Sustainability of Professional Pharmacy Services in Community Pharmacy.

Thesis

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Doctor of Philosophy
Graduate School of Health, Discipline of Pharmacy:
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CERTIFICATE OF ORIGINAL AUTHORSHIP

I, Carmen Crespo Gonzalez, declare that this thesis, is submitted in fulfilment of the requirements for the award of Doctor of Philosophy, in the Graduate School of Health at the University of Technology Sydney.

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Abstract

Background: Businesses have had to evolve through the development of innovations to respond to competitive markets. In the healthcare area, these innovations have been designed with the objective of improving patients' quality of life and safety. Specifically, in Pharmacy, the role of community pharmacists has significantly changed from a product to a patient orientation. As a result, multiple innovations referred to as professional pharmacy services have been designed, evaluated and implemented in practice. Nevertheless, once these innovations have been incorporated into practice, there is a paucity of evidence on how to maintain and make these services sustainable.

Objectives: This thesis covers the exploration, analysis and development of knowledge of the sustainability of professional pharmacy services. This research aims to fill a gap in the literature. The beliefs, perceptions and experiences of key stakeholders were explored to add their views on theories and knowledge acquired from the literature.

Methods: Qualitative and quantitative methods were used. This thesis encompassed four phases which included: (1) A literature review to explore definitions of sustainability in health services research and to develop a specific definition for the sustainability of professional pharmacy services. (2) A systematic review to identify the different conceptual approaches and assessment tools for the sustainability of innovations in healthcare. These data were used to develop a framework for the sustainability of professional services in pharmacy. (3) A qualitative study to explore community pharmacists' experiences and perspectives on the sustainability of professional services and to assess the applicability of the developed sustainability framework in practice. (4) A mixed-methods study to identify patients' needs and align them with the professional services provided by community pharmacists in Australia.

Results: Twenty-nine sustainability and twenty-three implementations definitions were identified in the literature review. The concepts retrieved from these definitions allowed the development of a specific definition for the sustainability of professional pharmacy services. One hundred thirty-two studies describing a sustainability conceptual approach or an assessment tool were identified in the systematic review. Factors affecting the sustainability of professional pharmacy services were identified, including funding, government support, adaptation, or program evaluation amongst others. From the results of this review a framework for the sustainability of professional pharmacy services was proposed. Eighteen interviews with community pharmacists were conducted as part of the qualitative study. The applicability of the framework for the sustainability of professional services was explored. The relevance of remuneration, training, government support as factors moderating the sustainability of professional services was reinforced. Additional moderating factors such as service promotion, government recognition or the need for making "patients feel comfortable" were also identified. In the last piece of research, 26 anonymous surveys were conducted with patients and pharmacy owners. Patients' needs (e.g. receiving information about their medication and management of their health condition) and the services most frequently provided by community pharmacists (MedsCheck, Monitoring and Screening services) were identified. These needs and services were aligned and the most suitable services to respond to patients' needs were identified (i.e. Tailored counselling, MedsCheck and Home Medicines Review)

Conclusion: The theoretical exploration of sustainability has revealed inconsistency on the terms and approaches available in the scientific literature. The resulting definition and proposed framework should be used as a guide to achieve the sustainability of professional services in pharmacy. The identified sustainability factors may serve as a guide for the development of future tools to measure the sustainability of these innovations in practice. Identifying patients' expressed needs should be a priority for community pharmacists who are willing to achieve the sustainability of their professional services.

Dissemination of Research

Peer reviewed publications

1. **Crespo-Gonzalez, C.,** Garcia-Cardenas, V., Benrimoj, S.I. 2017, 'The next phase in professional services research: From implementation to sustainability', *Res Social Adm Pharm.* 2017;13(5):896-901.

2. **Crespo-Gonzalez, C.**, Benrimoj, S.I., Scerri, M.**,** Garcia-Cardenas, V. 2020, 'Sustainability of innovations in healthcare: a systematic review and conceptual framework for professional pharmacy services`, *Res Social Adm Pharm.*2020;16(10):1331-1343.
3. **Crespo-Gonzalez, C.**, Benrimoj S.I. , Scerri, M., Garcia-Cardenas, V. 2020, 'Community pharmacists' perspectives about the sustainability of professional pharmacy services: A qualitative study', *J Am Pharm Assoc (2003).*(Submitted-Responded to Editors and Reviewers' comments)

Research papers under review

1. **Crespo-Gonzalez, C.**, Benrimoj, S.I., Scerri, M.**,** Garcia-Cardenas, V. 2020, ` Exploring patients' needs to achieve the sustainability of professional pharmacy services in Australia: A mixed-methods study'. (Submitted to "International Journal of Clinical Pharmacy")

Conference proceedings

1. **Crespo-Gonzalez, C.,** Garcia-Cardenas, V., Benrimoj, S.I. 2017, 'Conceptual approach to research and incorporation of services into community pharmacy', International Pharmaceutical Federation, International congress, Seoul, Korea, 2017
2. **Crespo-Gonzalez, C.,** Garcia-Cardenas, V., Benrimoj, S.I. 2018, 'Revisión sistemática de las herramientas para medir sostenibilidad de los servicios asistenciales de salud', SIMPODADER internacional congress in Granada, Spain, 2018

3. **Crespo-Gonzalez, C.,** Garcia-Cardenas, V., Benrimoj, S.I. 2018, 'Conceptual approaches to the sustainability of healthcare services and their application to pharmacy', 1st International conference pharmacy practice research (BPSPPR Conference).

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Preface

This thesis is presented in fulfilment of the doctoral degree (Doctor of Philosophy) requirements of the University of Technology Sydney, Australia.

The thesis is structured as a PhD by compilation. Chapter 1 includes an outline of the overall rationale, organisation and the objectives of the thesis. Chapter 2 covers the background of the thesis. Chapters 3-6 contain the results, which have been structured as research articles containing corresponding references, figures, tables and appendices related to the piece of research. Chapter 3 and 4 have been published, and a copy of the paper is included. Papers included as Chapters 5 and 6 are currently under review by a journal and the version provided in this dissertation is the same as that submitted to the journal.

Chapters 3-4 present an overview of the existing evidence on the topic of interest. A proposed definition (Chapter 3) and a framework (Chapter 4) for the sustainability of professional pharmacy services are included. Chapters 5-6 contain a qualitative exploration of the topic. Chapter 7, which discusses the results of each piece of research, summarises the contribution of the work and provides recommendations for future research.

Carmen Crespo Gonzalez is the primary author of each publication. Co-authors contributed to the conception, design of the work, data collection, data analysis, interpretation or critical revision of the manuscripts.

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Abbreviations

ACA	Australian Customers' Association
ACT	Australian Capital Territory
A.I.	Absolute importance
ATSIPSS	Aboriginal and Torres Strait Islander Pharmacy Scholarship Scheme
ACCHOs	Aboriginal Community Controlled Health Organisations
BP	Blood Pressure
CPE	Continuing Professional Education
CPA	Community Pharmacy Agreement
DAAs	Dose Administration Aids
GP	General Practitioner
HMR	Home Medication Reviews
HoQ	House of Quality
KTA	Knowledge to Action
PARiHS	Promoting Action on Research Implementation in Health Services
QFD	Quality Function Deployment
QLD	Queensland
QUM	Quality Use of Medicines
QUMAX	Quality Use of Medicines Maximised
MBS	Medicare Benefits Schedule
NT	Northern Territory
NSW	New South Wales
OTC	Over-the-counter
OSA	Obstructive Sleep Apnoea
PBS	Pharmaceutical Benefits Scheme

Pn	Patients' need
PO	Pharmacy Owner
PM	Pharmacy Manager
PP	Pharmacist Provider
RE-AIM	Reach, Effectiveness, Adoption, Implementation and Maintenance
RITA	Rural Intern Training Allowance
SA	South Australia
TAS	Tasmania
TBL	Triple Bottom Line
VIC	Victoria
VoC	Voice of the costumer
WA	Western Australia
WHO	World Health Organisation

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Chapter 1

Synopsis

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Rationale

Community pharmacists are developing and implementing a range of innovations in practice. Some of these innovations have been referred to as professional pharmacy services. The objective of these services is to improve medication management, health outcomes and ultimately the patient's quality of life. The development of these services is a complex process, which can be divided into four different phases: design, impact evaluation, implementation and sustainability. At the design phase, the components of the service are determined using a codesign method. The service's effectiveness is then assessed during the impact evaluation phase measuring clinical, economic and humanistic outcomes. Following this phase, effective services are integrated into usual practice (i.e. implementation phase). This implementation phase is evaluated using implementation process and outcome indicators. Finally, the service reaches a sustainable phase where it is maintained in the long-term.

Much of current health services research has focused on the first three phases, with limited evidence on the sustainability phase. Therefore, there is a need to further investigate the sustainability phase in the area of healthcare and specifically pharmacy practice. One of the main barriers faced by researchers in this area has been the inconsistency of terms used to refer to the sustainability phase. In the healthcare literature, there are a number of definitions and conceptual approaches referring to the sustainability of innovations. However, there is significant heterogeneity across these definitions and conceptual approaches used. There is an obvious need to develop a specific definition and approach that can be applied to the sustainability of professional services in community pharmacy. Having a specific definition will provide a common understanding of the concept within the discipline. Once a definition is available and accepted, developing a theoretical approach will help to understand the sustainability of pharmacy services as well as the factors that may moderate it. This conceptual approach can potentially guide and contribute to a sustainable future for professional services.

In Australia, many professional services have been designed and implemented, but there is limited evidence once these services have been integrated into usual practice. Exploring community pharmacists' experiences and perspectives with the provision of professional services and using a specific framework for professional pharmacy services will allow the identification of factors moderating the sustainability of these services in practice.

A fundamental part of ensuring the sustainability of services is considering the needs of those patients who are regularly visiting community pharmacies. Community pharmacists are said to be in an excellent position to provide their customers (i.e. patients) with services at the level of their needs and expectations. Prioritising patients' requirements and needs will allow optimising the services to obtain higher patients satisfaction and outcomes.

The context in which the professional services are provided is continuously changing along with patients' needs. Using planned services as a strategy to respond to these changes is necessary. Nevertheless, sometimes these services do not produce the expected results. Therefore, it would be useful to identify which are the most suitable services that can be used by community pharmacists to meet their patients' demands. This will allow community pharmacists to select, adapt and improve the quality of the professional services that they offer to produce benefits in the long-term.

Objectives

This thesis covers the exploration, analysis and development of knowledge of the sustainability of professional pharmacy services.

Primary Objectives

- To identify differences between implementation and sustainability phases of health innovations.
- To propose a specific definition for the sustainability of professional services in community pharmacy.
- To explore the conceptual approaches and assessments tools for the sustainability of innovations in healthcare.
- To develop a framework for the sustainability of professional services in pharmacy.
- To assess the applicability of the theoretical framework for the sustainability of professional services in practice by exploring community pharmacists' experiences and perspectives with the provision of professional services.
- To explore patients' expressed needs and their alignment with the professional services provided by community pharmacists.

Research Overview

This thesis applied a mixed methods approach. The thesis has been organised in seven chapters (Figure 1). Chapter 1 provides an overview and rationale of the thesis. Chapter 2 presents an introduction of the research. Chapters 3-6 present the main body of the research. Chapter 3, 4, 5 and 6 are structured as research articles:

- Chapter 3 is a literature review of implementation and sustainability definitions available in healthcare and proposes a definition for the sustainability of professional pharmacy services.
- Chapter 4 presents a systematic review of the literature to explore conceptual approaches and assessments tools for the sustainability of healthcare innovations. A framework for the sustainability of professional services in community pharmacy is proposed.
- Chapter 5 describes a qualitative study using semi-structured interviews with community pharmacists providing professional services. Framework analysis was used to explore the factors moderating the sustainability of professional services in community pharmacy to assess the applicability in practice of the framework developed in chapter 4.
- Chapter 6 is a mixed-methods study, using the Quality Function Deployment method to explore patients' needs for professional pharmacy services. The objective was to provide community pharmacists with a decision support tool to select the most appropriate services to meet those requirements.

Chapter 7 discusses the findings and future implications of the research. The final conclusions from the research are addressed.

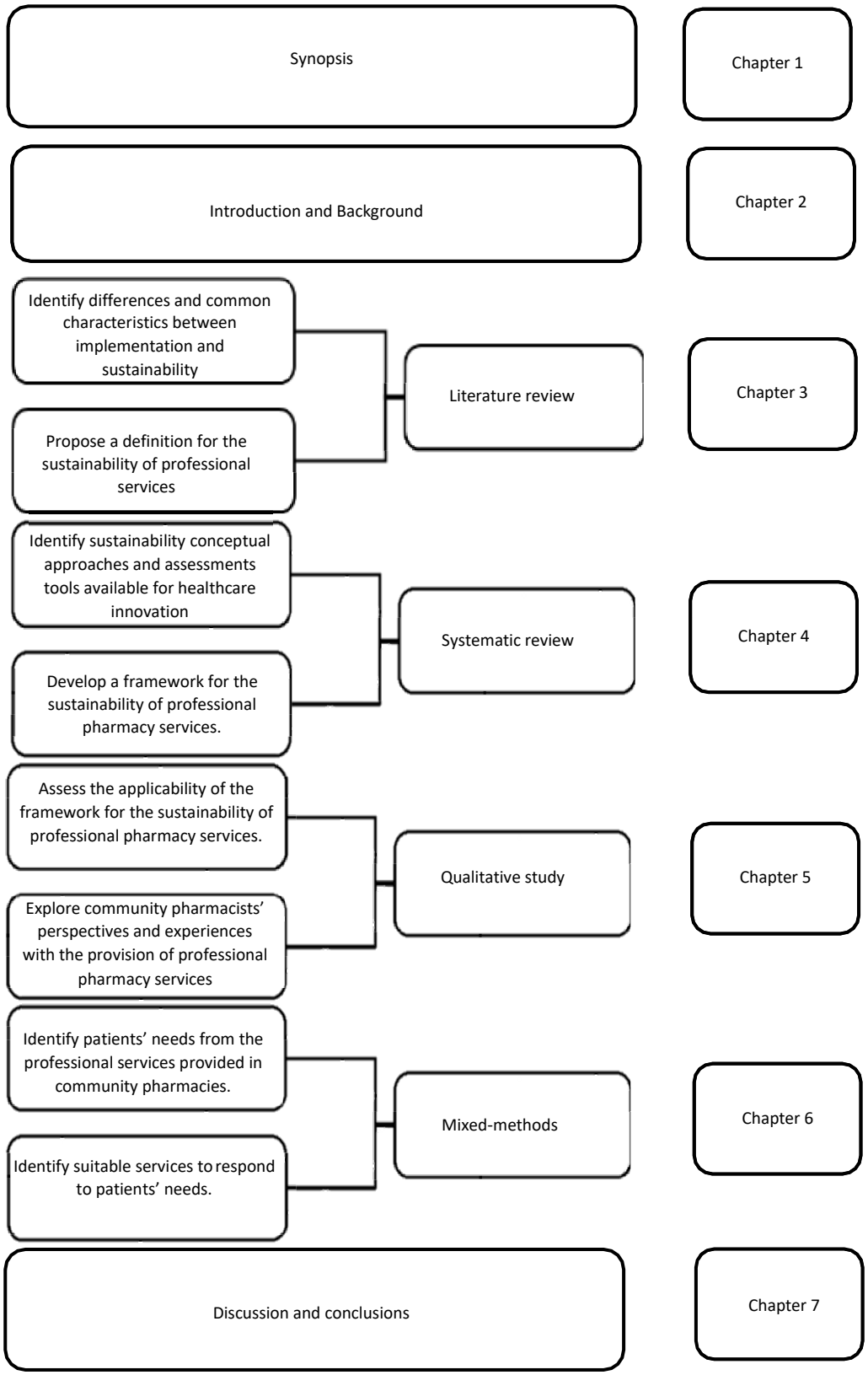


Figure 1: Thesis Structure

The remainder of this chapter will provide an overview of the main body of the research of this thesis (Chapters 3-6), with the key research findings highlighted.

Chapter 3 - The next phase in professional services research: From implementation to sustainability

The first part of this thesis was focused on determining the differences between implementation and sustainability phases in health services research and on proposing a definition for the sustainability for professional pharmacy services.

Community pharmacy and the role of community pharmacists has evolved with the development of professional services through different phases (i.e. design, impact evaluation, implementation and sustainability). Numerous services have been designed and evaluated in research environments proving their value and positive contribution to patient care. The implementation of these services into practice has been a challenge for community pharmacists and community pharmacy. Currently, community pharmacists are overcoming this challenge with the assistance of implementation science, which studies theories and research methods to incorporate evidence into practice. Once services have been successfully integrated into practice, the objective is to achieve their long-term continuity and sustainability. However, there is lack of knowledge and research with one of the main barriers being the lack of consensus in the terminology and definitions used to refer to the sustainability phase.

The objective of this paper was to describe the characteristics and differences between the implementation and sustainability phases in health services research. Using this analysis, a definition for the sustainability of professional pharmacy services was proposed to facilitate recognition, understanding and research on this phase by pharmacy practice researchers and practitioners.

A literature review was conducted in the journal Implementation Science, with no time restrictions, to identify terms and definitions used to describe the sustainability and implementation in health services research. The keywords used in the search were: “Implementation phase of health care services” OR “Sustainability phase of health care services”. The common characteristics and differences between

implementation and sustainability were identified through concepts extracted from each definition. These concepts were thematically organised in four categories- Aim (i.e. objectives of the phases), Process (i.e. performance of each phase), Point in time (i.e. start of each phase.) and Duration (i.e. length of each phase).

Twenty-nine sustainability and twenty-three implementations definitions were identified. The main ideas retrieved from the definitions were:

- The implementation phase aims to integrate new or evidence-based services into practice. In contrast, the sustainability phase aims to maintain the provision of the services over time to achieve long-term benefits.
- At the implementation phase, activities and strategies are used to integrate the new service. At the sustainability phase, there is a maintenance, adaption and improvement of these methods, processes and core components.
- The implementation phase occurs during the time between the adoption of a service and its integration into practice. However, there are different views and ideas proposed as to when the sustainability phase commences.
- The duration of the implementation phase was stated to be around one year, with most authors suggesting that there is not a defined duration for the sustainability phase.

Based on the sustainability definitions retrieved and on the concepts, extracted the following definition for the sustainability of professional pharmacy services was proposed:

“Sustainability is a phase in the process of a professional pharmacy service, in which the service previously integrated into practice during the implementation phase is routinised and institutionalised over time to achieve and sustain the expected service outcomes”.

In order to allow national and international comparisons, it was proposed that there should be a consensus on the definition for the sustainability phase of professional pharmacy services. Additionally, it was suggested that valid and reliable tools should be developed to evaluate the sustainability phase.

Chapter 4 - Sustainability of innovations in healthcare: a systematic review and conceptual framework for professional pharmacy services

The next phase of the research was focused on a theoretical exploration of sustainability in the area of healthcare innovations, in order to develop a conceptual approach specific for professional pharmacy services.

The sustainability of innovations in healthcare has been addressed in the literature through a broad range of conceptual approaches and assessments tools. Some of the innovations delivered and implemented by community pharmacists (i.e. professional pharmacy services) have been found to improve patients' health outcomes. However, there are still questions around the levels of adoption and implementation of such innovations. Furthermore, there is a gap in the literature to guide the process to measure the sustainability of professional services. Due to the apparent lack of evidence, the objective of this review was to explore conceptual approaches and assessments tools for the sustainability of innovations in healthcare and to develop a framework for the sustainability of professional services in community pharmacy.

In January 2019, a systematic review, with no time restrictions, was undertaken in PubMed, Scopus and Web of Science. The search strategy was created with terms related to sustainability (i.e. routinization, sustainability) AND healthcare (i.e. healthcare, health care sector [MeSH Terms]) AND conceptual approaches and assessment tools (i.e. model OR questionnaire). Papers including a sustainability conceptual approach and/or assessment tool were included. The exclusion criteria were: papers describing (a) any sustainability conceptual approach or assessment tool based on innovations performed within a setting other than healthcare (e.g. school or university), (b) environmental interventions or innovations promoting physical activity or related to diet, or (c) papers not written in languages with the Latin alphabet. The relevant papers were screened first by title and abstract. Secondly, a full-text review of selected papers was conducted. Additionally, a review of the references of the selected papers was performed.

General characteristics of the conceptual approaches and assessments tools were

retrieved (e.g. type of approach, name, aim, year, audience). Factors depicted as moderators of the sustainability of innovations in healthcare were identified.

4189 articles were retrieved and 1066 were duplicates and therefore removed. 3123 articles were screened by title and abstract and 468 full-text papers were reviewed. A total of 132 studies were finally included in the qualitative analysis (Fig.1). From the 132 studies, 106 described a sustainability conceptual approach for innovations in healthcare. From these 106 papers, the following factors were cited as the most common moderating the sustainability of innovations in healthcare: financial sustainability, including funding, political environment/context, organizational capacity, leadership, partnership, staff training and evaluation, adaptability or adaptation and program evaluation.

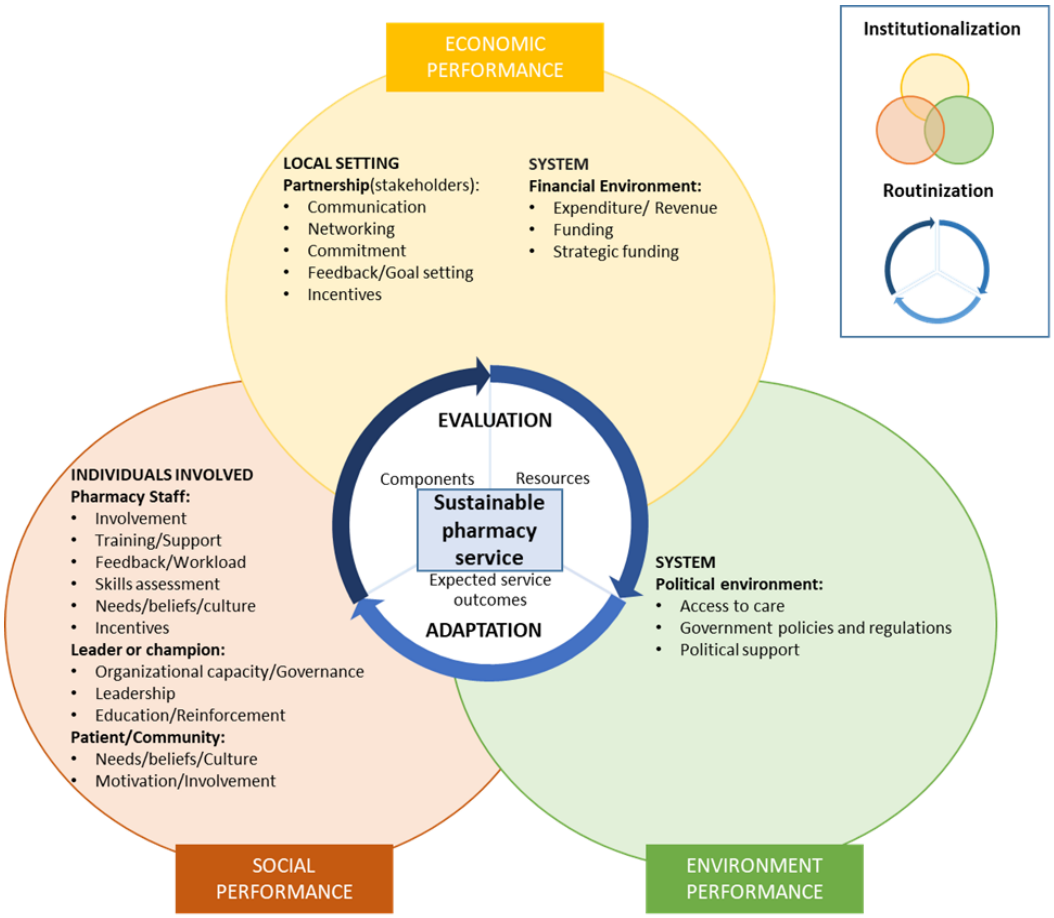
Twenty-six studies included an assessment tool used to evaluate the sustainability of innovations in a health setting. The most common factors identified in the assessment tools to evaluate the service were: strategic planning, program evaluation and adaptation, resources, partnership, community involvement, staff training and their involvement, leadership and communication with stakeholders, political support and strategic funding.

A theoretical framework for the sustainability of professional services (Figure 2) was developed based on:

1) The factors retrieved from the different conceptual approaches and assessment tools identified for evaluating the sustainability of innovations in healthcare.
2) The definition for the sustainability of professional pharmacy services to ensure the framework was specific for the community pharmacy setting. Two core concepts routinization and institutionalization from the definition were incorporated into the framework:
    - Routinization is the maintenance of the pharmacy's routine for the service provision through continuous improvement of the service's protocol and components.
    - Institutionalization is the gradual adaptation of the pharmacy's context, structures, and processes, to the provision of the service.

3) Three performance contextual domains from the Triple Bottom Line (TBL) framework were included: people (social domain), planet (environment domain), and profit (economic domain).

Figure 2: Framework for the sustainability of professional services in community pharmacy.



Chapter 5 - Community pharmacists' perspectives about the sustainability of professional pharmacy services: A qualitative study

In order to assess the applicability of the framework, the experiences and perspectives of community pharmacists with the provision of professional services implemented in Australian community pharmacies were explored.

A qualitative study was undertaken. Community pharmacists involved in the provision of professional services for at least two years were eligible to participate in the study regardless of their position at the pharmacy. The interview guide was created based on the factors depicted in the framework for the sustainability of professional services in pharmacy (Chapter 4). A snowball sampling was adopted until data saturation was reached. Eighteen semi-structured interviews were conducted and analysed using a framework methodology in NVivo12.

Some examples of the range of services provided by community pharmacists interviewed included medication adherence services, MedChecks, Home medications reviews (HMR), sleep apnoea services, services to promote health (e.g. smoke cessation campaign, flu vaccinations), health monitoring services (e.g. blood pressure, glucose, cholesterol).

The majority of interviewees, when asked about the meaning of sustainability for professional services, mentioned the economic feasibility of the services provided, others referred to the long-term continuation of the services and some referred to sustainable service as the ones perceived as necessary for the community.

In response to the question of how the sustainability of professional services could be measured, some interviewees suggested that it could be in terms of the service expenses and profits. Some community pharmacists indicated that it could be measured in terms of improved patient health outcomes. However, some of the interviewees were not able to propose a way to measure the sustainability of the services or did not believe that it would be possible to be measured.

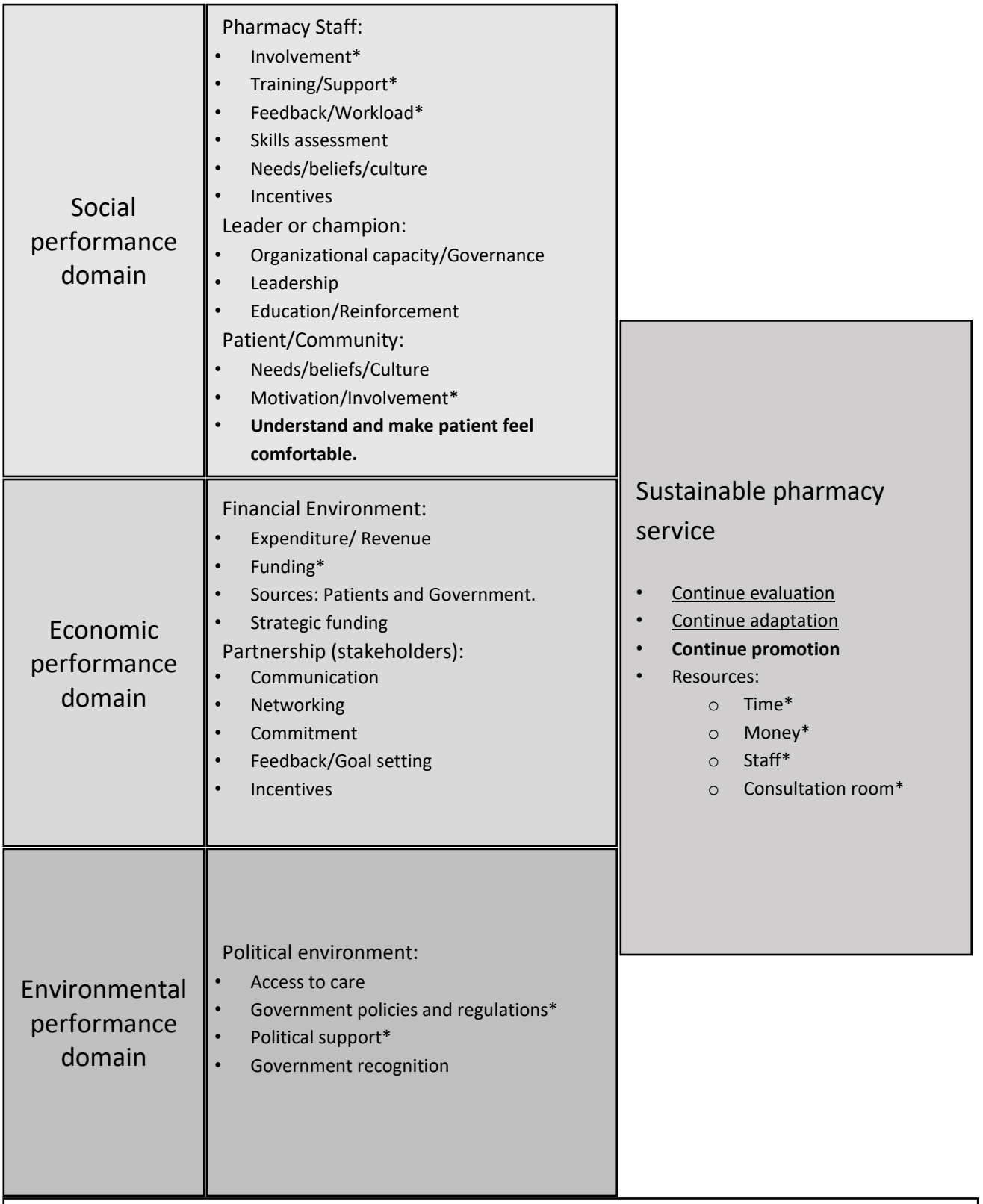
The major sustainability factors were identified and organised based on the three

context domains (i.e. economic, social and environmental) and the service characteristics (i.e. components and resources) according to the previously developed framework for the sustainability of professional services (see chapter 4).

Most of the sustainability factors identified in practice were analogous with those proposed in the theoretical framework for the sustainability of professional services (Chapter 4). However, additional sustainability factors were identified such as the necessity to continue service promotion as well as making “patients feel comfortable”. Even though the service adaptation was given high relevance in the literature most of the interviewees declared that they only had made changes in terms of the community pharmacy infrastructure (e.g. new consultation room).

The feedback from community pharmacists’ experience demonstrated the applicability of the proposed framework for the sustainability of professional services in practice. The resulting list of factors (Figure 3) may be highly useful as a guide to quantitatively identify how they influence the sustainability of professional pharmacy services in community pharmacy.

Figure 3: Factors affecting the sustainability of professional pharmacy services



Chapter 6 - Exploring patients' needs to achieve the sustainability of professional pharmacy services in Australia: A mixed-methods study.

Once the perspectives of community pharmacists were explored, the objective of the last phase of this research was to examine and identify the needs of the patients receiving professional services in Australia. The purpose was to provide community pharmacists with a decision support tool to identify the most suitable services to respond to their patients' demands.

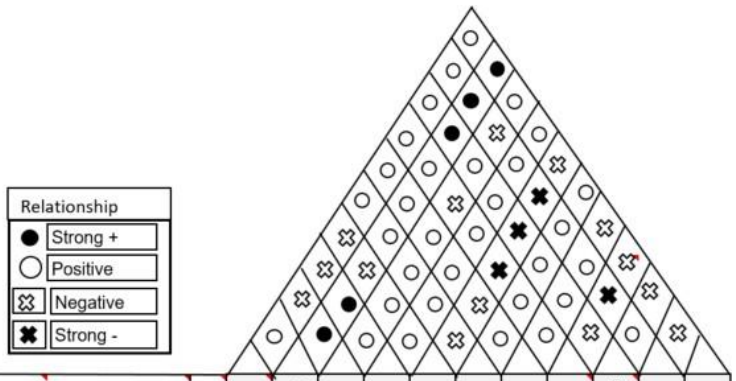
A mixed-methods study was undertaken. The Quality Function Deployment approach was applied using the House of Quality (HoQ). The HoQ is a planning matrix that allowed to establish the relationship between patients' needs and the professional services provided by community pharmacists. The data to complete the HoQ was collected and analysed in four steps through: (1) an anonymous qualitative survey to explore patients' needs; (2) an anonymous qualitative survey to explore what professional services were provided by community pharmacists to respond to the identified patients' needs; (3) Expert panel using the Delphi method to establish the relationship firstly between the needs and the services provided by community pharmacists and secondly, between the services offered by community pharmacists; (4) The absolute importance of the services provided by community pharmacists in relation to patients' needs was obtained.

A total of sixteen patients completed the first qualitative survey. Patients' most common needs identified were receiving (1) information about their medication (n=7, 43.75%) and services to monitor their health condition (n=7, 43.75%). A total of ten community pharmacists completed the second survey. From the results of the interview, the professional services most commonly reported as being provided by community pharmacists were: MedsCheck (100%, n=10), Monitoring services (90%, n=9), Home medication reviews (HMR) (80%, n=8) and Screening services (80%, n=8). Nine experts agreed to participate in the expert panel group. The service identified as having strong relationship with several of the patients' needs was tailored counselling (i.e. information about health condition and medication, medication

adherence medication administration and medication side-effects). The absolute importance of each of the services in relation to each patient need was obtained. The service which best responded to patients' need was Tailored counselling (A.I.=296). The other two services which were identified as more suitable to respond to patients' needs are MedsCheck (A.I.=260) and HMR (A.I.=259).

The resulting HoQ should (Figure 4) should be used as a decision support tool to identify the services which are most likely to fulfil patients' needs and therefore to survive over time.

Figure 4: House of Quality analysis.



Patients' needs (Pn) \ Sevices (S)	Importance (1-5)	S1.Educational campaigns	S2.Tailored counselling	S3.MedsCheck	S4.HMR	S5.DAA	S6.Health monitoring	S7.Screening	S8.Vaccinations	S9.Weigh management	S10.Sleep apnoea	S11.Minor ailments
n1.Provision of information on health conditions	4	7.11	8.11	6.78	7.44	1.78	6.38	6.22	2.78	5.44	6.56	6.33
n2.Management of the health condition	5	5.22	7.11	7.33	7.22	3.44	8	5.33	3	5.11	6	4.89
n3.Screening	3	5.44	6.56	4.56	4.44	2.11	5.75	8.78	2.89	5.22	6.44	4.78
n4.Disease prevention	4	7.44	6.89	5.56	5.22	2.22	6.5	7.67	7.44	7.22	5.78	5
n5.Lifestyle changes	5	7	7	6.33	6.11	1.78	5.13	5.44	1.22	7.89	7.22	5.33
n6.Medication adherence	3	3.44	8.33	8.56	8.44	7.78	5.13	3.89	1	3.33	2.56	3.67
n7.Medication administration	2	2.67	8.11	7.11	7.11	7.67	3.38	2.89	1.22	2.11	2.33	5.44
n8.Medication information	5	3.11	8.22	7.33	7.33	2.22	3.38	2.56	3.11	3.44	3.33	5.89
n9.Medication side-effects	3	2.67	8.44	8.33	8.44	1.67	5.25	3.78	2.44	2.44	2.33	6.33
n10.Health condition treatments	1	4.89	7.33	6.22	6.44	2.11	4.63	3.67	2.11	6.44	6.33	6.33
n11.OTC medications	4	4	7.67	5.22	5.11	3.33	3.75	4.22	1.44	3.89	3.78	8
Absolute Importance (A.I.)		196	296	260	259	119	209	198	107	192	192	219

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Chapter 2

Background

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“We cannot solve our problems with the same thinking we used when we created them.”

Albert Einstein, Physicist

Sustainability is a concept which has evolved across the years. The concept emerged more of a century ago due to the fear of the possible depletion of crucial resources caused by the increasing population. This situation led to a global awareness of the need for an action plan for the future (Du Pisani 2006). The World Commission on Environment and Development published a report in 1987 with guiding principles for sustainable development. This report defined sustainable development for the first time. The definition is still used worldwide, and it states that sustainable development is (Brundtland 1987):

“Development that meets the needs of the present without compromising the ability of future generations to meet their own needs”.

Initially sustainability was defined only from an environmental perspective. However, it also has social and economic connotation. These three aspects of sustainability are related in a framework called ‘The Triple Bottom Line’ created in order to assess businesses performance to achieve significant outcomes over time (Elkington 1998). At the same time, the importance of innovation for business owners is becoming critical with highly competitive markets. Many businesses are reinventing themselves through the design and incorporation of innovations. Innovation has been defined as (Baregheh, Rowley & Sambrook 2009):

“A multi-stage process whereby organizations transform ideas into new/improved products, service or processes, in order to advance, compete and differentiate themselves successfully in their marketplace.”

As stated in the above definition, an innovation goes through different stages including the design or creation, development, implementation and adoption of the innovation in practice. The challenge has been to adopt these innovations in usual practice. Innovations should be appropriately implemented to ensure that they produce the expected benefits for the business (Klewitz & Hansen 2014)

Healthcare Innovations

As in other disciplines, healthcare professionals are developing innovations usually driven to improve patients' quality of life and safety. These health innovations have been defined as (World Health Organization 2020):

"Health innovation identifies new or improved health policies, systems, products and technologies, and services and delivery methods that improve people's health and wellbeing. Health innovation responds to unmet public health needs by creating new ways of thinking and working with a focus on the needs of vulnerable populations. It aims to add value in the form of improved efficiency, effectiveness, quality, sustainability, safety and/or affordability. Health innovation can be preventive, promotive, curative and rehabilitative and/or assistive care."

The process associated with the incorporation of these innovations in practice has been the main focus of Implementation Science. "Implementation Science is the scientific study of methods to promote the systematic uptake of research findings and other evidence-based practices into routine practice, and hence, to improve the quality and effectiveness of health services and care" (Eccles & Mittman 2006).

Different theoretical approaches have been developed to assist and provide insights into the process by which these innovations are more likely to be translated successfully in practice. The terminologies used to refer to these theoretical approaches vary depending on their purpose (i.e. theories, models, frameworks) (Nilsen 2015). There are theoretical approaches, which present different phases required to the complete integration of the innovation in practice. Through the literature, these phases receive different names and include the design of the innovation, the evaluation of its impact, its implementation into practice and its final maintenance over time. Once the innovation is implemented, the final objective is to achieve its long-term survival during the last phase, sometimes referred to as sustainability.

The best-known approaches to aid the translation of the innovations in practice are: the Reach, Effectiveness, Adoption , Implementation and Maintenance (RE-AIM)

framework (Glasgow, Vogt & Boles 1999), the Knowledge to Action (KTA) framework (Graham et al. 2006; Graham & Tetroe 2007), and the Promoting Action on Research Implementation in Health Services (PARiHS) framework (Harvey & Kitson 2016; Kitson et al. 2008). Most of these frameworks have evolved over time (Milat & Li 2017). For example, the RE-AIM framework has been modified over the years and now proposes the following stages:

(1) Reach (i.e. the number or proportion of individuals to whom the innovation is targeted to); (2) Efficacy or effectiveness (i.e. evaluation of the innovation impact); (3) Adoption (i.e. organisation of the resources and staff required for implementing the innovation in a specific setting); (4) Implementation (i.e. fidelity and consistency of the provision of the service in real practice); (5) Maintenance (i.e. continuation of the innovations and its effects in the long-term).

The implementation of healthcare innovations in practice has been subject of debate in the last decade. As in any change process, there are many challenges associated with the implementation of innovations within healthcare settings. Some of these challenges are caused by the inadequacy of the innovation to the setting, absence of resources, or lack of motivation or preparation amongst others (Abdallah 2014). However, despite these challenges, there are multiple innovations such as new technologies (Øvretveit et al. 2007), lifestyle interventions (Lee et al. 2011), disease prevention interventions (Rhodes et al. 2016), health education (Hayes et al. 2012; Werdenberg et al. 2018) and quality improvement (Sunaert et al. 2009) programs, which have been successfully implemented across a range of healthcare settings. The process of incorporating these innovations in practice is crucial, before achieving their sustainability in the long-term (Fleiszer et al. 2015).

Sustainability in Healthcare

Although sustainability is a common term, the healthcare literature has a high variability of synonyms. Terms such as maintenance, continuation, routinisation or institutionalisation have been used interchangeably (Proctor et al. 2015). In many cases, authors do not provide a supporting definition of the term sustainability. Furthermore, the definitions in the literature have many differences (e.g. features,

nature, level, and timing) (Fleiszer et al. 2015). All these factors have made it difficult to achieve consistency in terms of the meaning of sustainability. Some authors have tried to develop a universal definition of sustainability (Moore et al. 2017). However, despite those efforts, a globally accepted definition is yet to be established (Borgonovi et al. 2018; Lennox, Maher & Reed 2018).

Implementation science has focused on identifying models, frameworks factors and strategies that influence the initial adoption and integration of innovations (Moullin et al. 2015). In healthcare, multiple studies have emphasised the importance of identifying factors and strategies for the sustainability of the innovations. The relevance of determining if these sustainability factors vary depending on the context, setting, and type of innovation has also been underlined. Moreover, there is an increasing number of studies highlighting the importance of having evidence-based strategies to support the sustained progress of a healthcare innovation (Proctor et al. 2015; Scheirer & Dearing 2011). In order to respond, advance and clarify the diverse ideas regarding the sustainability of innovations, multiple authors have proposed a range of conceptual approaches for sustainability in healthcare. These approaches have been applied across different healthcare settings such as hospitals (Ament et al. 2017), nursing homes (Gilissen et al. 2018), mental health centres (Lean et al. 2015), or primary care practices (Bray et al. 2009; Goodson et al. 2001). Most of them are aimed at identifying factors and strategies, proposing new methods, or guiding researchers and practitioners to understand and facilitate their path to achieve sustainable healthcare innovations (Baregheh, Rowley & Sambrook 2009; Shelton, Cooper & Stirman 2018).

As with implementation, it is fundamental to evaluate the sustainability of innovations in healthcare. To ensure the long-term survival of a healthcare innovation it is necessary to evaluate the innovation regularly, assessing its progress and impact. There is an increasing body of evidence concerning the evaluation of sustainability in health services research. Some papers have proposed tools and measures to assess and plan for the sustainability of innovations in healthcare (Lennox et al. 2017; Luke et al. 2014). Despite the availability of these conceptual

approaches and tools, there is still many of them which are yet to be validated (Proctor et al. 2015).

Exploring and developing the evidence available regarding sustainability is important. However, the opinions of stakeholders involved in the innovations are also a fundamental element to be considered while studying sustainability (Wiltsey Stirman et al. 2012). Exploring the opinions and experiences of different stakeholders provide an additional opportunity to understand the factors and circumstances which are having a positive or negative effect on the innovation progress in practice. Furthermore, exploring the needs of patients' receiving the innovations helps to understand the needs of the community. This will allow to tailor the innovations to patients' specific demands and at the same time assist in the maintenance and continuation of the innovations over time.

Debate regarding the sustainability phase

Implementation and sustainability are considered essential steps in health services research. However, there is still a controversy regarding the differences between these two phases. Some researchers have considered implementation and sustainability phases as occurring at the same point in time (Pluye et al. 2004). Others have defined sustainability as an implementation outcome (Proctor et al. 2011; Willmeroth, Wesselborg & Kuske 2019). In some cases, sustainability has been defined as the process that starts after the decision for adopting the innovation has been made (Johnson et al. 2004). In other cases, sustainability has been considered as the phase that occurs after the implementation stage is completed (Bopp, Saunders & Lattimore 2013; Dearing 2009). The issue associated with this lack of agreement is that there is no defined time or instance in the innovation's process to start considering and analysing the sustainability stage. Identifying which are the characteristics of the implementation and sustainability phases and determining the timing for the sustainability stage is crucial to achieve a consensus and advance the research (Scheirer & Dearing 2011).

There is another debate in the scientific community regarding the nature of the sustainability phase. Occasionally, the sustainability stage has been considered a

steady phase with no changes over time (Yin 1981). However, sometimes this stage has been stated as dynamic due to the constant changes happening in the context in which the innovation has been implemented. Therefore, at the sustainability stage, changes of the innovation over time are expected (Chambers, Glasgow & Stange 2013).

Pharmaceutical services: innovations

In the last three decades in the field of pharmacy practice and especially in community pharmacy, there have been global professional and economic changes that have affected significantly the professional practice and business (e.g. pharmacists training at university level, pricing reforms, changing remuneration systems, increased use of generic medicines). Community pharmacists' and community pharmacies' role has evolved along with these changes. Due to their high accessibility and expertise with medicines, community pharmacists are increasingly being integrated into the healthcare system and recognised as essential primary healthcare providers. Community pharmacists are in an excellent position to provide patients with much more personalised care through the implementation of innovations. In the last decade these innovations are referred to as professional pharmacy services. These professional services have been defined as (Moullin et al. 2013):

"an action or set of actions undertaken in or organised by a pharmacy, delivered by a pharmacist or other health practitioner, who applies their specialised health knowledge personally or via an intermediary, with a patient/client, population or other health professional, to optimise the process of care, with the aim to improve health outcomes and the value of healthcare."

The process in the creation of these new services is complex and encompass different stages or phases as in other healthcare disciplines. The phases are: The design phase in which the characteristics of the services are defined; Impact evaluation phase in which the service is tested for efficacy and the characteristics of the service can be redesigned; The Implementation phase in which the service is integrated into practice; and the sustainability phase which is the most unknown in the process. This

phase is described as the maintenance of the professional service once it is integrated into practice. There is a specific framework for the implementation of services in pharmacy (Moullin, Sabater-Hernandez & Benrimoj 2016). The framework includes different phases influenced by different contextual domains (i.e. individuals, organisation/pharmacy, local setting and system. All the phases are connected within each other, and there are various factors depicted as affecting the service at different levels (Garcia-Cardenas et al. 2018). In this framework, the sustainability phase is represented as independent of the rest of the phases because it is considered as an implementation outcome.

The pharmacy profession in Australia

The Australia Government, in conjunction with the State and Territory Governments, set the policy framework, resource and manage the health system (Australian Government Department of Health). Australian citizens and permanent residents have access to health and hospital services at low or no cost through a universal health insurance scheme called Medicare (Australian Government Department of Health 2020). Medicare funds access to health care in three main ways (Australian Government Department of Health 2019c, 2020): (1) Access to public hospitals for free, (2) The Medicare Benefits Schedule (which provides significant funding of primary health care access and services) and (3) the Pharmaceutical Benefits Scheme (PBS) (which provides timely, reliable and affordable access to necessary medicines for Australians).

The pharmacy profession in Australia is regulated at three levels: (1) the Federal Government, (2) the State and Territory Governments, and (3) the local Governments. In most cases, community pharmacists can exclusively own a pharmacy. There are specific rules for the number of community pharmacies that pharmacists can own, and these are set at State or Territory levels. There are also establishment location rules, which apply to community pharmacies location that supply PBS medicines. These types of pharmacies require approval prior to establish or relocate (Australian Government Health 2019).

Australia's population is 25,572,256 (Australian Bureau of Statistics 2020) with

approximately 4,468 residents per pharmacy. There are 95% of residents in urban areas who have access to a pharmacy within a 2.5 km range. In regional areas this percentage decreases to 72% (Pharmacy Guild of Australia, 2018). Only 1,274 of the 32,777 registered pharmacists are non-practising in community pharmacy (Pharmacy Board of Australia 2020).

Since 1990, five-year agreements are signed between the Federal Government and the Pharmacy Guild of Australia. These provide remuneration to those community pharmacies dispensing PBS medicines and providing services which are funded under these agreements (Australian Government Department of Health 2019a). The Community Pharmacy Agreements (CPAs) objectives are shared by (Australian Government Department of Health 2019c)

- "Promoting the sustainability, efficiency and cost-effectiveness of the PBS within the broader context of health reform;
- Ensuring that community resources are appropriately directed across the health system;
- Supporting the sustainability and viability of an effective community pharmacy sector".

Through time the scope of these CPAs has changed (Australian Government (Health) 1990-95, 1995-2000, 2000-05, 2005-2010; Australian Government Department of Health 2010-2015). Through these agreements, there has been an evolution in pharmacy remuneration. In the latest CPA, the 6 CPA, there was a major change in the way community pharmacists are funded. Their main role of medicines dispensing (which has traditionally funded through a margin of the medication price), is funded through: (1) a fixed dispensing fee, and a (2) fixed administration, handling and infrastructure fee. In this agreement, there is also significant funding to provide a range of medication adherence and management services.

The Australian government has had a critical part in providing remuneration for CPAs. It had also had an essential role in acknowledging community pharmacists' role as healthcare providers. The current 6 CPA is due to expire in June of 2020. Currently

the Department of Health continues their negotiations for the 7CPA with the Guild and the Pharmaceutical Society of Australia. The objective of the new CPA is to achieve increased affordability and access to PBS medicines(Australian Government Department of Health, 2019).

Professional pharmacy services in Australia

Community pharmacists in Australia are remunerated under Part B of the CPA for the provision of professional pharmacy services. There is a wide range of services that are currently being offered and organised in four different programs (i.e. Medication Adherence, Medication Management, Rural Support, Aboriginal and Torres Strait Islander) (Australian Government Department of Health 2019b; Pharmacy Programs Administrator):

1. **Medication Management Programs**: services designed to promote the quality use of medicines and reduce adverse medicine events. These include:
    - Home Medicines Review: clinical process provided by an accredited pharmacist that considers the patient's medicines and health in order to enhance the Quality Use of Medicines (QUM) and reduce the number of adverse medicines events.
    - Residential Medication Management Review: service provided to a permanent resident of an Australian Government funded facility. Designated to promote the rational use of medicines and reduce the risk of adverse reactions.
    - MedsCheck (Medicines Use Review): service provided within a community pharmacy that consists of a review of the patient's medications with the ultimate objective of improving the patient's understanding of their medicines, self-management and patient outcomes.
    - Diabetes MedsCheck: this is a specific type of MedsCheck focused on type 2 Diabetes.
2. **Trial Programs:** trial services administered by the Pharmacy Programs Administrator.

- Naloxone Pilot: program to assist witnesses or people at risk of opioid overdose by providing free access to Naloxone.
- Health Care Homes Trial: program to assist the incorporation of medication management services and planning in Healthcare Homes.

3. **Medication Adherence Programs**: services to improve medication compliance which are:
    - Dose Administration Aids (DAAs): used to assist patients with the management and timing of their medicines, in accordance with the prescriber's instructions.
    - Clinical Interventions: clinical services aimed at identifying and resolving drug-related problems and improve the QUM.
    - Staged Supply Support Allowance: under this program, pharmacies dispense PBS medicines in instalments when requested by the prescriber. This can assist patients with mental illness, drug addiction, or who are otherwise unable to manage medications safely.
4. **Rural Support Programs:** services to increase access to PBS medicines for people living in rural and remote regions. Some examples are:
    - The Rural Continuing Professional Education (CPE) Allowance: program to improve and strength the pharmacy workforce in regional and remote areas to increase the access of rural patients to quality pharmacy services.
    - The Emergency Locum Service Program: used to support Pharmacists in rural and remote by providing them with direct access to Pharmacist locums in emergencies (i.e. illness, bereavement, family emergencies).
    - The Rural Intern Training Allowance (RITA): program to provide financial support to access compulsory training activities for Interns Pharmacists practising in rural and remote areas.
5. **Aboriginal and Torres Strait Islander Specific Programs:** services to improve quality use of medicines and culturally appropriate services for Aboriginal

and Torres Strait Islander Patients.

- The Quality Use of Medicines Maximised for Aboriginal and Torres Strait Islander People (QUMAX) Program: used to support services provided by Aboriginal Community Controlled Health Organisations (ACCHOs) and Community Pharmacists to improve the QUM.
- Section 100 Pharmacy Support: program to provide annual allowance for community to support the delivery of a range of Quality Use of Medicines (QUM) services in a remote area.
- The Aboriginal and Torres Strait Islander Pharmacy Scholarship Scheme (ATSIPSS): program to address the pharmacy profession and health needs of the Aboriginal and/or Torres Strait Islander community by supporting students in their decision to undertake tertiary study in the field of pharmacy.
- The Aboriginal and Torres Strait Islander Pharmacy Assistant Traineeship Scheme: program to support training and employment of Aboriginal and/or Torres Strait Islander as a Pharmacy Assistant in a Community Pharmacy.

Sustainability of professional pharmacy services.

Australian community pharmacists are in a pivotal position to improve patients' health outcomes. Although the implementation of professional pharmacy services was challenging over the last 30 years, most pharmacies are fully or to some extent delivering these services. However, there still appears concerns regarding the sustainability of these services. Despite the growing body of research examining sustainability in healthcare innovations, the research in the area of professional pharmacy services is lacking. The lack of guidance and knowledge regarding sustainability jeopardize the effort to provide services from community pharmacists. Determining sustainability factors affecting the progress of pharmacy services and accomplishing long-term benefits is necessary. Exploring patients' needs in order to identify the most suitable services to respond to their perceived needs thus ensuring

sustainability is required. Several questions require further investigation:

1. *How has the sustainability of innovations been defined, addressed and measured?*
2. *What factors are affecting the sustainability of professional pharmacy services in Australia?*
3. *What professional pharmacy services are more suitable to respond to patients' needs and to achieve their sustainability?*

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Chapter 3

The next phase in professional services research: From implementation to sustainability

Crespo-Gonzalez, C., Garcia-Cardenas, V., Benrimoj, S.I. 2017, 'The next phase in professional services research: From implementation to sustainability', *Res Social Adm Pharm.* 2017;13(5):896-901.

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The next phase in professional services research: From implementation to sustainability

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ABSTRACT

The provision of professional pharmacy services has been heralded as the professional and the economic future of pharmacy. There are different phases involved in a service creation including service design, impact evaluation, implementation and sustainability. The two first phases have been subject to extensive research. In the last years the principles of Implementation science have been applied in pharmacy to study the initial uptake and integration of evidence-based services into routine practice. However, little attention has been paid to the sustainability of those services, during which there is a continued use of the service previously implemented to achieve and sustain long-term outcomes. The objective of this commentary is to describe the differences and common characteristics between the implementation and the sustainability phase and to propose a definition for pharmacy. A literature search was performed. Four critical elements were identified: 1. The aim of the implementation phase is to incorporate new services into practice, the sustainability phase's aim is to make the services routine to achieve and sustain long-term benefits 2. At the implementation phase planned activities are used as a process to integrate the new service, at the sustainability phase there is a continuous improvement of the service 3. The implementation phase occurs during the period of time between the adoption of a service and its integration. Some authors suggest the sustainability phase is a concomitant phase with the implementation phase and others suggest it is independent 4. There is a lack of consensus regarding the duration of each phase. The following definition of sustainability for pharmacy services is proposed: "Sustainability is a phase in the process of a professional pharmacy service, in which the service previously integrated into practice during the implementation phase is routinized and institutionalized over time to achieve and sustain the expected service outcomes". An agreement on a definition will facilitate an understanding of when the profession has reached this ultimate goal.

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Chapter 4

Sustainability of innovations in healthcare: a systematic review and conceptual framework for professional pharmacy services

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Sustainability of innovations in healthcare: A systematic review and conceptual framework for professional pharmacy services

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ABSTRACT

Background: Implementation science emerged to address the challenges associated with the incorporation of evidence-based innovations into practice. Once the challenge is overcome, the ultimate goal is to achieve the sustainability of innovations to promote their continuity and long-term integration. Conceptual approaches and assessment tools have been designed to assess the sustainability of innovations in research and practice environments. However, the variability of approaches and tools available becomes a challenge for policymakers, researchers and practitioners, particularly when deciding how to evaluate the sustainability of innovations.
Objectives: To identify conceptual approaches and assessment tools for the sustainability of healthcare innovations and to develop a specific discipline-based framework for the sustainability of professional pharmacy services.
Methods: A systematic literature review was conducted in January of 2019 using PubMed, Scopus, and Web of Science. General information regarding the conceptual approaches (based on Nilsen's classification), assessment tools and the factors affecting the sustainability of the healthcare innovations was retrieved.
Results: From 3123 articles screened, 132 articles were selected from which 106 conceptual approaches and 26 assessment tools were identified. Several key factors moderating the sustainability of the innovations in healthcare were identified (e.g. funding, adaptation). A framework for the sustainability of professional pharmacy services is proposed based on these factors. It presents three performance domains influencing the service sustainability (i.e. environment, social and economic).
Conclusions: The identified approaches in different healthcare settings have allowed the adaptation and design of a specific framework for pharmacy. The core factors included in the proposed framework are moderators of the sustainability process and should be considered in sustainability studies and evaluations. This framework will guide pharmacy practice researchers and practitioners to measure and achieve the sustainability of professional pharmacy services. Furthermore, the adaptation of this framework will allow its application to other healthcare settings. (Registration number CRD42018092160).

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Appendices

Table 1: Appendix A - Characteristics of the studies included.

Author	Title	Journal	Year of publication	Country	Study aims	Study design/methods	Location/ Setting	Type of innovation	Conceptual approach or tool?	Name/aim	Audience	Additional information	Sustainability definition	The point in time in which sustainability begins
Hamzeh et al.	Towards an assessment for organizational participatory research health partnerships: A systematic mixed studies review with framework synthesis.	Evaluation and Program Planning	2019	Canada	• To identify all available questionnaires to measure OPR health partnerships, and describe how they were developed, validated and/or reliability tested. • To describe the dimensions and items (questions) assessed by these questionnaires, leading to propose a pool of items. • To develop a theoretical model that structures the evaluation of the processes and outcomes of OPR health partnerships.	Systematic review		Organizational participatory research health partnerships	Conceptual approach-Evaluation frameworks	The Organizational Participatory Research Evaluation Model-to provide information to help stakeholders comprehensively structure the evaluation of their partnerships and subsequent improvement; thus, potentially helping to improve health organization practices.	Stakeholders		Sustainability is defined as the degree to which core group members from the health organization(s) and academic institution(s) are committed to pursue the research endeavour and to keep the partnership alive after research has finished, are effectively mixing their organizational perspectives, skills and experiences to foster organizational improvement, a reutilizing effective allocation of resources (e.g., budget renewal) to ensure the sustainability of the research partnership to bring about organizational improvement, and are working in a synergistic manner to maintain the partnership and support the integration of findings into ongoing practice.	
Lo Presti et al.	Engagement in healthcare systems: Adopting digital tools for a sustainable approach.	Sustainability	2019	Italy	To provide further knowledge on the role of engagement	Literature review+ Quantitative (Survey)			Conceptual approach-Determinant Framework	Factors affecting Physician loyalty			Social sustainability is defined as a genuine and credible long-term engagement in all business activities that are lived with consciousness and responsibility	
Yu et al.	Process Evaluation of the Diabetes Canada Guidelines Dissemination Strategy Using the Reach Effectiveness Adoption Implementation Maintenance (RE-AIM) Framework.	Canadian Journal of Diabetes	2018	Canada	To disseminate and implement the Diabetes Canada (formerly the Canadian Diabetes Association) 2013 Clinical Practice Guidelines and evaluate the impact of the dissemination and implementation strategy on process outcomes (reach, adoption, implementation and maintenance).	Literature review+ Quantitative (Survey)		Clinical Practice Guidelines	Conceptual approach-Process model	Reach Effectiveness Adoption Implementation Maintenance (RE-AIM) framework (Used this framework)				

Whitehead et al.	Framework for examining the spatial equity and sustainability of general practitioner services.	The Australian Journal of Rural Health	2018	USA	To propose a framework for examining both the spatial equity and sustainability of general practitioner (GP)) services.	Literature review		General practitioner services	Framework to the sustainability of Professional Pharmacy services.	Conceptual framework of spatial equity and sustainability analysis.				
Trainer et al .	Protocol to disseminate a hospital-site controlled intervention using audit and feedback to implement guidelines concerning inappropriate treatment of asymptomatic bacteriuria.	Implementation Science	2018	USA	To facilitate implementation of a scalable version of the Kicking CAUTI campaign across four geographically diverse Veterans Health Administration facilities while assessing what aspects of an antimicrobial stewardship intervention are essential to success and sustainability.	Interventional study	Hospital	Clinical Practice Guidelines	Conceptual approach-Determinant Framework	Conceptual Model for the Less is More Intervention		Based on Normalization Process Theory		
Scott et al.	Exploring the relationship between volunteering and hospice sustainability in the UK: a theoretical model.	International Journal of Palliative Nursing	2018	UK	To explore the relationship between volunteering and the sustainability of UK voluntary hospices	Narrative literature review	UK voluntary hospices		Conceptual approach-Determinant Framework	Theoretical model of volunteering impact on organizational sustainability- to provide a clear visual representation of the interplay of factors and the role of volunteers in the sustainability of hospices. With this framework, organizations may review their governance, funding, service delivery, workforce skill mix and local support from a volunteering perspective.	Organizations			
Pérez-Escamilla et al.	Scaling up Integrated Early Childhood Development programs: lessons from four countries.	Child: care, health and development	2018	USA	To examine the process of scaling up four major country level early Childhood Development (ECD) programs through the application of a complex adaptive systems (CAS) framework.	Qualitative (Interview with key informants)	Chile, south Africa, Bangladesh, India		Conceptual approach-Classic theories	Interview questions based on the health care complex adaptive systems (CAS) framework				
Nyholm et al.	Sustainability in care through an ethical practice model.	Nursing Ethics	2018	Finland	To unfold ethical values in the field of the ethical dimension of sustainability and to create an ethical practice model (EPM) for enabling ethically sustainable care.	Discussion + Quantitative (Questionnaire)	Hospital in western Finland.	Evidence-based interventions	Conceptual approach-Sustainability theories	Ethical practice model (EPM) for sustainability in care-to help careers had better understand an organization's common value base and what such means for sustainability in care.				
Mormina et al.	A conceptual framework for training of trainers (ToT) interventions in global health.	Globalization and Health	2018	UK	To an assumption and identify the strengths and limitations of this approach by analyzing qualitative data from a set of GHP funded by the UK Department for International Development through the Tropical Health and Education Trust.	Literature review + Qualitative (interview)		Training of trainers (ToT) interventions	Conceptual approach-Determinant Framework	The TRAIN framework-to health partnerships as a guidance in the design and operationalization of ToT.				

Johansen et al.	Exploring a transition in Dutch healthcare.	Journal of health organization and management	2018	Netherlands	• To analyze the process of the expedition and drawing lessons regarding its value in terms of Transition management (TM). • To explore a potential transition in (Dutch) healthcare to deal with persistent problems as well as how the expedition could contribute to this transition.	Longitudinal study_Qualitative (interviews) + Meetings			Conceptual approach-Sustainability theories			-The qualitative method utilized Key Informant Interview (KII) technique,		
Ibrahim et al.	An overview of civil society organizations' roles in health project sustainability in Bauchi State, Nigeria.	Pan African Medical Journal	2018	Nigeria	To assess the roles of Civil Society Organizations (CSOs) in post donor health project sustainability in Low and Middle Income Countries (LMICs).	Mixed-methods study-Qualitative (Interview) + Quantitative (Questionnaire)	Bauchi state, Nigeria	Civil society organizations projects	Tools	Semi-structured questionnaire- To provide policy and decision makers with evidence-based information that can be applied in developing sustainable approaches that ensure health project continuity after donors exit.	Policy and decision makers		Sustainability refers to the activities that ensure project capacity maintenance after donor support ends, preventing it from being phased out.	
Harding et al.	Advanced musculoskeletal physiotherapists in post arthroplasty review clinics: a state wide implementation program.	Physiotherapy .	2018	Australia	To evaluate outcomes following a state-wide implementation of post arthroplasty review (PAR) clinics for patients following total hip and knee arthroplasty, led by advanced musculoskeletal physiotherapists in collaboration with orthopaedic specialists.	Prospective observational study_ Mixed-methods - Qualitative (interviews) +Quantitative (Survey)	Victorian public hospital services	Arthroplasty review clinics (post operative arthroplasty review clinics)	Conceptual approach-Evaluation frameworks	The Victorian Innovation and Reform Impact Assessment Framework.		Validated		
King et al.	The survivability of dialectical behaviour therapy programmed: a mixed methods analysis of barriers and facilitators to implementation within UK healthcare settings.	BMC Psychiatry	2018	UK	• To investigate whether early and late adopters of dialectical behaviour therapy (DBT) have differential sustainability. • To investigate whether change in training method delivery impacts the sustainability of DBT programs. • To examine factors that act as a barrier or facilitator to implementation by using a theoretical implementation framework to guide assessment.	A concurrent mixed-methods approach _Qualitative + Quantitative (survey)		Dialectical behaviour therapy programmed	Tools	Questionnaire based on: The Consolidated Framework for Implementation Research + SWAIN factors - Sustainability of DBT programmed was quantified using Kaplan Meier (K-M) survival analysis-To investigate whether there were differences in sustainability between early and late adopters				
Greenhalgh et al.	Analyzing the role of complexity in explaining the fortunes of technology programmed: empirical application of the NASSS framework	BMC Medicine	2018	UK	To reports the first empirical application of the NASSS framework.	Case study+ Meetings		Technological innovations	Conceptual approach-Determinant Framework	The NASSS framework for considering influences on the adoption, non-adoption, abandonment, spread, scale-up and sustainability of health and care technologies.	Technology adopters, commissioners and policymakers			
Gilissen et al.	How to achieve the desired outcomes of advance care planning in nursing homes: a	BMC Geriatrics	2018	Belgium	To develop a theory that outlines the hypothetical causal pathway of advance care planning (ACP) in nursing homes.	Systematic review + input from stakeholders	Nursing homes		Conceptual approach-Classic theories	Theory of Change approach				

	theory of change.					from various backgrounds in two workshops.								
García-Goñi et al.	A new funding model for a chronic-care focused healthcare system in Australia.	Health Policy and Technology	2018	Australia	To analyze the main drivers of health expenditure with particular focus on chronic care and integrated care and provide an assessment of the most important problems.	Literature review		Chronic and social services	Conceptual approach-Process model	The Mandatory Integrated (Public & Private) Health Insurance (MIPPHI) model- to propose 22 policy actions that would improve the sustainability of the Australian health system while preserving its universal character for a more comprehensive basket of chronic and social services.				
Flynn et al.	The sustainability of Lean in pediatric healthcare: a realist review	Systematic Reviews	2018	Canada	• To identify core mechanisms that generate or contribute to the sustainability or non-sustainability of Lean efforts across pediatric healthcare settings. • To identify contextual factors triggering core mechanisms. • To contribute to the theoretical development of the sustainability of Lean efforts in pediatric healthcare.	Literature review		Lean sustainability in pediatric healthcare	Conceptual approach-Classic theories	CMO hypotheses		Based on the Normalization Process Theory and the National Health Services Sustainability Model, an operational definition for Lean and a comprehensive definition for sustainability .		Sustainability as implementation outcome.
deRiel et al.	Success factors for implementing and sustaining a mature electronic medical record in a low-resource setting: a case study of iSante´ in Haiti.	Health Policy and Planning	2018	Haiti	• To apply Fritz et al.'s framework to a case study of a more mature system: Haiti's national EMR. • To describe the system's development, performance on indicators of success and lessons learned. • To propose modifications to reflect the experience of a national-scale and long-standing implementation and identify areas for future exploration to achieve scalable, sustainable and locally-owned health information systems.	Case study		Electronic medical records (EMRs)	Conceptual approach-Sustainability theories	derived from frizer				Plan for sustainability during implementation.
Nazar et al.	Community pharmacy minor ailment services in UK: Pharmacy stakeholder perspectives on the factors affecting sustainability.	Research in Social and Administrative Pharmacy	2018	UK	To investigate the sustainability potential of pharmacy minor ailment services from the perspective of community pharmacy stakeholders within the North East of UK.	Mixed-methods_ Qualitative study(interview)+ quantitative (survey)	Community pharmacies	minor ailments services	Tools	Use the Programmed Sustainability Assessment Tool				Plan for sustainability during implementation

Dearing et al.	Diffusion Of Innovations Theory, Principles, And Practice.	HEALTH AFFAIRS	2018	USA	To identify the parameters of diffusion processes: what they are, how they operate, and why worthy innovations in health care do not spread more rapidly.	Literature review			Conceptual approach-Classic theories	Diffusion of Innovation				
Chu et al.	Incorporating sustainability in small health-care facilities: an integrated model.	Leadership in Health Services	2018		To propose an integrated model for small- and medium-sized healthcare facilities to integrate sustainability in their day-to-day operations, which have been derived from the leadership and change theories.	Literature review	Health-care facilities		Conceptual approach-Process model	Framework for introducing sustainable initiatives- To help leaders of healthcare facilities gradually integrate sustainability into their day-to-day operations	Leaders			
Campbell et al.	Follow-Up Support for Effective type 1 Diabetes self-management (The FUSED Model): A systematic review and metaethnography of the barriers, facilitators and recommendations for sustaining self management skills after attending a structured education programmed	BMC Health Services Reseach	2018	UK	• To synthesize from existing qualitative literature, the experiences and views of people with T1DM about sustaining learning and self-management skills after attending a SEP providing training in FIIT. • To identify recommendations for follow-up support provision.	Systematic review		Self-management skills after attending a structured education program	Conceptual approach-Determinant Framework	The line of argument synthesis developed the Follow-Up Support for Effective type 1 Diabetes self-management (FUSED) model.				
Basaza et al.	National framework for the Sustainability of health knowledge Translation initiatives in Uganda.	International Journal of Technology Assessment in Health Care	2018	Uganda	To provide evidence about the design and implementation of policies for advancing the sustainability of knowledge translation (KT) initiatives and policies in Uganda's health system.	Literature review + Qualitative (Interview)		Health knowledge initiatives	Conceptual approach-Determinant Framework	Framework for the sustainability of health knowledge translation (KT) (modified from gruen,2008)				
Scott et al.	Listening to the community: Using formative research to strengthen maternity waiting homes in Zambia.	Plos One	2018	Zambia	To design a Maternity waiting homes (MWH) intervention that could 1) overcome barriers to access to facility delivery; 2) be acceptable to the community; and 3) be both financially and operationally sustainable.	Concurrent triangulation study_Mixed-methods-Qualitative (interview)+ Quantitative (survey)	Districts of choma and kalomo in southern province, Zambia.	Maternity waiting homes (MWH) as one intervention to improve maternal and newborn health.	Conceptual approach-Determinant Framework	MWH intervention model_ To elicits opportunities for social enterprises that could serve the dual purpose of meeting a community need and generating revenue for the MWH.(Interview based on the framework for sustainability of public health programs Scheirer,2011)				
Lennox et al.	Navigating the sustainability landscape: a systematic review of sustainability approaches in healthcare.	Implementation Science	2018	UK	To identify what approaches are available to assess and influence sustainability in healthcare and to describe the different perspectives, applications and constructs within these approaches to guide their future use.	Systematic review		Healthcare innovations	Conceptual approach-Determinant Framework	Consolidated framework for sustainability constructs in healthcare- to provide a knowledge base for those who may wish to review proposed sustainability constructs and to help those considering creatinga sustainability method in their own setting.	Researchers, Healthcare professionals and improvement practitioners.			Sustainability as concomitant phase with implementation.

Klinga et al.	Understanding the dynamics of sustainable change: A 20-year case study of integrated health and social care.	BMC Health Services Research	2018	Sweden	To gain insight into the dynamics of sustainable changes in integrated health and social care through an analysis of local actions that were trigged by a national policy.	A retrospective and qualitative case-study.		Health and social care services.	Conceptual approach-Determinant Framework	Based on the Dynamic Sustainability Framework (Chambers,2013)				
Iandolo et al.	From Health Technology Assessment to Health Technology Sustainability.	Sustainability	2018	Italy	To propose a methodological lens to the analysis of unified healthcare assessment that overcomes a reductionist approach to the study of this phenomenon and its related issues.	Literature review			Conceptual approach-Evaluation frameworks					describe factor to consider in implementation to achieve sustainability
El Bcheraoui et al.	Results-based aid with lasting effects: sustainability in the Salud Mesoamerica Initiative.	Globalization and Health	2018	Mexico	• To explore whether the Salud Mesoamerica Initiative (SMI) design and components align with the Dynamic sustainability framework (DSF) as a means of forecasting potential long-term benefits. • To predict whether the gains of SMI documented so far are likely to be sustained when external funding ceases, to identify barriers to sustainability that may need to be addressed, • To discuss lessons learned about sustainability from this initiative that may be replicable in other regions of the world.	Qualitative methods- (document review, key informant interviews, focus group discussions, and a social network analysis)		Salud Mesoamérica Initiative	Conceptual approach-Determinant Framework	Based on the Dynamic Sustainability Framework (Chambers,2013)				
Ehrhart et al.	Leading for the long haul: a mixed-methods evaluation of the Sustainment Leadership Scale (SLS).	Implementation Science	2018	USA	To contribute to our understanding of EBI sustainment by employing mixed method research to examine a measure of sustainment leadership, the Sustainment Leadership Scale (SLS).	Mixed-methods study-Qualitative (Interview) + Quantitative(Survey)		Evidence-based intervention	Individual measure	The Sustainment Leadership Scale (SLS),adapted from the implementation leadership scale-for assessing leadership of first-level leaders to understand how staff perceive leadership during sustainment and to suggest areas where leaders could direct more attention in order to increase the likelihood that EBIs are institutionalized into the normal functioning of the organization.	Leaders	Scale 0 to 4.	Sustainment leadership: the attributes and behaviors of leaders that support the effective sustainment of EBI implementation.	
Borgonovi et al.	Framing the Shades of Sustainability in Health Care: Pitfalls and Perspectives from Western EU Countries	Sustainability	2018	Italy	To illuminate the different shades which concur to frame the idea of sustainability in the health care environment.	Literature review		Healthcare interventions	Conceptual approach-Determinant Framework	A systemic approach to deal with the wickedness of sustainability related issues.				
Saviano et al.	Monitoring Viability and Sustainability in Healthcare Organizations	Sustainability	2018	Italy	To re-examine the management control system in healthcare organizations in order to align its evolutionary trends to the current requirements of a sustainable and more inclusive approach.	Literature review		Management control system of healthcare organizations	Conceptual approach-Classic theories	The Systems Viability Monitoring Model for Sustainability-to build healthcare management control systems in which the notion of 'systems viability,' as defined by Viable				

										Systems Approach (VSA), becomes a bridging concept by means of which the sustainability perspective can be incorporated into the management control system of healthcare organizations.				
Story et al.	Institutionalizing community-focused maternal, newborn, and child health strategies to strengthen health systems: A new framework for the Sustainable Development Goal era.	Globalization and Health	2017	USA	• To present a conceptual framework that depicts three primary, non-exclusive, and often complementary pathways through which nongovernmental organizations (NGOs) have facilitated the institutionalization of community- focused approaches to improve maternal, newborn, and child health (MNCH) at the district, national and global levels. • To illustrate the practical application of these three pathways, we present six examples, or cases, from multiple NGOs. • To discuss the primary drivers of institutional change that were found to be critical for the success of community-focused MNCH strategies.	Literature review+ Case study + Practical experiences	Six countries from three regions (latin America and Caribbean, sub-Saharan Africa, and south Asia) and six NGOs ranging in size from small to large	Community-focused maternal, newborn, and child health (munch) strategies to strengthen health systems	Conceptual approach-Process model	Conceptual framework for the institutionalization of community-focused maternal, newborn and child health strategies into government health systems.	donors, governments, and NGOs to encourage collaboration and contribute to program planning and policy making for the institutionalization of community-focused health strategies in the SDG era			
Shelton et al.	The Sustainability of Evidence-Based Interventions and Practices in Public Health and Health Care	Annual Review of Public Health	2017	USA	To critically examine and discuss conceptual and methodological issues in studying sustainability, summarizes the multilevel factors that have been found to influence the sustainability of interventions in a range of public health and health care settings, and highlights key areas for future research.	Literature review		Evidence-based interventions	Conceptual approach-Determinant Framework	Integrated sustainability framework-to highlight key multilevel factors that may be important in facilitating sustainability across multiple settings and contexts.			Sustainability: the continued use of program components at sufficient intensity for the sustained achievement of desirable program goals and population outcomes	Sustainability planned when project is designed
Rapport et al.	The struggle of translating science into action: Foundational concepts of implementation science.	Journal of Evaluation of Clinical Practice	2017	Australia	To reveal how implementation science is presented and understood in health services research contexts and clarify the foundational concepts: diffusion, dissemination, implementation, adoption, and sustainability, to progress knowledge in the field.	Literature review		Health services research	Conceptual approach-Sustainability theories	Foundation concepts: the 5 categories of implementation science -(Based on Rabin 2008)			"Sustainability" is the logical endpoint of implementable interventions, once new knowledge and the intervention have been successfully applied and embedded. That an intervention, once implemented, should be sustainable is said to create "a feedback loop that cycles through the action phases" of an intervention.	
Lennox et al.	What makes a sustainability tool valuable, practical and useful in real-world healthcare practice? A mixed-methods study on the development of the Long Term Success Tool in Northwest London.	Health services research	2017	UK	To collaborate with stakeholders to develop a sustainability tool relevant to people in healthcare settings and practical for use in improvement initiatives.	Literature review +group discussion+stakeholder engagement+interviews.	National institute for health research collaboration for leadership in applied health research and care for northwest London	Improvement initiatives	Tools	The Long Term Success Tool (Self-reported)		Five point Likert scale		

Harris et al.	Sustainability in Health care by Allocating Resources Effectively (SHARE) 5: developing a model for evidence-driven resource allocation in a local healthcare setting	BMC Health Services Research	2017	Australia	To outline how the information was collected, synthesized and developed into a proposal for change and to introduce a model of the program to enable replication and testing	Literature reviews+ Mixed methods - qualitative (interviews and workshops) + quantitative (surveys)		Health service	Conceptual approach-Process model	Model for exploring Sustainability in Health care by Allocating Resources Effectively in the local healthcare setting				
Hodge et al.	Sustained Implementation Support Scale: Validation of a Measure of Program Characteristics and Workplace Functioning for Sustained Program Implementation	Journal of Behavioral Health Services and Research	2017	Australia	•To apply principles of measure development as outlined by Cohen to create a brief, user-friendly implementation sustainability measure; •To identify the factor structure of this measure via exploratory factor analysis (EFA);•To determine the construct validity (including the convergent and discriminant validity) of the measure via confirmatory factor analysis (CFA); •To determine internal consistency of the scale; and explore the predictive validity of the measure by evaluating the predictors of sustained program implementation 3 years or more after program training and evaluating supervision/peer support as a moderator between the constructs measured by the SISS and sustained program implementation.	Quantitative (Survey)		Evidence-based program	Tools	The Sustained Implementation Support Scale (self-reported)	Organizations	4 point Likert scale - validated	For the purpose of this paper, sustainability is defined as the capacity to maintain implementation of EBP components long term; sustainment and sustained implementation aredefined as the maintained implementation of an EBP at least 3 years past initial training in an EBP.	
Greenhalgh et al.	Beyond adoption: A new framework for theorizing and evaluating nonadopting, abandonment, and challenges to the scale-up, spread, and sustainability of health and care technologies.	Journal of Medical Internet Research	2017	UK	To produce an evidence-based, theory-informed, and pragmatic framework to help predict and evaluate the success of a technology-supported health or social care program.	Systematic Review+ Case study		Health or social care program.	Conceptual approach-Determinant Framework	The NASSS framework for considering influences on the adoption, non adopting, abandonment, spread, scale-up, and sustainability of patient-facing health and care technologies.		Diffusion of innovations		
Brown et al.	An Overview of Research and Evaluation Designs for Dissemination and Implementation.	Annual Review of Public Health	2017	USA	To introduce a conceptual view of the traditional translational pipeline	Literature review		Evidence-based clinical/prevention interventions	Conceptual approach-Process model	Traditional translational pipeline from preintervention, efficacy, effectiveness, and dissemination and implementation studies.			The final phase is sustainment and refers to how host delivery systems and organizations maintain or extend the supports as well as the clinical/preventive intervention, especially after the initial funding period has ended.	After implementation
Azeredo et al.	Sustainability of ARV provision in developing countries: challenging a framework based on program history.	Ciencia & saude coletiva	2017	Brazil	To challenge a conceptual framework applied to assess antiretroviral medicines (ARV) provision sustainability in Peru, Bolivia and Mozambique.	Literature review+ qualitative (interview)	Bolivia, Mozambique y Peru	Antiretroviral medicines provision programs	Conceptual approach-Evaluation frameworks	Framework for investigating the sustainability of ARV provision-to recognize event that may influence sustainable ARV provision			Sustainability: an attribute of an intervention, program or policy that emerges from the implementation process by means of the routinization and standardization of a set of durable activities and resources aimed at program-related objectives.	Implementation outcome

Markström et al.	What influences a sustainable implementation of evidence-based interventions in community mental health services? Development and pilot testing of a tool for mapping core components.	Journal of Mental Health	2017	Sweden	To develop and pilot test the sustainable implementation scale (SIS) for measuring the critical components in the sustainable implementation of community mental health services.	Literature review + Qualitative (interview)		Community mental health services	Tools	The sustainable implementation scale (SIS)-derived from Damschroder et al. (2009), Durlak & DuPre (2008), Fixsen et al. (2005, 2009), Greenhalgh et al. (2004) and Meyers et al. (2012).		The scoring of each item was conducted using three response categories.		
Ament et al.	Factors associated with sustainability of 2 quality improvement programs after achieving early implementation success. A qualitative case study.	Journal of Evaluation in Clinical Practice	2017	Netherlands	To explore factors related to sustainability of quality improvements in health care.	Qualitative (interview)	Hospitals	Surgery program for colorectal surgery and a short-stay program for breast cancer surgery	Conceptual approach-Determinant Framework	the Consolidated Framework for Implementation Research (CFIR)- with additional sustainability factors			Sustainability of change exists when a newly implemented innovation continues to deliver the achieved benefits over a longer period of time, certainly does not return to the usual processes and becomes “the way things are done around here”, until a better innovation comes along, even after the implementation project is no longer actively carried out	After implementation
Song et al.	Evaluating the Sustainability of Community-Based Long-Term Care Programmes: A Hybrid Multi-Criteria Decision Making Approach.	Sustainability	2016	USA	To develop a framework with multi-dimensional indicators to evaluate the sustainability of community-based LTC programmes.	A Hybrid Multi-Criteria Decision Making Approach _Literature review+quantitative (Fuzzy Delphi method)+ expert panel	Michigan	Community-based long-term care programmed	Conceptual approach-Evaluation frameworks	The framework for sustainability evaluation of Community based LTC programmed.		Weighting strategy-pilot study for validation		
Schalock et al.	A systematic approach to an organization’s sustainability.	Evaluation and Program Planning	2016	USA	• To present a literature-based sustainability model that incorporates the factors that drive an organization’s sustainability, and describe how sustainability is operationalized through a systematic approach to quality improvement. • To discuss the advantages of a systematic approach to sustainability, and share with the reader literature and experientially-based lessons learned about the approach.	Literature review		Qualitative improvement initiatives	Conceptual approach-Determinant Framework	Sustainability model-to consider what factors drive the organization’s ability to both adapt successfully to change and provide a range of sound service delivery opportunities and practices that result in valued outcomes.			Sustainability is defined as adapting successfully to change and providing a range of valued service delivery opportunities and practices in an effective and efficient manner	

Roy et al.	Understanding Sustained Retention in HIV/AIDS Care and Treatment: a Synthetic Review.	Current HIV/AIDS Reports	2016	USA	• To present a synthetic review of data on sustained retention in HIV care and treatment and aim to high light key concepts rather than systematically summarize quantitative results. • To offer a conceptual framework for both policy makers and researchers seeking to understand sustained retention, highlight barriers specific to sustained retention. • To review interventions addressing long term, sustained retention in HIV care with a focus on sub-Saharan Africa.	Literature review		HIV/AIDS interventions	Conceptual approach-Classic theories	Framework for Sustained Retention Framework for sustained retention in HIV/AIDS- based on the principles of Gruen 2011 and Chambers 2013	Policy makers and researchers	Ecologic principles of sustainability and dynamic adaptation over time.		
Radhakrishnan et al.	Barriers and Facilitators for Sustainability of Tele-Homecare Programs: A Systematic Review	Health Services Research	2016	USA	To identify the barriers and facilitators for sustainability of tele-homecare programs implemented by home health nursing agencies for chronic disease management.	Systematic review		Tele-homecare programs	Conceptual approach-Determinant Framework					
Moullin et al.	Qualitative study on the implementation of professional pharmacy services in Australian community pharmacies using framework analysis.	BMC Health Services Research	2016	Australia	To investigate professional service implementation in community pharmacy to contextualize and advance the concepts of a generic implementation framework previously published.	Qualitative (interviews)	Community pharmacies	Professional pharmacy services	Conceptual approach-Process model	Framework for the Implementation of Services in Pharmacy (FISpH)				
Aarons et al.	The Roles of System and Organizational Leadership in System Wide Evidence-Based Intervention Sustainment: A Mixed Method Study	Administration and Policy in Mental Health and Mental Health Services Research	2016	USA	To examine how outer and inner context leadership was related to system-wide evidence-based intervention (EBI) sustainment.	Mixed-methods study-Qualitative (Interview) + Quantitative (Survey)		Evidence-Based Intervention	Individual measure	The study is framed based on the Exploration, Preparation, Implementation, Sustainment (EPIS) conceptual framework. Outer context leadership- measured with the program sustainability index (Mancini 2004) Inner Context Leadership- Multifactor Leadership Questionnaire (MLQ) Sustainment- defined consistent with Stirman 2012.		5-point Likert scale.		
Iwelunmor et al.	Toward the sustainability of health interventions implemented in sub-Saharan Africa: a systematic review and conceptual framework.	Implementation Science	2016	USA	To conduct a systematic review of empirical literature to explore how health interventions implemented in Sub-Saharan Africa are sustained.	Systematic review	Africa	Health interventions	Conceptual approach-Determinant Framework	Conceptual framework of sustainability of interventions implemented in Sub-Saharan Africa- To advance the research on the sustainability of health interventions in Sub-Saharan Africa.				

Hodge et al.	Sustained Implementation of Evidence-based Programs in Disadvantaged Communities: A Conceptual Framework of Supporting Factors.	American Journal of Community Psychology	2016	Australia	• To review existing empirical literature to synthesize themes around the mechanisms and methodology used to evaluate program sustainability and the factors that facilitate success or create barriers to program sustainment. • To draw on the themes to develop a Sustained Implementation Support Framework for Evidence-based Programs (EBPs). • To use this framework to propose an approach to planning and monitoring EBP implementation and sustainment.	Systematic review		Evidence-based programs in disadvantaged communities	Conceptual approach-Determinant Framework	A Conceptual Framework of Supporting Factors-To guide ongoing implementation and sustainability research and to address key program, workplace and process factors that impact program sustainment in disadvantaged settings				
Shigayeva et al.	Communicable disease control programmed and health systems: an analytical approach to sustainability.	Health Policy and Planning	2015	UK	• To propose a conceptual framework to support analyses of sustainability of communicable disease programs. • To clarify a link between notions of integration and sustainability.	Literature review		Disease control program	Conceptual approach-Evaluation frameworks	The framework for the analysis of sustainability of a disease control programme. Modified from Atun et al. -To serve as a basis for further empirical evaluations in understanding complex interplay between programmed and broader health systems in the development of sustainable responses to communicable diseases.			Sustainable communicable disease programmed as continuously effective in reducing a disease problem, and responsive and adaptive to changes in the nature of disease epidemics (actual or perceived), population needs or contextual environment.	
Moullin et al.	Model for the evaluation of implementation programs and professional pharmacy service.	Research in Social and Administrative Pharmacy	2015	Australia	To propose a model for the evaluation of implementation of professional pharmacy services.	Commentary-Literature review		Professional pharmacy services	Conceptual approach-Process model	Framework for the Implementation of Services in Pharmacy (FISpH)				
Lean et al.	Barriers to the sustainability of an intervention designed to improve patient engagement within NHS mental health rehabilitation units: a qualitative study nested within a randomized controlled trial.	BMC Psychiatry	2015	UK	To investigate the experiences of staff within the intervention units and the contextual issues that may have influenced the effectiveness of the intervention.	Qualitative (Focus group)	Inpatient rehabilitation units across UK	NHS mental health	Conceptual approach-Determinant Framework	Analytical framework-To propose factors which need to be considered when designing interventions to ensure adequate buy-in from senior staff.				
Hunter et al.	Associations between implementation characteristics and evidence-based practice sustainment: a study of the Adolescent Community Reinforcement Approach.	Implementation Science	2015	USA	To examine sustainment of an EBP for adolescent substance use called the adolescent community reinforcement approach (A-CRA).	Mixed-methods-Qualitative (Interview)+ Quantitative(Survey)		Adolescent community reinforcement approach (A-CRA).	Conceptual approach-Determinant Framework	Use The Programmed Sustainability Assessment Tool				

Fox et al.	Theoretical frameworks to support research of health service innovation.	Australian Health Review : a Publication of the Australian Hospital Association	2015	Australia	To provide an integrative review of the literature and introduce a theoretical framework to evaluate the sustainability of health service innovations based on integration and synthesis of the literature.	Literature review		Healthcare innovation	Conceptual approach-Determinant Framework	The sustainability of innovation theoretical based on the concepts presented by Greenhalgh(2004) and the Dynamic Sustainability Framework of Chambers (2013) -to guide research, identify variables, data collection and evaluation methods.				
Ford et al.	Successful Organizational Strategies to Sustain Use of A-CHESS: A Mobile Intervention for Individuals With Alcohol Use Disorders.	Journal of Medical Internet Research	2015	USA	To identify the problems/challenges associated with sustained use of an mHealth addiction recovery support app and to determine strategies used by agencies that successfully sustained client use of A-CHESS.	Qualitative study (interview)	Health education consortium	A mobile intervention for individuals with alcohol use disorders	Conceptual approach-Process model	Strategies to Sustain Use of A-CHESS				
Cooper et al.	Sustaining Evidence-Based Prevention Programs: Correlates in a Large-Scale Dissemination Initiative.	Prevention Science	2015	USA	• To examine rates of sustainment in a non-research context (defined as maintenance of program functioning 2 years or more beyond the end of initial grant funding), • To identify factors that distinguish programs that were sustained from those that were not. • To explore variation in these factors by program type.	Quantitative (Survey)	Pennsylvania.	Evidence-based programs initiative	Tools			Five and Four point scales	Sustainability is a broad, general term used to describe the desired end point of a multifaceted, developmental process in which innovations are first introduced in a new setting and then become slowly integrated into existing structures and systems in a way that facilitates their long-term stability and success.	
Fleiszer et al.	An organizational perspective on the long- term sustainability of a nursing best practice guidelines program: a case study.	BMC Health Services Research volume	2015	Canada	To understand how a nursing best practice guidelines (BPG) program was sustained over a long-term period in an acute healthcare center.	Literature review + Qualitative descriptive case study	Acute care center in Canada	Nursing best practice guidelines (BPG) program	Conceptual approach-Determinant Framework	Framework for the sustainability of healthcare innovations	Leaders		Innovation sustainability: a process that emerges from and succeeds innovation implementation, wherein improvements are maintained, new ways of working become routine, surrounding systems are transformed in support, and the innovation may even be developed, over a period of time appropriate to a given situation.	
Fleiszer et al.	The sustainability of healthcare innovations: a concept analysis	Journal of advanced nursing	2015	Canada	To report on an analysis of the concept of the sustainability of healthcare innovations.	Literature review		Health care innovations	Conceptual approach-Determinant Framework	Preconditions of sustainability + concept analysis-to extend the existing body of knowledge regarding healthcare innovation sustainabilityand to advance the concept in nursing contexts.	Practitioners, administrators and researchers			

Birch et al.	In place of fear: aligning health care planning with system objectives to achieve financial sustainability.	Journal of Health Services Research & Policy	2015	Canada	• To show how the potential of publicly funded health care systems to contain health care expenditure through the use of the monopsony power of the single provider or purchaser has not been realized. • To show how this has resulted from planning mechanisms that focus on matters of health care supply and service utilization to the exclusion of explicit consideration of population needs. • To develop a sustainability framework (HCSF) to identify the drivers or determinants of health care expenditure.	Essay-Literature review			Conceptual approach-Determinant Framework	Health care system sustainability analytical framework- To propose diagnostic tool for understanding the sources of expenditure increase.	Health care planners			
Rasschaert et al.	Sustainability of a community-based anti-retroviral care delivery model: a qualitative research study in Tete, Mozambique.	Journal of the International AIDS Society	2014	Belgium	To highlight the components, which might facilitate and/or jeopardize the sustainability of the CAG model, and formulates recommendations to guarantee its long-term sustainability.	Literature review + Qualitative study (interview)	Tete, Mozambique	Community-based programs	Conceptual approach-Determinant Framework	Conceptual framework on sustainability of community-based programmed. Based on the work of Schell and Sarriot.			Sustainability of healthcare programmed: the capacity to maintain programmed services at a level that will provide ongoing prevention and treatment for a health problem after termination of major financial, managerial and technological assistance from an external donor.	
Ament et al.	Identification of promising strategies to sustain improvements in hospital practice: a qualitative case study.	BMC Health Services Research	2014	Netherlands	To explore potentially promising strategies for sustaining the Enhanced Recovery After Surgery (ERAS) program in colonic surgery as perceived by professionals, three to six years after the hospital had successfully finished a quality improvement collaborative.	Qualitative study (interview)	Hospitals	Enhanced Recovery After Surgery (ERAS) program	Conceptual approach-Process model	Strategies to sustain improvements in hospital practice			Sustainability of change exists when a newly implemented innovation continues to deliver the achieved benefits over a longer period of time and definitely does not return to the previous processes, even after the implementation project is no longer actively carried out.	
Luke et al.	The Program Sustainability Assessment Tool: A New Instrument for Public Health Programs.	Preventing chronic disease	2014	USA	Program Sustainability Assessment Tool (PSAT). -To assess sustainability for a wide variety of public health programs.	Literature review		Public health programs	Tools	Program Sustainability Assessment Tool (PSAT) The structure of the PSAT was based on a sustainability conceptual framework (Schell,2013). The tool has been developed and tested on a large number of public health programs at both the community and state level.		Scores range from 0 to 7 (Validated)		
Persaud.	Enhancing Learning, Innovation, Adaptation, and Sustainability in Health Care Organizations The ELIAS Performance Management Framework.	The health care manager	2014	Canada	• To examine the importance of accountability and its vital position in the development of sustainable health care organizations. • To explain of health care organizations as complex adaptive systems (CASs) and the necessity of providing mechanisms for continuous learning in order for innovation, adaptation, and sustainability to flourish. • To outline the tenets of sustainable health care provision, innovation in health care, and learning in health care organizations. • To propose a rationale for the development of a dynamic learning culture that actively promotes and practices organizational learning by	Literature review		Evidence-based practices and innovations	Conceptual approach-Process model	The Enhancing Learning, Innovation, Adaptation, and Sustainability Performance Management Framework (ELIAS)-into improve the sustainability of health care organizations and can be seamlessly integrated into existing performance measurement systems. The framework is premised on action learning while assessing the achievement of organizational goals and evaluating the efficacy of organizational	health care managers			

					utilizing the ELIAS framework. .					routines and evidence-based practices.				
Nystrom et al.	Strategies to facilitate implementation and sustainability of large system transformations: a case study of a national program for improving quality of care for elderly people.	BMC Health Services Research	2014	Sweden	• To examine the characteristics of core activities and strategies to facilitate implementation and change of a national program aimed at improving life for the most ill elderly people in Sweden. • To assess the impact of these strategies.	Case study		National program for improving quality of care for elderly people	Conceptual approach-Determinant Framework	Strategies to facilitate implementation and sustainability of large system transformations				
Amaya et al.	After the Global Fund: Who can sustain the HIV/ AIDS response in Peru and how?.	Global Public Health,	2014	Peru	To examine the transition from Global Fund support to increasing national HIV/AIDS funding in Peru (2004–2012) by analyzing actor roles, motivations and effects on policies, identifying recommendations to inform decision-makers on priority areas. A conceptual framework, which informed data collection, was developed.	Literature review + Qualitative study (interview)	Peru	HIV/AIDS programmed	Conceptual approach-Determinant Framework	Conceptual framework for sustainability-Framework based on Gruen et al. (2008) and Olsen's (1998) sustainability frameworks.			Sustainability: the ability of the government to manage health programmes long term without depending on the intervention of external bodies for technical or financial support.	
Calhoun et al.	Using the Program sustainability assessment tool to assess and plan for sustainability.	Preventing chronic disease.	2014	USA	To provide a guide for how a program van use the program sustainability assessment tool to identify its strengths and challenges and engage in sustainability planning to build sustainability capacity.	Discussion _Case study		Public health programs	Tools	The program sustainability assessment tool (validation)				
Schell et al.	Public health program capacity for sustainability: a new framework.	Implementation Science	2013	USA	To present a new conceptual framework for program sustainability capacity for public health programs.	Systematic review +expert panel input		Public health programs	Conceptual approach-Determinant Framework	sustainability framework-To establish a shared understanding ofsustainability for practitioners, funders, and researchersworking in a range of public health areas, and is responsiveto calls for greater theoretical and definitional structureand clarity.	Stakeholders, including decision makers, practitioners, funders, researchers, and evaluators			

Johnson et al.	Sustaining innovations in community prevention systems: a data-informed sustainability strategy.	Journal of Community Psychology (JCOP)	2013	USA	To discuss: • Key sustainability challenges to be addressed. • A sustainability strategy with an underlying theory and a step-by-step data-informed process to address these challenges. • A support system for achieving successful sustainability. • Conclusions drawn from a pilot implementation study in a small sample of community coalitions.	Literature review		Community prevention system innovations	Conceptual approach-Sustainability theories	A sustainability theory of change-To propose a systematic accountability approach to sustainability			Sustainability: the process of ensuring an adaptive prevention system and a sustainable innovation that can be integrated into ongoing operations to benefit diverse stakeholders	
Isabalija et al.	A Framework for Sustainable Implementation of E-Medicine in Transitioning Countries.	International Journal of Telemedicine and Applications	2013	Uganda	To develop a framework which can facilitate the development, implementation, and sustainability of e-medicine in Sub-Saharan Africa employing a mixed research approach.	Mixed-methods_ Qualitative study(interview)+ quantitative (survey)	Uganda, Ethiopia y Nigeria - hospital	E-medicine	Conceptual approach-Determinant Framework	Framework for e-medicine sustainability-to help in providing e-medicine professionals with grounded, reliable, and valid information on which to build their sustainability efforts in an intentional, cohesive, comprehensive, and efficient way	Researchers and practitioners	Sustainability network theory		Plan for sustainability early in the process
Chaudoir et al.	Measuring factors affecting implementation of health innovations: a systematic review of structural, organizational, provider, patient, and innovation level measures.	Implementation Science	2013	USA	• To identify a multi-level framework that captures the predominant factors that impact implementation outcomes. • To conduct a systematic review of available measures assessing constructs subsumed within these primary factors. • To determine the criterion validity of these measures in the search articles.	Systematic review + Expert panel input		Evidence-based health innovations	Conceptual approach-Process model	A multi-level framework predicting implementation outcomes.			Sustainability: the extent to which a newly implemented treatment is maintained or institutionalized within a service setting's ongoing, stable operations';	Sustainability after implementation
Chambers et al.	The dynamic sustainability framework: addressing the paradox of sustainment amid ongoing change.	Implementation Science	2013	USA	To explicate: • Evolving understandings of sustainability and of related concepts of continuous quality improvement (CQI) and the learning healthcare system; • An iterative, dynamic approach to sustainability, termed the 'Dynamic Sustainability Framework' (DSF) that integrates and extends these concepts; and • Implications of this framework for research, policy, and practice	Literature review		Health interventions	Conceptual approach-Determinant Framework	The dynamic sustainability framework- to provide a foundation for research, policy and practice that supports development and testing of falsifiable hypotheses and continued learning to advance the implementation, transportability and impact of health services research.			Sustainability: To what extent an evidence-based intervention can deliver its intended benefits over an extended period of time after external support from the donor agency is terminated	
Doyle et al.	Making change last: applying the NHS institute for innovation and improvement sustainability model to healthcare improvement.	Implementation Science	2013	UK	To describe an application of the SM by the National Institute for Health Research (NIHR) Collaboration for Leadership in Applied Health Research and Care for Northwest London (CLAHRC NWL), a five-year program supporting frontline care teams implement evidence-based practice using mechanisms such as care bundles, care pathways, reviews and assessments, and new methods of testing for disease.	Case study		Evidence-based practice	Tools	Sustainability Model-Maher model				

Blanchet et al.	Selection of sustainability indicators for health services in challenging environments: Balancing scientific approach with political engagement.	Evaluation and Program Planning	2013	UK	To describe a methodology, the Sustainability Analysis Process, based on several conceptual frameworks.	Literature review+ workshop	Cambodia , Liberia, Nepal, Sierra Leone and Somaliland	Physical rehabilitation sector.	Conceptual approach-Process model	The Sustainability Analysis Process (SAP) based on the Process Analysis Method and the Child Survival Sustainability Assessment (CSSA) framework (Sarriot,2004).-to systematic explore the quantity, quality and cost components to sustainable health systems in low-income countries and fragile states.	evaluators			
Knapp et al.	A five-year self-sustainability analysis of nurse-administered HIV rapid testing in Veterans Affairs primary care.	International Journal of STD & AIDS	2013	USA	To evaluate the long-term sustainability of NRT in a VA primary care clinic in Los Angeles following training and an initial kickoff event.	Qualitative (interview)	Veterans affairs primary care clinic in downtown los Angeles.	HIV oral rapid testing (RT)	Tools	The British National Health Service Sustainability Index (SI) Model-Interview based on this tool				
Stirman et al.	The sustainability of new programs and innovations: a review of the empirical literature and recommendations for future research .	Implementation Science	2012	USA	To review studies that investigated whether or to what extent programs or interventions that had previously been implemented were sustained, and those that sought to understand factors that influence their sustainment. To present an overview of the ways that some key research considerations have been addressed from this perspective in a variety of fields.	Systematic Review		Health care programs and innovations	Conceptual approach-Determinant Framework	Influences on sustainability				
Parand et al.	Strategies for sustaining a quality improvement collaborative and its patient safety gains.	International Journal for Quality in Health Care	2012	UK	To identify strategies to facilitate the sustainability of a quality and safety improvement collaborative: the Safer Patients Initiative (SPI) and its successes.	Qualitative (interview)	Hospitals	Organizational safety improvement program	Conceptual approach-Determinant Framework	Strategies to sustain SPI-To identify strategies to facilitate the sustainability of a quality and safety improvement collaborative.				
Okeibunor et al.	A model for evaluating the sustainability of community-directed treatment (CDT) with ivermectin in the African Program for Onchocerciasis Control (APOC).	The International Journal of Health Planning and Management	2012	Nigeria	To presents a model for evaluating the sustainability of APOC-supported CDTI projects.	Literature Review + interview + workshop	Africa	Community health interventions	Conceptual approach-Evaluation frameworks	A model to evaluate the sustainability of the community-directed treatment (CDTI) approach and has been tested at 35 projects in 10 countries of the African Program for Onchocerciasis Control (APOC).		Scale of 0–4 (worst to best), in terms of its perceived contribution to sustainability	Project sustainability : the ability of a project to continue functioning effectively, using both its own resources and those provided from outside provided the latter are dependable.	
Finch et al.	From theory to 'measurement' in complex interventions: Methodological lessons from the development of an e-health normalisation instrument.	BMC Medical Research Methodology	2012	UK	• To describe the process and outcome of a project to develop a theory-based instrument for measuring implementation processes relating to e-health interventions.• To identify key issues and methodological challenges for advancing work in this field.	Literature review + quantitative (survey)		E-health service intervention	Tools	Technology Adoption Readiness Scale (TRAS)	Researchers and practitioners	Normalization process theory.7 point response scale; with the option of choosing 'don't know'. (Validated)		

Bond et al.	Long-Term Sustainability of Evidence-Based Practices in Community Mental Health Agencies.	Administration and Policy in Mental Health and Mental Health Services Research	2014	USA	To identify: • The rate of sustainability. • Factors perceived as crucial for sustaining or not sustaining the practices. • Similarities and differences in the factors influencing sustainability at 2 and 6-year follow-up, and 6-year follow-up. • Adaptations to the EBP model.	Mixed methods_ Survey with qualitative and quantitative items		Evidence-based practices	Conceptual approach-Determinant Framework					Sustainability after project funding ceases
Blackford et al.	Tracking the route to sustainability: a service evaluation tool for an advance care planning model developed for community palliative care services.	Journal of Clinical Nursing	2012	Australia	To develop a service evaluation tool for an advance care planning model implemented in community palliative care.	Literature review+ Mixed-methods_ Qualitative (interview) + Quantitative	Victoria	Community palliative care services	Conceptual approach-Evaluation frameworks	advance care planning service evaluation tool	nurses and other health professionals in community palliative care to monitor, evaluate and plan quality improvement of their ACP model and thereby improve decisions at end of life.			
Slaghuis et al.	A framework and a measurement instrument for sustainability of work practices in long-term care.	BMC Health Services Research volume	2011	Netherlands	To further the conceptualization of sustainability with these concepts and to develop a measurement instrument.	Literature review +Group discussion+Field testing	Tool testing :nursing homes, elderly homes, home care and care for disabled	Changed work practices of quality improvements projects	Tools or measure + Conceptual approach	Framework and measurement instrument for sustainability of changed work practices- to assess sustainability of changed work practices after implementation of quality improvements. (Self-assessment)		Five point Likert scale (Validated)	Sustainability can then be seen as a dynamic process in which actors in a targeted work practice develop and/or adapt the organizational routines to a new work method.	
Scheirer et al.	An Agenda for Research on the Sustainability of Public Health Programs.	American Journal of Public Health	2011	USA	To provide guidance for research and evaluation of health program sustainability, including definitions and types of sustainability, specifications and measurements of dependent variables, definitions of independent variables or factors that influence sustainability, and suggestions for designs for research and data collection.	Literature review +Group discussion+Workshop		Public health programs	Conceptual approach-Determinant Framework	Conceptual framework for sustainability of public health programs.	Researchers and funders			Sustainability after implementation
Melnyk et al.	Sustaining Evidence-Based Practice Through Organizational Policies and an Innovative Model.	American Journal of Nursing	2011	USA	To guide system-wide implementation and sustainability of EBP for the purpose of improving quality of care and patient outcomes.	Group discussion	Hospitals	Evidence-based practice	Conceptual approach-Process model	The Advancing Research and Clinical Practice Through Close Collaboration (ARCC) Model for System-Wide Implementation and Sustainability of evidence-based practice				
Leffers et al.	Conceptual Model for Partnership and Sustainability in Global Health.	Public Health Nursing	2011	USA	To identify components of partnership and sustainability that are reflected in the Conceptual Framework for Partnership and Sustainability in Global Health Nursing.	Literature Review+qualitative (Interview)		Nursing interventions	Conceptual approach-Determinant Framework	Sustainability of Global Health Nursing Interventions- to provide guidance for nurses who work internationally to promote effective partnerships and				

										sustainable interventions.				
Campbell et al.	Examining sustainability in a hospital setting: Case of smoking cessation.	Implementation Science	2011	Canada	To understand how hospitals using The Ottawa Model for Smoking Cessation (OMSC) were addressing sustainability and determine if there were critical factors or issues that should be addressed as the program expanded.	Literature review + Qualitative (interview)	Hospitals	Smoking cessation program	Conceptual approach-Sustainability theories	The Ottawa Model of Smoking Cessation-Based on Gruen (2008)			Sustainability of the OMSC: the performance of all OMSC activities at the same or higher level than at the time of initial implementation (launch date). To achieve this, hospitals were asked to make OMSC activities part of normal hospital routine, accept responsibility to track performance, and provide performance feedback to the hospital cessation program, administrators, and staff.	Sustainability as implementation outcome
Ford et al.	Measuring Sustainability within the Veterans Administration Mental Health System redesign initiative.	Quality management in health care	2011	USA	To examine how attributes affecting sustainability differ across Veterans Health Administration organizational components and by staff characteristics.	Mixed-methods study-Qualitative (Interview) + Quantitative(Survey)		Mental health system redesign initiatives	Tools	British National health system sustainability index model (Maher,2010)		5-item Likert scale (weekly or less, monthly or less, quarterly or less, whenever we could find the time, or do not know).		
Aarons et al.	Advancing a Conceptual Model of Evidence-Based Practice Implementation in Public Service Sectors.	Administration and Policy in Mental Health	2011	USA	To propose a multi-level, four phase model of the implementation process (i.e., Exploration, Adoption/Preparation, Implementation, Sustainment), derived from extant literature, and apply it to public sector services.	Literature review		Public service sectors	Conceptual approach-Determinant Framework	Conceptual model of implementation phases and factors affecting implementation in public service sectors (EPIS)-provide heuristic value in understanding and navigating the implementation process.				

Maher et al.	NHS sustainability model.	Institute for Innovation and Improvement NHS.	2010		To develop an easy-to-use tool to help teams:• plan for sustainability of improvement efforts• recognize and understand key barriers for sustainability, relating to their specific local context• self-assess against a number of key criteria for sustaining change.• identify strengths in sustaining improvement• monitor progress over time.	Literature review + group discussions		Health services	Tools	NHS III Sustainability Model (self assessment tool)- The Sustainability Model is a diagnostic tool that will identify strengths and weaknesses in your implementation plan and predict the likelihood of sustainabilityfor your improvement initiative. The Sustainability Guide provides practical advice on how you might increase the likelihood of sustainability for your improvement initiative.	Individuals or teams.		Sustainability can be described as 'when new ways of working and improved outcomes become the norm'. A more detailed description, which includes the notion of 'steady state', is as follows: 'Not only have the process and outcome changed, but the thinking and attitudes behind them are fundamentally altered and the systems surrounding them aretransformed as well. In other words, the change has become an integrated or mainstream way of working rather than something 'added on'. As a result, when you look at the process or outcome one year from now or longer, you can see that at aminimum it has not reverted to the old way of working, or old level of performance. Further, it has been able to withstand challenge and variation; it has evolved alongsideother changes and perhaps has continued to improve over time. Sustainability means holding the gains and evolving as required - definitely not going back'.(NHS Institute for Innovation and Improvement 2005)	Sustainability after implementation
Swain et al.	The Sustainability of Evidence-Based Practices in Routine Mental Health Agencies.	Community Mental Health Journal	2010	USA	To discern the number of sustainers overall and by evidence-based practice, the reasons sites sustained or did not sustain their practices, the characteristics of sustainers and non-sustainers, and the nature of, and reasons for, any adaptations of the sustained practices.	Mixed methods_ Survey with qualitative and quantitative items		Evidence-based practices in routine mental health	Tools	Survey		Likert-type scale + five-point scale		
Sarriot et al.	Taking the Long View: A Practical Guide to Sustainability Planning and Measurement in Community-Oriented Health Programming.	Calverton, MD: Macro International Inc.	2008	USA	To present a method to plan for, manage, and measure progress toward sustainability.	Manual_ based on 30 community health projects+ literature review		Health programs	Conceptual approach-Evaluation frameworks	the Sustainability Framework (SF)(Sarriot 2004)/tool-It is intended as a practical guide for health project managers, especially those implementing community health projects in resource-constrained settings.	Project managers, planners, and evaluators in their efforts to improve their approaches		The Sustainability: a process within a local system whose aim is to maintain improved health status. This local system is composed of local stakeholders (individuals, communities, and local organizations) that operate within a larger environment.	
May et al.	Implementing, Embedding, and Integrating Practices: An Outline of Normalization Process Theory .	Sociology	2009	UK	To sketch out the dimensions of a middle range theory of Normalization Processes that provides an explanatory framework for investigating the routine embedding of material practices in their social contexts.	Literature review		Complex practices for example, business processes or healthcare interventions	Conceptual approach-Sustainability theories	Model of the components of normalization process theory/Framework for operationalizing normalization process theory-to understand the normalization potential of new techniques and technologies in healthcare settings		Normalization process theory		planning for sustainability from project design

Bray et al.	After the Collaborative Is Over: What Sustains Quality Improvement Initiatives in Primary Care Practices?	Joint Commission journal on quality and patient safety / Joint Commission Resources	2009	USA	• To better understand and describe the characteristics and/or activities of primary care practices that are associated with sustaining Quality Improvement (QI) initiatives. • To examine the association between practice characteristics and sustaining QI activities initiated in the collaborative.	Qualitative study (interview).	Primary care practices	Qualitative improvement initiatives	Conceptual approach- Determinant Framework	Sustainability Pyramid- To illustrate the relative importance and hierarchical relationships among the practice characteristics that are required to sustain QI activities				
Sarriot et al.	Measuring sustainability as a programming tool for health sector investments: report from a pilot sustainability assessment in five Nepalese health districts.	International Journal of Health Planning and Management	2009	USA	• To proposed a definition and model of sustainability that has been implemented by different Primary Health Care projects. • To propose a method for assessment according to six components of evaluation, to be measured at project outset and periodically afterwards.	Participatory, bottom-up approach.	Nepal districts(kanchanpur, far-western region; banke, mid-western region; chitwan, central region; and jhapa, eastern region) and one in the mountain central region (rasuwa).	Health sector development assistance programs.	Tools	Sustainability Dashboard (modified from Sarriot 2008)- to measure and examine together multiple dimensions of the performance of a system. Aimed at improve long-term outcomes by guiding programmatic responses, which can range from humanitarian assistance to partial or complete phasing out of support, based on the progress observed in the six components of assessment.	Donors and program implementers,	Scores are scaled from 0 to 100 points, with a definition of progress ranging from ''Poor'' (0–20 points), ''Emerging'' (>20– 40 points), ''Intermediary'' (>40–60 points), ''Promising'' (>60–80 points), to ''Strong'' (>80–100 points).		
Savaya et al.	Projected Sustainability of Innovative Social Programs.	Evaluation Review	2009	Australia	To examine projected sustainability and its predictors along a continuum of forms, the continuation of the program (a) with similar activities and target groups, (b) with similar activities and new target groups, (c) with similar activities in a different location or community, and (d) with new activities and the same target groups, building on the previous work.	Literature Review + Quantitative (Questionnaires)	Focused on australian projects that had a direct service delivery component, whether alone or in conjunction with capacity building.	Social programs	Individual measure	The study aimed to answer these questions: 1. What is the projected sustainability of projects after funding ends? 2. In what forms are projects expected to continue after initial funding ends? 3. Which of the explanatory models predict perceived project diversity and its future form? The individual measures used: • Projected likelihood of project's continuation • Expected form of continued project • Diversity of continued activity • Project funding (diversity of funding sources/ diversity of nonfinancial support) • Community support (Diversity of attempts to enlist community support/Diversity of partnerships/Perceived importance of partnerships)	Leaders	Likert scale (different scale depending of the factor measured)		Sustainability after funding ends.

										• Perceived Effectiveness of Project • Project Institutionalization in the Auspice Organization (Source of project idea/Perceived effectiveness of auspice organization support/Anticipation of continued auspice involvement) • Sense of Community Ownership.				
Tuyet et al.	Development of a Framework for Evaluating the Sustainability of Community-based Dengue Control Projects.	The American journal of tropical medicine and hygiene	2009	Australia	To develop a frameworks developed specifically for assessing community-based dengue control project sustainability.	Literature Review+qualitative (Interview)		Community-based dengue control projects	Tools	Based on Shediac-Rizkallah and Bamberger (using a quantifiable scale.)		Five-point scale for each of 13 criteria, leading to a five interval sustainability score for assessing sustainability or lack (Validated)		
Gruen et al.	Sustainability science: an integrated approach for health-program planning.	The Lancet	2008	Australia	• To review existing perspectives and empirical research about health-program sustainability. • To draw on the review to derive a practical framework for understanding health-program sustainability. • To use this framework to propose an approach to planning for health-program sustainability and developing a strong evidence base to support refinements to and implementation of the approach.	Systematic Review	Low-income and middle-income countries	Health-program	Conceptual approach-Sustainability theories	Model of health-program sustainability-to informed the development of an approach to planning for health-program sustainability.		sustainability science		
Feinberg et al.	Predictors and Level of Sustainability of Community Prevention Coalitions.	American Journal of Preventive Medicine	2008	USA	This paper examines the sustainability of CTC coalitions formed over the last decade in Pennsylvania. It both documents the degree to which these coalitions have continued beyond their initial funded implementation period and examines longitudinal predictors of their sustainability.	Literature review	Pennsylvania.	Community prevention coalitions	Individual measure					
Feldstein et al.	A Practical, Robust Implementation and Sustainability Model (PRISM) for Integrating Research Findings into Practice	The Joint Commission Journal on Quality and Patient Safety	2008	USA	To propose and describe a practical and prescriptive model for improve practice.	Literature review +Case study		Health care innovations	Conceptual approach-Determinant Framework	Practical, Robust Implementation and Sustainability Model (PRISM)-To evaluate how the health care program or intervention interacts with the recipients to influence program adoption, implementation, maintenance, reach, and effectiveness.	Researchers and health care managers	Diffusion of innovations, social ecology, the PRECEDE/PROCEED model, and more pragmatic Quality improvement concepts.		

Sridharan et al.	Analysis of strategic plans to assess planning for sustainability of comprehensive community initiatives.	Evaluation and program planning	2007	USA	To analyze the plan to examine the explicit focus on sustainability in the planning process.	Mixed-methods_ Qualitative (interview)+ Quantitative (survey)		Comprehensive community initiatives	Tools or measure + Conceptual approach	Analysis of strategic plans to assess planning for sustainability of comprehensive community initiative		6-point scale.(Not validated)		Sustainability as concomitant phase with implementation.
Nelson et al.	Successfully maintaining program funding during trying Times: Lessons From Tobacco Control Programs in Five States	Journal of public health management and practice : JPHMP	2007	USA	To synthesize findings from the case studies and from prior research to describe lessons learned that may benefit other public health programs facing similar funding threats.	Case study	Nebraska, New York, Indiana, Virginia, and Colorado	Public health programs	Conceptual approach-Determinant Framework	The five basic elements of program sustainability (Based on a framework previously created-Saint Louis University researchers)-To provide valuable insights for other public health programs facing funding threats.			Program sustainability in public health includes maintaining adequate service coverage that will provide continuing control of a health problem, continuing to deliver benefits over a long period of time, becoming institutionalized within an organization, and continuing to respond to community issues.	Planning early for sustaining program(concomitant processes)
May et al.	A rational model for assessing and evaluating complex interventions in health care.	BMC Health Services Research	2007	UK	To present a rational conceptual model – the normalization process model – that can assist both service provider and research constituencies in understanding the practical problems of workability and integration that complex interventions pose.	Literature review +Previous qualitative studies		Health care interventions	Conceptual approach-Sustainability theories	Normalization process Model	service provider and research constituencies	Normalization	Normalization is defined as the embedding of a technique, technology or organizational change as a routine and taken-for-granted element of clinical practice	
Edwards et al.	Sustainability of Partnership Projects: A Conceptual Framework and Checklist	The Joint Commission Journal on Quality and Patient Safety	2007	USA	To develop a conceptual framework and a checklist for sustainability of Partnership projects.	Literature review		The partnerships for quality intervention projects	Tools or measure + Conceptual approach	Sustainability framework/Catholic Healthcare partners HF-GAP Sustainability Assessment (AHRQ) (checklist) -to prompt consideration of sustainability issues during the design of a project's goals and implementation strategies.	partnership leaders	Diffusion of innovation/ Ratings: –1: Problem; 0: Neither Positive nor Negative; 1: Strength	Sustainability :as the capacity to collaborate, to make developmental progress in realizing partnership objectives, and to secure a stable financial base.	
Amazigo et al.	Performance of predictors: Evaluating sustainability in community-directed treatment projects of the African program for onchocerciasis control	Social science & medicine	2007	Burkina Faso	This article examines the performance of communities on the predictors of CDTI project sustainability.	Mixed-methods - Qualitative (Interview)+ Quantitative(Survey)		African program for onchocerciasis control	Individual measure	Measure two sustainability indicators: -Leadership: to assess whether the program is effective, and whether the community is taking ownership of it. -Human resources: to assess whether the project can mobilize the resources it needs, and whether the community has taken ownership of the program		Scale of 0–4	Sustainability: The ability of a project to continue to function effectively, for the foreseeable future, with high treatment coverage, integrated into available health care services, with strong community ownership using resources mobilized by the community and government''	
Racine.	Reliable Effectiveness: A Theory on Sustaining and Replicating Worthwhile Innovations.	Administration and Policy in Mental Health and Mental Health Services Research	2006	USA	To suggest a comprehensive conceptual framework of programmatic, organizational, and environmental factors that may shape the circumstances for sustaining and replicating effectiveness.	Literature review		Health and human service innovations	Conceptual approach-Determinant Framework	Model of sustaining innovations in their effectiveness-To propose factors, stated as researchable propositions, which appear to play important roles in whether innovations are replicated and sustained in their effectiveness.		Diffusion of innovations		

Israr et al.	Good governance and sustainability: A case study from Pakistan.	International Journal of Health Planning and Management	2006	Israel	To correlate the issue of health systems' sustainability with specific governance issues manifested during the implementation of the Family Health Project.	Case Study+ Qualitative analysis based on secondary data		The family health project	Conceptual approach-Determinant Framework	Sustainable management approach (SMA) - To ensure the sustainability of health systems projects, particularly those funded by international organizations in developing countries.				
Blasinsky et al.	Project IMPACT: A Report on Barriers and Facilitators to Sustainability.	Administration and Policy in Mental Health and Mental Health Services Research	2006	USA	To discuss the issues involved in sustaining the model in a primary care practice.	Literature Review+Qualitative (site visits+interview)		Collaborative care intervention to assist older adults suffering from major depressive disorder or dysthymia	Conceptual approach-Determinant Framework				Sustainability: as the continuation of all or part of the IMPACT model in a usual-care setting. To date, there is strong evidence of sustainability and efforts to maintain, adapt, or build on the IMPACT model.	
Nilsen et al.	Towards improved understanding of injury prevention program sustainability .	Safety Science	2005	Sweden	To contribute to improved understanding of the conditions under which community-based injury prevention programs are most likely to attain sustainability.	Case study+ Qualitative (Interview)		Injury prevention program	Conceptual approach-Process model	Analytical framework to create interviews- To guide collection and analysis of data.			Sustainability the maintenance of a program at a level of activity that will provide continuing management of a health problem (Claquin, 1989) or program delivery of intended beneWts over a long period of time (The World Bank's donation, in Bamberger and Cheema,1990).	
Sarriot et al.	A methodological approach and framework for sustainability assessment in NGO-implemented primary health care programs	The International journal of health planning and management	2004	USA	To present the Child Survival Sustainability Assessment (CSSA) methodology—a framework and process—to map progress towards sustainable child health from the community level and upward.	Literature review		NGO primary healthcare programs	Conceptual approach-Evaluation frameworks	Child Survival Sustainability Assessment (CSSA) framework and process-for evaluation and research design and places sustainability at the center of primary health care programming.			Sustainability: is a contribution to the development of conditions enabling individuals, communities, and local organizations to express their potential, improve local functionality, develop mutual relationships of support and accountability, and decrease dependency on insecure resources (financial, human, technical, informational), in order for local stakeholders to negotiate their respective roles in the pursuit of health and development, beyond a project intervention.	
Pluye et al.	Making public health programs last: conceptualizing sustainability.	Evaluation and Program Planning	2004	Canada	To re-conceptualize the structural and temporal dimensions of sustainability.	Literature review		Public health programs	Conceptual approach-Classic theories	Program sustainability: The 'concomitancy' conceptualization.	Practitioners, decision-makers, and researchers			
Mancini et al.	Sustaining Community-Based Programs for Families: Conceptualization and Measurement*.	Family Relations	2004	USA	To present a community-based program sustainability conceptual model and a multifactor measure that corresponds to the model.	Literature review +mixed methods_ Qualitative (interview) + Quantitative (survey)		Community-based programs	Tools or measure + Conceptual approach	Model of community-based program sustainability/Program Sustainability Index (PSI)- to monitor program supports and to continue to focus on sustainability elements. Using the PSI as a monitoring tool helps to appraise and prioritize the sustainability process, including strengths and gaps.	Program professionals	3 point scale	Sustainability is the capacity of programs to continuously respond to community issues. A sustained program maintains a focus consonant with its original goals and objectives, including the individuals, families, and communities it was originally intended to serve.	

Johnson et al.	Building capacity and sustainable prevention innovations: a sustainability planning model.	Evaluation and Program Planning	2004	USA	• To discuss the literature about sustainability and related terms. • To present a prevention-focused sustainability-planning model that highlights key factors relating to sustaining innovations and how to deal with them. • To discuss lessons learned and future steps for the model.	Literature review		Prevention innovations	Conceptual approach-Determinant Framework	A Sustainability Planning Model-This planning model is being presented to provide the impetus for further empirical investigation relating to the sustainability of prevention innovations.			Sustainability: the process of ensuring an adaptive prevention system and a sustainable innovation that can be integrated into ongoing operations to benefit diverse stakeholders.	Sustainability after implementation.
Jana et al.	The sonography project: a sustainable community intervention program.	International Society for AIDS Education	2004	USA	• To describe components of the Sonagachi Project, a multilevel HIV prevention intervention that appears to be effective and replicable. • To articulate the various modes of intervention of the Sonagachi model, with a focus on factors that account for the sustainability of the intervention over the past 12 years. • To describe key components of the Sonagachi model at the community, group, and individual levels.	Report		Community intervention program (HIV/AIDS)	Conceptual approach-Determinant Framework	THE SONAGACHI MODEL				
Sivaram et al.	Training outreach workers for AIDS prevention in rural India: is it sustainable?	Health policy and planning.	2003	USA	To understand: (1) how best to identify outreach workers, (2) strategies used during project implementation to facilitate sustainability, and (3) factors associated with sustainability success.	Mixed-methods_ Qualitative (interview)+ Quantitative (survey)	Rural karnataka state in India	Rural communities in HIV prevention prevention education activities.	Conceptual approach-Determinant Framework	Conceptual framework to develop a strategy that will facilitate sustainability of outreach worker efforts in AIDS prevention to examine approaches for achieving sustainability			Sustainability as a continuous process and as an integral part of project implementation.	Sustainability integral part of project implementation.
Evashwick et al.	Organizational Characteristics of Successful Innovative Health Care Programs Sustained Over Time.	Family & community health	2003	USA	To identify the characteristics of organizations that implemented innovative community-based health programs for older adults and sustained these programs over time	Qualitative(interview)		Health care programs	Conceptual approach-Determinant Framework	Framework for sustainability and operational variables-Based on Shediac-Rizkallah			Sustainability : the endurance of the program since its inception. The receipt of the Archstone Award often represented a milestone in service delivery, and also served as an indicator event by which to judge future program sustainability.	
Alexander et al.	Sustainability of Collaborative Capacity in Community Health Partnerships.	Medical care research and review : MCRR.	2003	USA	• To develop a conceptual model of sustainability in community health partnerships. • To identify potential determinants of sustainability using comparative, qualitative data from four partnerships from the Community Care Network Demonstration Program.	Qualtative (interviews)		Community health partnerships programs	Conceptual approach-Determinant Framework	Sustainability conceptual model- to propose sustainability factors for community health partnership.				
Wong et al.	Factors supporting sustainability of a community-based scabies control program.	Australasian Journal of Dermatology	2002	Australia	To present results of scabies screening 15 months post-intervention and to discuss factors that have contributed to the success and sustainability of the program.	Interventional study	Australia	Community-based scabies control program	Conceptual approach-Determinant Framework					
Gruen et al.	Outreach and improved access to specialist services for indigenous people in remote Australia: the requirements for	Journal of Epidemiology & Community Health	2002	Australia	To examine the role of specialist outreach in supporting primary health care and overcoming the barriers to health care faced by the indigenous population in remote areas of Australia, and to examine issues affecting its sustainability.	Literature review	Australia	Health care service	Conceptual approach-Determinant Framework	Requirements for sustainable specialist outreach in the Northern Territory-to summarize aspects that were likely to influence sustainability from practitioners, specialists				

	sustainability.									and administrators perspectives.				
Knight et al.	Developing sustainable collaboration: learning from theory and practice	Primary Health Care Research & Development	2001	UK	• To develop a framework within which existing or past collaborative efforts can be interrogated, and by which proposals for future collaboration may be judged. • To illustrate the application of the framework using two case studies of collaborative working.	Case study	Easington in county durham	Health and social care service	Conceptual approach-Determinant Framework	A framework for evaluating the sustainability of collaborative working-to explore existing or past collaborative efforts, and by which proposals for future collaboration may be judged.			Sustainability is one such quality, since collaborative working seldom produces immediate outcomes and the transition from a culture of autonomy and separatism to a culture of collaboration will take time. In economic terms, sustainability may be conceptualized as the capacity to continue without (continuing) subsidy. However, in organizational terms, sustainability is an expression both of the value that collaborative working arrangements command and of the capacity of a collaborative venture to command support as a valued enterprise	
Goodson et al.	Maintaining Prevention in PracticeSurvival of PPIP in Primary Care Settings.	American journal of preventive medicine.	2001	USA	• To examine the institutionalization of PPIP within five primary care clinics funded by the Texas Department of Health to implement PPIP. • To examine the organizational determinants of program institutionalization.	Mixed-methods study-Qualitative (Interview) + Quantitative(Questionnaire)	Primary care clinics	Preventive services	Tools	Level of Institutionalization (LoIn) Scale(Goodman 1993)-Interview based on this tool		three possiblescores: 0, if there were no evidence of that factor in the site; 1, if the site fully exhibited that characteristic; and 0.5, if thefactor were only partially in place.	Institutionalization after funding ends	
Glasgow et al.	Evaluating the public health impact of health promotion interventions: the RE-AIM framework.	American journal of public health.	1999	USA	To describe the RE-AIM evaluation model, which emphasizes the reach and representativeness of both participants and settings.	Commentary-Literature review		Public health interventions	Conceptual approach-Evaluation frameworks	RE-AIM- to evaluate public health interventions that assesses 5 dimensions: reach, efficacy, adoption, implementation and maintenance.		0 to 1 Scale	Maintenance (extent to which a program is Individual and organization sustained over time)	
Eliason.	Towards sustainability in village health care in rural Cameroon.	Health Promotion International	1999	USA	To evaluate the sustainability of the first 16 LAP-associated Primary Health Centers after 17 years of field practice, and to share lessons learned from that experience.		Africa	Life abundant program	Conceptual approach-Determinant Framework					

Shediac-Rizkallah et al.	Planning for the sustainability of community-based health programs: conceptual frameworks and future directions for research, practice and policy	Health Education Research	1998	USA	• To provide the beginnings of a coherent and systematic knowledge base about program sustainability. • To guide others who are also attempting to build sustainable programs.	Literature review+Experimental work	Inner-city women in Baltimore, maryland +urban African-American patient population in Baltimore, Maryland.	Community programs(community-based cancer control prevention program educational and behavioral interventions in improving blood pressure care and control, and subsequent morbidity and mortality)	Conceptual approach-Determinant Framework	Conceptual framework for planning for sustainability of community based health programs-To conceptualize and measure sustainability and tentative guidelines to facilitate sustainability in community programs.			Definition I Sustainability is the capacity to maintain service coverage at a level that will provide continuing control of a health problem (Claquin, 1989). Definition II Project sustainability is defined by many economists and international development agencies as the capacity of a project to continue to deliver its intended benefits over a long period of time (The World Bank's definition in Bamberger and Cheema, 1990). Definition III A development program is sustainable when it is able to deliver an appropriate level of benefits for an extended period of time after major financial, managerial and technical assistance from an external donor is terminated (US Agency for International Development, 1988).	
O'Loughlin et al.	Correlates of the Sustainability of Community-Based Heart Health Promotion Interventions.	Preventive Medicine	1998	Canada	To investigate factors related to the perceived sustainability of 189 heart health promotion interventions initiated by a public health department or research initiative and implemented in a variety of organizations across Canada.	Quantitative (Survey)		Heart health promotion interventions	Tools	Correlates of the Sustainability of Community-Based Heart Health Promotion Interventions	Health promotion program planners	3 point scale		
Olsen.	Sustainability of health care: a framework for analysis.	Health policy and planning.	1998	Norway	To introduce a conceptual framework which can be used to study sustainability of health services in developing countries.	Literature review+ Professional expertise		Health services	Conceptual approach-Determinant Framework	the clusters for analyzing sustainability-to study the sustainability of health services in developing countries				
Cropper.	Collaborative Working and the Issue of Sustainability.	Business	1996	UK	To sketch a framework setting out some elements in terms of which that process of construction of value can be considered.	Literature review		Collaborative initiatives	Conceptual approach-Determinant Framework	Institutional framework			Sustainability is a behavioural quality, which connotes future persistence, continuity and continuing viability: it is both an outcome of, and a consideration in, the design and regulation of collaborative working; something to be explained and something which bears directly on organizational practice.	
Goodman et al.	Development of Level of Institutionalization Scales for Health Promotion Programs.	Health Education & Behavior	1993	USA	• To discuss the construct of institutionalization of health promotion programs within their host organizations. • To reports on the development of a self-administered questionnaire for measuring it. • To review, research upon which the instrument is based along with methods for collecting data, and a description of the analytical procedures and results.	Perspective_Quantitative(Questionnaire)		Health promotion programs	Tools	Level of Institutionalization (LoIn) Scale-Interview based on this tool	Practitioners and researchers	4-point scale		

Stefanini et al.	Managing externally-assisted Health projects for sustainability in Developing countries.	Medicine	1992	UK	To proposes a conceptual framework to monitor the performance of externally-assisted health projects in building their own sustainability.	Literature review		Donor-supported health projects	Conceptual approach-Evaluation frameworks	Conceptual framework to monitor the performance of externally-assisted health projects	Project managers, donor agencies and recipient countries		Sustainability of a donor-supported health project is the ability of the benefits produced by the project itself to be sustained over time after the end of the external support, either through the same activities set up during project implementation or through other activities.	
Brinkenhoff et al.	Promoting the Sustainability of Development Institutions: A Framework for Strategy	World Development	1992	USA	To present a generic framework for understanding institutional sustainability in development.	Literature review	Agriculture and health sectors.		Conceptual approach-Determinant Framework	The analytical framework for Institutional sustainability_To analyze the generic conditions for sustaining institutions in general and provide suggested strategies.				
Bossert.	Can they get along without us? Sustainability of donor-supported health projects in Central America and Africa.	Social science & medicine.	1990	USA	To present a synthesis of five country studies of the sustainability of U.S. government funded health project reports which is designed to bring their salient conclusions to bear on the current debates about sustainability in Central America.	Literature review	Central America and Africa	Donor-supported health projects	Conceptual approach-Determinant Framework	Sustainability factors				Sustainability after implementation
Bamberger et al.	Case Studies of Project Sustainability: Implications for Policy and Operations from Asian Experience.	Washington, DC: The World Bank.	1990	Bangladesh	The purpose of the seminar was to introduce the concept of project sustainability to senior government officials, to present an overview of project sustainability experience in Asia, and to assess the importance of the concept in Bangladesh. It is hoped that the present publication will contribute to the very limited empirical data currently available on this topic, and that the case studies prepared for the seminar will encourage other research and training institutions to prepare similar kinds of cases.	Report-Seminar	Bangladesh	Project	Conceptual approach-Determinant Framework				The term "Sustainability" describes the ability of a project to maintain an acceptable level of benefit flows through its economic life. While this may often be expressed in quantitative terms involving the internal economic or financial rates of return, benefits may also be qualitatively assessed. For projects in the productive sectors such as industry, the principal measure of performance is output, generally expressed in terms of capacity utilization, but Bank supported projects normally have other objectives such as subsectoral policies, technology transfer and institution building, which must be assessed qualitatively.	
Goodman et al.	A model for the institutionalization of health promotion programs.	Family & Community Health	1989	USA	To provide information about how a program could be more durable.	Literature review+ Case study _ Qualitative (interviews, observations and documents)		Health promotion programs	Conceptual approach-Determinant Framework	A model for program institutionalization				

*USA (The United States of America)
*UK (United Kingdom)

PRISMA checklist

PRISMA 2009 Checklist

Section/topic	#	Checklist item	Reported on page #
TITLE			
Title	1	Identify the report as a systematic review, meta-analysis, or both.	Title page
ABSTRACT			
Structured summary	2	Provide a structured summary including, as applicable: background; objectives; data sources; study eligibility criteria, participants, and interventions; study appraisal and synthesis methods; results; limitations; conclusions and implications of key findings; systematic review registration number.	Abstract page
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of what is already known.	Pag 1-3
Objectives	4	Provide an explicit statement of questions being addressed with reference to participants, interventions, comparisons, outcomes, and study design (PICOS).	Pag 3: First paragraph.
METHODS			
Protocol and registration	5	Indicate if a review protocol exists, if and where it can be accessed (e.g., Web address), and, if available, provide registration information including registration number.	Pag 4: Second paragraph.
Eligibility criteria	6	Specify study characteristics (e.g., PICOS, length of follow-up) and report characteristics (e.g., years considered, language, publication status) used as criteria for eligibility, giving rationale.	Pag 3: Literature search section
Information sources	7	Describe all information sources (e.g., databases with dates of coverage, contact with study authors to identify additional studies) in the search and date last searched.	Pag 3: Literature search section
Search	8	Present full electronic search strategy for at least one database, including any limits used, such that it could be repeated.	Table 1
Study selection	9	State the process for selecting studies (i.e., screening, eligibility, included in systematic review, and, if applicable, included in the meta-analysis).	Pag 3-4: Screening section
Data collection process	10	Describe method of data extraction from reports (e.g., piloted forms, independently, in duplicate) and any processes for obtaining and confirming data from investigators.	Page 4: data extraction section

PRISMA 2009 Checklist

Data items	11	List and define all variables for which data were sought (e.g., PICOS, funding sources) and any assumptions and simplifications made.	Table 2.
Risk of bias in individual studies	12	Describe methods used for assessing risk of bias of individual studies (including specification of whether this was done at the study or outcome level), and how this information is to be used in any data synthesis.	N/A justification page 4, last paragraph screening section
Summary measures	13	State the principal summary measures (e.g., risk ratio, difference in means).	N/A
Synthesis of results	14	Describe the methods of handling data and combining results of studies, if done, including measures of consistency (e.g., I^2) for each meta-analysis.	Pag 4: data extraction section

Section/topic	#	Checklist item	Reported on page #
Risk of bias across studies	15	Specify any assessment of risk of bias that may affect the cumulative evidence (e.g., publication bias, selective reporting within studies).	N.A. justification page 4, last paragraph screening section
Additional analyses	16	Describe methods of additional analyses (e.g., sensitivity or subgroup analyses, meta-regression), if done, indicating which were pre-specified.	N/A
RESULTS			
Study selection	17	Give numbers of studies screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally with a flow diagram.	Fig. 1.
Study characteristics	18	For each study, present characteristics for which data were extracted (e.g., study size, PICOS, follow-up period) and provide the citations.	Appendix A.
Risk of bias within studies	19	Present data on risk of bias of each study and, if available, any outcome level assessment (see item 12).	N/A (see item 12).
Results of individual studies	20	For all outcomes considered (benefits or harms), present, for each study: (a) simple summary data for each intervention group (b) effect estimates and confidence intervals, ideally with a forest plot.	Pag. 5-9 and appendix A
Synthesis of results	21	Present results of each meta-analysis done, including confidence intervals and measures of consistency.	Pag-5-9

PRISMA 2009 Checklist

Risk of bias across studies	22	Present results of any assessment of risk of bias across studies (see Item 15).	N/A(see Item 15).
Additional analysis	23	Give results of additional analyses, if done (e.g., sensitivity or subgroup analyses, meta-regression [see Item 16]).	N/A
DISCUSSION			
Summary of evidence	24	Summarize the main findings including the strength of evidence for each main outcome; consider their relevance to key groups (e.g., healthcare providers, users, and policy makers).	9-13
Limitations	25	Discuss limitations at study and outcome level (e.g., risk of bias), and at review-level (e.g., incomplete retrieval of identified research, reporting bias).	Pag.13: Limitations section
Conclusions	26	Provide a general interpretation of the results in the context of other evidence, and implications for future research.	Pag.13-14
FUNDING			
Funding	27	Describe sources of funding for the systematic review and other support (e.g., supply of data); role of funders for the systematic review.	Pag.14: Funding section

From: Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group (2009). Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement. PLoS Med 6(7): e1000097. doi:10.1371/journal.pmed1000097

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Chapter 5

Community pharmacists' perspectives about the sustainability of professional pharmacy services: A qualitative study

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Community pharmacists' perspectives about the sustainability of professional pharmacy services: A qualitative study

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Abstract

Background

Pharmacists have been increasing patient-focused care through the implementation and provision of professional services. However, there is a lack of evidence on how to achieve service long-term sustainability once implemented. A framework identifying factors affecting the sustainability of professional pharmacy services was developed. The objective of this study is to explore the experiences of community pharmacists providing professional services to contextualize and assess the applicability in practice of the sustainability framework.

Methods

A qualitative study was undertaken in Australia. Community pharmacists were identified using purposive and snowballing sampling. Data was collected through semi-structured interviews. The interview guide was based on the proposed sustainability framework for professional pharmacy services. Eighteen interviews were conducted and analysed using framework methodology in NVivo.

Results

A range of major sustainability factors were identified and organized in social, economic and environmental domains. At the social domain, most interviewees stated the importance of motivating staff to increase service promotion and patients' demand. The majority of participants emphasized that having adequate trained staff numbers is required to enhance and maintain services over time. The perceived reluctance of some patients to spend more time than usual at the community pharmacy was another factor highlighted as affecting service sustainability. At the economic domain, the concern about lack of remuneration for service provision was highlighted by the majority of interviewees. Having economic support was seen as essential for achieving sustainable services. At the environmental domain, the necessity of Government recognition of the pharmacists' role and value to the healthcare system was identified as a new key sustainability driver

Conclusion

The applicability of the framework for the sustainability of professional services was evaluated in practice. The identified factors will guide pharmacists to maintain implemented services and achieve their sustainability. Future research should focus on designing a discipline specific tool to measure the sustainability of pharmacy services.

Background and rationale

Community pharmacists' high accessibility and skills place them in an ideal position to provide healthcare to patients. In the last twenty years, community pharmacists have also been implementing new professional services to provide patients with more personalized health support.[1] These services allow pharmacists to assess and monitor patients' medications and their health problems, with the ultimate objective of improving the quality use of medicines and health outcomes.[2-4] Some examples of these professional services are medication adherence programs, medicines use reviews, comprehensive medication reviews, or screening and monitoring services amongst others. The efficacy and effectiveness of these professional services has been proved. However, the implementation and complete integration of professional services in practice is not always achieved.[5,6] This so-called science to service gap is a common phenomenon reported in many disciplines including pharmacy.[7,8] Nevertheless, the challenges associated with the implementation of services in practice[9,10], are commencing to being resolved by applying implementation science (i.e. that studies the use of theoretical and pragmatic methods to promote the uptake of research findings into routine practice). As a result, there is a significant range of professional services that have successfully been implemented internationally (e.g. Canada, United Kingdom, United States of America, and Australia).[11-13]

These professional pharmacy services are often funded by national health care systems due to their proven effectiveness in enhancing clinical, humanistic and economic outcomes. [14-16] In Australia, an agreement between the Pharmacy Guild of Australia and the Federal Governments is signed every five years. As part of this agreement, remuneration is allocated to deliver various adherence and medication management services such as Staged Supply, MedsChecks or Home Medicines Reviews.[17] Despite the availability of funding for service provision, which is a key driver for practice change in community pharmacy, there are significant challenges associated with the long-term sustainment of these services in routine practice. Thus, exploring mechanisms to achieve their sustainability should be a priority for

community pharmacists, to ensure the continuation and the maintenance of these services' benefits over time.

Despite its relevance, the sustainability of professional services in community pharmacy is an area yet to be further studied. A recent definition has been proposed, suggesting that "Sustainability is a phase, where a professional pharmacy service, previously integrated into practice, is routinized and institutionalized over time to achieve and sustain the expected service's outcomes".[18] The definition implies that the key to sustainability is the maintenance of the service and its provision overtime until it becomes part of routine practice. Furthermore, the relevance of achieving a service's sustainability relies on the maintenance of long-term outcomes and benefits ensuring at the same time that the time, effort and costs invested in those services by community pharmacists will have financial returns. Sustainability is considered a dynamic process, in which the service previously implemented, is continuously adapted in line with changes in the setting and context, allowing its optimization and quality assurance over time. Assessing the service's performance is pivotal to ensure that the service is functioning as planned.[19]

The service's sustainability has been found to be moderated by a range factors that can act as barriers (e.g. lack of funding and staff) or facilitators (e.g. staff involvement, availability of resources).[20-23] Identifying these factors is essential as a guide to develop sustainable pharmacy services in the future. For this reason, an overarching theoretical framework for the sustainability of professional services in community pharmacy was developed based on the evidence available in healthcare settings.[24] This theoretical based framework provides researchers with guidance on how to research and practitioners on how to achieve the sustainability of services over time. The service itself with its components, resources and outcomes are in the core of the framework. Factors moderating the sustainability are organized across three performance domains social, economic and environmental perspectives. These factors need to be explored in practice to understand the underlying causes of a service failure or success. Various stakeholders influence these domains. Considering the perspectives and experiences of the stakeholders involved in the service provision

is critical to advance and transfer the knowledge of sustainability in pharmacy practice. Therefore, the objective of this qualitative study was to explore community pharmacists' experiences and perspectives on the sustainability of professional services and to assess the applicability of the sustainability framework in practice.

Methods Study Design

A qualitative study was conducted. The data was collected through semi-structured interviews and analyzed using a framework methodology. This paper follows the reporting standards recommended by COREQ.[25]

Participants' selection

Participants were identified using purposive and snowballing sampling, and 18 were recruited between December 2018 and April 2019. Initially two pharmacy owners, key stakeholders in a national professional organizational and leaders in the implementation of professional pharmacy services, were identified and selected through an online search. An additional 16 participants were identified using snowballing technique. Participants were recruited and interviewed until data saturation was reached.[26] Any community pharmacist who was involved in the provision of professional services during the recruitment period was eligible to participate in the study regardless his/her position at the pharmacy (i.e. Pharmacy owner (PO), pharmacy manager (PM), pharmacist provider of professional services (PP)). The following participant inclusion criteria were applied:

- Community pharmacist working in a pharmacy located within an hour's drive from Sydney (for in-person interviews) or located all over Australia (if they agreed to be interviewed via Skype or any similar platform).
- Community pharmacist who had implemented a professional pharmacy service in his/her pharmacy, which had been operating for a minimum of two years.

Pharmacists were interviewed based on their highest position held in the pharmacy (e.g. if working as a pharmacist and as a manager, the interview guide for pharmacy managers was used). Interviewees were contacted by email or phone, and information regarding the study was provided subsequently by email or in person for

those pharmacists willing to participate.

Setting

Individual one-to-one interviews were conducted by one of the study researchers (CCG). Ten of the interviews were conducted in person in a private area within the community pharmacy where the participant was practicing. Eight interviews were conducted through Skype or Zoom (or a similar platform).

Data collection and protection

The interview guide (Appendix 2) was designed taking into account the factors depicted as moderators of the sustainability of professional services in a framework, which had been previously compiled from a literature review.[24] The interview questions were designed to explore the knowledge, beliefs and experiences of pharmacy owners, pharmacy managers and professional pharmacy service providers regarding the professional pharmacy services already implemented in their pharmacies and their sustainability. The interview questions were reviewed by all the research team (CCG, MS, VGC, SIB). The interview guide was piloted with two community pharmacists who provided their feedback, to establish face validity.

A Research Data Management Plan was created using Stash to maintain control over the study data. The interviews were audio-recorded, transcribed and managed through NVivo 12, a qualitative data analysis software that allows to collect, organize, analyze and visualize unstructured or semi-structured data. Interview transcripts were de-identified to ensure privacy and confidentiality. A digital audio recorder, which contained a direct USB connector, was used to record the interviews. Once transcription of all the interviews was complete (with the use of numeric identifiers), the audio files were destroyed in all the stored places. Before analysis, a copy of the transcript was sent to each participant via email for comments.[27]

Framework analysis, a constructivist qualitative method, was used to analyze the data.[28] All audiotaped interviews were listened, to test the precision of the transcript and to get familiar with the data. The primary researcher first read line by line and openly coded the transcripts to identify core ideas, concepts and themes and to

ensure crucial aspects of the data were not missed. Secondly, these codes were organized according to the different categories of the framework. The data was charted into a framework matrix. Charting was used to summarize the data by categories and to create the whole data image, considering the range of experiences for each theme. The different steps and findings of this process were discussed between all the researchers.

Ethics consents and permission

The University of Technology Sydney Human Research Ethics Committee approved this study (UTS HREC REF NO. ETH18-2982). Before the interview, participants were provided with an information sheet. Written consent from the interviewers was obtained in person or via email, prior to the interview.

Results

Eighteen interviews were conducted, which included 10 pharmacy owners, five managers and three pharmacist providers. At this point, thematic saturation of the main themes appeared to be achieved, with no new themes emerging from the data and therefore, no further sampling was conducted.[27] The average interview duration was 26min (± 11). Participant characteristics are provided in Table 1. Some of the services provided by the participants included medication adherence services, MedChecks, sleep apnoea services, services to promote health (e.g. smoking cessation, flu vaccinations), and health monitoring services (e.g. blood pressure, glucose, cholesterol).

Table 1: Participant Characteristics

Role in the pharmacy	Owner	10
	Manager	5
	Professional services provider	3
Pharmacy Size[a]	Small	3
	Medium	6
	Large	9
State of Australia	New South Wales (NSW)	13
	South Australia (SA)	2
	Queensland (QLD)	2
	Western Australia (WA)	1
Pharmacy location	Metropolitan	15
	Rural	3
	Remote	0
[a] The size of the pharmacy is determined by the number staff who are regularly on duty. Small: 1-2 Medium:3-4 Large: five or more		

Sustainability of professional services conceptualization

When asked about the sustainability of professional services, most interviewees referred to the economic feasibility and financial viability of the services provided:

[PO1]: *'I think sustainability as a proprietor and a pharmacist comes down to really the financial viability. If it's not financially viable, then there's no future in it.'*

[PM1]: *'It needs to be able to be provided in a way where there's sufficient funds, but also there's enough profitability for the business owner to justify maintaining it with the required resources, staffing.'*

Most interviewees defined sustainability in terms of the routinization and the long-term continuation of the services:

[P09]: *'I think the sustainability means it becomes a part of the normal way of doing*

pharmacy practice into the future.'

[PM5]: *'It means being able to provide them in a timely manner, on a long-term basis and being able to be remunerated appropriately for them.'*

Some of the interviewees identified sustainable services as those that were perceived as necessary and valuable for the community:

[PM3]: *'In order for a service to be sustainable, it needs to be a perceived need, perceived value, for those who are receiving and paying for the service.'*

Regarding the question of how they could measure the service's sustainability, some interviewees focused on the service's economic sustainability and suggested using the service's expenses and profits for its assessment:

[PO5]: *'You can look at the cost of provision of the service, and there are multiple ways you can do that, but also the revenue and the profit derived for the pharmacy itself.'*

[PO1]: *'When you are in a business there's financial parameter. You look at simple things like the cost of the service versus how much income it's bringing in, so that's on a very basic store level.'*

Some community pharmacists indicated that the service's sustainability could be measured in relation to improved patient health outcomes. However, some of the interviewees were not able to suggest a sustainability measure or did not believe that it would be possible to measure it:

[PM5]: *'I think it would be difficult to measure, I'm not quite sure how it would be done.'*

[PP3]: *'Can it be measured? I don't know. I don't think so ,'cause sustainability, the word itself is something you use as a concept. You can't measure it. No.'*

Sustainability factors identified for the sustainability of professional services

Diverse major sustainability factors were identified and organized based on the three performance domains (i.e. economic, social and environmental) and the service characteristics (i.e. components and resources) according to the framework for the sustainability of professional services previously proposed.[24] Examples of quotations

supporting the factors below can be found in Appendix 3.

In terms of the **social domain**, sustainability factors related to the staff and patients/community were identified. Having appropriate staffing numbers was identified as being directly associated with the sustainability of the services.

[PP1]: *"So I guess in myself I found it really difficult to keep up with the services when you don't have that support from the staff and that's not their fault. It's probably more to do with not having enough staff on."*

[PO2]: *"If you run yourself and you have to oversee everything without having the staff doing anything, you can't do it. You can't."*

Most community pharmacists described staff as essential for the continuation of the services because of their crucial role in enhancing and promoting the service as well as ensuring that all the duties in the pharmacy were fully covered. The majority of interviewees declared the importance of training staff, and in some cases, the lack of training was described as being one of the barriers encountered during the implementation of the services.

[PP3]:*"Staff needs to be constantly educated and trained up in terms of related things."*

[PO6]: *"We have continuously tried to upscale all of our pharmacy staff, including myself. We're training, that's not change".*

Differences between the types of training received across the community pharmacies were identified. Some pharmacies focused their training on the clinical aspects of the services (e.g. the characteristics of the disease, disease risk factors), others focused on technical training (e.g. use of computer software), and others covered the service protocol for its provision (e.g. explanation on how to do a specific services as vaccinations, MedsCheck). The majority of community pharmacists described how important it was to keep the staff motivated to ensure the service's sustainability, with some of them suggesting their staff's lack of motivation could be due to the time allocation and the lack of rewards. Some interviewees claimed the use of incentives to increase staff commitment and involvement, while others did not believe in the

use of financial incentives to motivate staff.

[PO5]: *"I can't do it myself, I need to have my staff working for me that want to do the services to make these successful. And if you don't have that, you don't have a successful service."*

[PO1]: *"Yeah, it's not an option, because your business is your staff. And if your staff can't support it, then you can spend thousands on consult rooms and marketing, but if your staff cannot engage the customer with it or adopt it into the business, then it's going to fail."*

[PM4]: *"And we also too, sometimes do incentives for staff. So team challenges. "So doing incentives like that to help keep the staff motivated to keep delivering them."*

[PO4]: *"Training, training, training. I don't believe in giving financial incentives to staff to do things, because then they do them just for the sake of getting the money and not for doing it properly."*

The majority of pharmacists recognized the importance of a leader to guide and promote staff motivation.

[PO6]: *"It's actually not important, it's critical to the success of it and unless someone takes that, as the Americans call it, a champion for it. Unless that leadership happens ..."*

[PO9]: *"And I think all pharmacies need that. Cause often the aid and the business owner may not be present and so and, but sometimes it's the person has got a different responsibilities. So you need sort of a champion for professional services who can coordinate and deliver those service I believe is really important."*

Having regular meetings to identify and understand staff needs was described as relevant for the continuation and improvement of the services.

[PO9] *"You should have regular staff meetings to talk about a whole range of things. But including that would be the professional services and the roles of the staff within your pharmacy. So staff meetings are a really important part of trying to make professional services sustainable."*

[PM4]: *"We try and have just staff catch-ups every month and chat about what they like, what they don't like doing. What they want more training on, and things like that"*

The promotion of the service was new factor acknowledged as essential to increase patient demand and ensure the maintenance of the service thus leading to its sustainability.

[PP1]: *"cause we try to obviously promote it and ask the ... to let the community know that it is available."*

[PO1]: *"think that we need all of our staff, pharmacists, pharmacy assistants, to be more conscious that we need to promote those services to customers"*

Most community pharmacists stated that patients need to be aware of the value of the professional services provided by community pharmacists to ensure their demand and make them sustainable. Additionally, participants highlighted it was essential to make patients feel comfortable with the pharmacist and the services provided. Some pharmacist indicated there were patients reluctant to spend more time than usual at the community pharmacy.

[PM2]: *"They probably have some hard time to understand what medication they've been taking. So we need to make them comfortable with what the person is taking as well."*

[PO2]: *"As we developed in ourselves the expertise in asking, trying to get the things together, making sure the person feels comfortable about it"*

[PO2]: *"People will wait for an hour, hour and a half to five hours for a doctor. They don't want to wait for us, and we're being pushed all the time to get them through quicker."*

At the **economic domain**, most pharmacists discussed the need of adequate remuneration for the service provision. The relevance of remuneration for the continuation of services was identified by the majority of interviewees.

[PP1]: *"I guess there must be enough staff on the floor and remuneration for to be ongoing"*

[PO9]: *"Another conversation perhaps, but professional services and their payment. I don't think, that if you do it well and do it properly, I don't think they are appropriately remunerated." "Moving professional services forward and making them sustainable is making them viable as we're discussing here, and part of that is around the remuneration of the service itself to properly reward people for doing it well."*

The only remuneration for the service provision for the majority of community pharmacists was provided by the Australian government for those services involved in the 6th Community pharmacy Agreement (e.g. Medication management and medication adherence programs). Most pharmacists did not charge their patients directly for the services. However, some of them where charging some of their patients for some of the services not covered under the current CPA (e.g. sleep apnea services). Despite the availability of Government funding, most interviewees declared that at this stage, the services did not provide enough return on investment to cover the initial investment and maintenance costs. Most interviewees stated that they would like to have external collaborators in the future. In this regard, some participants mentioned the reticence of other healthcare professionals to the expansion the community pharmacists' role.

[PO9]: *"I think a lot of the programs we should be talking to GPs a lot more. I'm great at advocating for any new services come in and the pharmacies should actually go and sit down with your local GPs tell them about the service, what you intend to do"*

[PO1]: *"I think that it would be great to have a variety of collaborations."*

[PO6]:*"And the collaboration is mainly obviously GP services, but sadly sometimes even physiotherapy and podiatry centres that people aren't very proactive in taking up."*

At the **environmental domain**, the majority of the interviewees declared that the changes in the Government policies and regulations did affect their service sustainability.

[PM4] *"Yeah, I think so, because I guess if you use influenza and vaccination changes. We now need to review again." "Our staffing levels and all of that sort of thing, and*

our workflow to ensure that we can still keep providing the vaccination services to the same level that we were last year. So when something changes in legislation, we sort of need to be prepared for that. Yeah."

[PO7]: *"I think if anything the changes have been dispatch and I think it's probably the services that has actually kept us going well because with cutting prices and things like that make it harder to actually operate."*

Some pharmacists mentioned the necessity of Government recognition of the value of the role of the pharmacists in the healthcare system as new key sustainability driver not previously considered in the framework.[24]

[PO8]: *"I think governments need to recognize a lot of what we do isn't just sticking pills for example in a packet."*

[PO4]: *"The problem is we're not remunerated for it or recognized."*

In terms of the service characteristics, most community pharmacists did not identify a specific element of the service that was not properly functioning. Time, staff and economic resources were highlighted as essential resources for the continuation of services. The lack of at least one of these three factors was identified as a barrier to the sustainability of the services in all the interviews. The service provision was described by most pharmacists as time demanding, making it difficult to deal with other work in the pharmacy. Most interviewees indicated they were tracking and monitoring the progress of the services they had implemented (e.g. in terms of reach and patient satisfaction).

[PM4]: *"Yeah, so the three main things would probably be time. So time for the pharmacist to actually get out and provide the services properly. Money or price. I don't believe that professional services should be done for free."*

[PO6]: *"The average pharmacist is very busy in the dispensary and the time constraints of being able to be accessible to the patients and provide these services has been a major challenge." "At the very same time that we need their money as a resource to help us do that."*

Most interviewees stated that they had made adaptations but not in any of the

service components (i.e. changes in their workload, community pharmacy infrastructure). The full list of factors identified can be found in (Figure 1).

[PO8]: “Structurally yes. Three years ago, we did build ... we always had a private area we conducted services in but we have built a consulting room now, which is well-utilized. It has a dispense point in there as well.”

[PO5]: *“Changes would be either for marketing or completely getting rid of some of the services”*

Figure 1. Factors affecting the sustainability of professional pharmacy services

Social performance domain	Pharmacy Staff: • Involvement* • Training/Support* • Feedback/Workload* • Skills assessment • Needs/beliefs/culture • Incentives Leader or champion: • Organizational capacity/Governance • Leadership • Education/Reinforcement Patient/Community: • Needs/beliefs/Culture • Motivation/Involvement* • **Understand and make patient feel**	Sustainable pharmacy service • <u>Continue evaluation</u> • <u>Continue adaptation</u> • **Continue promotion** • Resources: o Time* o Money* o Staff* o Consultation room*
Economic performance domain	Financial Environment: • Expenditure/ Revenue • Funding* • Sources: Patients and Government. • Strategic funding Partnership (stakeholders): • Communication • Networking • Commitment • Feedback/Goal setting • Incentives	
Environmental performance domain	Political environment: • Access to care • Government policies and regulations* • Political support* • Government recognition	

Bold: New factors identified
*: Most common factors identified
<u>Underline: factors found in the literature but still only used by a few pharmacists</u>

Discussion

In this study, factors moderating the sustainability of professional pharmacy services have been explored from a practitioner's perspective. Results from this study contribute to the validity, applicability and utility in practice of a previously theory-based framework for the sustainability of professional pharmacy services, allowing the identification of additional moderating factors which had not previously been considered in the literature.

The pharmacy profession has evolved over the past 20 years, successfully achieving the national implementation of multiple professional pharmacy services.[29] Despite this progression, many pharmacists nor do the profession appear to have considered the sustainability of these professional services. It has previously been suggested that planning for sustainability should occur during the service's development phase[20, 30], but this appears not to be the case.

The various responses to the exploratory questions aiming at conceptualizing the sustainability of professional pharmacy services, have provided more evidence that this is a research topic yet to be investigated. Despite recent advances in the area of health services research, there seems to be a gap between theory and practice, which may be caused by the lack of empirical evidence on the sustainability of services.[31, 32] Despite the efforts of community pharmacists' to routinize and provide services that could be sustainable in the future, multiple factors are still hindering this last goal. The methods used in practice to assess sustainability (e.g. in terms of the service expenses and profits, patients' outcomes) were heterogeneous.

The data analysis revealed different factors influencing the sustainability of pharmacy services in various domains. It also revealed overarching factors moderating the long-term sustainability of the services implemented were staff training, motivation and availability, patient's involvement, remuneration, resources and government support. Moreover, these factors were also previously identified as moderators of the implementation of professional services in community pharmacy.[29, 33] Therefore, considering these factors before integrating the service in practice may be crucial to

enhance the implementation of sustainable services.

At the social domain, staffing was identified as a crucial factor. In many cases the lack of staff was associated with a lack of revenue.[34] As lack of revenue is a significant barrier for a service's implementation and sustainability[35], there may be a need to make community pharmacy owners aware of the necessity of improving the quality, and not the quantity, of their staff. Training for service provision is usually focused on the service delivery protocol, software use or clinical aspects of the disease being targeted. However, staff's motivation, confidence or needs and beliefs should be taken into account in these training programs.[36] Motivation and confidence building can be driven by an internal leader.[37,38] Staff motivation has been identified as a factor directly related with service promotion, which may positively benefit the sustainability of the services over time.[39]

Patients' reluctance to spend more time than usual and as a result of receiving professional services at the community pharmacy was raised during the interviews. However, regardless of pharmacists' perception, the alignment between what patients want and what is provided can sometimes be inadequate.[40] The importance and benefits of shared decision making with patients or caregivers are often not considered.[41] There is a necessity to explore patients' demands and expectations, as well as to conduct patients' needs assessment to ensure the services offered are aligned to those needs.[42,43] Involving patients during the design stage may be useful strategy to guarantee the service is focused on patients and their requirements from the beginning of the process.[44] This more in-depth analysis of individual patients' needs and requirements may be fundamental to ensure the development of long-term sustainable services.

At the economic domain, the relevance of remuneration to the provision of improved and extended services was identified, a notion well supported in the literature.[30] A recent study reported that there is a need to improve the remuneration of the professional pharmacy services implemented in Australian community pharmacies.[45] Remuneration is fundamental to sustainability. However, the dependence on a single

source of funding is precarious. New strategies may need to be implemented to increase current and also find alternative remuneration sources.[46] If the services meet patients' needs, they might become a potential remuneration source for professional pharmacy services. However, at present that does not appear to be the case. Studies on patients' willingness to pay for professional services have added evidence that patients have a positive attitude toward community pharmacists' role and they are willing to pay for some of the services provided.[47,48] Community pharmacists should explore strategies which reinforce the patient value and benefits in order to increase their demand and their willingness to pay.

Despite the importance given in the literature to the concept of adaptation, the results of this study have shown that most pharmacists at their practice level do not consider this factor. A reason for the lack of adaptation may be caused by the business rules and protocols established by third party payers, which limit or obviate the possibility of the service's adaptation. Another explanation could be that community pharmacists are still in the process of identifying malfunctioning services' components, which would give them the possibility to adapt and optimize the service over time.[10] Nevertheless, there have been many adaptions at the national level such as changes in methods and payment structures, cuts in the number of services provided, or accreditation processes amongst others.

Some of the limitations associated with qualitative research may be that the interviews were conducted and analyzed by one of the researchers. However, all the steps during the research process were discussed between all the researches. Due to the qualitative nature of our research, the representativeness of our findings to all community pharmacies across Australia may be limited. Also, the results of the analysis did not differentiate between the types of services provided. Focusing on specific services may highlight different factors affecting their sustainability.

Conclusion

This study explored community pharmacists' experiences and perspectives on the

sustainability of professional services. Overall, the concept of sustainability as such had not been deeply considered. However, there seemed to be an emphasis on aligning the sustainability of services with patient health needs, the need of obtaining financial benefits through service provision, and staffing considerations.

Results from this study have contributed to increasing the body of evidence on the factors that moderate the sustainability of professional pharmacy services in community pharmacy. Most of the moderating factors previously identified in the healthcare literature can be applied to pharmacy practice. These factors can be used in guiding the profession through its next phase in the continued evolution of service provision, thus aiding the transformation to a patient orientation pharmacy profession.

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Appendices
Appendix 1-Participants information sheet and consent form.

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PARTICIPANT INFORMATION SHEET

Community pharmacists' perspectives about the sustainability of professional pharmacy services: A qualitative study. [ETH18-2982]

WHO IS DOING THE RESEARCH?

My name is Carmen Crespo Gonzalez and I am a PhD Candidate at UTS. My supervisors are Dr Victoria Garcia Cardenas (02) 9514 9297; Victoria.GarciaCardenas@uts.edu.au and Prof Kylie Williams (02) 9514 4050; Kylie.Williams@uts.edu.au.

WHAT IS THIS RESEARCH ABOUT?

Community pharmacy practice has evolved in the last decade. Pharmacists' capability to manage complex and chronic conditions has been widely acknowledged. Currently, community pharmacists are implementing and providing professional pharmacy services, which have been proven to improve patient outcomes. Research has been dedicated to the implementation of those services but achieving sustainability of services is still a major challenge.

The objective of this research project is to explore pharmacist's perceptions, experiences and concerns about the sustainability of professional pharmacy services and further validate a sustainability framework. The aim is to advance the knowledge about sustainability to ensure long-term integration and continuity of professional pharmacy services implemented in Australian community pharmacies.

WHY HAVE I BEEN ASKED?

You have been invited to participate in this study because you have been identified as a professional service provider through an online search or you have been referred by another professional service provider.

IF I SAY YES, WHAT WILL IT INVOLVE?

If you decide to participate, I will ask you to answer some questions about your views and experiences on the sustainability of professional services you are providing in your pharmacy. I (Carmen Crespo Gonzalez) will conduct this 20-30 minutes one-on-one interview, on the previously agreed date/time of your convenience.

The interview will be performed either:

1) In a quiet place in your pharmacy (at least one other pharmacist should be in charge of the pharmacy during the interview time)
2) Via Skype or any similar platform (in a quiet location with no background images that are not intended to be seen during the interview).

The interview will be audiotaped and transcribed (**no video recording will be performed** even if you decide to be interviewed through skype).

After the interview, you will be asked if you would not mind recommending other pharmacists in your same situation to participate in the study. However, **it is not required that you provide this information if you do not feel comfortable.**

ARE THERE ANY RISKS/INCONVENIENCE?

Yes, there are some risks/inconvenience. Inconvenience may occur due to time away from your usual work commitments. Also, slight discomfort may occur based on the questions asked. If you are worried about disclosing personal, business-specific or sensitive information, you will have the opportunity to review your interview transcripts and the draft reports to guarantee that you are happy with your answers and the way in which this information will be used. The aim, however, is to explore the sustainability of

professional pharmacy services in community pharmacy. The quantity and/or quality in which you provide services will not be judged.

DO I HAVE TO SAYYES?

Participation in this study is voluntary. It is completely up to you whether or not you decide to take part. If you choose not to participate, **this information will remain confidential.**

WHAT WILL HAPPEN IF I SAYNO?

If you decide not to participate, it will not affect your relationship with the researchers or the University of Technology Sydney. 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, by contacting Carmen Crespo Gonzalez or Dr Victoria Garcia-Cardenas. If you withdraw from the study, the study tapes and transcripts will be destroyed.

CONFIDENTIALITY

By signing the consent form you consent to the research team collecting and using personal information about you for the research project. All this information will be treated confidentially. The data will be de-identified to ensure privacy and confidentiality.
We would like to store your information for future use in research projects that are an extension of this research project. In all instances your information will be treated confidentially.

In any publication, information will be provided in such a way that you cannot be identified.

WHAT IF I HAVE CONCERNS OR A COMPLAINT?

If you have concerns about the research that you think I, Carmen Crespo Gonzalez, or my supervisors can help you with, please feel free to contact us on:

- Carmen Crespo Gonzalez (02) 9514 9223;Carmen.CrespoGonzalez@student.uts.edu.au
- Dr Victoria Garcia Cardenas (02) 9514 9297;Victoria.GarciaCardenas@uts.edu.au
- Prof Kylie Williams (02) 9514 4050 ; Kylie.Williams@uts.edu.au

You will be given a copy of this form to keep.

NOTE:
This study has been approved by the University of Technology Sydney Human Research Ethics Committee [UTS HREC]. If you have any concerns or complaints about any aspect of the conduct of this research, please contact the Ethics Secretariat on ph.: +61 2 9514 2478 or email: Research.Ethics@uts.edu.au], and quote the UTS HREC reference number. Any matter raised will be treated confidentially, investigated and you will be informed of the outcome.

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CONSENT FORM

Community pharmacists' perspectives about the sustainability of professional pharmacy services: A qualitative study. [ETH18-2982]

I_____agree to participate in the research project Community pharmacists' perspectives about the sustainability of professional pharmacy services: A qualitative study. [ETH18-2982] being conducted by Carmen Crespo Gonzalez, mobile: [redacted], of the University of Technology, Sydney for her doctoral degree in Pharmacy Practice Research.

I have read the Participant Information Sheet or someone has read it to me in a language that I understand.

I understand the purposes, procedures and risks of the research as described in the Participant Information Sheet.

I have had an opportunity to ask questions and I am satisfied with the answers I have received.

I freely agree to participate in this research project as described and understand that I am free to withdraw at any time without affecting my relationship with the researchers or the University of Technology Sydney.

I understand that I will be given a signed copy of this document to keep.

I agree to be:
☐ Audio recorded

I agree that the research data gathered from this project may be published in a form that:
☐ Does not identify me in any way
☐ May be used for future research purposes

I am aware that I can contact Carmen Crespo Gonzalez, Dr Victoria Garcia-Cardenas or Prof Kylie Williams if I have any concerns about the research.

_____ ___/___/___
Name and Signature [participant] Date

_____ ___/___/___
Name and Signature [researcher or delegate] Date

Appendix 2-Interview guide (Owners, managers and providers)

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Interview guide-Owners and managers

Community pharmacists' perspectives about the sustainability of professional pharmacy services: A qualitative study. [ETH18-2982]

1. What do you think the term "sustainability" means in regards to professional services being provided in community pharmacies?
2. Do you think the sustainability of professional services can be measured? If so, how do you think it can be measured?

Regarding the services that are currently being provided in your pharmacy:

1. What professional pharmacy services are you providing?
2. How long have you been providing them?
3. Why did you choose to implement these professional pharmacy services in your community pharmacy?
4. Did you take into account the needs and beliefs of your local community before you implemented your services? If so, are you still assessing their needs and beliefs?
5. How often do you provide these professional pharmacy services?
6. How do you monitor (if you do) the progress of the services you provide?
7. Have you identified if any service elements were not working as you expected?
8. Have you made any changes to adapt these services since they were implemented in your pharmacy? If so, how did you do it?
9. What resources do you think have been crucial for the continuation of services you are delivering?
10. Based on your experiences, are your professional services providing the outcomes that you expected (i.e. to patients and to the pharmacy)? If so, have you notice any significant difference in your service outcomes since you implemented them?
11. Which are the most common barriers that you have encountered while providing the services?
12. What strategies have you used to overcome those barriers?

Regarding individuals (i.e. pharmacy staff) involved in service provision:

1. Would you describe their involvement in delivering services as essential to obtain and maintain your expected outcomes? If so, why?

2. Did your staff undertake training to provide these services before you implemented them? If so, what training was undertaken?
3. Are you monitoring/ have you undertaken an evaluation of your staffs' skills to deliver services? If so, please describe your monitoring and evaluation processes.
4. Do you think that taking into account your staff needs and beliefs about the services is important for the continuation and improvement of the services? If so, Why?
5. What are the strategies (i.e. goal setting, incentives,) you use in your relationship with them?
6. Do you have any internal leader or champion who is leading the service provision and previous implementation? If so, what are the roles of the leader?

Regarding collaborators or partners (i.e. stakeholders, other health care professionals) to your services:

1. Do you have any partners who support the services you are offering? If so, how important do you think established communication systems are with them?
2. Do you think that their commitment to the services being provided in your pharmacy is key to their sustainability? If so, why?
3. What are the strategies (i.e. goal setting, incentives) you use in your relationship with them?

Regarding financial and political environment for the service:

1. Are you receiving funding to support the provision of your services? If so, what sources of funding are you receiving?
2. How have you planned from an economic point of view the sustainability of your professional service?
3. Do you think that funding is essential to achieve the sustainability of your services? If so, why?
4. Are your services providing enough economic benefits to cover the expenses of their implementation?
5. Do you think that the changes in the government policies and regulations have affected your service in any way? If so, why?

UTS UNIVERSITY OF TECHNOLOGY SYDNEY

Interview guide-Providers

Community pharmacists' perspectives about the sustainability of professional pharmacy services: A qualitative study. [ETH18-2982]

1. What do you think the term "sustainability" means in regards to professional services being provided in community pharmacies?
2. Do you think the sustainability of professional services can be measured? If so, how do you think it can be measured?

Regarding the services that are currently being provided in your pharmacy:

1. Which professional pharmacy services are you providing?
2. How long have you been providing them?
3. How often do you provide these professional pharmacy services?
4. How do you monitor (if you do) the progress of the services you provide?
5. Have you identified if any service elements were not working as you expected?
6. Have you made any changes to adapt these services since they were implemented in your pharmacy? If so, how did you do it?
7. What resources do you think have been crucial for the continuation of services you are delivering?
8. Which are the most common barriers that you have encountered while providing the services?
9. What strategies have you used to overcome those barriers?

Regarding your performance for service provision:

1. Would you describe your involvement in delivering services as essential to obtain and maintain the service expected outcomes? If so, why?
2. Did you undertake training before the services were implemented? If so, what training was undertaken and what do you think were the most useful components of this training?
3. Are your skills being monitored or have they been evaluated to deliver services? If so, what monitoring and evaluation was undertaken?
4. Would you describe your needs and beliefs about the services as important for the continuation and improvement of the services over-time? If so, why?
5. Do you have any internal leader or champion for services who is leading the service provision and previous implementation?
6. Do you think that his/her role is essential to the long-term success of the service provided in the pharmacy? If so, why?

Table 2: Appendix 3- Quotations supporting the identified factors

Identified factors			Quotations
Social performance domain	Staff	Staffing (number)	[PM5]:*"the main resources is just staff availability yeah and time."* [PO2]: *"If you run yourself and you have to oversee everything without having the staff doing anything, you can't do it. You can't."* [PO3]: *"Because if we didn't have staff doing it, it wouldn't happen."* [PO10]: *"It would have to be time and staff availability, I think."* [PP1]: *"So I guess in myself I found it really difficult to keep up with the services when you don't have that support from the staff and that's not their fault. It's probably more to do with not having enough staff on."*
		Training	[PM4]: *"If any pharmacist or pharmacy is going to provide a service, all the staff need to be trained"* [PP3]:*"Staff needs to be constantly educated and trained up in terms of related things."* [PO6]: *"We have continuously tried to upscale all of our pharmacy staff, including myself. We're training, that's not change".* [PO1]: *"Staff training as I mentioned, I think really important that the staff constantly trained and reminded and empowered, so they feel like they're part of the process of helping the patient"*
		Ideas	[PM1]: *"And then we have a discussion with those staff members to find out why they believe that. And then we can sort of give them the evidence behind why we think it's a good idea. And because I think it is important that this the staff that you employ, and if they're going to be delivering services, they need to align with the visions and goals of the business and able to deliver them."* [PO7]: *"If your team is not aligned with your vision and they don't have the same sets of values that you do, you either coast them up or you coast them out."*
		Motivation/ Involvement	[PO5]: *"I can't do it myself, I need to have my staff working for me that want to do the services to make these successful. And if you don't have that, you don't have a successful service."* [PO1]: *"Yeah, it's not an option, because your business is your staff. And if your staff can't support it, then you can spend thousands on consult rooms and marketing, but if your staff cannot engage the customer with it or adopt it into the business, then it's going to fail."*
		Incentives	[PM4]: *"And we also too, sometimes do incentives for staff. So team challenges. "So doing incentives like that to help keep the staff motivated to keep delivering them."* [PO4]: *"Training, training, training. I don't believe in giving financial incentives to staff to do things, because then they do them just for the sake of getting the money and not for doing it properly."*

			[P010]: *"Our service is important to the business, and I think they're aware of that. I mean, I probably praise the best ones. I'm not giving them incentives or anything like that."*
	Patients	**Leader**	[PO6]: *"It's actually not important, it's critical to the success of it and unless someone takes that, as the Americans call it, a champion for it. Unless that leadership happens ..."* [PM2]: *"So I think she did a good job in pushing the staff to be highly motivated and then actually make sure the staff always adhere to policy here as well."* [PO9]: *"And I think all pharmacies need that. Cause often the aid and the business owner may not be present and so and, but sometimes it's the person has got a different responsibilities. So you need sort of a champion for professional services who can coordinate and deliver those service I believe is really important."*
		Communication	[PO9] *"You should have regular staff meetings to talk about a whole range of things. But including that would be the professional services and the roles of the staff within your pharmacy. So staff meetings are a really important part of trying to make professional services sustainable."* [PM4]: *"We try and have just staff catch-ups every month and chat about what they like, what they don't like doing. What they want more training on, and things like that"* [PO5]: *"A lot of the strategies go back to identifying the personality types and having regular meetings with the staff, asking them questions, communicating with them to see what they want to do, what they don't want to do."*
		Service promotion	[PM3]: *"I guess maybe a bit more promotion to the community. Once again, other health professionals, medical professionals in the community that they're aware of the value and the ability to come to the pharmacy to access these services. Perhaps that would help with uptake."* [PP1]: *"cause we try to obviously promote it and ask the ... to let the community know that it is available."* [PO1]: *"think that we need all of our staff, pharmacists, pharmacy assistants, to be more conscious that we need to promote those services to customers"* [PO1]: *"I guess trying to promote to the general public and the community what pharmacists do offer"* [PM4]: *"Because one thing that we found too, is that we knew what we provided, but our patients that have been coming to us for years and years didn't know what services we provided. So educating our pharmacy assistants to have that conversation with our patients was really important."*
		Comfortable	[PM2]: *"They probably have some hard time to understand what medication they've been taking. So we need to make them comfortable with what the person is taking as well."* [PO2]: *"As we developed in ourselves the expertise in asking, trying to get the things together, making sure the person feels comfortable about it"*
		Reluctance of receiving the service	[PO5]: *"Another barrier is patient perception of the service or the ability of the pharmacy to provide their services appropriately."* [PO2]: *"People will wait for an hour, hour and a half to five hours for a doctor. They don't want to wait for us, and we're being pushed all the time to get them through quicker."*
Economic performance	**Remuneration**		[PP1]: *"I guess there must be enough staff on the floor and remuneration for to be ongoing"* [PO9]: *"Another conversation perhaps, but professional services and their payment. I don't think, that if you do it well and do it properly, I don't think they are appropriately remunerated." "Moving professional services forward and making them sustainable is making them viable as were discussing here, and part of that is around the remuneration of the service itself to properly reward people for doing it well."*

domain			[PO4]: *"All of these things are what we do as a community pharmacy and we need to be either remunerated for it better than a discount pharmacy, or not be around and don't have us. We are a great resource as a primary health care provider"*
			[PO7]: *"It's very important to pharmacies and actually be funded because that can actually have some meaningful help that comes to the patients."*
	Partners	**Collaboration**	[PO9]: *"I think a lot of the programs we should be talking to GPs a lot more. I'm a great at advocating for any new services come in and the pharmacies should actually go and sit down with your local GPs tell them about the service, what you intend to do"*
			[PO1]: *"I think that it would be great to have a variety of collaborations."*
			[PO6]: *"And the collaboration is mainly obviously GP services, but sadly sometimes even physiotherapy and podiatry centre that people aren't very proactive in taking up."*
		Do not want to collaborate	[P02]: *"I don't have doctors telling people to come across very often."*
			[PM1]: *"Doctors are also not familiar with clinics or programs where there's a multidisciplinary team within one location."*
	Economic benefits		[PO2]: *"At the moment? No, because we're not getting lots of extra. As I said before, getting through things like that, the amount of work that covers all these extra things that going through with the implementation of this idea, the extra products are coming but the extra products for the time spent are not there."*
			[PO6]: *"At the moment, definitely not."*
			[PO1]: *"Not yet. Not yet, but I'm pretty positive and optimistic that if we can get out there and really promote it and get behind it 100%, then I think it could potentially be a very good source of revenue, yeah."*
	Policies and regulations		[PM4] *"Yeah, I think so, because I guess if you use influenza and vaccination changes. We now need to review again." "Our staffing levels and all of that sort of thing, and our workflow to ensure that we can still keep providing the vaccination services to the same level that we were last year. So when something changes in legislation, we sort of need to be prepared for that. Yeah."*
Environmental			[PO7]: *"I think if anything the changes have been dispatch and I think it's probably the services that has actually kept us going well because with cutting prices and things like that make it harder to actually operate."* [PO5]: *"I definitely believe that changes the policies in a positive way would affect service, but also, other changes where the government seize funds would completely kill lots those services as well."*
performance	**Recognition**		[PO8]: *"I think governments need to recognize a lot of what we do isn't just sticking pills for example in a packet."*
domain			[PO4]: *"The problem is we're not remunerated for it or recognized."*
	Economic support		[PO8]: *"But governments, I've got a funny attitude to government and funding, I do follow the little buckets of money they put out, but I don't make it my sole source of income."*
			[PO5]: *"I think government funding is essential for not all of them but a large proportion of those things."*
			[PO1]: *"So we just have to move away from our reliance on government funding, and we can't sadly rely on other bodies"*
	Evaluation		[PM5]: *"I suppose we just go on verbal feedback from the customers."*

		[PO2]: *"I actually do backup at home, as in extra work at home after hours to try and get it because while you're working"* [PO4]: *"It's on numbers, I'm looking at numbers."* [PO10]: *"Probably by the numbers. We looked at the MedsChecks numbers. We were trying to get the maximum cap."* [PO7]: *"We actually measure basically how many of ... how much we've done in terms of numbers for the services"*
Service	**Adaptation**	[PO4]: *"So when I knew they were coming, and we changed the structure of the workflow"* [PO5]: *"Changes would be either for marketing or completely getting rid of some of the services"* [PO6]: "*We are talking about making some structural change by having more consulting rooms in our pharmacies, but that's obviously an expensive process"* [PO8]: *"Structurally yes. Three years ago, we did build ... we always had a private area we conducted services in but we have built a consulting room now, which is well-utilized. It has a dispense point in there as well"*
	Resources	[PO2]: *"Time constrain is always one of those situations on that. the barrier and as I said the extra work that it actually entails after hours."* [PM3]: *"Staffing and time, I think. Yeah, staffing and time. With the clinical interventions, sometimes you just quickly fix it if you have five minutes to talk to the customer and then to do the recording and all that. That's great, but sometimes you just, you've got three other customers waiting."* [PM4]: *"Yeah, so the three main things would probably be time. So time for the pharmacist to actually get out and provide the services properly. Money or price. I don't believe that professional services should be done for free."* [PO6]: *"The average pharmacist is very busy in the dispensary and the time constraints of being able to be accessible to the patients and provide these services has been a major challenge." "At the very same time that we need their money as a resource to help us do that."*

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Chapter 6

Exploring patients' needs to achieve the sustainability of professional pharmacy services in Australia: A mixed-methods study.

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Exploring patients' needs to achieve the sustainability of professional pharmacy services in Australia: A mixed-methods study'

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Abstract

Background

Taking into account stakeholders involved in a service is an essential part of service design, implementation and sustainability. In any business, customers are the central focus, thus considering their opinions and needs is critical to ensure that services are sustained over time. Service value is a major determinant of customer satisfaction and loyalty, which is accompanied by increased profitability as a consequence of long-term revenues. During the last 30 years, community pharmacists have been developing professional services as a strategy to provide more personalised care to their customers. Despite the importance of customers for the service, there seems to be a gap in the scientific literature regarding their opinions and needs in pharmacy. Therefore, this study aims to explore patients' expressed needs and their alignment with the professional services provided by community pharmacists.

Methods

A mixed-methods study was undertaken from January until April of 2020. The Quality Function Deployment (QDF) approach, one of the most well-known approaches for prioritising customers' needs, was selected. The QFD uses a tool in the form of a matrix, the House of Quality (HoQ), which enable to establish the relationship between customers' needs and the services offered by a specific business. The data to complete the HoQ was collected and analysed in four stages through: (1) an anonymous qualitative survey to explore patients' needs; (2) an anonymous qualitative survey to explore what professional services were provided by community pharmacists to respond to the identified patients' needs; (3) Expert panel using a modified Delphi technique to establish the relationship firstly between the needs and the services provided by community pharmacists and secondly, between the services offered by community pharmacists; (4) The absolute importance of the services provided by community pharmacists in relation to patients' needs was obtained.

Results

Twenty-six responses to the surveys in stage 1 and 2 were received, including 16 patients and 10 pharmacy owners. The expert panel group consisted of nine experts. The most common needs or requirements expressed by patients in the survey were receiving information about their medication (43.75%,n=7) and monitoring or management of their health condition (43.75%,n=7). From the pharmacy owners' survey, the professional services most commonly reported as being provided were: MedsCheck (100% n=10), Monitoring services (90%, n=9), Home medicines reviews (HMRs) (80%, n=8) and Screening services (80%, n=8). From the results of the expert panel the service identified as having a strong relationship with several of the patients' needs was tailored counselling [(i.e. information about a health condition (8.11) and medication (8.22), medication adherence (8.33), medication administration (8.22) and medication side-effects (8.44)]. Furthermore, tailored counselling was also depicted as one of the services strongly aligned with other services such as MedsCheck (8.6), HMR (8.6), Weight management (8.3) and sleep apnoea (8.3) and minor ailments (7.8). From the analysis of the results in the HoQ, the service identified as best responding to patients' needs was Tailored counselling (A.I.=296) following by MedsCheck (A.I.=260) and HMR (A.I.=259).

Conclusion

The resulting HoQ provides a decision-support tool, which may assist community pharmacists to decide and prioritise the implementation of those services, which are more likely to succeed over time. The results of this study indicate that even though community pharmacists are providing complex services, patients are still in the process of understanding their value, as they are still prioritising simpler services such as counselling. Moreover, considering patients' views and needs may help to save time and effort to community pharmacists who are willing to implement services. In conclusion, patients' needs are paramount in the decision-making process to ensure the future services will satisfy their needs and thus be sustainable.

Background

Sustainable services have been defined as "offerings that satisfy customer needs and significantly improve the social and environmental performance along the whole life cycle".[1] Consideration of stakeholders involved in a service such as providers, partners, payers and customers is a fundamental part of service design, implementation and sustainability.[2] Examining their perceptions and experiences is highly beneficial to understand the barriers associated within a specific service and setting. In business, customers are the central focus of the services[3,4], so much so that Sampson and Frohle suggest that customer input is a precondition to commencement of the service delivery process.[5] Thus, considering their opinions and needs is essential to ensure services are sustained over time. Understanding customers' needs is not only crucial during the design phase of a service, but also once they are implemented.[3] Any gaps between the service delivered and the customers' service expectations would then lead to a re-design to guarantee customers' satisfaction and as a consequence may create significant demand impacting sustainability.[6]

Service value is a major determinant of customer satisfaction and loyalty.[7] Customer satisfaction depends on creating value for customers, through managing their expectations and satisfying their needs.[8] Maintaining customer satisfaction is a challenge for service industries due to the heterogeneity of customers.[9] Increasing customer satisfaction and loyalty is associated and accompanied by an increased profitability as a consequence of long-term revenues.[10] Customers who are loyal also serve as promotors to others, increasing demand and sustainability of services.[11]

During the last 30 years, community pharmacists have been developing professional services as a strategy to provide more personalised care to their customers (i.e. the customers who receive these type of services are usually referred as patients in the pharmacy setting).[12-15] The development of professional services encompasses different phases, which include the design, impact evaluation, implementation in routine practice and the final phase of sustainability.[16] Currently, achieving the sustainability of professional services is a major challenge for community

pharmacists. Crespo-Gonzalez *et al* proposed a theoretical framework in which factors affecting the sustainability of professional pharmacy services were identified.[17] In this framework, factors are organised across three performance domains (i.e. social, economic and environmental). The applicability in practice of the framework was examined in a qualitative study exploring service providers (i.e. Pharmacy owners, Pharmacy managers and professional services providers) perspectives and experiences with the sustainability of professional services. In alignment with the framework, sustainable services were identified as those that were perceived as necessary and valuable for the community.

Despite its importance, there seems to be a gap in the scientific literature regarding the opinions and needs of the stakeholders receiving professional pharmacy services (i.e. customers/patients). Although the implementation of these services is rapidly expanding, it does not appear that patients' opinions have been generally considered during their design and development. Therefore, this study aims to explore patients' expressed needs and their alignment with the professional services provided by community pharmacists.

Methods

A mixed-methods study was undertaken from January until April of 2020. The Quality Function Deployment (QDF) approach, one of the most well-known approaches for prioritising customers' needs, was used. QFD has been defined as "a system for translating consumer requirements into appropriate company requirements at each stage from research and development to engineering and manufacturing to marketing and distribution".[18] The origins of the methodology dates to the late 1960s in Japan. It was instigated by Y. Akao and T. Fukuhara in Japan, where it was mainly focused on the design of new products.[19] However, the approach has been used in service operations management with the aim of ensuring that the voice of the customer (VOC) is fully incorporated and understood throughout the development process of a service. The VOC is used to define the characteristics of a service or product. The approach helps to understand what improvements are required to meet their customers expressed needs.[20] QFD allows to systematically translate

customers' demands, retrieved qualitatively, into quantitative parameters for the design or re-design of services to achieve sustainability of services.[21] The strength of the QFD relies on being a collaborative approach that allows a holistic view of what needs to be improved. The QFD uses a tool in a form of a matrix, the House of Quality (HoQ), which establishes the relationship between customers' needs and the services offered by a specific business. The HoQ is a product-planning matrix that is built to show how customer requirements relate directly to the services. HOQ is considered the primary tool used during quality function deployment to help facilitate group decision making. QFD has been increasingly used in healthcare settings [22-25] but has not been yet applied in community pharmacy services.[12-14]

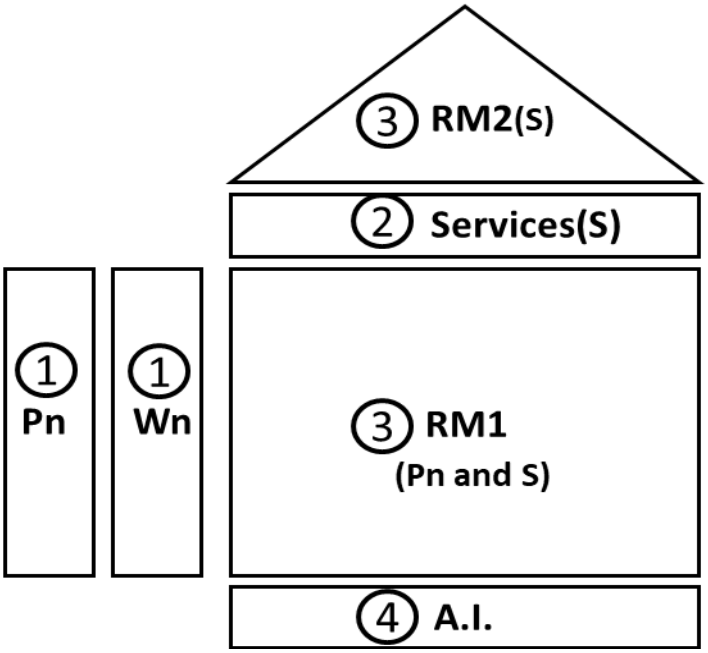


Figure 1. Stages to complete the House of Quality (Adapted to this study).
(1) Patients' needs (Pn) are identified and their importance (Wn) is rated in terms of frequency of appearance.
(2) Professional services provided by community pharmacists to respond to Pn are identified.
(3) The relationship matrix 1 (RM1) is completed by establishing the relationship of the Pn (1) and the services (2) identified.
The Relationship matrix 2 (RM2) is completed by establishing the alignment between the services (i.e. this matrix represents if the implementation and provision of one service promote or does not have any effect to the provision of another service). The results of this matrix are represented as symbols at the roof of the HoQ.
(4) The average results relationship values obtained in (3) are obtained. These values are then multiplied by Wn obtained in (1) to obtain their absolute importance (A.I.).

The data to complete the HoQ[18] was collected and analysed in a four stage (Figure 1) process consisting of:

(1) an anonymous qualitative survey to explore patients' needs, (2) an anonymous qualitative survey to explore what professional services were provided by community pharmacists to respond to the identified patients' needs. (3) Expert panel using the Delphi method to establish the relationship between the expressed needs and the services provided by community pharmacists. (4) Analysis of the relationship between patients' expressed needs and the services provided.

Stage 1. Anonymous qualitative survey to identify patients' needs (Pn).

The research applied qualitative research approach using a case study method. According to Yin case study research is appropriate when applying existing knowledge to a new or emerging context.[26] A sample size of around 10 patients was predicted according to the case study methodology.[27]

Patients' needs (Pn) data were collected through an anonymous qualitative survey with open-ended questions in order to identify the current needs of patients who were receiving professional services (Appendix 1). The survey was pilot tested with four patients. Some demographic data were collected at the end of the survey. The participants' inclusion criteria were patients visiting the pharmacies regularly and who at least once had received professional service. The importance weight (Wn) of each one of the needs was rated based of the frequency that were reported in the survey.

Patients' recruitment was performed through:

a) The Australian Customers' Association (https://www.customers.org.au/). The ACA sent an email with the survey to those customers who met the inclusion criteria and were willing to participate voluntarily. REDCap, which is a secure web application for building and managing online surveys, was used to ensure that all the data collected was secured and protected. A researchers (CCG) received the answers through the REDCap platform.[28]

b) Two community pharmacies located in Sydney were used, with an agreement to ensure respondents' anonymity. The researcher left hardcopies of the survey which were then collected from the community pharmacies.

Stage 2. Anonymous qualitative online surveys for pharmacy owners (S).

Similarly, to the previous phase, a qualitative research approach using a case study method was applied. In order to identify the services provided by community pharmacists (S), data were collected through a qualitative survey consisting of open-ended questions to explore services currently provided by community pharmacists and how they thought these met patients' needs. The questions were formulated based on the list of patients' needs identified during the first research stage (Stage 1). The participants' inclusion criteria were pharmacy owners who were providing professional services at their community pharmacy. A sample size of approximately 10 community pharmacists was predicted according with case study methodology.[27]

Pharmacy owners were recruited through a 'listserv'. The list of participants was created based on an online search which was targeted at finding community pharmacy owners who were providing professional services. The survey link as well as the participant information sheet was included in the email sent to the potential participants to avoid direct contact between the participant and the researcher.

Stage 3. Expert panel using a modified Delphi technique (RM1 and RM2).

A modified Delphi technique was used to establish consensus on the relationships using the matrices of the HoQ. This method was used as it allows each member of the panel to work individually, and to remain anonymous. Potential participants were recruited via email, phone or face to face. The inclusion criteria were experts in the area of professional services with a Bachelor in Pharmacy (i.e. educators who were registered as pharmacists and were researchers in the area of professional services).

During the first round, the members of the expert panel received an email with the documents to be completed (Matrix 1 and 2) and detailed instructions on how to complete them. Matrix 1 (RM1) was provided to establish the relationship between patients' identified needs (Pn) (identified in Stage 1) and the services (S) reported by

pharmacy owners (identified in Stage 2). In Matrix 2 (RM2), which is reported as the 'roof of the house' in the HoQ, panel members needed to indicate the relationship between the different services provided by community pharmacists (i.e. identify if the presence of services facilitated or did not affect the provision of others). In both matrices participants rated the relationship or alignment using on a scale from 0-9 (i.e. 0 indicated no relationship and 9 indicated a very strong relationship). The average of responses for RM2 was translated into symbols and incorporated in the roof of the HoQ. These symbols represent the level of alignment between the services with the following options: black circle (strong positive), white circle (positive), white X (negative) and black X (strong negative). Therefore, if the average was a score of between 8 and 9, the alignment of the services was considered as strong positive and was represented as a black circle at the roof of the house. If the average of responses was a score of between 5-6 it was considered positive, and if it was a score between 2-4, the relationship was considered negative and if it was less than one it was considered strong negative (Figure 2).

Four days after the first round, expert panel members received their responses together with the average group data to compare. The average results showed each relationship in RM1 and RM2, with no identification of individual-specific responses.[29] They were then requested to complete the matrices again, following the same process as in the first round. Members were given the option to amend their responses.[30]

The final average of responses obtained during the second round for RM1 were aggregated in the House of Quality analysis (Figure 2). From the average of responses for RM2 obtained at the second round, were translated into symbols and are presented at the roof of the HoQ.

Stage 4. House of Quality data analysis.

The weights assigned to the relationship between the needs and the services by the expert panel member were averaged. Once the average score is obtained, each of the services is multiplied by the importance given to the eleven patients' needs (Wn). The relationship values obtained are aggregated to determine the absolute

importance (A.I).

For example, for the service 1 (S1) the process would be:

A.I.= [Sum (Average relationship (between patients' need (n1, n2...n11)) and service 1) * (Importance of each one of the needs (Wn1, Wn2…))]

Ethics

Approval from the University of Technology Sydney Human Research Ethics Committee (UTS HREC REF NO. ETH20-4633) was obtained.

Results

Twenty-six responses to the surveys in stage 1 and 2 were received, including 16 patients and 10 pharmacy owners. Nine experts completed the Delphi.

Stage 1. Patients' needs/requirements anonymous qualitative survey (Pn).

From the 16 patient respondents, 69% (n=11) were females and 31% males (n=5). A quarter was aged 70 or older (n=4) and 25 % (n=4) between 50-59. Eighty one percent (n=13) of participants were located in New South Wales (NSW) and 19% (n=3) in Victoria (VIC). All the respondents lived in urban areas. Thirty-one percent (n=5) of participants reported visiting the pharmacy at least once a month, with 25% (n=4) visiting the pharmacy two to three times, and four times or more a month 25% (n=4). Fifty percent (n=8) of the participants only had one health condition. A list of the participants' demographic factors can be found in Appendix 2.

The most common needs or requirements expressed by patients were receiving information about their medication (43.75%, n=7) and monitoring or management of their health condition (43.75%, n=7). The respondents also expressed a need for receiving advice to improve their lifestyle (37.75%, n=6). Other needs included receiving information about their health condition (31.25%, n=5), or information about over-the-counter medication and minor ailments conditions (25%, n=4). They also expressed that they would like to receive services to help prevent diseases (25%, n=4) (table 1). Patients' need importance (Wn) on a scale from (1-5) was obtained based on the frequency of appearance in the survey in the final analysis (Figure 2).

Stage 2. Pharmacy Owners' anonymous qualitative online survey (S).

From the 10 pharmacy owners who responded to the survey, 60% (n=6) were female. The age range of 50% (n=5) of the respondents was 40-49 while 30% (n=3) was 30-39 and 20% (n=2) between 20-29. Seventy percent (n=7) of respondents were located in NSW, and the remaining 30% in Queensland (QLD), Western Australia (WA) and Australian Capital Territory (ACT). All (n=10) the community pharmacies were established in urban areas. A list of the participants' demographic factors can be found in Appendix 2.

From the results of the qualitative survey, the professional services most commonly reported as being provided by community pharmacists were: MedsCheck (100% n=10), monitoring services (90%, n=9), home medicines reviews (HMRs) (80%, n=8) and screening services (80%, n=8). The following services most frequently provided were tailored counselling (70%, n=8) or minor ailments service (70%, n=8). The full list of services and definitions for each service can be found in table 1.

Table 1: Most frequently reported needs and services.

Patient need (Pn)	Description
N1. Provision of information on health conditions*	Provision of information, counselling and/or advice to the patient on health conditions
N2. Management of the health condition*	Assessment of patient's health condition (e.g. Blood pressure (BP) monitoring, glucose, monitoring, etc)
N3. Screening	Screening of undiagnosed health conditions (e.g. diabetes, sleep apnoea, etc)
N4. Disease prevention	Availability and provision of services aimed at preventing diseases
N5. Lifestyle changes	Provision of advice and support to change and manage lifestyle factors (e.g. exercise, diet, etc)
N6. Medication adherence	Provision of advice on how to adhere to medications
N7. Medication administration	Provision of advice on how to use and/or take medications (including use of devices)
N8. Medication information	Provision of general information about the medication (e.g. mode of action, precautions, potential interactions, dosage, etc)
N9. Medication side- effects	Provision of information about' side-effects of medications and how to deal with them
N10. Health condition* treatments	Provision of information about available treatments for a health condition
N11. OTC medications	Accessibility and provision on advice on over-the-counter (OTC) medications.
Service number (S)	**Description**
S1. Educational campaigns	Health promotion campaigns to help patients understand their health condition with the assistance on some occasions of a specialist (e.g. diabetes educator)
S2.Tailored counselling	Provision of pharmacists' advice tailored to the patient's needs/circumstances (i.e. specific medication, health problem.), using CMI if needed.
S3. MedsCheck	A medicine review between pharmacists and patients designed to enhance quality use of medicines and reduce the number of adverse medicines events.
S4. Home Medication Review (HMR)	A review designed to enhance the quality use of medicines and reduce the number of adverse medicine events, by assisting patients to better manage and understand their medicines through a medication review conducted in the patient's home.
S5. Dose administration aids (DAA)	Designed to assist consumers in the community to better manage their medicines, with the objective of avoiding medication misadventure and improving medication compliance.
S6. Health monitoring	Routine monitoring and evaluation of the patient's health or clinical indicator (e.g. Blood pressure and glucose monitoring)
S7. Screening	Screening services to evaluate patients' health status or risk of developing a particular health condition (e.g. Diabetes screening, Mental health screening, hearth health screening)
S8.Vaccinations	Immunisation services to protect patients from a range of diseases.

S9.Weigh management	Service to assist in weight loss or management of risk factors associated with obesity.
S10.Sleep apnoea	Sleep Apnoea Services designed to help investigate people with Obstructive Sleep Apnoea (OSA),and assisting them to find the appropriate treatment. Lifestyle advice and ongoing, personalised support for general sleep issues are also provided.
S11. Minor ailments	The provision of a non-prescription medication and/or counselling to treat a minor condition or making changes to products which were self-selected by the patient

***Health conditions refer to any chronic, acute diseases and minor ailments**

Stage 3. Expert panel using a modified Delphi technique (RM1 and RM2)

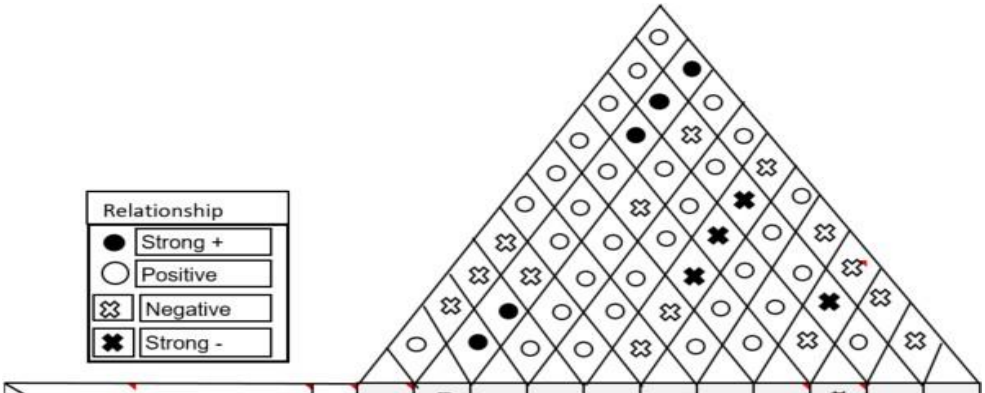
The expert panel group consisted of nine experts. Five of them changed some of their responses based on the group average at the second round. During the first round, in Matrix 1 (RM1), patients' needs and pharmacy services which were determined as strongly related were: MedsCheck (S3) and tailored counselling (S2) with the need of patients of receiving information (n8) or advice on how to adhere to their medication (n6) and its side effects (n9), with an average of responses between 8.3-8.5. In Matrix 2 (RM2), MedsCheck (S3) and HMR (S4) services were reported as highly aligned with tailored counselling.

During the second round, in Matrix 1 (RM1), the service which was identified as having a strong relationship with several of the patients' needs was tailored counselling(S2) [(i.e. information about health condition (8.11) and medication (8.22), medication adherence (8.33), medication administration (8.22) and medication side-effects (8.44)] (Figure 2). In Matrix 2, tailored counselling was also depicted as one of the services strongly aligned with MedsCheck (8.6), HMR (8.6), Weight management (8.3) and sleep apnoea (8.3) and minor ailments (7.8) (Figure 2 at the roof of the HoQ represented as black circles).

Stage 4. Analysis Results-(Absolute importance (A.I.) of relationships in Matrix 1)

The absolute importance of each service in relation to each patient expressed need was based on the average score of the responses obtained on the second round of the expert panel. The service best responding to patients' needs was Tailored counselling (A.I.=296). The other two services which were identified as more suitable to respond to customers' needs were MedsCheck (A.I.=260) and HMR (A.I.=259). Minor ailments services (A.I.=219) following by health monitoring (A.I.=208) and

screening (A.I = 196) were the following services identified as better fulfilling patients' needs. Vaccinations services (A.I.=106) and dose administrations aids (DAA) were found less identified to fulfil expressed patients' needs.



Patients' needs (Pn) \ Sevices (S)	Importance (1-5)	S1.Educational campaigns	S2.Tailored counselling	S3.MedsCheck	S4.HMR	S5.DAA	S6.Health monitoring	S7.Screening	S8.Vaccinations	S9.Weigh management	S10.Sleep apnoea	S11.Minor ailments
n1.Provision of information on health conditions	4	7.11	8.11	6.78	7.44	1.78	6.38	6.22	2.78	5.44	6.56	6.33
n2.Management of the health condition	5	5.22	7.11	7.33	7.22	3.44	8	5.33	3	5.11	6	4.89
n3.Screening	3	5.44	6.56	4.56	4.44	2.11	5.75	8.78	2.89	5.22	6.44	4.78
n4.Disease prevention	4	7.44	6.89	5.56	5.22	2.22	6.5	7.67	7.44	7.22	5.78	5
n5.Lifestyle changes	5	7	7	6.33	6.11	1.78	5.13	5.44	1.22	7.89	7.22	5.33
n6.Medication adherence	3	3.44	8.33	8.56	8.44	7.78	5.13	3.89	1	3.33	2.56	3.67
n7.Medication administration	2	2.67	8.11	7.11	7.11	7.67	3.38	2.89	1.22	2.11	2.33	5.44
n8.Medication information	5	3.11	8.22	7.33	7.33	2.22	3.38	2.56	3.11	3.44	3.33	5.89
n9.Medication side-effects	3	2.67	8.44	8.33	8.44	1.67	5.25	3.78	2.44	2.44	2.33	6.33
n10.Health condition treatments	1	4.89	7.33	6.22	6.44	2.11	4.63	3.67	2.11	6.44	6.33	6.33
n11.OTC medications	4	4	7.67	5.22	5.11	3.33	3.75	4.22	1.44	3.89	3.78	8
Absolute Importance (A.I.)		196	296	260	259	119	209	198	107	192	192	219

Figure 2. House of Quality analysis.

Discussion

The objective of this mixed-methods study using the quality function deployment was to identify which services provided by community pharmacists better fulfilled their patients' needs. A final list of eleven patients' needs and eleven services provided by community pharmacists were defined and included in the analysis.

The patients' needs more frequently expressed were receiving information about their medication and receiving services to monitor their conditions. The fact that one of the patients' priorities was to receive information about their medication is not surprising. This aligns with the historic role of pharmacists as medication providers. Community pharmacists are medicines experts and as such, should provide patients with reliable information about their medication. Patients also expressed their willingness to receive services, which lead to better management of their health condition. In the scientific literature, it is often reported that patients consider community pharmacies as a place for receiving services which can also be provided by GPs clinics.[31,32] This patient need or consumer demand can be used to promote the provision of disease and health-based information.[10] A commonly identified need was patients' willingness to receive services related to improve their lifestyle, commonly associated with weight management or smoking cessation. Community pharmacists should consider establishing new partnerships with other healthcare professionals (i.e. dieticians, GPs) as a strategy to market and capture the attention of patients who are willing to receive these types of services.[33,34] Patients appear to be recognising the changing role and services provided by community pharmacists. Therefore, community pharmacists are in an ideal position to prove the value of their services and also to increase patients' loyalty.[35,36] Listening to the patient's voice should acquire much more relevance in the future, as it will support the optimisation and priorisation of the most appropriate services to meet their needs.[37,38]

From the pharmacy owner's survey, the most common services reported as being provided in community pharmacists in Australia were MedsCheck, monitoring and screening services. In the case of MedsCheck, this is not surprising as it is one of the key services that are currently remunerated by the Australia government and

therefore, it is more likely that community pharmacists can provide them sustainably. Moreover, monitoring and screening services are frequently provided in community pharmacies for the detection and management of chronic conditions.

The results of the HoQ demonstrated that tailored counselling, MedsCheck and HMR are the services which are more suitable to respond to patients' demand. These results should be taken into account by community pharmacy owners and managers willing to implement new services, as they will have a higher probability of long-term success. HoQ can be used to prioritise the services that better respond to patients' needs in the community. This may ensure an increase of patient satisfaction, which has been proven to be essential to increasing demand and sustainability. Tailored counselling was the service most suitable to respond to patients' requirements. This may be explained by the fact that communication is the key to establish a solid relationship with patients and increase their loyalty.[39] Furthermore, this may indicate that community pharmacists are not required to deliver complex services which require extra time, effort and resources to obtain patients satisfaction.[40] It must be mentioned some of the more complex professional services currently offered by community pharmacists do not appear to be "top on mind" for patients, perhaps suggesting the value of comprehensive medication reviews has not been promoted sufficiently.

In regards to the relationships between services, tailored counselling was found to be strongly aligned with the rest of the services identified in this study. This is not surprising, as most other services incorporate an element of tailored advice and information provision. Counselling can be associated and used as a part of a wide range of services, as it allows the provision of personalised health and medicines information. Those services, which are positively aligned, may open an opportunity to consider implementing several services simultaneously, as it may require less effort from the implementer's perspective. However, there were some services, which showed a negative relationship (e.g. MedsCheck with vaccinations). These negative relationships can also be explained by the fact these services are targeted to completely different patients' needs.

Implications and limitations

This research has several implications for the sustainability of professional pharmacy services. This is the first study applying the quality function deployment method, which although it has widely been used in the services literature, it was yet to be applied in pharmacy. Using this method, patients' requirements and needs have been prioritised, allowing the identification of services which are more likely to be demanded and therefore sustainable. Furthermore, the resulting HoQ provides a decision-support tool, which may assist community pharmacists decide and prioritise the implementation of those services, which are more likely to succeed over time. For those community pharmacists who are already involved in the provision of professional services, this approach will permit them to optimise the services they already offer.

Some limitations need to be discussed, such as the small sample size of the surveys and Delphi technique. However, the small sample size of the qualitative surveys can be justified due to the qualitative nature of the information retrieved and the specific target population (i.e. patients and community pharmacists who had received/ provided professional pharmacy services in Australia). The number of experts who participated in the expert panel, using a modified Delphi technique, may seem smaller than usual. However, similar studies using this technique with less than 15 experts have been found in the literature.[41-44] Furthermore, to increase the trustworthiness of the results, the step by step methodology has been fully described in the paper. Another limitation of this study is that patients' needs may vary over time or may depend on the area and on the type of pharmacy that they regularly visit. Thus, the application of these findings to other settings or countries might be limited.

Conclusion

This study has allowed the identification and prioritisation of patients' needs, through a collaborative approach involving different key stakeholders, to ensure the sustainability of services in pharmacy. The most critical needs reported by patients were receiving information about their medication, the availability of services for the

management of their condition and improvement of their lifestyle. The services most commonly provided by community pharmacists were MedsCheck, monitoring and screening services. As a result of the relationship established by the expert panel members, three services were found to be more likely to respond to the identified patients' needs. These were Tailored counselling, MedsCheck and HMR. However, the results of this study indicate that even though community pharmacists are providing more complex services, patients are still in the process of understanding their value, as they are still prioritising simpler services such as counselling. The results indicate that considering patients' views and prioritising their needs may save time and effort to community pharmacists who are considering implementing services. In conclusion patients' needs are paramount in the decision-making process to ensure the future services will satisfy their needs and thus sustainable. The resulting House of Quality can be used as a decision support tool for program developers as well community pharmacists' providers to decide which services should prioritise to respond to their patients' needs.

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Appendices

Appendix 1.Participant information sheet and consent form

UTS UNIVERSITY OF TECHNOLOGY SYDNEY

INFORMATION SHEET AND CONSENT FORM

ETH20-4633N- PROMOTING THE SUSTAINABILITY OF PROFESSIONAL SERVICES IN AUSTRALIAN COMMUNITY PHARMACIES.

What is the research study about?

Customers' demands of community pharmacists are changing. In response to these changing demands, community pharmacists across Australia have implemented and are offering **new professional services** beyond medicine dispensing. These professional services are delivered by your community pharmacist in collaboration with you and sometimes with other healthcare professionals. These services allow pharmacists to assess and monitor your medication, to teach you how to manage it and to identify any potential problem that you could have while using it and its side effects. These services are aimed at reducing or preventing your symptoms and improving your health and quality of life. Examples of these services include but are not limited to medication reviews, administering asthma plans, managing chronic diseases such diabetes and high blood pressure. My research project investigates how these professional services can be improved to meet your needs. A previous phase in this research project explored community pharmacists' perspectives and experiences with the provision of professional services. Now that community pharmacists' views have been researched, the purpose of this anonymous survey is to explore your needs and expectations from the professional services offered in the community pharmacy that you regularly visit. The goal is to provide Community pharmacy owners with a decision support tool to assist them in prioritising and selecting the most appropriate strategies to meet their specific customer and patient requirements. In doing so, community pharmacists will be able to improve and adapt their professional service offerings to meet your needs and expectations better.

You are invited to participate if you have received a professional pharmacy service in one or more community pharmacies across Australia.

Who is conducting this research?

My name is Carmen Crespo Gonzalez and I am a PhD Candidate at UTS. My supervisors are Dr Victoria Garcia Cardenas (02) 9514 9297; Victoria.GarciaCardenas@uts.edu.au and Dr Moira Scerri (02) 9514 5496; moira.scerri@uts.edu.au.

Inclusion/Exclusion Criteria

Before you decide to participate in this research study, we need to ensure that it is ok for you to take part. The inclusion criteria of this study are any regular customers visiting a community pharmacy who have received a **professional pharmacy service** at least once.

Do I have to take part in this research study?

Participation in this study is voluntary. It is entirely up to you whether or not you decide to take part. If you decide to participate, you will be invited to complete a survey. You will have the opportunity to decide whether to complete the survey by hand or online using an iPad. The survey is anonymous and you will not be identifiable.

In the survey, I will ask you an open-ended question about your requirements and expectations from the professional services provided by your community pharmacists. It is expected that your time commitment will be approximately 5-8 minutes to complete.

As the survey is anonymous, you will not be required to provide any personal or sensitive information. **Please be aware as part of the survey, there will be a few questions asking you some demographic details, but this information will not identify you in any way.**

You can change your mind and withdraw from the research at any time without any questions being asked and without prejudice.

Are there any risks/inconvenience?
We don't expect this survey to cause any harm or discomfort, however if you do experience feelings of distress as a result of participation in this study you can let the researcher know and they will provide you with assistance, or you can withdraw from the research.

What will happen to information about me?
Access to the online questionnaire is via a weblink. Submission of the survey is an indication of your consent (either online or by hand). If you consent, the research team will collect and use the information provided by you for the research project. As you will not be identified at any point of the study, all the data collected will be anonymous.

What if I have concerns or a complaint?
If you have concerns about the research that you think I, Carmen Crespo Gonzalez, or my supervisor can help you with, please feel free to contact us on:

- Carmen Crespo Gonzalez (02) 9514 9223; Carmen.CrespoGonzalez@student.uts.edu.au
- Dr Victoria Garcia Cardenas (02) 9514 9297; Victoria.GarciaCardenas@uts.edu.au
- Dr Moira Scerri (02) 9514 5496; moira.scerri@uts.edu.au

If you would like to talk to someone who is not connected with the research, you may contact the Research Ethics Officer on 02 9514 9772 or Research.ethics@uts.edu.au and quote this number **[ETH20-4633N]**

1. Patients' anonymous survey

PROMOTING THE SUSTAINABILITY OF PROFESSIONAL SERVICES IN AUSTRALIAN COMMUNITY PHARMACIES.

The University of Technology Sydney (UTS) is conducting research to explore customers' needs from the new services provided by community pharmacists in Australia. Please read the participant information sheet before completing it. At the end of the survey, there are seven questions to collect some of your demographic characteristics. Please remember that this survey is completely anonymous; none of the responses will identify you in any way. The survey will take you approximately 5-8 minutes to complete.

Do you agree to participate in this research?

- Yes ☐
- No ☐

Customers anonymous survey

Research indicates that customers and patients have changed their expectations from the community pharmacies that they regularly visit. Customers and patients are expecting their community pharmacists to meet their individual needs regarding their health and medications. In response to these expectations, pharmacists are now offering new services to give you personalised advice about your medications to help you understand and manage them properly.

The question in this anonymous survey is formulated to explore your health and medicine-related needs about the new services provided by your community pharmacists. Remember that the new services provided by your community pharmacists are the ones that help you to understand and manage your medications. For the purpose of this research, the provision of a medication alone is not considered a service.

- In your opinion, what are your health and medicine-related needs from your community pharmacists and the new services they provide? Please list up to ten of your needs below.

1. _____

2. _____

3. _____

4. _____

5. _____

6. _____

7. _____

8. _____

9. _____

10. _____

Demographic questions-Please mark with an X one of the answers below or fill the box provided.

- Which category below includes your age?
  - 20 or younger ☐
  - 21-29 ☐
  - 30-39 ☐
  - 40-49 ☐
  - 50-59 ☐
  - 60-69 ☐
  - 70 or older ☐
- What gender do you identify as?
  - Male ☐
  - Female ☐
  - Other ☐
- Where do you live?
  - NSW ☐
  - QLD ☐
  - SA ☐
  - VIC ☐
  - WA ☐
  - Tas ☐
  - ACT ☐
  - NT ☐
- Which of the following best describes the area you live in?
  - Urban ☐
  - Remote ☐
- How frequently do you visit your community pharmacy?
  - Less than once a month ☐
  - Once a month ☐
  - Two-Three times a month ☐
  - Four times or more ☐
- Number of medications that you are currently taking. (Please provide just the number)

- Do you suffer from any condition? If so, please specify which ones. (e.g. Asthma, Hypertension)

2. Pharmacy owners' anonymous online survey

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INFORMATION SHEET AND CONSENT FORM FOR ONLINE SURVEYS

ETH20-4633N - PROMOTING THE SUSTAINABILITY OF PROFESSIONAL SERVICES IN AUSTRALIAN COMMUNITY PHARMACIES.

What is the research study about?

Community pharmacists across Australia have implemented and are offering professional pharmacy services beyond medicine dispensing. My research project investigates how the sustainability of these professional pharmacy services can be obtained. A previous phase in this research project explored community pharmacists' perspectives and experiences with the provision of these professional services. This phase aims to explore what services have been adopted by community pharmacy owners to respond to their customers' and patients' requirements. The goal is to provide Community pharmacy owners with a decision support tool to assist them in prioritising and selecting the most appropriate services to meet their specific customer and patient requirements. In doing so, community pharmacists will be able to improve and adapt their professional service offerings to meet their customers' and patients' needs and expectations better, enhancing the long-term sustainability of their services.

You are invited to participate if you are a pharmacy owner who has provided a professional pharmacy service at your community pharmacy.

Who is conducting this research?

My name is Carmen Crespo Gonzalez and I am a PhD Candidate at UTS. My supervisors are Dr Victoria Garcia Cardenas (02) 9514 9297; Victoria.GarciaCardenas@uts.edu.au, Dr Moira Scerri (02) 9514 5496; moira.scerri@uts.edu.au and Prof Kylie Williams; Kylie.Williams@uts.edu.au.

Inclusion/Exclusion Criteria

Before you decide to participate in this research study, we need to ensure that it is ok for you to take part. The inclusion criteria of this study are pharmacy owners who have provided professional services at their community pharmacy.

Do I have to take part in this research study?

Participation in this study is voluntary. It is entirely up to you whether or not you decide to take part. If you choose to participate, you will be invited to complete an online survey. The survey is anonymous and you will not be identifiable.

In the survey, I will ask you an open-ended question about the professional services that you have used or you will use to meet your patients' requirements. It is expected that your time commitment will be approximately 10 minutes to complete.

As the survey is anonymous, you will not be required to provide any personal or sensitive information. **Please be aware as part of the survey, there will be a few questions asking you some demographic details, but this information will not identify you in any way.**

You can change your mind and withdraw from the research at any time without any questions being asked and without prejudice.

Are there any risks/inconvenience?

We don't expect this survey to cause any harm or discomfort, however if you do experience feelings of distress as a result of participation in this study you can let the researcher know and they will provide you with assistance, or you can withdraw from the research.

What will happen to information about me?

Access to the online questionnaire is via a weblink. Submission of the online surveys is an indication of your consent. By clicking the weblink, you consent to the research team collecting and using the information provided by you for the research project. As you will not be identified at any point of the study, all the data collected will be anonymous.

What if I have concerns or a complaint?

If you have concerns about the research that you think I, Carmen Crespo Gonzalez, or my supervisor can help you with, please feel free to contact us on:

- Carmen Crespo Gonzalez (02) 9514 9223; Carmen.CrespoGonzalez@student.uts.edu.au
- Dr Victoria Garcia Cardenas (02) 9514 9297; Victoria.GarciaCardenas@uts.edu.au
- Dr Moira Scerri (02) 9514 5496; moira.scerri@uts.edu.au
- Prof Kylie Williams; Kylie.Williams@uts.edu.au

If you would like to talk to someone who is not connected with the research, you may contact the Research Ethics Officer on 02 9514 9772 or Research.ethics@uts.edu.au and quote this number **[ETH20-4633N]**

UNIVERSITY OF TECHNOLOGY SYDNEY

PROMOTING THE SUSTAINABILITY OF PROFESSIONAL SERVICES IN AUSTRALIAN COMMUNITY PHARMACIES.

The University of Technology Sydney (UTS) is conducting research to explore what professional services community pharmacy owners use or will use to respond to customers' requirements. Please read the participant information sheet before completing the survey. At the end of the survey, six questions to collect some of your demographics characteristics will be displayed. Please remember that this survey is completely anonymous; none of the responses will identify you in any way. The survey will take you approximately 10 minutes to complete.

If you agree to participate in the research click the YES button, otherwise click NO button and you will be redirected to the end of this survey.

- Yes ☐
- No ☐

Pharmacy owners' anonymous online survey

From a survey and a literature search, we have identified several patients' requirements from the services provided at community pharmacies. The question in this anonymous survey is formulated to explore what professional services you are using or you will use to respond to those requirements. Remember that by professional services we refer to those services which differ from your usual dispensing role (e.g. 6CPA services such as Home Medicines Reviews, MedsCheck and other such as Vaccinations, sleep apnoea.) For the purpose of this research, the provision of a medication alone is not considered a service.

- **What professional services are you adopting or you will adopt to respond to the following patients' requirements? Please include a service or services below each one of the identified requirements.**

1. "I want my community pharmacist to advise me about my health condition

2. "I want my community pharmacist to assess or monitor my health conditions."

3. "I want my community pharmacist to provide me with services to prevent diseases."

4. "I want my community pharmacist to help me to improve my lifestyle."

5. "I want my community pharmacist to manage and help me with the diverse medications that I am taking and their interactions."

6. "I want my community pharmacist to provide me with directions on how to take my medication and respond to any concerns that I have dealing with it."

7. "I want my community pharmacist to give me information about how my medication is supposed to work and how to mix it with other medications."

8. "I want my community pharmacist to give me information about my medication side-effects and how to deal with them."

9. "I want my community pharmacist to give me information about the different options that I have to treat my health condition."

10. "I want my community pharmacist to counsel me about the over-the-counter medications."

Demographic questions-Please mark with an X one of the answers below or fill the box provided.

- Your age is:
  - 20 or younger ☐
  - 21-29 ☐
  - 30-39 ☐
  - 40-49 ☐
  - 50-59 ☐
  - 60-69 ☐
  - 70 or older ☐
- What gender do you identify as?
  - Male ☐
  - Female ☐
  - Other ☐
- Where is your community pharmacy located?
  - NSW ☐
  - QLD ☐
  - SA ☐
  - VIC ☐
  - WA ☐
  - Tas ☐
  - ACT ☐
  - NT ☐
- Which of the following best describes the area where your community pharmacy is located?
  - Urban ☐
  - Remote ☐
- Type of pharmacy
  - Buying group ☐
  - Banner group ☐
  - Independent ☐
- The number of all types of staff (Full-time equivalents) working in the pharmacy, including you:

3. Expert panel-Participant information sheet, instructions, matrices and consent form.

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Structure of the document

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EXPERT PANEL INFORMATION SHEET

ETH20-4633-PROMOTING THE SUSTAINABILITY OF PROFESSIONAL SERVICES IN AUSTRALIAN COMMUNITY PHARMACIES.

WHO IS DOING THE RESEARCH?

My name is Carmen Crespo Gonzalez and I am a PhD Candidate at UTS. My supervisors are Dr Victoria Garcia Cardenas (02) 9514 9297; Victoria.GarciaCardenas@uts.edu.au, Dr Moira Scerri (02) 9514 5496; moira.scerri@uts.edu.au and Prof Kylie Williams (02) 9514 4050; Kylie.Williams@uts.edu.au.

WHAT IS THIS RESEARCH ABOUT?

Community pharmacists across Australia have implemented and are offering professional pharmacy services. My research project is aimed to investigate how the sustainability of these professional pharmacy services can be obtained. A previous phase in this study identified patients' needs and some services provided by community pharmacies in Australia. Now the objective of this phase is to investigate the relationship between the identified patients' needs and the services offered by community pharmacies. The goal is to provide community pharmacists with a decision support tool to assist them in prioritising and selecting the most appropriate services to meet their specific customer and patient needs. In doing so, community pharmacists will be able to improve and adapt their professional service offerings to meet their patients' needs and expectations better, enhancing the long-term sustainability of their services.

WHY HAVE I BEEN ASKED?

You have been invited to participate in this study because you have been identified as an expert in the area of professional services.

IF I SAY YES, WHAT WILL IT INVOLVE?

If you decide to participate, you will form part of an expert panel. We will follow a Delphi methodology involving responding to two rounds of information. The participation will require some time commitment as you will be asked to complete two matrices to establish the relationship between: (1) the identified patients' needs and the services provided by community pharmacies; (2) the services provided by community pharmacies. I will provide you with a document with the steps to follow to complete two matrices. Once you finish this process, you will need to send your answers to me in the following two days. I will provide you with a full report of the answers to all the members of the expert panel but their names will be not identified or their specific response. I will then ask you to complete the matrices again following the same process, is up to you to change your previous answers or to maintain the same response. If after reading the document, you still feel unsure of how to complete them, you can contact me by phone (+61) or email (Carmen.CrespoGonzalez@student.uts.edu.au).

ARE THERE ANY RISKS/INCONVENIENCE?

We don't expect this process to cause any harm or discomfort, however if you experience feelings of distress as a result of participation in this study you can let the researcher know and they will provide you with assistance or you can withdraw from the research

DO I HAVE TO SAY YES?

Participation in this study is voluntary. It is completely up to you whether or not you decide to take part. If you choose not to participate **this information will remain confidential.**

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WHAT WILL HAPPEN IF I SAY NO?

If you decide not to participate, it will not affect your relationship with the researchers or the University of Technology Sydney. 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, by contacting Carmen Crespo Gonzalez or any of the researchers named in this document. If you withdraw from the study, the documents that you provided, if any, will be destroyed.

CONFIDENTIALITY

By signing the consent form, you consent to the research team collecting the information provided by you for the research project. All this information will be treated confidentially. The data will be de-identified to ensure privacy and confidentiality.

We would like to store your information for future use in research projects that are an extension of this research project. In all instances your information will be treated confidentially.

In any publication, information will be provided in such a way that you cannot be identified.

WHAT IF I HAVE CONCERNS OR A COMPLAINT?

If you have concerns about the research that you think I, Carmen Crespo Gonzalez, or my supervisors can help you with, please feel free to contact us on:

- Carmen Crespo Gonzalez (02) 9514 9223; Carmen.CrespoGonzalez@student.uts.edu.au
- Dr Victoria Garcia Cardenas (02) 9514 9297; Victoria.GarciaCardenas@uts.edu.au
- Dr Moira Scerri (02) 9514 5496; moira.scerri@uts.edu.au
- Prof Kylie Williams (02) 9514 4050; Kylie.Williams@uts.edu.au

You will be given a copy of this form to keep.

NOTE:
This study has been approved by the University of Technology Sydney Human Research Ethics Committee [UTS HREC]. If you have any concerns or complaints about any aspect of the conduct of this research, please contact the Ethics Secretariat on ph.: +61 2 9514 2478 or email: Research.Ethics@uts.edu.au], and quote the UTS HREC reference number. Any matter raised will be treated confidentially, investigated and you will be informed of the outcome.

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Delphi study

1. Results from previous phase

From recent surveys of patients and pharmacy owners undertaken in community pharmacies across Australia, we have identified several patient needs (listed and described in Table 1) and some services provided by community pharmacies (listed and described in Table 2).

Table 1: Identified patients' needs for service delivery in community pharmacies in Australia

Patient need number	Patient need description
N1. Provision of information on health conditions*	Provision of information, counselling and/or advice to the patient on health conditions
N2. Management of the health condition*	Assessment of patient's health condition (e.g. BP monitoring, glucose, monitoring, etc.)
N3. Screening	Screening of undiagnosed health conditions (e.g. diabetes, sleep apnoea, etc.)
N4. Disease prevention	Availability and provision of services aimed at preventing diseases
N5. Lifestyle changes	Provision of advice and support to change and manage lifestyle factors (e.g. exercise, diet, etc.)
N6. Medication adherence	Provision of advice on how to adhere to medications
N7. Medication administration	Provision of advice on how to use and/or take medications (including use of devices)
N8. Medication information	Provision of general information about the medication (e.g. mode of action, precautions, potential interactions, dosage, etc.)
N9. Medication side- effects	Provision of information about side-effects of medications and how to deal with them
N10. Health condition* treatments	Provision of information about available treatments for a health condition
N11. OTC medications	Accessibility and provision on advice on over-the-counter (OTC) medications.

*Health conditions refer to any chronic, acute diseases and minor ailments

Table 2: Most frequently reported pharmacy services provided by community pharmacies

Service number	Service Description
S1. Educational campaigns	Health promotion campaigns to help patients understand their health condition with the assistance on some occasions of a specialist (e.g. diabetes educator)
S2.Tailored counselling	Provision of pharmacists' advice tailored to the patient's needs/circumstances (i.e. specific medication, health problem.), using CMI if needed.
S3. MedsCheck	A medicine review between pharmacists and patients designed to enhance quality use of medicines and reduce the number of adverse medicines events.
S4. Home Medication Review (HMR)	A review designed to enhance the quality use of medicines and reduce the number of adverse medicine events, by assisting patients to better manage and understand their medicines through a medication review conducted in the patient's home.
S5. Dose administration aids (DAA)	Designed to assist consumers in the community to better manage their medicines, with the objective of avoiding medication misadventure and improving medication compliance.
S6. Health monitoring	Routine monitoring and evaluation of the patient's health or clinical indicator (e.g. Blood pressure and glucose monitoring)
S7. Screening	Screening services to evaluate patients' health status or risk of developing a particular health condition (e.g. Diabetes screening, Mental health screening, hearth health screening)
S8.Vaccinations	Immunisation services to protect patients from a range of diseases.
S9.Weigh management	Service to assist in weight loss or management of risk factors associated with obesity.
S10.Sleep apnoea	Sleep Apnoea Services designed to help investigate people with Obstructive Sleep Apnoea (OSA), and assisting them to find the appropriate treatment. Lifestyle advice and ongoing, personalised support for general sleep issues are also provided.
S11. Minor ailments	The provision of a non-prescription medication and/or counselling to treat a minor condition or making changes to products which were self-selected by the patient

3. Instructions on how to complete matrix 2.

You will now need to complete matrix 2. Matrix 2 (Appendix 1) is designed to show the relationship among services. Using a scale from 0 to 9, (shown below) where 0 indicates no relationship and 9 indicates a very strong relationship, please complete the relationship matrix to show the extent of relationship among the services.

Scale

0	1	3	5	7	9
No relation	Very weak	Weak	Moderate	Strong	Very strong

As an example, if you believe service 1 (S1), has a strong relationship with service 2 (S2) then put 7 in the cell $\mathbf{S_1S_2}$. Similarly, if you think that there is no relationship between service 1(S1) and service 3 (S3), put 0 in $\mathbf{S_1S_3}$. Please continue in the same way for all other services.

Example of how to complete matrix 2.

Services (S) / Services (S)	S1	S2	S3	S4	S5	S6				Sn
S1		7	0	5						

2. Instructions on how to complete matrix 1.

You will need to complete matrix 1. Matrix 1 (Appendix 1) shows each of the patient needs and pharmacy services that were listed in tables 1 and 2. Patient needs are listed in the first column of the matrix and services are listed in the first row. Using a scale from 0 to 9, (shown below) where 0 indicates no relationship and 9 indicates a very strong relationship, please complete the relationship matrix to show how each service relates to each of the patients' needs.

Scale

As an example, if you believe in order to fulfil need 1 (N_1), service 1 (S_1) is important at a moderate level, then put 5 in the cell $\mathbf{N_1S_1}$. Similarly, if you think that there is no relationship between need 1(N1) and service 2 (S2) then put 0 in $\mathbf{N_1S_2}$. Please continue in the same way for all other needs and services.

Example of how to complete matrix 1

Services (S) / Needs (N)	S1	S2	S3	S4	S5	S6				Sn
N1	5	0	9	7						

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Matrix 1-Please complete your answers in the matrix 1 below:

Matrix 1: Patients' needs and services

Services(S) / Needs (N)	S1. Educational campaigns	S2. Tailored counselling	S3. MedsCheck	S4. HMR	S5. DAA	S6. Health monitoring	S7. Screening	S8. Vaccinations	S9. Weigh management	S10. Sleep apnoea	S11. Minor ailments
N1.Provision of information on health condition											
N2.Management of the health condition											
N3.Screening											
N4.Disease prevention											
N5.Lifestyle changes											
N6.Medication adherence											
N7.Medication administration											
N8.Medication information											
N9.Medication side-effects											
N10.Health condition treatments											
N11.OTC medications											

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Matrix 2-Please complete your answers in the matrix 2 below:

Matrix 2: Interrelationships among services

Services(S) / Services (S)	S1. Educational campaigns	S2. Tailored counselling	S3. MedsCheck	S4. HMR	S5. DAA	S6. Health monitoring	S7. Screening	S8 Vaccinations	S9. Weigh management	S10. Sleep apnoea	S11. Minor ailments
S1. Educational campaigns											
S2. Tailored counselling											
S3. MedsCheck											
S4. Home Medication Review (HMR)											
S5. Dose administration aids (DAA)											
S6. Health monitoring											
S7. Screening											
S8. Vaccinations											
S9. Weigh management											
S10. Sleep apnoea											
S11. Minor ailments											

*Note: You do not need to complete the shaded cells

Thank you for completing this document.

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CONSENT FORM

PROMOTING THE SUSTAINABILITY OF PROFESSIONAL SERVICES IN AUSTRALIAN COMMUNITY PHARMACIES.

I_____agree to participate in the research project **Promoting the sustainability of professional services in Australian Community Pharmacies** being conducted by Carmen Crespo Gonzalez, mobile: [redacted] of the University of Technology, Sydney for her doctoral degree in Pharmacy Practice Research.

I have read the Participant Information Sheet or someone has read it to me in a language that I understand.

I understand the purposes, procedures and risks of the research as described in the Participant Information Sheet.

I have had an opportunity to ask questions and I am satisfied with the answers I have received.

I freely agree to participate in this research project as described and understand that I am free to withdraw at any time without affecting my relationship with the researchers or the University of Technology Sydney.

I understand that I will be given a signed copy of this document to keep.

I agree that the research data gathered from this project may be published in a form that:

☐ Does not identify me in any way
☐ May be used for future research purposes

I am aware that I can contact Carmen Crespo Gonzalez, Dr Victoria Garcia-Cardenas, Dr Moira Scerri or Prof Kylie Williams if I have any concerns about the research.

_____ ___/___/___
Name and Signature [participant] Date

_____ _____
Name and Signature [researcher or delegate] Date

Table 2: Appendix 2-Participant characteristics (Stage 1 and 2)

Stage 1-Patients' characteristics		n	%
Age	70 or older	4	25
	60-69	3	18.75
	50-59	4	25
	40-49	2	12.5
	30-39	1	6.25
	21-29	2	12.5
	20 or younger	0	0
Sex	Female	11	68.75
	Male	5	31.25
State	NSW	13	81.25
	QLD	0	0
	SA	0	0
	VIC	3	18.75
	NT	0	0
	Tas	0	0
	WA	0	0
	ACT	0	0
Type of area	Urban	16	100
	Remote	0	0
Frequency of visits per month	4 times or more	4	25
	Two-three times	4	25
	Once a month	5	31.25
	Less than once a month	3	18.75
Number of medications	9	1	6.25
	8	1	6.25
	7	0	0
	6	1	6.25
	5	1	6.25
	4	2	12.5
	3	4	25
	2	3	18.75
	1	1	6.25
	0	2	12.5
Number of conditions	4	2	12.5
	3	3	18.75
	2	2	12.5
	1	8	50
	0	1	6.25

Stage 2-Pharmacy owners' characteristics		n	%
Age	70 or older	0	0
	60-69	0	0
	50-59	0	0
	40-49	5	50
	30-39	3	3
	21-29	2	20
	20 or younger	0	0
Sex	Female	6	60
	Male	4	40
State	NSW	7	70
	QLD	1	10
	SA	0	0
	VIC	0	0
	NT	0	0
	Tas	0	0
	WA	1	10
	ACT	1	10
Community pharmacy location	Urban	10	100
	Remote	0	0
Type of pharmacy	Buying group	2	20
	Banner Group	6	60
	Independent	2	20
Staff number (Full time equivalents)	25 or more	0	0
	20-25	2	20
	15-19	0	0
	10-15	3	30
	5-10	4	40
	5 or less	0	0

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Chapter 7

Discussion and conclusions

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Historically the dispensing of medicines has been the primary role and main source of income of community pharmacists and pharmacies. However, over the last three decades community pharmacists have been reinventing themselves through the provision of professional services (Basak, van Mil & Sathyanarayana 2009; Dunlop & Shaw 2002; Roberts et al. 2005; van Mil & Schulz 2006). These professional services are designed to provide patients with more personalised care to improve their health outcomes. In most cases the effectiveness of services is evaluated in research environments. Due to the positive clinical, economic and humanistic outcomes, these services have been gradually being implemented at a national and international level (Alawneh et al. 2020; Dineen-Griffin et al. 2020; Yuan et al. 2019). Once implemented, the ultimate objective is to achieve their sustainability (Crespo-Gonzalez, Garcia-Cardenas & Benrimoj 2017).

There were three main areas that needed to be addressed at the onset of this research: Firstly, the relationship between the implementation and sustainability phases of innovations (i.e. services). Secondly, the lack of consensus in the literature of terms and definitions used to refer to the sustainability phase (Fleiszer et al. 2015; Proctor et al. 2015,Wiltsey Stirman, 2012 #65) and thirdly the lack of a theoretical framework underpinning the concept, in practice, of the sustainability of professional pharmacy.

Since the initial literature search only found a limited number of papers on the sustainability of professional services delivered in community pharmacy, a literature review was undertaken in the field of sustainability of innovations in healthcare. The knowledge acquired from the healthcare field was then contextualised and applied to the area of professional services in community pharmacy. The exploration of the literature associated with the sustainability of healthcare innovations, revealed various theories with a lack of empirical supporting evidence. It was evident that for community pharmacy there was a necessity of developing a foundation for driving research and practice associated with the sustainability of professional services. Thus, this research proposed a definition and a framework to create debate in the scientific community and subsequently, provide a guidance for future research on

the sustainability of pharmacy services (Crespo-Gonzalez et al. 2020; Crespo-Gonzalez, Garcia-Cardenas & Benrimoj 2017). The applicability in practice of the proposed sustainability framework was then evaluated through a qualitative study, which explored community pharmacists' perspectives and experiences with the provision of these professional services. The qualitative study identified the factors affecting the sustainability of professional pharmacy services. In addition, the alignment between patients' health needs and the services provided by community pharmacists were explored in a mixed-methods study. The objective was to identify which were the most suitable services to be used by community pharmacists to respond to patients' needs.

A literature review was conducted in the journal Implementation Science (Chapter 3), due to the availability of high-quality publications in this specialised journal. In order to explore the characteristics of the implementation and sustainability phases, the literature review's first objective was to identify the definitions available to refer to these two phases. Arising from this review, the second objective was to propose a definition, which could be applied to the sustainability of professional pharmacy services. Four key findings resulted from the identified definitions:

- The objective of the implementation phase (i.e. to integrate and translate the service in practice) was evident. However, the objective of the sustainability phase was not clearly defined in the literature. In some cases, and surprisingly, it was not considered as a phase in the process of developing health services. Scheirer et al. stated that program components developed and implemented in earlier stages are maintained after the initial funding or other impetus is removed (Scheirer 2005). There was general agreement that the sustainability phase relies on the possibility of maintaining the services and its benefits over time, which has to be a priority for any healthcare professional planning to implement a service. Stirman et al. suggested that therefore, there is a need to maximise the research in the area of sustainability to understand and refine the phenomenon as well as to develop strategies to promote sustainment (Wiltsey Stirman et al. 2012).

- During the implementation phase, methods and strategies are used to ensure the integration of the service into usual practice and its quality. In the sustainability phase, the service provided, its components and the strategies previously used may be adapted and optimised over time. The adaptations of the service may occur at different levels, such as changes in the way the service is delivered and/or substituting a service component for a more effective one. These adaptations could also be related to changes in the personnel providing the services (e.g. changes in the workload), changes in the setting in which the services are provided (e.g. counselling areas) or changes of the stakeholders involved (e.g. new partnership with other HCP). A service is most likely to evolve over time due to the changes in the context (e.g. policy and funding priorities, changes of patients' demands, changes in the target population or changes in the available resources for the provision of the services) (Chambers & Norton 2016). Thus, planning in advance for the sustainability phase may require to anticipate those changes to ensure the service's success in the future (Gruen et al. 2008). The continuous assessment of the changes in the context and setting in which the service is provided may be necessary (Dopson, Fitzgerald & Ferlie 2008). This assessments could be a solution to develop tailored strategies to respond to those changes in a more cost-effective way (Iwelunmor et al. 2016).
- There is a significant debate in the literature in regards to the conclusion of the implementation phase and the commencement of the sustainability phase. Some authors consider implementation and sustainability as concomitant phases. Others suggest that the sustainability phase commences once the initial implementation funding terminates. The diversity of ideas may be caused by different perspectives and theoretical underpinnings in which authors have focused their research. This lack of agreement in the published literature makes it even more critical to develop a consensus in order to be able to compare different services, contexts and settings in healthcare (Buchanan, Fitzgerald & Ketley 2006). Defining a timing for sustainability may not be necessary as long as there is an agreement on the characteristics and objectives of this phase.

- Although most of the characteristics of implementation are distinctly defined, there are still some doubts regarding its duration over time. Some authors have indicated that the implementation phase should last around a year. Likewise, the duration of sustainability has not been established (Scheirer 2005). The lack of consensus regarding the duration of these two phases emphasises that maybe, there is not a specific duration which can be generally applied for all the services and settings. The type of service (e.g. the complexity of the service, number of components), context (e.g. target population, area in which the service is provided), resources (e.g. availability of materials to provide the service, economic support to maintain the service), staff availability and implication will be determining aspects that may affect achieving the sustainability of specific services (Schell et al. 2013). Establishing a determined duration for the sustainability phase is complicated. As the ultimate objective is to maintain the service over time, it is logical to think that this phase will continue as long as the service is provided.

These four core ideas guided the development of a proposed definition for the sustainability of professional pharmacy services. The definition developed for this research was (Crespo-Gonzalez, Garcia-Cardenas & Benrimoj 2017);

"Sustainability is a phase in the process of professional pharmacy service, in which the service previously integrated into practice during the implementation phase is routinised and institutionalised over time to achieve and sustain the expected service outcomes".

This definition incorporates two core concepts: routinisation and institutionalisation. Routinisation refers to the maintenance in the pharmacy routine through continuous provision and improvement of the services. Institutionalisation refers to the gradual adaptation of the pharmacy context in which the services are provided. Continuous adaptation and updating of the skills of the service provider are required if for example there are changes in the setting or protocols for the services. Suggesting this definition as a basis for advancing the debate and research in this area may assist the

development of a shared understanding of sustainability in pharmacy. The development of this definition is the first step in achieving a consensus of the sustainability concept. Further discussion through different channels (e.g. focus groups, congresses, meetings) between community pharmacists, researchers and leaders in the area of professional services may be highly valuable, in order to debate it, amend it and subsequently adopt a consensually agreed definition.

Once a definition for the sustainability phase was developed, the next stage was to explore the elements/components, or as defined in this research, the factors moderating the sustainability phase. A systematic review to identify sustainability conceptual approaches and assessments tools for healthcare innovations was performed (Chapter 4). Using a broader approach, which included innovations in healthcare, allowed access to research on the sustainability of innovations in different healthcare settings. Factors moderating the sustainability of these innovations were identified. The approaches and tools identified in the literature reflected differences in the conceptualisation, organisation and understanding of sustainability. Within the different conceptual approaches and assessments tools, some factors appeared recurrently irrespective of setting (e.g. adaptation, evaluation, funding, political environment). The results of this systematic review and the sustainability definition (Chapter 3) were used as inputs to develop a specific framework for the sustainability of professional pharmacy services. However, we not only considered the definition and the results from the systematic literature review, but added a well-known approach in business denominated the Triple Bottom Line (Henriques & Richardson 2013; Slaper & Hall 2011). This theory is not often contemplated in health services research and may be fundamental to the sustainability of services. The economic, environmental and social components of sustainability were added to the resulting framework for professional pharmacy services. The framework encompasses the service surrounded by the setting in which it is provided and the factors moderating the sustainability of the services at different levels.

The findings of the systematic review also provided some key concepts to debate. Firstly, it was suggested that sustainability should be planned and taken into account from the initial phase in the development of the service, usually termed the design phase. Having a plan may ensure the success of the innovation over time. Secondly, from the factors identified in the literature, adaptation was one of the most commonly repeated factors affecting sustainability. The adaptation of the services across time has been described as necessary for the long-term continuity of the service (Chambers & Norton 2016). During implementation, fidelity (i.e. the degree to which an innovation is delivered as intended) has been considered essential for the internal validity of the innovations (Breitenstein et al. 2010; Carroll et al. 2007). Fidelity and adaptation appear to be opposing concepts; however, they can be integrated (Bopp, Saunders & Lattimore 2013). The importance of fidelity relies on the capacity to maintain the service and deliver it in a consistent protocol-driven approach, to ensure it produces the expected benefits. In most cases, the concept of fidelity does not alter or consider the changing circumstances over time. Changing necessities of the community are usually not addressed. However, the reality is that the context and needs change over time and thus, adaptation of services is required (Escoffery et al. 2018). Some researchers are reluctant to consider modifying the components of the service as it may lose its primary impact objective alongside its fidelity. Nevertheless, adaptation relies on the capacity of responding to the changes without compromising the foundations and benefits accrued for the service. Therefore, there is a need to adapt the service while simultaneously maintaining its fidelity. Continuous monitoring of the service and its progress would be essential in order to determine which components of the service are hindering its progress. This monitoring may permit that the service's adaptations do not affect its core components, which were designed and tested before its implementation phase. Some authors also consider the adaptation of the service non-essential components at implementation which may not affect the fidelity of the service (Moullin et al. 2016).

Thirdly, the proposed framework for the sustainability of professional pharmacy services supports that sustainability is a dynamic process. This concept has been

previously discussed and highlighted by Chambers et al (Chambers, Glasgow & Stange 2013). The continuous evaluation and adaptation of the services as well as updating the skills, components and processes for the service provision is required. Currently, in the implementation phase the service's progress is monitored and evaluated. Many authors suggest that this evaluation and monitoring should continue through to the sustainability phase (Lennox, Maher & Reed 2018). Having continuous evaluation of services will anticipate the adaptations that are required. As the service progresses, the continuous training and updating of the skills of the staff involved in the provision of the services may be required. Some adaptations may also occur at the external level, e.g. if the government was changing funding mechanism due to a policy change and changes to service delivery are required.

In the proposed framework, sustainability is also considered from the social, economic and environmental perspectives, as suggested by Elkington et al (Elkington 1998). Incorporating these three perspectives will ensure that the service provides economic benefits to the providers, yet at the same time covers the necessities of the community in an ethical way, which may result in higher patient satisfaction and service demand. Therefore, when planning for sustainability the perspectives of all the stakeholders (i.e. patients, pharmacists and partners) should be considered (Achterkamp & Vos 2006; Herrera 2015).

It is hoped that this framework will guide researchers and practitioners by providing information about the factors that may have an impact on the services they provide. This framework will assist them in recognising those moderating factors and address any barriers which may be hindering the progression and sustainability of services. Other systematic reviews have explored and proposed frameworks for the sustainability of innovations in healthcare settings (Iwelunmor et al. 2016; Shelton, Cooper & Stirman 2018; Story et al. 2017); however, to the best of our knowledge, none have developed a framework for the sustainability of professional pharmacy services.

The results of the systematic review and the proposed framework for the sustainability of professional pharmacy services guided the qualitative study.

(Chapter 5). The objective of the qualitative study was to explore the experiences and perspectives of community pharmacists with the provision of professional pharmacy services. The results of the study were aimed at assessing the applicability of the sustainability framework in practice. Community pharmacists were asked about their perspectives and experiences regarding the definition and assessment of sustainability. These exploratory questions were used to understand the knowledge that community pharmacists had regarding sustainability. The responses obtained showed a range of opinions which reflected the different perspectives of the participants. The majority of factors affecting the sustainability of services were in accordance with those found in the literature. The factors most frequently mentioned were: funding, government policies and regulations, time and staff availability, training and involvement. Funding was found to be a key factor to ensure the economic sustainability of services. It was highlighted that initial investment and maintenance costs needed to be covered. There is a possibility that some services could be maintained without funding through some indirect source of revenue such as patient loyalty. However, it was also stated that most services are time intensive which prevents community pharmacist from attending to the rest of their responsibilities (e.g. dispensing), which are the primary source of revenue for the pharmacy. Finding and securing ongoing economic support may ensure that the services are maintained over time (Hofmarcher 2008). Moreover, funding is essential to support the adaptations of the service and its components, as these can have associated costs (e.g. increasing staff number to provide the services, hiring another healthcare specialist to provide further input to patients or introducing new technologies as part of the service). It is not surprising that the government support and its policies and regulations was one of the most mentioned factors driving the sustainability of services. The Australian government is providing funding for some of the professional services delivered by community pharmacists through the CPA (Australian Government Department of Health 2019a) (e.g. medications management and medication adherence programs). Thus, playing a fundamental role in supporting the provision of these services. If at any point the government support ceased, it is highly probable that most of the services would not continue.

Alternative funding sources such as other third-party payers may be needed to be found. Interestingly some of the interviewees were charging patients a small fee for some of their services, which may contribute to their financial sustainability.

Time was another key factor raised by the interviewees which moderates the sustainability of services. Not only is additional time required for the provision of the services, but also for the organisation and planning of the pharmacy workflow to ensure efficient delivery (Seghezzo 2009). Having all the essential resources available to provide a service may not be sufficient to ensure its success if there is not adequate time devoted to its planning and provision.

The importance of defining staff roles was also identified in the interviews. Staff involvement and commitment in the provision of services is crucial for their progress over time (Bakker, Albrecht & Leiter 2011; Flynn & Scott 2020). If the beliefs and motivations of an individual service provider do not align with the organisational service goals, it is likely to fail. Pharmacy staff need to be self-confident, motivated and incentivised as well as being provided with appropriate training and information about the service (Halm 2011). Most of the interviewees also identified availability of staff as essential.

There were some factors identified in the interviews which were not contemplated in the theoretical framework for the sustainability of pharmacy services. A factor that was highlighted by the interviewees was service promotion. It is reasonable to expect an increase in the service demand if it is appropriately promoted. The use of marketing campaigns to promote services, finding the right collaborators to advertise the services may be essential to increase patient demand. A strategy which presumably will have an effect on the promotion of the services is patient satisfaction (Friedman et al. 2009). Word of mouth of a patient satisfied with the service received will engage more patients with similar needs (Goodman 2019). A second factor identified from the interviews was the need to make patients "comfortable with the service provided", which is likely to affect the overall satisfaction with the services (Gremler, Gwinner & Brown 2001). It is important to note that the central focus of these services is the patient. If patients are not interested in specific services, none

of the factors will have any relevance as the service will not have a chance of being sustained over time.

As the relevance of stakeholders for sustainability was previously highlighted, the next step focused on one of the most critical stakeholders for the service: the patients. The objective was to identify the needs of patients and align them with the services provided by community pharmacists. The consumer and business literature was searched for suitable methods. The Quality Function Deployment (QFD) (Chan & Wu 2002; Govers 1996) method has been extensively used in business for the design and quality improvement of products and services. This approach was selected as it allows prioritising customers' demands and transforming them into specific actions to respond to those needs. QFD requires the completion of a matrix denominated The House of Quality. The HoQ allows identifying patients' requirements and the services that community pharmacists are adopting to respond to these demands (Hauser & Clausing 1988; Park & Kim 1998). Thus, the relationship between the patients' requirements and the services offered by community pharmacists are analysed and potentially aligned. The result of this process identified tailored counselling (A.I.=296), MedsCheck (A.I.=260) and HMR (A.I.=259) as being the more suitable services to respond to patients' needs. Tailored counselling was the service which is more likely to respond to patients' requirements. This may serve to prove that the complexity of the service is not linked with the level of satisfaction of the patients as sometimes they may prefer to receive services which are easier to follow and comprehend. Another reason that might be causing this is the fact that patients' may not see the value of the more complex services that are currently being offered. Therefore, community pharmacists should try to identity or develop strategies to show their value to their patients. One main reason, which may have affected patients' demand is that community pharmacists have not been involving them and their opinions in the decision-making process of implementing these services (Ng, Sweeney & Plewa 2019). Taking into account patients' needs and demands from the design of the services may help to ensure that the services implemented achieve sustainability (Lee 2019). This will permit to optimise and increase the quality of the services provided based on patients' necessities. Service quality and patients

perceived value of the services has been proven to be a driver to increase patients' satisfaction (Bashir et al. 2020; Giammanco & Gitto 2019). As discussed above, patient satisfaction will also help to improve the demand for the services directly affecting the maintenance of the services over time (Hallencreutz & Parmler 2019). The resulting HoQ should be used as a decision support tool for community pharmacists to enhance the selection of those services which better respond to their patients' demands. This support tool will ensure that the services delivered comply with customers' needs.

Methodological Strengths and Limitations

This thesis has been built on the theory and perspectives underpinning implementation science and business. The different phases or stages involved in the creation of innovations have been subject to extensive research. However, there were significant gaps in knowledge associated with the sustainability phase of innovations. The lack of consensus on concepts, definitions and terminology used is evident. A narrative review was conducted to provide an overview of existing literature. The methodology provides a focus on the context on which a research project can be founded. The results of the review permitted the characterisation of the sustainability phase and to define sustainability for professional pharmacy services. The literature review's primary source was the journal Implementation Science, as it was the only journal focused in the area at the time this review was performed. Therefore, there is a possibility that some definitions might be missing if published in other journals.

A systematic review was then used to explore conceptual approaches and tools available to measure the suitability phase. The systematic review approach allows minimising bias in the selection, interpretation and analysis of the information and data (Mallett et al. 2012). The use of a structured methodology minimises bias in the misinterpretation of the results and provides readers with more consistency to interpret the reliability of the results. The framework proposed for pharmacy services, as a result of the systematic review, was created based on the available evidence in the healthcare field since limited research had been reported in the

pharmacy literature.

Qualitative methods were used to assess the applicability of the framework in practice (Pope, Ziebland & Mays 2000). The relevance of this methodology relies on the possibility of exploring details about human behaviour, emotion, and personality characteristics that cannot be measure by quantitative studies. Qualitative data explore user behaviours, needs, routines, perspectives and a variety of other information that is crucial to understand what is happening in a specific setting. One of the critical group of stakeholders in this research were community pharmacists, and as such, their perspectives are essential. Semi-structured interviews with community pharmacists were conducted using purposive and snowballing sampling. For the snowballing approach, two pharmacy owners previously identified were asked to recommend others to act as future participants. The relevance of the snowballing approach is that participants are identified within the context of their naturally formed relationships and social networks, due to the established familiarity between participants and those they refer. However, this approach presents some limitations. There is a risk of capturing a biased group of the total population, as potential eligible participants not linked to the original set of informants might not be included in the study (Frey 2018). Thus, the data collected from participants cannot be considered generalizable to community pharmacists in Australia. Moreover, the reproducibility of the results to other countries or settings may require additional investigation. However, it is important to note that in order to include a broad population, community pharmacists working in different types of pharmacies and locations were included in the study. Most community pharmacies were located in urban areas and the factors affecting the sustainability of services in other settings (e.g. in rural areas) may vary.

In the last part of the research, patients' needs, which are another critical stakeholder, were taken into account. A mixed-methods study was performed using the quality function deployment approach (Chan & Wu 2002). This approach was selected primarily because it is a customer-driven process. This research was therefore built on the requirements of the customer, allowing and giving them

priority in the design and redesign of services. Furthermore, the approach is an important planning tool which allows identifying areas that need to be improved to achieve the desire results. The approach may lead to improving the efficiency of the services by addressing possible service' weaknesses prior to its failure. The objective of this part of the research was to identify the most suitable services to respond to patients' needs and achieve sustainable outcomes. Despite the relevance of the QFD approach, there are some limitations in using this method. The QFD allows identifying customers' needs, but it ignores other aspects such as costs, time and resources that may be necessary to consider to satisfy those needs. Furthermore, despite its use to identify potential areas of growth for a business, it does not cover long-term strategies that may be applied to achieve the expected outcomes. It is also worth noting that customers' needs are identified at a specific point of time, but these may change over time. Another limitation of this study was that the emails of community pharmacists who participated in the previous phase of the research were included in the listserv used to send the survey. Thus, there may be an overlap between the participating community pharmacists in the research reported in Chapter 5 and 6. However, to minimise the risk of bias, these community pharmacists were not contacted directly, so their participation was voluntary. They did not have previous information about the study. Moreover, as the survey was anonymous, the researchers did not have access to any information regarding the participants completing the survey.

A limitation among the studies undertaken in this thesis was that a single researcher was in charge of collecting, synthesising and analysing the data. However, several procedures were applied to reduce the impact of this limitation. In the literature review, the data extraction methodology of the definitions' key concepts was discussed between the researchers. Furthermore, once data were extracted and organised by the researcher, the research team discussed the results (Chapter 3). In the systematic review, the researchers agreed on the definitions and terminologies that were used for data extraction and within the text (Chapter 4). Furthermore, if the researcher in charge had any doubt during the screening process, this was discussed with the other researchers. For the qualitative study, the interview guide

was created and reviewed by all the researchers. During the analysis process, the codes and themes that emerged were discussed between researchers (Chapter 5). In the mixed-methods study (Chapter 6), each of the tools and procedures for collecting the data in each one of the phases was discussed between the researchers. Once the final analysis was performed, the results were checked by a specialist in the methodology to ensure the reliability of the results. The interpretation of the results was discussed in several meetings by all the authors.

Implications and recommendations for future research

Community pharmacists' interests are increasingly being focussed on improving their patients' health outcomes and quality of life through the provision of professional pharmacy services. Nevertheless, there is limited evidence on how to make these services and their expected benefits sustainable over time. The availability of evidence-based data is fundamental to assist community pharmacists in their decision-making process, to implement and sustain services over time. The lack of a theory based and practical approach linked with lack of information and data has hindered the development of effective strategies required to achieve and maintain the sustainability of services. Providing insight with associated factors facilitating the sustainability of services can assist community pharmacists to continue and improve the services offered, producing benefits to all stakeholders.

The definition and framework proposed should be used as a guide for researchers and practitioners to understand sustainability and to identify and consider the factors moderating the long-term maintenance of the services. Further studies to assess the applicability of the framework in different pharmacy contexts and with different types of services should be carried out. Moreover, tailoring this framework to different disciplines within healthcare is encouraged. The different sustainability factors should be assessed to identify the effect and importance that they have as moderators of the sustainability of services (Berta et al. 2019). These factors should be used for the development of future assessment tools and measures for evaluating the sustainability of the services. The sustainability measures already available in healthcare include both external (i.e. partnerships and funding) and internal context

factors (e.g. training and leadership) but there is a lack of pragmatic and psychometrically robust measures that can be used by providers. Therefore, it would be useful to have measures that combine the internal and external factors with those specific with the service (e.g. adaptation of the components) (Moullin et al. 2020). For example, a tool to register and measure the voluntary and involuntary adaptations of the service over time may be useful to understand service outcomes. Determining and predicting the clinical and economic impact that those changes have in the business performance may also be helpful. Specific tools to measure social aspects of sustainability, such as the evolution of patient behaviours and engagement with services in the long-term may have a significant impact on service sustainability. The applicability of the framework and the moderating factors in other countries should be considered for further investigation.

The results of the qualitative study revealed the importance of some moderating factors for the sustainability of professional pharmacy services. The relevance of policies and regulations, as well as government support and recognition, have been highlighted. This serves as a reminder for policy-makers that wish to promote the universal access to professional pharmacy services that funding infrastructure should not cease after implementation. Resources are required for the adaptability of services over time. In Australia, the government remuneration, through the CPAs (Australian Government Department of Health 2019), is the main source of income for most of community pharmacies and pharmacists and is essential for the maintenance of services. Furthermore, the idea of the changes in policy and financial support from the government is a major concern for community pharmacists in Australia. The results of this thesis indicate that strategies should be developed to identify new and alternate sources of income other than the government to promulgate the sustainability of services.

The importance of patients' involvement to ensure the long-term survival of the innovations was established and is evident from the results of this research. The use of the quality function deployment prioritises patients' needs and identifies the most effective professional services to respond to their demands. This will allow

community pharmacists to prioritise which services to implement to better meet their patients' needs. Future studies should focus on investigating strategies to promote the simultaneous implementation of these services with less time and effort. Studies focused on investigating the changes in patients' needs and demands over time should be conducted. This will allow an anticipation and response to patients' needs potentially increasing their demand and satisfaction.

Conclusions

This thesis has addressed the important and novel concept of sustainability of professional pharmacy services. The theoretical exploration of sustainability in healthcare through the review of the literature allowed the development of a definition and framework to be used by community pharmacies, the pharmacy profession, research and other stakeholders such as policymakers. The exploration of pharmacists' perspectives and experiences with the provision of professional services implemented in their community pharmacies have been taken into account in the proposed sustainability framework. An analysis of patients' expressed needs and their alignment with current professional services was undertaken.

Several conclusions have arisen from the results of this thesis.

- In health services research, the sustainability phase is aimed at maintaining and improving the implemented service over time. This phase is dynamic and needs to be continuously evaluated and adapted to the changes in the circumstances.
- Planning for sustainability should be considered during the design of the service, in order to remain flexible to the adaptations the service may require.
- The sustainability of a service needs to be considered from a social, environmental and economic point of view to ensure all the factors which may moderate its sustainability are contemplated. These moderating factors should be considered in research and practice.
- Funding is a major factor affecting the sustainability of professional pharmacy services. Currently, the major source of funding for services is the government which leaves the sustainability of the services vulnerable to changes in policy.

Having strategies to obtain alternate ongoing economic support are encouraged.

- Patients' have a critical role in the sustainability of professional services. They are the main driver for their provision; therefore, patients' needs should be assessed and monitored over time. Moreover, patients should be involved from the design of the services in order to ensure their needs are met.
- The definition and framework developed in this thesis should be used as a guide for future researchers and practitioners to enhance the sustainability of the services. The applicability of the framework for the sustainability of professional pharmacy services has indicated that it could applied in the development of future programs or protocols and tools to measure sustainability in the future.
- The decision support tool resulting from the QFD, should be used by community pharmacists in order to prioritise those services which better meet their patients' needs. This tool will also serve as a guide to those community pharmacists willing to implement new services in their community pharmacy to help them in the decision-making process.

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Appendices

A. Ethics Approval-Qualitative study (Chapter 5)

22 November 2018

Dear Dr Garcia Cardenas,

Re: UTS HREC REF NO. ETH18-2982 – Community Pharmacists' Perspectives about the Sustainability of Professional Pharmacy Services: A Qualitative Study

Thank you for submitting your research project amendment for review by the GSH AD-R Local Research Office Ethics Panel, which has delegated approval by the UTS Human Research Ethics Review Committee to review low risk research within the Graduate School of Health.

The Panel noted the responses and revisions submitted by you.

1. Regarding the Panel's concerns about recruitment requiring an arms length recruitment approach, the Panel note that you have stated that two pharmacy owners will be identified using an "online search" as opposed to pre-existing relationships, and are thus assured.
2. Regarding the Panel's earlier concerns about pharmacy service providers potentially feeling apprehensive about providing responses which would challenge their employers, the Panel noted the revisions to the Participant Information Sheet and Consent Form and the fact that participants will have the opportunity to review their interview transcripts to ensure that they feel happy about the information.

I am pleased to advise that your request has been approved. Your approval number is UTS HREC REF NO. ETH18-2982

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).

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.

To access this application, please follow the URLs below.
* if accessing within the UTS network: https://rm.uts.edu.au
* if accessing outside of UTS network: https://vpn.uts.edu.au , and click on " RM6 – Production " after logging in.

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 me.

Yours sincerely,

Eddy Dr[illegible]
GSH Local Research Office
University of Technology Sydney

B. Ethics amendment approval (Chapter 5)

17 May 2019

Dear Dr Garcia-Cardenas,

Re: UTS HREC REF NO. ETH19-3352 – Community Pharmacists' Perspectives about the Sustainability of Professional Pharmacy Services: A Qualitative Study

Thank you for submitting your research project for review by the GSH AD-R Local Research Office Ethics Panel which has delegated approval by the UTS Human Research Ethics Review Committee to review low risk research within the Graduate School of Health.

The Chair on behalf of the Panel has considered your responses. I am pleased to advise that your request has been approved.

Your approval number is UTS HREC REF NO. ETH19-3352.

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).

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.

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* if accessing outside of UTS network: https://vpn.uts.edu.au , and click on " RM6 – Production " after logging in.

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 me.

Yours sincerely,

Eddy Dharmadji
GSH Local Research Office
University of Technology Sydney

C. Negligible Risk Ethics Approval-Mix-Method study (Chapter 6)

From: research.ethics@uts.edu.au
To: Research Ethics; Carmen Crespo Gonzalez; Victoria Garcia Cardenas
Subject: Neg Risk approval - ETH20-4633
Date: Friday, 17 January 2020 7:51:13 AM

This is an automated email

Dear Applicant

Project title: PROMOTING THE SUSTAINABILITY OF PROFESSIONAL SERVICES IN AUSTRALIAN COMMUNITY PHARMACIES.

You have declared your research as Nil/Negligible Risk and that it DOES NOT include any of the following:
* Establishment of a register or databank for possible use in future research projects
* Collection, transfer and/or banking of human biospecimens
* Any significant alteration to routine care or health service provided to participants
* Interventions and therapies, including clinical and non-clinical trials, and innovations
* Targeted recruitment or analysis of data from any of the participant groups listed in Chapter 4 of the National Statement (or where any of these participants are likely to be significantly over-represented in the group being studied) including:
  - Women who are pregnant and the human fetus
  - Children and young people (under 18 years)
  - People in dependent or unequal relationships
  - People highly dependent on medical care who may be unable to give consent
  - People with a cognitive impairment, an intellectual disability, or a mental illness
  - People who may be involved in illegal activities (including those affected)
  - Aboriginal and Torres Strait Islander Peoples
* Collection, use or disclosure of personal information (except where expert opinion is being canvased with full disclosure, consent and identification for use in the public domain)
* Collection, use or disclosure of health information
* Collection, use or disclosure of sensitive information
* Covert observation, active concealment, or planned deception of participants
* Activity that potentially infringes the privacy or professional reputation of participants, providers or organisations (except where expert opinion is being canvased with full disclosure, consent and identification for use in the public domain)
* Potential for participants to experience harm (e.g. physical, psychological, social, economic and/or legal)
* Direct contact with UTS staff/students, patients, consumers or members of the public (except where expert opinion is being canvased with full disclosure, consent and identification for use in the public domain)
* Participants who have a pre-existing relationship with the researcher (except where expert opinion is being canvased with full disclosure, consent and identification for use in the public domain)
* People unable to give free informed consent due to difficulties in understanding the Information Sheet or Consent Form
* People in other countries

PLEASE NOTE: If at any time, the scope of your research changes to include one or more of the above categories, you are immediately required to submit a new application.
To access the National Statement on Ethical Conduct in Human Research, visit the NHMRC webpage:
https://www.nhmrc.gov.au/guidelines-publications/e72

Please keep a copy of your ethics application form and approval letter on file to show you have considered the risks associated with your research. You should consider this your official letter of approval.
For tracking purposes, you have been provided with an ethics application number, which is UTS HREC ETH20-4633N.

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.

Instructions for saving the application form can be downloaded from:
https://staff.uts.edu.au/howdoi/Pages/Researching/Research%20ethics%20and%20Integrity/Human%20research%20ethics/download-a-copy-of-my-application.aspx

To access this application, please follow the URLs below:
* if accessing within the UTS network: https://rm.uts.edu.au
* if accessing outside of UTS network: https://vpn.uts.edu.au, and click on ""ResearchMaster" after logging in.

If you have any queries about this approval, please do not hesitate to contact your local research office or Research.Ethics@uts.edu.au.

Kind regards

UTS HREC Ethics Secretariat
C/- Research Office
University of Technology Sydney
E: Research.Ethics@uts.edu.au
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'The next phase in professional services research: From implementation to sustainability', Res Social Adm Pharm. 2017;13(5):896-901.	Conception or design of the work	X	X	X	
	Data collection	X			
	Data analysis	X			
	Data interpretation	X			
	Manuscript preparation	X	X	X	
	Revision of the manuscript	X	X	X	
'Sustainability of innovations in healthcare: a systematic review and conceptual framework for professional pharmacy services`, Res Social Adm Pharm.	Conception or design of the work	X	X	X	
	Data collection	X		X	
	Data analysis	X			
	Data interpretation	X			
	Manuscript preparation	X	X	X	X
	Revision of the manuscript	X	X	X	X
Community pharmacists' perspectives about the sustainability of professional pharmacy services: A qualitative study'	Conception or design of the work	X	X	X	X
	Data collection	X			
	Data analysis	X			
	Data interpretation	X		X	X
	Manuscript preparation	X	X	X	X
	Revision of the manuscript	X	X	X	X
`Exploring patients' needs to achieve the sustainability of professional pharmacy services in Australia: A mixed-methods study'	Conception or design of the work	X		X	X
	Data collection	X	X	X	
	Data analysis	X			
	Data interpretation	X			X
	Manuscript preparation	X	X	X	X
	Revision of the manuscript	X	X	X	X
	Signature	Production Note: Signature removed prior to publication.	Production Note: Signature removed prior to publication.	Production Note: Signature removed prior to publication.	Production Note: Signature removed prior to publication.