

THE IMPACT OF HORTICULTURE THERAPY ON MENTAL HEALTH CARE CONSUMERS ON A RETROFITTED ROOF

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ABSTRACT

With increasing urbanisation and population growth, the potential for social isolation within urban settlements including central business districts (CBDs) grows. Mental health and related illnesses are determined by multiple, interacting social, psychological, and biological factors. Mental health may be impacted by individual or societal factors, including economic disadvantage, poor housing, lack of social support and the level of access to, and use of, health services. Living arrangements give some indication of the level of social support that a person is able to access. Interaction with people is vital to human development and social relationships and networks can act as protective factors against the onset or recurrence of mental illness and enhance recovery from mental disorders (WHO, 2005). It is possible that retrofitted rooftop gardens and green roofs could provide an environment whereby people can engage through a structured program of horticulture therapy. This research analyses a horticulture therapy program in Sydney in 2016 and this paper concentrates on the question; *what is the impact of a rooftop horticulture therapy on mental health consumers?* An illustrative case study approach was the framework around data collected via a semi structured focus group interview for this qualitative research. The findings reveal positive outcomes, including improved health and well-being, social interaction and skill development.

Keywords: health, horticulture therapy, well-being, retrofit, roof, Sydney.

INTRODUCTION

Globally populations are growing as well as becoming more urbanised. It is predicted that by 2050, 66% of the total population will live in urban settlements (RICS, 2015) a fair increase over the 50% currently residing in urban settlements. Many of these people are housed in high-density residential buildings with very limited outdoor or communal space, the potential for social interaction and engagement in this type of housing can be limited.

Interaction with people is vital to human development. What is more, is that social relationships and networks can act as protective factors against the onset or recurrence of mental illness and enhance recovery from mental disorders (WHO, 2005). In Australia, the annual cost of mental illness in 2013 was estimated at \$20 billion, and this figure includes the costs of loss of productivity and labour force participation (ABS, 2013). Mental health is defined as a state of wellbeing in which individuals can cope with the typical stresses of life, and can work productively and fruitfully, and are able to contribute to their community (ABS, 2013). Whereas mental illness describes a number of diagnosable disorders that can significantly interfere with a person's cognitive, emotional or social abilities. An individual's ability to relate with their family, friends, workmates and the broader community can be affected by their mental health, wherein it can cause significant distress and disability, and can lead to discrimination against, and isolation of, those affected. It follows that increasing the spaces in dense urban environments where people can interact with others should improve mental health and well-being (Nutsford et al, 2013).

Wilkinson & Reed's study (2009) found that approximately 17% of Melbourne CBD rooftops could be retrofitted as green roofs and so there is good potential to increase the amount of urban green space in high

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density environments. This research analyses a horticulture therapy program in Sydney in 2016 on a retrofitted green roof to ascertain whether mental health and well-being may be enhanced.

LITERATURE REVIEW

Urban settlements and current trends

According to the UN (2015), it took hundreds of thousands of years for global population to grow to 1 billion – then in another 200 years, it grew seven times. In 2011, the world population stood at 7 billion and in 2015, it had increased to around 7.3 billion and it is predicted in 2030 to reach 8.5 billion, 9.7 billion in 2050 and 11.2 billion in 2100 (UN DESA 2015). Growth has been driven largely by greater numbers of people surviving to reproductive age, together with significant changes in fertility rates, increasing urbanisation and accelerating migration. These trends will have far-reaching implications for generations to come (UNPF, 2015).

The world is undergoing the largest wave of urban growth in history. More than 50 per cent of the world's population now lives in towns and cities, and by 2030 this number will swell to about 5 billion (UNFPA, 2015). Although much of this urbanisation will unfold in Africa and Asia, bringing huge social, economic and environmental transformations; all countries and cities will be affected. There will also be migration from densely populated countries, which suffer adversely from climate change impacts such as rising sea levels and inundation for example (UNFPA, 2015). One result is that there is pressure on open green space in cities as more people locate to urban settlements.

Urbanisation has the potential to usher in a new era of well-being, resource efficiency and economic growth, however cities also house high concentrations of poverty and inequality. In some urban areas, wealthy communities coexist alongside, and separate from, slums and informal settlements. So our cities will grow, in many cases faster than ever before. As such, we need planning and governance that delivers transition from one level, scale and type of development to others at the city scale, ensuring infrastructure can support growing populations and changing land uses. Within this adaptation of existing areas to accommodate greater numbers of people, and as the predominant land uses undergo change, we need to consider optimum levels of sustainable development that includes, at the building level, different degrees of change of use adaptation. Sustainable change of use adaptation is focussed on environmental, social and economic factors. Retrofitting roofs for food production or gardening is an opportunity to improve urban air quality, to improve thermal performance of buildings, to increase bio-diversity, to attenuate storm-water, to contribute to attenuation of the urban heat island (whereby city centres tend to be warmer, by up to 5 degrees Celsius (Osmond & Irger, in Wilkinson & Dixon, 2016), than suburban areas due air conditioned buildings exhausting hot air into the atmosphere, and finally to provide open amenity space for building occupants.

A NZ study concluded that proximity and access to green space in dense urban environments has a positive effect on people's mental health and well-being (Nutsford et al, 2013). Angold et al ((2006) cited in Fuller and Gaston, 2009) found green spaces varied significantly in their level of overall coverage among cities, ranging from, 11% in Birmingham, UK (Angold et al, 2006), to 39% in Stockholm, Sweden (Bolund and Hunhammar, 1999) and 45% in Sheffield, UK (Fuller et al, 2010). They noted that in 2001 that 386 European cities accommodated 34% of the population or 170.6 million people (Fuller and Gaston, 2009), however the coverage of green space fluctuated distinctly, with an average of 18.6% that ranged from as little as 1.9% for Reggio di Calabria, in Italy, to as much as 46% for Ferrol, in Spain. Furthermore per capita green space provision varied from 3 to 4m² per person in the Spanish cities of Cádiz, Fuenlabrada and Almería and Reggio di Calabria in Italy, to over 300m² in Liège, Belgium), Oulu in Finland and the French city of Valenciennes (Fuller and Gaston, 2009). Of concern was their finding that proportional green space coverage per person diminished with population density increases in European cities (Fuller and Gaston, 2009).

Finally there is the issue of urbanisation and increased social isolation. Social isolation is defined 'as non-participation by individuals or groups in a society's mainstream institutions' (Barry 1998). Groups that are considered to be at higher risk include those experiencing mental illness (SANE 2013), minorities and the

aged (Wenger et al, 1996) and those who had little or no regular contact with others (Chappell and Badger, 1989).

Mental health issues

Determined by multiple, interacting factors, including social, economic, psychological, and biological, mental health is an integral component of overall health and wellbeing, and it is vital for the development of social relationships and participation in, and enjoyment of, life (WHO 2013a).

Mental illness is a term referring to a range of clinically diagnosable conditions that vary in regard to age of onset, frequency and impact on individuals, their families and the wider community (ABS 2007). The most recent *National Survey of Mental Health and Wellbeing* revealed that in the previous twelve months approximately 20% of Australian adults experienced a mental illness, such as an anxiety, affective or substance use disorder, (ABS 2007). A further 0.5% of adults experienced a psychotic disorder, such as schizophrenia (Morgan et al 2011). Moreover, mental illness is often first experienced during adolescence and young adulthood and the impacts occur at a time when young people are striving for independence, developing crucial relationships and commencing work and further education.

Poor mental health and subsequent development of mental illness can lead economic disadvantage, inadequate housing, reduced social interaction and support, and lower levels of access to, and use of, health services (WHO 2013b). Furthermore, stigma and the resulting discrimination and isolation are common experiences of people who have a mental illness affecting their full participation in life, such as contributing to the workforce and the wider community (SANE 2013). Recovery from mental illness is an individual process, involving a clinical and a personal recovery, that enables an individual to 'create and live a meaningful and contributing life', with self-determination and self-management central to the process (DoHA 2013, p.11). For this to occur, individuals recovering from mental illness require access to a broad range of health services, therapeutic interventions, and community supports and resources. It requires a whole-of-community approach involving not only the individual, but also their family, friends, and the wider community, including churches, clubs, community organisations, and places of employment (DoHA 2013).

The relationship between green space and health and well-being

Living environments that facilitate healthy lifestyle choices contribute positively to individuals' mental health and wellbeing (WHO 2016). In particular, environments in which there is access to green spaces are reported to offer many benefits, including participation in activities that promote social interaction and increase physical exercise, and health benefits, such as reductions in stress and improvements in mood and attention (Lee, Jordan & Horsley 2015). Moreover, the health benefits of green spaces are more likely associated with participation in activities within the space rather than the existence of the green space itself (Lee et al 2015; Nutsford et al 2013).

A systematic review of the mental health benefits afforded by green spaces revealed the most benefit from living near green spaces was for those from a lower socioeconomic situation, and that increasing such spaces might contribute to reducing health disparities in urban areas (Gascon et al 2015). Van den Berg et al (2010) reported that large amounts of green space within a three kilometre radius, moderated the negative health impacts of stressful events, and in urban areas green spaces had a positive effect on anxiety and mood disorders, with access to green spaces associated with a decrease in treatment counts (Nutsford et al 2013).

Horticultural Therapy

An example of the therapeutic use of green space is horticultural therapy (HT), 'a treatment modality that utilizes plants and gardening activities as vehicles in adjunctive therapy programs' (Kim 2003, p.71). The therapy is led by a professional trained in the approach and it is usually conducted in small groups using green spaces, such as roof-top or community gardens. A number of studies have reported that HT can contribute to recovery from a range of conditions, such as mental illness (Gonzalez et al 2011; Granerud & Eriksson 2014; Perrins-Margalis et al 2008), brain injury (Soderback, Soderstrom & Schalander 2004), and physical and developmental disability (Kim 2008). The benefits associated with HT include: improvements in physical, emotional, cognitive and social functioning (Kim 2003; Soderback et al 2004), reduction in

symptoms of depression and creation of meaningful experience (Gonzalez et al 2011), increases in health, wellbeing and social participation (Granerud & Eriksson 2014; Soderback et al 2004), and positive effects on life satisfaction and self-concept (Perrins-Margalis et al 2008).

In summary, urban populations and urban density are increasing and with it, reduced access to the natural environment as well as the potential for increased social isolation. Retrofitting and using spaces not previously used for social interaction or healthcare, such as rooftops, offers potential for beneficial human health and wellbeing associated with proximity to nature. Mental illness affects people of all genders, ages, and social and economic backgrounds and recovery requires access to a broad range of interventions, supports and resources. To date no empirical studies have been undertaken in Sydney to evaluate these outcomes based on a retrofitted rooftop setting for a horticulture therapy program; and herein lies the gap in knowledge this research sought to explore.

RESEARCH QUESTIONS / AIMS

Given the trends in urbanisation and the mental health and well-being of urban populations, as well as the evidence of the potential benefits of horticulture therapy, this research analyses a rooftop horticulture therapy program in Sydney in 2016. This paper concentrates on the research question; *what is the impact of a rooftop horticulture therapy on mental health care consumers?* The research aims are to gain a deeper understanding of the benefits or otherwise to participants of a rooftop horticulture therapy program. It is considered that the findings can contribute towards making a case for the inclusion of horticulture therapy in health care plans, as well as having applications in other environments; such as high density housing generally and possibly, workplace environments.

RESEARCH DESIGN

This research adopts a qualitative research design and methodology consisting of two steps. First, a literature review of green roofs, community gardens, and mental health and wellbeing was undertaken to identify the perceived and reported benefits of horticulture therapy, green roofs and trends in urbanisation and population demographics. An inductive approach was adopted sharing the characteristics identified by Patton (1980) of being naturalistic and inductive. An illustrative case study approach is the framework around which data is collected and analysed (Robson, 2003).

Second, a carefully designed semi-structured focus group interview was undertaken with the participants of a horticulture therapy (HT) program hosted at a church in Sydney. Very limited research has been conducted in NSW to understand participants' experiences of and motivations in urban rooftop HT programs as a component of recovery from mental illness.

Setting

The study was undertaken in a horticultural therapy program conducted on the rooftop garden of an inner-city church, St Canice's, Kings Cross, Sydney in 2016. The rooftop space was approximately 55 square metres with garden beds containing vegetables, small shrubs, flowering plants, and herbs. In addition, there was a small vertical garden for flowers, herbs and strawberries. Some of the vegetables and herbs grown on the rooftop garden were used by the kitchen of the church in the preparation of meals for local homeless populations.

Participants

The four participants in the HT program had experienced a mental illness and previously received treatment in an inpatient mental health service. They chose to attend the HT program as part of their recovery process.

Role of the Researchers

The researchers explained the purpose of the research at the first HT session. They immersed themselves in the HT experience by undertaking the activities and interacting with the participants throughout the eight-week program. They kept field notes of the therapy activities and their observations of the participants as they engaged in the HT program. Two representatives from the mental health service where the participants

had previously received treatment also attended and participated in the HT program and their views were also noted.

Data Collection and Analysis

Three of the participants of the program consented to participate in the study and two participants, one male and one female both mature middle-aged people, were available on the day to participate in the semi-structured focus group interviews; both of these participants had attended the entire eight-week program. At the time of conducting this research, horticulture therapy as a therapeutic intervention was in an early stage of development and offered a unique opportunity to investigate the experiences of participants. Sample sizes are governed by the nature of the qualitative research project (Silverman, 2013). Although the number of participants is small, it is adequate and valuable as it represented a good response rate considering the small number of participants of the total research population. Each participant was considered as a highly competent respondent for an interview, and provided better accuracy in outcomes and met reliability and validity criteria for qualitative research (Silverman, 2013). An ethics approval from UTS Human Research Ethics Committee (HREC) was sought prior to commencing the research, and the interviews were conducted after obtaining consents from the respondents.

Data were collected via a focus group interview which is a useful means to discuss the experiences of a group of people (Silverman 2011). The interview questions were grouped under the following areas: (a) motivations to join the horticulture therapy program, (b) benefits of participation in the program and (c) impacts of the program. The hour-long interviews were conducted by one of the researchers on the church's rooftop garden just prior to the final session of the HT program. The second researcher took notes during the focus group. The interviews were audio-recorded and transcribed verbatim. An inductive thematic analysis of the interview data was undertaken, and the researchers' weekly field notes were a source of reference of the program's weekly activities.

All research has limitation and this is no exception; here the limitations are that a single case only is analysed. This is partly because in Australia this approach currently is highly unusual as a means of supporting mental health consumers in their recovery.

CASE STUDY –ST CANICE'S

The GROW Project Horticultural Therapy Program

The GROW project is a group HT program conducted on the uncovered, rooftop of the St Canice's Church hall in the Cross in Sydney. The HT program comprised weekly, 2-hour sessions for eight consecutive weeks, led by a professional trained in horticultural therapy who was supported by a professional gardener. In addition, during two of the sessions, guest presenters with specialist skills in music and cookery were invited to lead activities that complimented the focus of that week's program.

Initially, five participants who had experienced a mental illness commenced the HT as part of their recovery process at St Vincents Hospital in Darlinghurst. Two participants did not return after the first week, and a new member joined in week three, resulting in four people who regularly attended the weekly program. Additionally, two staff members attended from the mental health service where the participants had previously received health care, and the two researchers of this study also participated in the program.

The activities in each week of the program had a specific focus, such as a sensory experience in the rooftop garden, and each session began and concluded with a short relaxation technique focusing on breathing. In addition, there were opportunities for participants to discuss associated feelings, memories and previous experiences as they related to the HT activities. An overview of the weekly HT program activities is set out in Table 1.

Over the eight weeks, the group members began to learn more about each other, and by week three, participants began addressing the researchers by name and discussing issues and experiences beyond those

related to the HT program. For example, the participants asked the researchers questions about how they were enjoying the program, and in week four participants discussed aspects of their home life, the suburbs and dwellings in which they lived, and how they spent their week outside of the HT program. Each week, as the group members came to know each other, more was shared, including experiences of smoking cessation, preferences for certain foods, recreational pursuits, and knowledge about gardening and plants. The participants enquired about each other's and the researchers' previous week. In week six, the participants shared in the preparation and cooking of the food and cleaning up the kitchen, and during the final session, all participants brought food to share at the afternoon tea. At the completion of this session, they were keen to take group photographs and provide their email addresses for contact should a further HT program be implemented.

The Participants' Experiences of the HT Program

Audio-recorded focus group interviews were conducted with two participants, facilitated by the researchers. The interviews comprised eight questions related to the participants' experiences of the HT program, and an inductive, thematic analysis of their responses to the open-ended questions was undertaken (Bazeley 2013; Sandelowski & Leeman 2012). The following five themes were identified from their experiences of the HT program and are presented below: health and wellbeing, social interaction, sanctuary of the garden space, skill development, and expert facilitation of the program. The two participants had both attended previous GROW HT groups and identified four broad reasons for participating in the HT program outlined in this study, including: access to group activities, active participation, enjoyment from gardening, and developing gardening skills.

Health and Wellbeing: 'It got everyone into a similar state of mind'

As the participants of the HT program revealed that they did not have their own gardens, the weekly rooftop garden HT program provided them with regular opportunities to access a relaxing, garden space. The program was associated with a number of benefits for the participants' health and wellbeing, and this included benefits for their emotional, mental and physical health. Specifically, the stimulating and inclusive nature of the program, and regular connection with others who have had similar life experiences, contributed to the participants' health and wellbeing, and is reflected in their comments below:

My mental health, I guess it's stimulated me remembering peoples' names and conversations that we've had in the past week, so you could converse again the following week (participant 1).

It is something to look forward to each week, and to have the same people here; it's good to catch up and see what they've been doing... It involved everyone and it got everyone into a similar state of mind, and there was no involvement with people that made it difficult to be around (participant 2).

It's very relaxing and its good to have a place where you feel comfortable...and you can relax with other people with similar problems...and there's no pressure on you (participant 2).

Physical health benefits were also identified by the participants and included the actual exercise involved during the weekly gardening activities, such as planting and potting, lifting and hauling materials for, and preparation of, the garden beds, walking considerable distances to and from the HT program, and undertaking these activities in the fresh air:

Walking to and from GROW group...which is a bit of a hike...and it's a bit physical as well on occasions, lifting the hot compost...and re-potting things and watering (participant 2).

Being with fresh air with the plants, breathing the fresh air (participant 1).

Furthermore, the participants reported that the HT program contributed to their mental health and wellbeing by developing their sensory awareness, and for on participant this was a standout feature for her:

Natalie (the therapist) got us to connect with our senses, each week to connect with a different sense and practise it during the week. So that was stimulating mentally... Expanding your awareness of where you are, and who you're with, and what you're doing, that was really useful. (participant 1).

Whilst the personal growth opportunities the program afforded stood out in comparison to previous HT programs that another participant had attended:

The personal growth approach has been different...it's been the key...more so than in previous times. So there's been a bit more individual involvement in the activities, talking and responding to the activities. Each week each person has to mention how it's ... related to them specifically...whereas before, it might have been a bit more like a lecture (participant 2).

Social Interaction: 'It's been brilliant developing relationships'

As the HT program was group-based, it provided participants with a number of social benefits related to the development of interpersonal connections not only with each other but also with the program's facilitators. These benefits were attributed to: gaining deeper knowledge about each other and their life experiences, developing ways to actively work together to achieve positive outcomes, developing relationships, and the enjoyment resulting from group activities:

It makes me be active in socialising with people in the group... and as we were working we were working together and incorporating with the group... I much prefer being with a group, doing a group activity (participant 1).

Getting to know everyone a bit more each week, it's been brilliant, developing relationships, and friendships...and more personal stories...so you get to learn more about everyone each week you come to the program, and it's been interesting (participant 2).

They (the facilitators) developed relationships along the way with each of us, and relaxed a bit more each week (participant 2).

Sanctuary of the Garden Space: 'It's like a little haven'

The rooftop garden was valued highly by the participants of this study, and it was described as a relaxing and beautiful space to visit, particularly due to the backdrop provided by the St Canice's Church, the quality of the garden design, and the variety and growth of the plants, some of which were used in the preparation of meals in the Church's kitchen for homeless populations. The participants developed a connection to the garden and looked forward to seeing its growth each week. They identified sections of the garden, including specific plants, that they most enjoyed, with both participants upset that some of the healthy plants deemed surplus to needs, were removed to make way for edible varieties:

It's like a little haven, or a little sanctuary to come to every week. You would never imagine something like this up on a roof. It's a beautiful garden... and there's lots of different plants and they produce oxygen for us. It's just a beautiful place (participant 1).

The church as a backdrop...sort of gives it a serene sort of quality...and the space itself is well designed and well thought out (participant 2).

The expectation, seeing how things have grown over the previous week when you come back to the garden space...seeing how things responded...to the sunshine and to the water (participant 2).

The plants, herbs and vegetables that all differ in flavor, texture and colour, so it makes it very beautiful to the senses (participant 1).

I like the beds we've planted in the last couple of weeks, because the plants are looking fantastic and it's really remarkable and inspiring to see the plants actually ready for harvest (participant 2).

It was sad for me to see them pulling out herbs that were fully grown. I felt that was very sad (participant 1).

Skill Development: 'We developed quite a lot of different skills'

The comprehensive nature of the HT program assisted not only in the development of skills related to gardening, such as preparation of garden beds, potting, planting, and weeding, but a range of additional skills were developed over the eight-weeks. The participants identified skills such as sensory development, tea making and cooking skills, and art skills, such as drawing and painting, and the opportunity to take a potted plant home at the end of the program was also appreciated:

How to make chocolate...the end result was fantastic, so I'm going to try make some myself. And some gardening skills...spacing of plants is important, and re-potting, and the space at which plants grow...and painting of pots was fun (participant 2).

I have a vision of building another 'lasagna' bed... and re-potting things, planting seeds...and developing our own senses (participant 1).

We touched on a variety of different activities... the painting and drawing...and describing different senses....and how they relate to nature and plants in particular...which were all interlinked and woven into an interesting course. We developed quite a lot of different skills...The plant I'm going to take home at the end of the course...I've got a pot to keep it in...and I keep thinking of things I can use the oregano for, like a Greek salad (participant 2).

Expert Facilitation of the HT program: 'They brought that passion into everything they did here'

Overwhelmingly, the participants reported that the structure and organization of the HT program and its facilitation by passionate professionals, contributed to its success and the benefits they experienced. They noted however, that more experiences of planting and harvesting in the program were warranted, but overall, they were very satisfied with the program and looked forward to future opportunities to participate, again:

Just the regularity of it...and being involved in a structured course that involved a lot of social activities...and it was all very relaxed...that was most satisfying (participant 2).

And Danny (the gardener) was very enthusiastic and very knowledgeable about gardening, so it was always good to get his input...he was very enthusiastic (participant 2).

They were each very skilled and very passionate about what they were doing, and they brought that passion into everything they did here and encouraged us to develop that passion, too...They were very experienced and they shared that experience with us (participant 1).

I'd like to see plants taken from seeds to harvest during an eight-week program...It's a bit unfortunate we won't see the harvesting of a lot of plants we've planted...It would be good to get involved with harvesting some of the plants and maybe being involved with the cooking for the other groups of people that use the kitchen (participant 2).

I'd like to see more flowers growing in the beds as well so that they attract more bees (participant 1).

Finally, the expertise of guest facilitators who had specialist skills in music and cooking were deemed to compliment and add to the overall success of the HT program:

I thought it was really great how they introduced some other people that were passionate about what they were involved in...The guy who was doing the drumming, that was beautiful, and mastering the cooking, too (participant 1).

I think its good that they keep running the course and we can do it again...I think they linked the parts well...they developed it into a proper course instead of just week to week...the course was very well organised (participant 2).

Table 1: Overview of the Horticultural Therapy Program Activities

Week	Activity
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One	<p>Welcome, introductions, purpose of HT</p> <p>Memories of gardening experiences</p> <p>Walk through the garden, selection of something that attracts you</p> <p>Discussion of selected item with the group</p> <p>Weeding and trimming garden beds</p> <p>Selection of herbs for tea-making during the break</p> <p>Potting a plant in a clay pot</p> <p>Relaxation exercise – imagine you are tree</p> <p>One word to describe how you feel</p> <p>Information about the research study</p>
Two	<p>Re-introductions</p> <p>Deep breathing exercise</p> <p>Walk through the garden, selection of something with a unique smell</p> <p>Discussion about what the smell invokes</p> <p>Preparation of garden beds for future planting</p> <p>‘Smudging’ – smoking of sage leaves</p> <p>One word to describe how you feel</p>
Three	<p>Deep breathing exercise</p> <p>Reflection on memories of smell from the previous week and discussion of experiences with the group</p> <p>Selection of a leaf from a provided basket, consideration of how it feels to touch</p> <p>Discussion of the experience and the memories it invoked</p> <p>Barefoot walk on the pebbles, sand and rock particles provided and discussion of the different sensations</p> <p>Planting of lettuce beds</p> <p>‘Smudging’ – smoking of sage leaves</p>
Four	<p>Deep breathing exercise</p> <p>Reflection on memories of touch from the previous week and discussion of experiences with the group</p> <p>Walk through the garden, selection of something that is not perfect</p> <p>Discussion of reasons for the selection. Consideration of its qualities, strengths and beauty</p> <p>Art in the garden group - Visual diaries used to draw elements of the garden or creation of a collage using items from the garden</p> <p>Painting the clay pots from week one</p> <p>One word to describe how you feel</p>
Five	<p>Deep breathing exercise</p> <p>Reflection on what was observed/noticed during the week and discussion of experiences with the group</p> <p>Relaxation exercise – accompanying music provided by a specialist hand pan player</p> <p>Focus on what is edible in the garden - small bed gardening to remove inedible plants accompanied by music played on the hand pan</p> <p>Tuition on playing the hand pan</p>

Six	<p>Deep breathing exercise</p> <p>Reflection on sounds we noticed from the previous week</p> <p>Focus on what we can eat from the garden</p> <p>Transfer and propagation of plants from the vertical garden into other pots</p> <p>Specialist vegan chef, demonstrating earth to table cooking.</p> <p>Group cooking using herbs from the garden to make spiral zucchini pasta with pesto sauce, and chili and rosemary chocolate</p> <p>Enjoyment of the food produced</p>
Seven	<p>Deep breathing exercise</p> <p>Selection of a card to discuss personal meaning – themes such as fun, nature, healing, friendship, connection, celebration, music and adventure</p> <p>Transfer of previous week’s potted plants to the garden beds</p> <p>Art in the garden – painting pots, painting stones, drawing a tree to represent the self</p> <p>Discussion of your tree</p> <p>Naming three things for which you are grateful</p> <p>Deep breathing exercise</p>
Eight	<p>Deep breathing exercise</p> <p>Reflection on the seven-week program</p> <p>Potting and pruning and re-installation of the vertical garden</p> <p>Celebration with food brought by all participants</p> <p>Art work – mandala to reflect the HT experience</p> <p>Discussion of mandala with the group</p> <p>Selection of one word describing how you feel</p> <p>Group photos</p> <p>Deep breathing exercise</p> <p>Our future plans and potential HT groups</p> <p>Farewell</p>

CONCLUSIONS AND FURTHER STUDY

This paper demonstrates the rationale for rooftop horticulture in high-density urban environments. The cost of mental illness in Australia in 2013 was \$20 billion and includes loss of productivity and labour force participation. Mental illness describes a number of diagnosable disorders that can significantly interfere with a person's cognitive, emotional or social abilities. The rationale for the research was that increasing the spaces in dense urban environments where people can interact with others should improve mental health and well-being (DoHA 2013. Nutsford et al, 2013). The literature review highlights the issues contributing to poor mental health and the perceived benefits of increased social interaction and group based activities such as horticulture therapy. The site for the study was the retrofitted rooftop garden at St Canice’s in the Cross area of Sydney Australia. The researchers evaluated participants’ experience of an 8-week horticulture therapy programme. This paper posed the question; *what is the impact of a rooftop horticulture therapy on mental health care consumers?* We found a number of positive outcomes in respect of individuals’ health and wellbeing. Positive aspects included improved sense of good health and wellbeing, social interaction, sanctuary of the garden space, skill development, and expert facilitation of the programme. A limitation of the research is that this is a single case study only with four participants experiencing the full programme. The research aim of gaining a deeper understanding of the benefits or otherwise to participants of a rooftop horticulture therapy programme were achieved, as the description of the participants’ perceptions and experiences reveals. These positive findings provide evidence to make a case for the inclusion of horticulture

therapy in health care plans, and could be transferred to other environments; such as high-density housing and some workplace environments. The positive outcomes experienced in the Cross are reaffirmed through other similar studies conducted in other countries. Further programmes in Australia should be evaluated to compare experiences perceptions and outcomes and build a case to adopt rooftop gardening as a means of enhancing mental health and well being across the wider urban population

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