (Program clinical director)

Before you decide whether or not you wish to participate in this study, it is important for you to understand why the research is being done and what it will involve. Please take the time to read the following information carefully and discuss it with others if you wish.

1. What is the purpose of this study?

To explore how you felt about participating in the KBIM program, what you found to be helpful about the program and how you think it could be improved in the future.

2. Why have I been invited to participate in this study?

You are eligible to participate in this study because you were involved in the original KBIM intervention.

3. What does participation in this study involve?

If you agree to participate in this study you will then be asked to participate in a interview or group discussion about your experiences in the KBIM program. It is estimated the interview or group discussion will take 60-90 of your time and take place at the Bondi Centre.

Any information obtained in connection with this research project that can identify you will remain confidential, and stored securely in a locked filing cabinet or password encrypted computer.

If you agree to participate in this study, you will be asked to sign the Participant Consent Form.

4. What if I don't want to take part in this study, or if I want to withdraw later?

Participation in this study is voluntary. It is completely up to you whether or not you participate. If you decide not to participate, it will not affect the treatment you receive now or in the future. Whatever your decision, it will not affect your relationship with the staff caring for you.

If you wish to withdraw from the study once it has started, you can do so at any time without having to give a reason.

5. How is this study being paid for?

Any costs related to this study will be borne by Prince of Wales Hospital Foundation.

6. Are there risks to me in taking part in this study?

The only foreseeable risk/s in taking part in this study is

You may feel that some of the questions we ask are stressful or upsetting.

- If you do not wish to answer a question
 - You may skip it and go to the next question, or
 - You may stop immediately.

If you become upset or distressed as a result of your participation in the research project, the research team will be able to arrange for counselling or other appropriate support. Any counselling or support will be provided by qualified staffs who are not members of the research team. This will be provided free of charge.

Whilst all care will be taken to maintain privacy and confidentiality, you may experience embarrassment if one of the group members were to repeat things said in a confidential group meeting.

7. What happens if I suffer injury or complications as a result of the study?

If you require treatment or suffer loss as a result of the negligence of any of the parties involved in the study you may be entitled to compensation; the cost of your treatment would have to be paid out of such compensation.

8. Will I benefit from the study?

This study aims to further mental health care knowledge and may improve future treatment of the metabolic effects of antipsychotic treatment, however it may not directly benefit you.

9. Will taking part in this study cost me anything, and will I be paid?

Participation in this study will not cost you anything, nor will you be paid. You will be reimbursed for your time and reasonable travel expenses in the form of a gift card to the amount of \$20.

10. How will my confidentiality be protected?

Any identifiable information that is collected about you in connection with this study will remain confidential and will be disclosed only with your permission, or except as required by law. Only the researchers named above will have access to your details and results that will be held securely at Bondi Community Health Centre.

11. What happens with the results?

If you give us your permission by signing the consent document, we plan to discuss/publish the results the HREC for monitoring purposes, peer-reviewed journals, presentation at conferences or other professional forums.

In any publication, information will be provided in such a way that you cannot be identified.

12. What should I do if I want to discuss this study further before I decide?

When you have read this information, the researcher Andrew Watkins will discuss it with you and any queries you may have. If you would like to know more at any stage, please do not hesitate to contact him/her on 9366 8610 or his PhD supervisor, Jane Stein-Parbury on 0418 287 241.

13. Complaints

This study has been approved by the South Eastern Sydney Local Health District Human Research Ethics Committee. Any person with concerns or complaints about the conduct of this study should contact the Research Support Office which is nominated to receive complaints from research participants. You should contact them on 02 9382 3587, or email RSOseslhd@sesiahs.health.nsw.gov.au and quote 13/040 (LNR/13/POWH/85)

**Thank you for taking the time to consider this study.
If you wish to take part in it, please sign the attached consent form.
This information sheet is for you to keep.**

Bondi Community Health Centre

CONSENT FORM

Participant Experiences of Keeping the Body in Mind (KBIM) Program

1. I,.....
of.....
agree to participate in the study described in the participant information statement set out above for an interview of focus group of 60-90 minutes duration.
2. I acknowledge that I have read the participant information statement, which explains why I have been selected, the aims of the study and the nature and the possible risks of the investigation, and the statement has been explained to me to my satisfaction.
3. Before signing this consent form, I have been given the opportunity of asking any questions relating to any possible physical and mental harm I might suffer as a result of my participation and I have received satisfactory answers.
4. I understand that I can withdraw from the study at any time without prejudice to my relationship to Bondi Community Health Centre
5. I agree that research data gathered from the results of the study may be published, provided that I cannot be identified.
6. I understand that if I have any questions relating to my participation in this research, I may contact Andrew Watkins on telephone 9366 8610, who will be happy to answer them.
7. I acknowledge receipt of a copy of this Consent Form and the Participant Information Statement.

Complaints may be directed to the Research Support Office, South Eastern Sydney Local Health District, Prince of Wales Hospital, Randwick NSW 2031 Australia (phone 02-9382 3587, fax 02-9382 2813, email RSOseslhd@sesiahs.health.nsw.gov.au).

Signature of participant	Please PRINT name	Date
_____	_____	_____

Signature of witness	Please PRINT name	Date
_____	_____	_____

Signature of investigator	Please PRINT name	Date
_____	_____	_____

Bondi Community Health Centre

Participant Experiences of Keeping the Body in Mind (KBIM) Program

REVOCATION OF CONSENT

I hereby wish to **WITHDRAW** my consent to participate in the study described above and understand that such withdrawal **WILL NOT** jeopardise any treatment or my relationship with the Bondi Junction Community Health Centre.

Signature of participant

Please PRINT name

Date

The section for Revocation of Consent should be forwarded to:

Dr Jackie Curtis
26 Llandaff St
Bondi Junction
NSW 2022

Physical health care in mental health

COURSE CODE: 32 086 1207

About the College

The Mission of the College is to provide leadership through partnerships with nurses in line with the changing needs of the community, trends in health care service delivery and the aspirations of nurses themselves.

About the course

This course is conducted over two days and is equivalent to 14 Continuing Professional Development (CPD) hours. Please note that this course is subject to change without notice.

Who should attend?

Clients with serious mental illness have a 20% reduction in life expectancy compared with the general population. This is primarily a result of poor metabolic health. This two day course will provide an introduction to the issue of physical health care within mental health. The core focus of the course teaches participants how to identify and monitor metabolic abnormalities, and implement prevention and treatment strategies to overcome them. There is solid evidence that lifestyle and pharmacological interventions are successful in reducing rates of morbidity and mortality in people with serious mental illness. Participants will be guided through the utilisation of these interventions in a practical way that will allow participants to put into operation what they have learnt on return to the workplace.

Key learning outcomes

After successfully completing the course participants should be better able to:

- Understand and comply with the NSW Health 'Linking Physical Health and Mental Health' guidelines.
- Confidently screen for metabolic health.
- Understand factors that lead to poor physical health in mental health consumers.
- Have a clear comprehension of pharmacological and lifestyle interventions available to intervene to prevent and treat metabolic complications.
- Be able to implement these interventions on return to the workplace.

Consultants and facilitator

This course was developed by Andrew Watkins, CNC Mental Health - Bondi Community Health Centre

Program Outline – Physical health care in mental health

Day 1

0845 – 0900

Registration and welcome

0900 – 1000

Physical Health and Mental Health Introduction and background

Andrew Watkins

1000 – 1100

Understanding metabolic syndrome

Andrew Watkins

1100 – 1115

Morning tea

1115 – 1315

Screening for metabolic health

Andrew Watkins

1315 – 1400

Lunch

1400 – 1515

The RaDiCaL (Bondi) model – An intervention approach for metabolic care

Andrew Watkins

1515 – 1530

Afternoon tea

1530 – 1645

Smoking and mental health

Dr Tanya Ahmed

1645 – 1700

Summary

Program Outline – Physical health care in mental health Day 2

0900 – 1000

Physical Health Care of Mental Health Consumers – The NSW Health Guidelines
Andrew Watkins

1000 – 1100

The lived experience consumer perspectives
Stephanie Webster/Julio Vargas

1100 – 1115

Morning tea

1115 – 1215

Interventions part 1 – Exercise
Simon Rosenbaum (Exercise Physiologist)

1215 – 1300

Lunch

1300 – 1400

Interventions part 2 – Dietary
Janice Plain

1400 – 1530

Interventions part 3 – Pharmacological
An algorithm for better metabolic health
Dr Jackie Curtis

1530 – 1545

Afternoon tea

1545 – 1645

Shaping the future – developing a model that is suitable for your work setting
Andrew Watkins

1645 – 1700

Evaluation and Finish