The Development of an Interprofessional Model for Primary Healthcare Clinics in

Australia

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Abstract

Interprofessional practice (IP) involves health practitioners, the community, and clients working together to achieve a higher quality of healthcare. Research continues to grow, showing that interprofessional practice can be particularly effective in chronic and complex disease management and prevention. In Australia, IP uptake is low, especially in primary healthcare settings (such as general practice medical clinics), yet most healthcare occurs in these settings. This lack of uptake means fewer Australians can access IP, so they miss the potential benefits. While there is extensive literature in some areas of IP, such as how it can be taught, very little literature offers specific guidance on how it can be implemented in primary practice settings. This study had two primary aims. The first primary aim was to investigate the barriers to implementing IP in primary healthcare settings in Australia and to identify potential solutions for those barriers. . The second aim was to develop a practice model for implementing IP in primary healthcare settings. This second aim was achieved by integrating the findings regarding the barriers and solutions.

This qualitative study consisted of three phases. In Phase One, interviews were undertaken with 20 participants working in primary healthcare settings to explore the barriers preventing IP implementation in primary healthcare. Nine barriers were identified, which included cost, logistics, and a lack of understanding of IP and its principles. In Phase Two, solutions to the barriers were explored. To assist with this, the barriers were categorised using The Centers for Disease Control and Prevention (CDC)'s Social-Ecological Framework (Perkinson et al., 2007). This analysis furthered understanding of the multifaceted nature and the dynamic interrelations between the identified barriers. A critical review of the literature was undertaken to identify evidence-based solutions to the barriers, which took into account the

Social-Ecological Framework. A case study was undertaken to further explore possible solutions to two important barriers to IP: cost and logistics. These barriers were found to be impacted by rapidly changing external factors, such as government funding and the rise of advancing technology, such as Artificial Intelligence (AI). The case study findings indicated that AI could potentially address many of the logistical barriers faced in interprofessional implementation and reduce costs.

In Phase Three, a model was developed that integrated the study's findings regarding barriers and potential solutions to facilitate IP implementation in primary healthcare clinics. The conceptualisation of identified barriers and solutions within the CDC's framework was then integrated with Kotter's 8-Step Change Model (Kotter, 1996) to develop a model that guides clinics on addressing the barriers to implementation. The model also draws on well-established design principles based on the work of Norman (2002), which emphasises refining implementation rather than simply applying solutions. This approach could allow the model to be more easily adapted to Australia's wide variety of primary healthcare clinics.
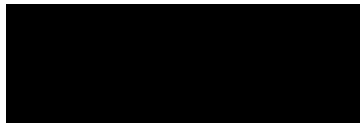
This study's findings have both theoretical and clinical implications. This study's theoretical contribution includes the innovative integration of a socio-ecological model with change management principles to develop an IP implementation model. The socio-ecological model provided a framework for conceptualising the barriers to IP and the need for a multi-level approach to address these barriers. The integration of change principles provides further guidance for the effective implementation of IP in primary healthcare settings. On a clinical level, this research gives primary healthcare clinics a model by which they can implement interprofessional practice, ultimately allowing many more Australians to benefit from it by improving the delivery of healthcare.

Declaration

I, Frank Perri, declare that the PhD thesis entitled 'The Development Of An Interprofessional Model For Primary Healthcare Clinics In Australia' is no more than 80,000 words in length including quotes and exclusive of tables, figures, appendices, bibliography, references and footnotes. This thesis contains no material that has been submitted previously, in whole or in part, for the award of any other academic degree or diploma. Except where otherwise indicated, this thesis is my own work.

I have conducted my research in alignment with the Australian Code for the Responsible Conduct of Research and Victoria University's Higher Degree by Research Policy and Procedures.

Signature: Date: 5th July 2024

All research procedures reported in the thesis were approved by the Victoria University's Committee, Approval Number HRE15-203.

Signature: Date: 5th July 2024

Acknowledgment

The quote from Ken Blanchard, "None of us is as smart as all of us", encapsulates my experience with interprofessional practice. As an academic, watching students from different disciplines develop a treatment plan far beyond what they could have achieved individually highlighted the power of working as an interprofessional team and cemented my belief in it.

I had my own 'team' in this journey, from my supervisory team, who offered me professional support to my family and friends whose support could be as simple as a smile at the achievement of a milestone. I sincerely thank the many people whose influence and support helped shape this thesis.

I want to thank my parents, like many migrant families, who came to Australia from very humble beginnings to build a better life for themselves and did so through hard work. They have always been a beacon of respect and love; I dedicate this work to you, Rosario and Angelina. I was the first in our family to get a degree and now the first to complete a PhD. Hopefully, this thesis inspires others in the family to follow. Thank you to my partner Matt, who brings so much joy to my life and has made the hard times and challenges I've faced on this journey much easier. To my other family members for their encouragement along this journey; your excitement and smiles motivate me. Thank you to my lifelong friends Piero, Ange and Paulo, who always make me laugh and help keep my feet firmly on the ground.

Thank you to my supervisors: Prof Kristine Martin-McDonald, who first introduced me to interprofessional practice; Associate Professor Peter Hartley, who put his hand up when I needed a second supervisor; and Dr Keis Ohtsuka, who not only started me on my journey in academic teaching but also helped me with my supervision after Kristine and Peter's departure from academia. Keis also introduced me to Prof Shah Miah, whose infectious enthusiasm

encouraged me to pursue a PhD internship. Thank you to Steve Zanon, whom I worked for during the internship, who opened my eyes to the world of the care economy and emphasised the importance of applying research to industry. Thanks also to my work colleagues at Victoria University, especially in Dermal Sciences, whose patience and support have allowed me to focus on this journey.

Great thanks go to my current supervisory team: Dr Romana Moda, Dr Peter Gill, and Prof Dawn Forman. Each of you brings a skill set that has allowed me to excel. Dawn's knowledge and experience in interprofessional practice are immense, and her encouragement of this work has been inspirational. Peter's understanding of Victoria University's requirements for a PhD has helped me to ensure that I meet that criteria, and Romana's attention to detail and feedback has helped to clarify my writing. As a team, they stepped up to support me after Keis' retirement, and for that, I will be forever grateful.

My goal is that this work will encourage more clinics to implement interprofessional practice. In doing so, I hope more graduates with interprofessional skills will have clinics to showcase their abilities, that the profile of interprofessional practice will continue to be raised, and that many more members of the public will benefit from it.

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Glossary

Vocabulary evolves over time and is influenced by culture (Smith, 2004). Thus, it is important to clarify terms related to interprofessional practice and how they are used in this thesis. For the purpose of this thesis, the following terms will be defined:

Interprofessional Practice (IP). Interprofessional practice is the process whereby healthcare practitioners actively work together in clinical settings, applying interprofessional techniques and knowledge (Harrod et al., 2016; Nandan & Scott, 2014). Similar terms are sometimes used interchangeably in the literature, such as interprofessional collaborative practice, and interprofessional healthcare. Whereas terms such as collaborative practice and team-based care encompass a wider scope of meaning and may or may not be interprofessional.

Interprofessional Education (IPE). Interprofessional education is a process of bringing together healthcare professionals from different disciplines to learn with, from and about each other to enhance collaboration and improve patient care (Angelini, 2011). Interprofessional learning can build on IPE and is used in both practical settings, teaching healthcare providers about interprofessional practice, and in classroom and simulation settings, where students learn about other healthcare professions and how to work with them.

Intraprofessional Practice. Intraprofessional practice relates to collaboration within a profession but not outside of it. It might include a group of Medical Practitioners specialisations working together or a group of nurses working together. Conferences that are limited to members of the profession are examples of intraprofessional practice where information is shared only with a select group (Jelley et al., 2013).

Interprofessional Assessment. Interprofessional assessment refers to the assessment of an individual's understanding, abilities, and values with regard to their interprofessional

education (the level of interprofessional knowledge they have) and practice (how that knowledge is then applied in a clinical setting (Frost et al., 2019).

Interprofessional Core Competencies. Interprofessional core competencies refer to fundamental skills, knowledge, and attitudes required for healthcare professionals to engage in interprofessional practice effectively (Verma et al., 2006).

Interprofessional Communication. Interprofessional communication is the exchange of information between healthcare professionals to ensure that the patient's care is coordinated and effective (Foronda et al., 2016).

Interprofessional Leadership. Interprofessional leadership refers to the ability of healthcare professionals to take a proactive role. Leadership in interprofessional practice can change depending on the skills best required for the patient at the time (Brewer et al., 2016).

Patient-Centred Care. Patient-centred care is an approach to health care that prioritises the needs, preferences, and values of patience in decision-making in care delivery (Pelzang, 2010).

Primary Healthcare Clinics. Primary healthcare clinics are, by definition, the first interaction a client will have with the healthcare system for non-emergency situations. They can be government or private enterprises and may be medical (as in a medical clinic) or allied health (as in a physiotherapy clinic) (Australian Institute of Health Welfare, 2016).

Private Practice Clinics. Private practice clinics is a phrase often used in Australia to denote a clinic, often a medical clinic, that is non-government run. As a business enterprise, they must ensure that they remain economically viable. If they are a medical clinic, they will often have more than one form of health practitioner, mainly General Practice medical doctors and

nurses, but they will also often have allied health practitioners either working from the same site or that they often refer to (Swerissen et al., 2018).

      Patient Versus Client. The recipient of healthcare services is the patient or the client. From a medical standpoint, the term patient has traditionally been used, but from an allied health perspective, the term client is increasingly being used (Deber et al., 2005). In the context of interprofessional practice and the more active role the client can take as a part of their treatment planning, the term client will be used in this thesis.

COVID-19 Thesis Impact Statement

The COVID-19 pandemic impacted this research, and subsequently, a modification in the research design from what was initially planned needed to occur. The original research design was going to take an action-based research approach, whereby interviews were to be conducted to identify the issues in implementing interprofessional practice in primary healthcare settings, solutions were going to be explored, and then those solutions were going to be re-presented to those health practitioners and clients via focus groups for further refinement and to help finalise a model of practice.

After the initial data collection, the pandemic had significant impacts on healthcare. Each state in Australia had its healthcare directives, and rapid measures were introduced, including social distancing and limitations on services that could be provided. Victoria experienced some of the most significant lockdown measures in the world in 2020 and 2021. Healthcare workers were particularly at risk and faced extreme workloads.

It was impossible to reconnect and run the planned focus groups discussing a new practice model where collaboration is critical in an environment focused on social distancing and isolation. At the time, it was difficult to know what the outcome and impacts the pandemic would have on the healthcare system, which, at times, was close to buckling under the strain in Victoria.

A decision was then made to modify the design, and instead of the focus groups, an in-depth exploration of the solutions to some of the issues was conducted. Due to the significant problem of funding interprofessional practice, a health economics PhD internship was undertaken to explore how AI and spending in some areas of healthcare can create longer-term savings and sustainability. By analysing existing data from the internship and past research, a

model for implementation was still produced. This COVID-19 Thesis Impact Statement does not

infer that this thesis is of a lower standard because of the impact of the pandemic; rather, the

research design needed to be modified.

Structure of the Thesis

The following section outlines the thesis format and what will be presented in each chapter.

Chapter 1 Overview. Background and Introduction

This chapter introduces the concept of interprofessional practice and provides an overview of the healthcare system in Australia. A clear and up-to-date understanding of the healthcare system is required to introduce a model, especially as the system constantly evolves as new laws and practices are introduced. It then concludes with the study's aim and research questions.

Chapter 2 Overview. Literature Review

In Chapter 2, an in-depth literature review is presented. As developing an implementation model considers and synthesises several research areas, the review will examine the central research areas related to interprofessional practice; this will help to create a clearer understanding of issues in the field. This will be followed by a deeper exploration and evaluation of the most recent research in the field of interprofessional practice related to primary healthcare and model creation. Ultimately, this chapter will highlight the gaps in the literature and how this study seeks to address some of those gaps.

Chapter 3 Overview. Methodology

This chapter begins by outlining the chosen research paradigm, including exploring ontology, epistemology, methodology and methods to collect and analyse data. It will also present information on the participants and procedures for data collection. This section will also include reflexivity as part of the qualitative research process. The chapter will then outline the methodology that was used for this thesis.

Chapter 4 Overview. Issues Identified

This chapter discussed the findings from the Phase One data collection. Phase One aimed to identify the barriers to implementing interprofessional practice in primary healthcare settings. Interviews were conducted, transcribed, and coded for themes. The interviews explored participants' thoughts on potential barriers and issues with the implementation of interprofessional practice. In this chapter, possible solutions to address identified barriers were discussed.

Chapter 5 Overview. Solutions for the Issues

To create the implementation model, the literature was explored to identify possible solutions for the barriers identified in Chapter 4. These solutions were considered within The Centres for Disease Control and Prevention's (CDC) Social-Ecological Model, which helped to situate them within a contextual framework. The solutions were discussed in this chapter and constituted the beginning of Phase Two.

Chapter 6 Overview. Costing and Technology

Cost and logistics were reported as significant barriers to the clinical implementation of interprofessional practice in Phase One data collection. This chapter focused on these barriers and how they could be addressed by analysing existing case study data. It discussed how interprofessional practice could be made financially viable and how some of the logistical issues can be addressed via technology. This chapter formed part of a PhD internship, a paper entitled 'The Economic Viability of an In-home Monitoring System in the Context of an Aged Care Setting' (Perri et al., 2023), was submitted for publication and a summary is included in the chapter. This chapter also continues Phase Two.

Chapter 7 Overview. A Model for Implementation

      This chapter consolidated the identified barriers, evidence-based solutions, change management theory, the CDC framework, and design thinking principles and proposed a model for implementing interprofessional practice in primary healthcare clinics. It also outlined how the model can be customised to suit individual clinics. This chapter constitutes Phase Three.

Chapter 8 Overview. Conclusion

      This chapter presents the thesis's conclusions. It summarised the proposed model's benefits, limitations, possible future directions, and evolution; it also discussed the study's theoretical and clinical implications, as well as its applications.

Chapter 1. Background And Introduction

Overview of the Chapter

This chapter introduces the concept of interprofessional practice, explains why it is vital to healthcare, and explains the extent to which it occurs worldwide and in Australia. It outlines and discusses background information related to interprofessional practice in primary healthcare settings. The final section presents the study's aims and research questions.

What is Interprofessional Practice?

Interprofessional practice is the collaboration and communication between healthcare professionals, the community, and clients to improve patient outcomes. The concept of interprofessional practice gained prominence with the release of the World Health Organization's Report: Framework for Action on Interprofessional Education and Collaborative Practice (World Health Organization, 2010). Interprofessional practice aims to provide a comprehensive, client-centred approach to health care, considering everyone's unique needs and preferences (World Health Organization, 2010). As healthcare has evolved, each profession has become more specialised, and a more in-depth understanding of the field has been gained (Castiglioni, 2019). While this in-depth understanding of treatment knowledge has seen average human expectancy increase over the past few decades (Blagosklonny, 2010), it has become increasingly difficult for any single practitioner to get a complete overall *and* in-depth view of an individual, especially as professional boundaries may actively prevent this from occurring (King et al., 2015). For example, the specialist cardiologist will have in-depth knowledge of an individual's heart but less of an individual's psychological issues; the individual would need to see a psychologist. A cardiologist treating a psychological condition may be considered outside their scope of practice and crossing professional boundaries.

These boundaries and specialisations in healthcare are a more recent phenomenon because, for most of human history, healthcare within a community was usually the domain of chosen individuals such as tribal healers or medicine practitioners. These healers would consider the person as a whole, evaluating their physical, mental, and spiritual health, and in-depth specialisations were not the norm (Castiglioni, 2019). Today, every healthcare field has evolved such extensive knowledge that is beyond the scope of any one individual to know all about all areas. As such specialisations have become the norm.

However, this specialisation can lead to competition and conflicting attitudes between health providers (Chung et al., 2012). For example, a common condition such as muscular-skeletal back pain could be treated by Osteopaths, Chiropractors, Physiotherapists, Exercise Physiologists, Massage Therapists, Acupuncturists, General Medical Practitioners, Neurosurgeons, and Orthopaedic Surgeons (Corp et al., 2021). Treatment approaches will vary and thus could have differing levels of impact and success on different clients.

Clients in the above example may be in pain; they may not know the detailed differences in the approaches of each profession, may be receiving conflicting advice, and may have to make choices with profound implications, such as whether to have surgery. Gaining clarity in such a situation could involve bringing the health professionals together in an interprofessional manner. To do this, healthcare professionals must be willing and able to work together effectively to share information, expertise, and resources to ensure the best possible outcomes for their clients; this requires open communication, respect for each other's expertise, and a commitment to teamwork (Foronda et al., 2016). Again, using the above example, if some of those health experts were to examine the client's case and discuss it with others, including the client and their carers, they might be able to devise a treatment plan that is more likely to work (as differing

viewpoints can be discussed and addressed). In this scenario, it could be argued that the client is

more likely to engage with the treatment plan because they have been part of the treatment

planning process, rather than simply told what to do. As carers and supports have been identified

and included, the treatment plan will likely be followed through by all involved.

Interprofessional and Multidisciplinary Practice

Many of the disciplines mentioned in the above example may work from one location,

but that does not necessarily make them interprofessional. Multidisciplinary and

interprofessional practice are two different approaches to healthcare delivery, but they share

some similarities (Körner, 2010). As many clinics in Australia operate in a multidisciplinary

setting, it is essential to note the differences. In multidisciplinary practice, healthcare

professionals from different disciplines work independently with little collaboration and

coordination apart from referrals. They may work in the same or different settings and have

different goals, objectives, and processes for delivering care (Tieman et al., 2007). In contrast,

interprofessional practice involves healthcare professionals from different disciplines working

together as a team to improve patient outcomes. Interprofessional practice emphasises

collaboration, communication and teamwork, with each team member contributing their unique

skills and knowledge to achieve the best possible outcomes for the client (World Health

Organization, 2010).

In the context of the Australian healthcare system, the distinction between

multidisciplinary practice and interprofessional practice is crucial. As this research focuses on

the primary healthcare setting, it is expected to see clinics with different healthcare providers

working from one location. For example, general practice clinics might have medical

practitioners (GPs), nurses, psychologists, dietitians, podiatrists, and other healthcare

professionals working from one location. The public perception of such a clinic might be that the practitioners work in an 'interprofessional' manner. However, as interprofessional practice is still in its infancy in private practice settings (Lynch, 2021), it is much more likely that such a clinic is operating as a multidisciplinary clinic with very little interprofessional practice occurring.

Advantages of Interprofessional Practice

Interprofessional practice is said to offer advantages over multidisciplinary practice. Interprofessional practice involves a diverse range of professionals bringing a unique set of skills, knowledge, and experience (Nandan & Scott, 2014). By discussing differing viewpoints and working together, practitioners can provide more effective and efficient care to their clients, improve client outcomes, and reduce healthcare costs over time (World Health Organization, 2010). Interprofessional practice has much to offer in improving patient safety and reducing hazards in medicine (Anderson et al., 2017). Thus, it has been argued that interprofessional practice should be part of mainstream health practice (Illingworth & Chelvanayagam, 2017). However, interprofessional practice is not simply health practitioners discussing cases and handing down a decision, as it is a client-centred approach; clients can be part of the discussion and treatment planning, increasing the likelihood of client adhering to the agreed management plan (Delaney, 2018). Community support is also an essential part of interprofessional practice. Community support encompasses programs and services designed to help clients stay engaged between treatments and promote positive community change by introducing initiatives that address specific community needs (Ploeg et al., 2017). For example, community cooking classes could be offered to individuals whose treatment plan focuses on improving their nutrition.

A comparison can be made between non-interprofessional and interprofessional approaches to highlight the benefits of interprofessional practice. In the earlier example

regarding the client with back pain, a non-interprofessional approach may be that the client experiences pain, seeks treatment from one of the practitioners in the field, and if not successful, might then try different practitioners from different fields with varying degrees of success; this may result in added pain and costs to the individual (Payne et al., 2014). Using an interprofessional approach, different health practitioners may be able to discuss differing views on treatment and include the client in those discussions (if possible) so that the client is more likely to engage because if they have concerns about the treatment plan, they can be addressed (Sidani & Fox, 2014). Community support can help to ensure that treatment occurs and is further supported; sometimes, treatment may not occur simply because a client cannot get to their provider; community programs may support them by providing additional support such as transport to and from appointments, local activities such a yoga or stretching classes to help further ease pain, and/or connecting them with others with similar conditions (El Ansari, 2001). Interprofessional practice can combine the teamwork of healthcare professionals, which may better address the client's needs and concerns. A more personalised treatment plan can be developed by also including input from the client and/or their caregivers; adding community support can help the client achieve their treatment goals. This approach can help to build trust and confidence in the healthcare system, leading to higher patient satisfaction and better health outcomes (Reeves et al., 2013).

Another benefit is that interprofessional health practice can help to reduce healthcare costs (Corcoran et al., 2017). By working together, healthcare professionals can avoid duplication of services, minimise errors and treatment complications (such as post-surgical complications), and provide more targeted and effective treatments (Schmitt et al., 2011). This can lead to better patient outcomes and lower healthcare costs over time. The adage in healthcare

that prevention is better than cure can also be better achieved through interprofessional practice. By having different practitioners observe and communicate their observations to other healthcare professionals, they may be better able to spot potential future complications (Davoli & Fine, 2004). For example, the physiotherapist who observes behavioural changes in a patient could then alert the doctor or psychologist to elicit an early intervention.

Effective interprofessional practice can also help to improve population health (Shirey et al., 2020). By working together, healthcare professionals can address broader health issues, such as chronic disease management and health promotion, that can significantly impact overall health outcomes. (Zenzano et al., 2011). It can be argued that healthcare professionals should collaborate to provide coordinated and effective care to help address complex and chronic health conditions. Interprofessional health practice is crucial in ensuring that all aspects of a client's care are considered from various sources, ultimately leading to a higher quality of care (Nandan & Scott, 2014). Dementia is one such example, whereby treatment for a chronic and complex condition involving multiple health practitioners can benefit from an interprofessional model (Forman & Pond, 2015). Dementia treatment can involve several healthcare workers, such as gerontologists, neurologists, psychiatrists, general practitioners, nurses, occupational therapists, physiotherapists, speech pathologists, pharmacists, social workers, dietitians, and care workers. With a client's diminishing cognitive capacity, it becomes even more critical that health practitioners work together, as the client may not be able to relay important information; clues to what the person is experiencing may be identified by different healthcare workers and thus need to be shared.

With increasing numbers of healthcare professionals and specialities involved in client care, effective communication and collaboration become even more critical to ensure patient

outcomes. Even in settings such as hospitals where systems are more unified and health practitioners are often employed by one organisation, a client may see, on average, around 8 – 15 different health professionals in an average hospital stay (Manidis et al., 2009). Each interaction creates data points of information that may benefit the individual's health and should be considered in developing and implementing treatment plans. Interprofessional practice, emphasising better communication and teamwork, becomes essential to ensure that these people work together rather than taking a more siloed approach, mainly focusing on completing their individual roles.

There are areas in health, such as tumour boards, where many elements of interprofessional practice are already standard practice. Tumour boards, or as they are known in Australia, Multi-Disciplinary Teams (MDTs), gather a team of different experts to discuss and recommend oncological treatment for cancer patients. The team might include oncologists, surgeons, nurses, radiologists, psychologists, physiotherapists and others related to the individual's care (Specchia et al., 2020). This approach is used because of the severe nature of cancer treatment, the complexity of cancer care, and wanting the best possible outcome for the client (El Saghir et al., 2014). The question then arises: If we know that interprofessional practice is the best standard of care for complex conditions and is used in scenarios like tumour boards or MDTs, then why is it not being implemented earlier in treatment and for issues other than cancer so that illnesses such as cancer may be prevented or potentially treated much earlier?

Challenges of Interprofessional Practice

Although interprofessional practice has numerous advantages, specific issues make its implementation challenging. These challenges include training and understanding the scope of practice within professional boundaries; it would be impossible for interprofessional practice to

work by simply placing people together and expecting them to work cohesively, as each

profession is also bound by its guidelines and has its own approaches to health (Clark et al.,

2007). Osteopathy and Chiropractic care can treat many of the same conditions, but their

viewpoints and approaches may vary (Toloui-Wallace et al., 2022). Similarly, Medical

practitioners are trained in a medical model, whilst Traditional Chinese Medicine (TCM) comes

from an Eastern philosophy and does not always fit into the Western Medical Model. Therefore,

a Western Medical Doctor who identifies an issue with an organ will view it from the issues in

its structure and function, whereas in TCM, an issue with that same organ may not relate to its

structure or function but rather to the balance of elements within the body (Xiao & Luo, 2018).

These differences in viewpoints could create clashes if not properly handled.

These differences in approaches extend to communication. Communication is critical in

interprofessional professional practice, but miscommunication can occur for several reasons,

such as differences in communication styles, jargon and even terminology used by different

professionals (Paxino et al., 2022b). There are no universal texts or terminology that every health

practitioner uses. While some texts try to standardise terminology on an international level, such

as the use of the International Classification of Diseases (World Health Organisation, 2019), not

all countries will follow that particular classification system, so even the diagnosis or discussion

of a particular health issue may be unclear. There may also be problems in communication based

on differences in professions in how they approach information and their background

knowledge, as mentioned in the Western versus TCM example.

These background differences can also create power imbalances (Farrell et al., 2021). All

health professionals will achieve a particular level of education as part of their training. This

education could be vocational, as is the case with remedial massage therapists, whose minimum

qualification to practice in Australia is a Certificate IV in Remedial Massage (which can be completed in 6-12 months) (Smith, 2015), to a medical specialist such as a psychiatrist with tertiary medical and specialised training of approximately 14 years (Gosbell et al., 2013). There has been much work on power imbalances, even between nurses and doctors in hospital settings and how that can impact a patient's treatment (Burford et al., 2013; Dalinghaus et al., 2021). Doctors in these settings can have varying levels of power because of the sociology at play within the hospital setting, often taking more senior roles. However, in interprofessional practice, the leadership of the interprofessional practice team looks beyond levels of education (Morris & Matthews, 2014). Each team member brings a certain level of knowledge in a particular area that might be relevant to the client's case. For example, the remedial massage therapist may have more knowledge of muscles and structures and movement and may be able to speak with more authority in those areas than a psychiatrist, who may not have the same level of knowledge in that particular field.

Part of the solution to addressing these imbalances is learning about other health professionals, learning with them, and learning from them (Morris & Matthews, 2014). Interprofessional practice requires ongoing learning and professional development in interprofessional practice (Moyer, 2016). Key professionals must be willing to update their skills and knowledge continually and learn from each other to operate interprofessionally (Chung et al., 2012). This flags another issue: a potential increase in workload. The COVID-19 pandemic has highlighted an overstretched healthcare system that buckled under the strain in many places worldwide (DeDiego et al., 2023; Du & Hu, 2021; Venz & Boettcher, 2022). It would be difficult to ask these health professionals to add another task of ongoing learning outside their usual professional development to their already busy workload. However, in the bigger picture,

effective interprofessional practice has the potential to lower the workload of the individual practitioner, by sharing responsibilities better.

Nevertheless, without such education, role confusion is more likely to occur (Chung et al., 2012). The question 'who does what?' in developing treatment plans and providing services needs to be answered when providing interprofessional care. Without such clarification, there may be issues of duplication of services and gaps in services (Coates et al., 2022; Lewis & Gill, 2023). Duplication can occur when individuals provide similar services for the same client. Gaps in an individual's care may occur when health practitioners focus on other aspects they perceive are more critical and are unaware of the roles others are performing, thus leaving the potential for the client to miss out on care because they believe another person is responsible. Role confusion is not only an issue for the patient but also becomes an issue for the health practitioner due to the potential for litigation (Ries, 2017).

To change how an individual practices healthcare, healthcare professionals must first be open to change, and this openness can begin when training. There is a history of many professions focusing on the development of the profession and its professional skills; for example, professions like psychology might focus on developing and training the best psychologists and keeping knowledge within the profession to help strengthen the profession (Rubin et al., 2007). An example of this is professions isolating themselves by limiting some conferences to members of their profession, thereby creating knowledge that is held solely within the profession. It could be argued that while this may lead to greater specialisation, it can also lead to greater isolation. This is compounded when different professions provide similar services, leading to greater chances of 'turf wars', where different health professionals believe their

profession is better than that of competing professions, which becomes a barrier to teamwork (Keepnews, 2010).

Even practitioners wanting to work with other professions may face issues of ethics and professional boundaries (Clark et al., 2007). Each healthcare profession must abide by its code of practice and ethics. However, some professions may not be obliged to follow the codes of ethics of other professions. For example, some professions might request mandatory reporting but not others in certain circumstances. What does that mean for the health professional mandated to report, but the information comes from another healthcare professional treating the client? Health professionals may be reluctant to share information without thoroughly clarifying such issues.

Processes and funding for the implementation of interprofessional practice also need to be considered (Pearce et al., 2011). There are some circumstances where interprofessional practice can more easily occur, such as in hospitals, because health practitioners often work for one organisation and may be in one location. In such circumstances, it may be easier to organise a meeting with different health professionals than if they were employed by different organisations and operating from different locations. Moreover, even if it was easy to coordinate everything for those meetings, who pays for everyone's time?

How Technology Can Potentially Overcome Some of the Challenges

Interprofessional practice may be on the cusp of significant growth due to technological advances (Thistlethwaite et al., 2019). Technology may be able to help overcome the workload challenges of interprofessional practice. Clients, especially those with chronic and complex conditions who have engaged with multiple health practitioners, will likely have multiple data points of information (Callahan et al., 2023). For the first time in human history, healthcare can combine vast information and understand it meaningfully via technology. So-called 'big data' is

one example; multiple data points from different sources can be combined and analysed to identify trends and make predictions (Davenport et al., 2012). The same could be applied to healthcare, whereby multiple data points across different health practitioners may be combined to give new insights into a person's health and avert possible illness without the need for practitioners to trawl through many notes and reports (Dash et al., 2019). Quantum computing and blockchains can process this vast information in ways unseen before; it can process information beyond the 0s and 1s of binary computing, making it a significant leap forward in processing power (Agbo et al., 2019). Blockchains make data storage much safer by decentralising storage, making it much more difficult to hack (Kaushik & Kumar, 2023). Artificial Intelligence (AI), with its ability to provide context and highlight data points from large pieces of information (Nursalim et al., 2023), may help interprofessional teams by summarising salient points from large amounts of data. While the earliest forms of AI have existed since the 1950s, and narrow AI (such as AI to read images) has been used in medicine for many years, generative AI is a much newer phenomenon with expanding capabilities (Kaul et al., 2020).

The future could be the quantum computer analysing data stored on a blockchain with an AI interface as part of the interprofessional team. However, AI is unlikely to replace practitioners or the interprofessional practice team as that would require Artificial General Intelligence (AI as smart and as natural as human intelligence) or Artificial Super Intelligence (AI intelligence well beyond human intelligence) and timeframes for such milestones vary from between 2029 (Kurzweil, 2006) and 2050 (Müller & Bostrom, 2016). Still, even without this technology, interprofessional practice has grown worldwide.

Interprofessional Practice Around the World

While interprofessional healthcare has a long history, it has not, for the most part, been embraced by the majority of healthcare (Dickie, 2016). It became more known worldwide when the World Health Organisation released its report in 2010 (World Health Organization, 2010). Several countries have since made significant strides in implementing interprofessional health practice. However, it is challenging to determine which country has implemented interprofessional practice the 'best' since different countries have different healthcare systems, resources and cultural contexts that can impact the implementation of interprofessional practice; that being said, some countries have been recognised for their efforts in the area of interprofessional health practice (Herath et al., 2017).

Canada

The Canadian healthcare system has implemented interprofessional collaboration as a core competency for healthcare professionals, with many educational programs and health organisations promoting interprofessional education and practice (Azzam et al., 2022; Herbert, 2005). Via organisations such as the Canadian Interprofessional Health Collaborative (CIHC), Canada has developed a National Interprofessional Competency Framework (Orchard et al., 2010). This approach is at the heart of implementing interprofessional practice: training the next generation of healthcare practitioners in their profession, being interprofessional with others, and sharing their information. In this way, they develop not only a healthcare professional in their chosen field but also an interprofessional healthcare professional.

United States

The United States has made progress in promoting interprofessional education and practice by developing interprofessional education programs and integrating interprofessional

collaboration in healthcare policies and programs (Schmitt et al., 2013). Like Canada, the USA has the American Interprofessional Health Collaborative and the National Centre for Interprofessional Practice and Education to spearhead these endeavours (Brandt, 2014; Zorek et al., 2021). Again, a national approach that links with the global community can help to build practice standards.

United Kingdom

The United Kingdom has been recognised for its implementation of interprofessional practice in areas such as mental health, the elderly and palliative care with the development of interprofessional education programs and integration of interprofessional practice into healthcare policies and guidelines (Barr et al., 2016). Commencing in 1987, The Centre for the Advancement of Interprofessional Education (CAIPE) introduced the Journal of Interprofessional Education to help encourage research (Goldman, 2011). Authors such as Cuthbert et al. (2015) and Reeves et al. (2012) have highlighted how interprofessional practice can be integral to the UK's national healthcare system.

Nordic Countries

Countries like Denmark, Finland, Iceland, Norway and Sweden have implemented interprofessional practice through team-based care models in interprofessional education programs focusing on patient-centred care and collaboration among healthcare professionals. The Nordic Interprofessional Network organises conferences and educational programs with collaborative Universities (Barr, 2016).

Japan

Interprofessional practice plays a vital role in healthcare delivery in Japan. Japan has a universal healthcare system that is largely publicly funded, and interprofessional practice is seen

as a way to improve the quality of care, reduce healthcare costs (Haruta et al., 2018) and allow

healthcare professionals to provide comprehensive care. The National Centre for Global Health

and Medicine in Japan helps to integrate interprofessional practice as part of healthcare (Haruta

& Goto, 2023).

Globally

Interprofessional Global, the Global Confederation for Interprofessional Education and

Collaborative Practice, is an international organisation trying to bring together different working

groups and networks worldwide, including the countries listed above. In addition to these

countries, there are networks for German-speaking countries, India, South and Central America

and the Caribbean, Africa, Arabic-speaking countries, and the Asia-Pacific region

(Interprofessional.Global, 2023a).

Healthcare in Australia

Before discussing interprofessional practice in Australia, an overview of the Australian

healthcare system must be presented. This overview can help understand interprofessional

practice in the Australian context. Australia has funding models such as Medicare and other

forms of support that can hinder and benefit interprofessional practice; hence, they are explored

below.

Medicare

To better understand the limitations of interprofessional practice in Australia, there needs

to be some understanding of the Australian healthcare system in general, as all healthcare needs

to operate under the constraints of the national system. Australia has public and private

healthcare funding that essentially operates on a fee-for-service model: a particular service is

provided, and a particular fee is charged (Willis & Parry, 2012). Public funds are used to wholly

or partly subsidise services like those provided in hospitals and community centres. Medicare offers rebates or fully funds services to providers outside of the public hospital setting (Boxall & Gillespie, 2013); of course, with any government funding, strict controls exist on when and how these funds can be spent. Australia is not a completely nationalised health service, so medical and allied health professionals can charge their own fees (Willis & Parry, 2012). Thus, private funds can also be used to pay for services and offer greater freedom as they do not have as strict controls as government funds.

The system generally works well for the more straightforward cases. If an individual is unwell and requires treatment, they go to a healthcare practitioner, and will either be fully funded publicly or the individual would pay an out-of-pocket cost. Medicare, as a system, generally works well to cover these costs. Medicare is administered by the Australian Government through the Department of Health and is funded through a combination of general taxation and a Medicare levy paid by most taxpayers (Krassnitzer & Willis, 2016).

Under the Medicare system, eligible individuals can access various medical services, including consultations with general practitioners, medical specialists, and allied health professionals (Willis & Parry, 2012). Medicare also covers a range of diagnostic tests such as X-rays and blood tests. The issue with Medicare is that to access funds, providers of services need to be registered with Medicare, and Medicare limits this mainly to medical doctors and specialists. Allied health professionals have minimal access to Medicare funding (Angeles et al., 2023). As interprofessional practice benefits from the involvement of health professionals outside of medicine, Medicare alone may be inappropriate for interprofessional funding. Australia has diverse healthcare needs, so other funding and healthcare models must be considered.

My Aged Care

My Aged Care is an Australian government-funded program that commenced in 2013 to better meet older Australians' needs (Ellis et al., 2021). The program is designed to help older Australians stay independent longer by giving them access to support and care services when needed. Under the My Aged Care program, eligible individuals undergo an assessment to determine their needs and are then provided with information about the available support services. This can include personal care, home modifications, nursing care, respite care and social support (Tran & Gannon, 2020). One of the critical features of My Aged Care is its focus on consumer-directed care; this means participants have a more significant say in the services and supports they receive and can choose from various service providers to access them. As there is more freedom regarding the types of services and who provides them, it is possible that My Aged Care could provide interprofessional funding.

The NDIS

My Aged Care is limited only to older Australians. There is another group, individuals with disabilities who also often have complex and chronic conditions, that would benefit from a similar system. The National Disability Insurance Scheme (NDIS) is an Australian government-funded program that provides support to individuals with significant disabilities (Mavromaras et al., 2018). The NDIS was established to provide individuals with more choice and control over disability support services and to create more equitable and sustainable disability support systems. Under the NDIS, eligible individuals are assessed to determine their disability-related support needs and are then provided with funding to purchase the services and support they need. This can include support for daily living activities, mobility aids, therapies and other types of support (Laragy & Fisher, 2020).

Similar to the My Aged Care program, one of the critical features of the NDIS is its focus on individual choice and control. Participants in the scheme have a more significant say in the services and support they receive and can choose from various providers. It aims to promote inclusion and participation in the community and provides funding for activities and programs that support these goals (Mavromaras et al., 2018). NDIS is funded through a combination of government funding and a Medicare levy increase and is overseen by the National Disability Insurance Agency (NDIA) (Laragy & Fisher, 2020). Again, there is scope for NDIS funding to fund interprofessional practice for its participants.

It could be argued that of Australia's three central funding systems, Medicare, NDIS, and My Aged Care, Medicare seems least suited to fund interprofessional practice. This is compounded by Medicare being too restrictive in where it can be applied and underfunded in where it is applied. This is reaching a crisis point where more and more medical doctors and allied health practitioners that offer Medicare bulk billing are no longer doing so as it has simply become too unaffordable (Mudiyanselage et al., 2023). Medicare rebates have not kept up with inflation. For example, since the introduction of Medicare rebates for psychology sessions in 2006, the initial rebate was equal to approximately $82; in 2023, it was approximately $93.32 (Commonwealth of Australia, 2023d). Medicare has started introducing some provisions for item numbers related to collaborative practice. However, again, they were initially limited to use only by medical doctors, which ultimately is not fit for the purpose of interprofessional practice. Other forms of healthcare funding in Australia such as health insurance, can be considered.

Health Insurance

Insurance agencies operate on public and private models, further complicating how healthcare can be funded. For example, in case of transport accidents, motorists may pay levies

on registration fees that would cover the healthcare costs of those injured in transport accidents as part of Transport Accident Commission (TAC) insurance (Transport Accident Commission, 2023). Workcover offers a similar model, charging businesses an insurance premium to cover injuries at work. These forms of insurance are legislated and must be held by businesses employing staff ("WORKERS COMPENSATION ACT 1958," 1958). In addition to these mandated forms of insurance, there are additional voluntary insurance options, with many large multinational corporations offering private health insurance on an individual, voluntary level.

Individuals can become private health insurance fund members, paying a premium and receiving rebates from certain services depending on their policy. While it should be noted that private health insurance cannot cover out-of-hospital medical services, under the health insurance legislation, these forms of insurance offer more flexibility than Medicare's fee-for-service model. Insurance agencies also have fee-for-service but can cover a wider range of services than Medicare, such as allied health, thus potentially better funding interprofessional practice (Hurley et al., 2002).

Primary Healthcare Settings

The primary healthcare setting is where most healthcare occurs in Australia (Swerissen et al., 2018). The Australian Government identifies primary healthcare as generally the first interaction with the healthcare system (apart from hospital emergencies) and includes settings such as local medical practices, community centres, and allied health providers such as physiotherapists and psychologists (Department of Health and Aged Care, 2023d). These settings can be public and private organisations and do not have a central register (Halcomb et al., 2023). The idea is that in non-emergency situations, the general public will attend one of those locations

to obtain initial care, which, if required, could then be referred to more specialised services, such as specialist medical practitioners or hospitals (or, in the case of allied health, a medical clinic).

Consequently, primary healthcare settings can vary in approach and organisational structure. They could be a small podiatry clinic run as a small business or a community health organisation with a Board of Directors and multiple doctors, nurses, social workers, and allied health working from one location. This can create significant issues when introducing a new practice model because they are very different organisations. The government has introduced primary healthcare networks (PHNs) covering particular catchment areas to link these varied primary healthcare organisations (Booth et al., 2016). The primary healthcare network aims to provide and disseminate information to primary care providers and help clients receive services. A clinic's addition to a PHN is entirely voluntary. Implementing interprofessional practice is an added challenge with vastly different organisations, what may work for one clinic may not necessarily work for another.

Interprofessional Practice in Australia

Interprofessional practice in Australia can be viewed from a rural and metropolitan perspective, as rural healthcare operates in a different environment and has different challenges than metropolitan healthcare. Australia is a large country with a relatively low population; it could be argued that healthcare in rural areas has naturally become more interprofessional. Due to the vast distances between towns, it is much more likely that different health practitioners operate from one location. As they are smaller communities, it allows them to build more of a relationship with their clients, leading to higher community collaboration (Martin et al., 2023; Mullan et al., 2023; Taylor et al., 2023). There is an ease of accessibility if they work from one location, and if it is a government-funded clinic, then there may be fewer issues in discussing

client cases as there will not likely be a fee for service (Gum et al., 2020; McNair et al., 2001). Interprofessional practice in the rural context may not be easily replicated in larger cities with much greater numbers of staff and clients (Liaw & Kilpatrick, 2008).

The expansion of interprofessional practice in Australia should also be discussed. Of course, there is no official start date when interprofessional practice began in Australia, but past developments in healthcare have been significant contributors to the development of interprofessional practice. As education is the cornerstone of progress, projects such as The Curriculum Renewal for Interprofessional Education in Health (The Interprofessional Curriculum Renewal Consortium Australia, 2013) made five recommendations, including establishing national leadership, developing a coordinated approach to interprofessional practice and education, introducing educational standards to professions, establishing research in the field and developing a repository of knowledge. Projects such as the Curriculum Renewal Studies program were integral in helping to shape interprofessional education in Australia (Dunston et al., 2018).

This Curriculum Report was followed up by the 'Work-based assessment of teamwork: an interprofessional approach' report (The iTOFT Consortium Australia, 2015), which helped standardise the implementation of interprofessional practice education by introducing a team-based activity measurement tool. The Australian and New Zealand Association for Health Professional Educators (ANZAHPE) provides a repository for many other training materials and supporting research, further emphasising that the curriculum report's recommendations are being met. Organisations such as ANZAHPE go beyond leadership; their goal is also to nurture those wanting to become more interprofessional (Ash et al., 2023). The Securing an Interprofessional Future Project (Dunston et al., 2020) furthered the direction interprofessional practice should

take in Australia. While the project reiterated the need for leadership, a coordinated approach, curriculum development, and research and dissemination of resources, it highlighted the need for a national work plan supported by the above measures.

Many of these objectives continue to grow with groups such as the Australasian Interprofessional Practice and Education Network and the Australian and New Zealand Association for Health Professional Educators under the umbrella of Interprofessional Global (Interprofessional.Global, 2023b). The Australasian Interprofessional Practice and Education Network (AIPPEN), a community of practice, helps link those involved in the education and practice of interprofessional activities (Australia and New Zealand Association for Health Professional Educators, 2023). One of their current objectives is to contribute to the scope of practice review in primary healthcare currently occurring in Australia (Thistlethwaite et al., 2023). This review conducted by the Federal Government aims to redesign primary healthcare in Australia to help better meet its needs, in which interprofessional practice can play a significant role; the review is set to be completed in the latter part of 2024 (The Department of Health and Aged Care, 2023). The Australian Health Practitioner Regulation Authority is also seeking public consultation on the proposed Interprofessional Collaborative Practice statement of intent (Australian Health Practitioner Regulation Authority, 2023), indicating that in the future, interprofessional standards could play a role in a health practitioner's ability to practice. It is clear that these bodies are impacting Australia and will continue to do so.

While these reports and reviews are more recent (and in some cases continuing), studies on communication and teamwork in healthcare have a much longer history; the term interprofessional is regarded as first coming to light in the 1960s, being highlighted by the W.H.O in the late 1980s then again in the early 2000s (Thistlethwaite, 2012). The W.H.O

recommendations, along with AIPPEN and ANZAHPE, encourage governments in countries like Australia to support interprofessional practice, which leads to the establishment of several initiatives aimed at promoting professional collaboration and teamwork, including the introduction of interprofessional education programs in universities and the development of national guidelines (Dunston et al., 2020; Matthews et al., 2011; Moran et al., 2015; Steketee et al., 2014; The iTOFT Consortium Australia, 2015; Thistlethwaite et al., 2019). These initiatives have created change in Australia, especially in the education sector, with more health and medical courses including elements of interprofessional practice as part of their curriculum (Australia and New Zealand Association for Health Professional Educators, 2023).

Today, interprofessional practice is gaining recognition as an essential component of healthcare delivery in Australia. The leadership to move it forward is supported by various initiatives, policies, and guidelines. However, challenges remain to be addressed, especially at the ground level. If they were addressed, the interprofessional practice might be utilised in many more clinics across Australia.

Aims and Research Questions

As previously discussed, interprofessional practice has many positives but also has challenges that can make its implementation difficult. As discussed above. the projects completed by the Curriculum Renewal Studies Program (The Interprofessional Curriculum Renewal Consortium Australia, 2013) have given Australia a clear framework for building an interprofessional capable workforce. The Australian Government is starting to support those recommendations, professional associations are beginning to include it as a competency, and healthcare courses are implementing it as part of the curriculum (Australia and New Zealand Association for Health Professional Educators, 2023).

However, even with the most highly trained and capable interprofessional workforce, the workplace of the healthcare practitioner must be structured so that interprofessional practice is functional and sustainable. Issues around operational funding and the structure of how clinics operate must be addressed. Most healthcare in Australia occurs in the primary healthcare setting (Commonwealth of Australia, 2022b), but it is also one of the most complex areas for implementing interprofessional practice due to the variability of how these settings are structured.

The factors mentioned above highlight the bottleneck in expanding interprofessional practice in Australia. While many new healthcare professionals are graduating with interprofessional skills, they are being met with clinics unable to support interprofessional practice, thus stopping them from being utilised. Limited research has explored interprofessional practice in primary healthcare clinics in Australia. Therefore, further research must be conducted to better understand the barriers to implementing interprofessional practice in these clinical settings. As most of these primary healthcare settings are privately run, simply identifying the barriers may not be enough; these businesses will require solutions and, ultimately, a model they can follow, making it easier for them to implement interprofessional practice in the clinical setting.

This study was undertaken with two primary aims. The first aim was to explore barriers and potential ways to overcome identified barriers in implementing interprofessional practice in primary healthcare settings in Australia. To achieve this first aim, two research questions were explored:

1. What are the barriers to implementing interprofessional practice in primary healthcare settings in Australia from the viewpoints of health practitioners working in those settings?

2. How can barriers to implementing interprofessional practice be overcome or resolved?

The second aim of this study was to develop a practice model for implementing interprofessional practice in primary health settings. This aim is to be achieved by integrating findings regarding both the barriers and solutions to these identified barriers and will be used to answer a third research question:

3. How can those solutions to the barriers be applied to create a model that clinics can follow to implement interprofessional practice?

Chapter 2. Literature Review

Chapter Overview

Many research areas relate to interprofessional practice, and exploring them all in-depth would be beyond the scope of this thesis. Part of creating a model of practice requires an in-depth understanding of interprofessional practice itself; this can be achieved by exploring the main themes in the literature that have helped to form its evidence base. An overview of the main research in interprofessional practice is identified, and the areas most related to the model development are presented and critically discussed in this chapter. From a preliminary literature review of the research aims (barriers to implementation, solutions and model development), the following research areas were identified as most relevant:

Education - teaching and training in interprofessional practice.

Teamwork, roles and responsibilities - working in teams and the roles and responsibilities of team members.

Social identity - understanding the role of professional and individual identity in the interprofessional context.

Systems - the systems in which interprofessional practice operates, including government and community.

Application of interprofessional practice in clinical settings - the efficacy and clinical issues related to interprofessional practice.

Person-centred care - the central role of the client in interprofessional practice.

Together with these main areas, The Australian National Healthcare Strategy is also discussed. Any model developed must adhere to the Australian Government's future healthcare strategy to have a greater chance of successful implementation.

Literature Review Methodology

A search strategy on interprofessional practice was devised based on identified keywords. The selection of interprofessional practice keywords is critical in this process because there is no universal terminology, so the terms selected will impact the search results. Adding further complexity, some terms used in prior research are no longer used. For example, Choi and Pak (2006) discuss the differences between the terms interdisciplinary, transdisciplinary, and multidisciplinary in health research; they highlight that terms are ambiguously defined and used interchangeably. According to Choi and Pak (2006) multidisciplinary involves several disciplines, interdisciplinary involves working between several disciplines only (akin to interprofessional but not quite), and transdisciplinary involves working across or beyond several disciplines (transdisciplinary would involve different disciplines, clients, scientists, and other stakeholders). Transdisciplinary seems to be interprofessional, but this term is used less often in more recent research.

The process of reviewing the literature was continuous. As this thesis was carried out over many years, it needed to be continuous to check for new findings in the literature. Variations of those keywords, such as interprofessional practice and collaborative care, also needed to be included. A final search was undertaken in the last months before thesis submission to review the latest findings; the process is explained below to give an example of how the review was undertaken.

Two database search engines were utilised, Academic Search Elite, selecting all available databases (these included Medline and Cinahl). The 'apply related keywords and subjects' were selected, as were 'only peer-reviewed documents. The other database was Proquest Central; all available databases were selected again. The terms "Interprofessional" and "primary healthcare"

were selected by applying the 'related keywords' function, and related keywords would also be selected. The term rural was de-selected as rural interprofessional practice in Australia has some factors that differ from interprofessional practice in metropolitan and regional settings. This search yielded 4613 studies in Academic Search Elite. The inclusion of the term 'Australia' identified 291 studies. Using the same search terms with Proquest Central yielded 654 studies.

The studies were then briefly reviewed for relevance and excluded if they were considered irrelevant to this study. For example, some studies were not included because they focused on students in clinical placement, specific to one condition, such as brain tumours, specific to a population such as First Nations Peoples, or interprofessional practice was a minor component of the study as it was more focused on other issues in primary healthcare. The search results are presented below and grouped according to the relevant research areas identified in the preliminary review.

The Literature on Education in Interprofessional Practice

Educating professionals in interprofessional practice is one of the fundamental requirements for effective interprofessional practice (Barr et al., 2016; Dickie, 2016). Interprofessional practice is not simply bringing together different healthcare practitioners to work on a client's health issue(s). Instead, those participating in interprofessional practice must understand how to operate as part of an interprofessional team, and healthcare professionals need to be taught how to take that approach (Nandan & Scott, 2014). Otherwise, those involved have the potential to revert to a hierarchical structure whereby those in more traditionally more dominant professional positions direct others to do what they believe is the right course of action (Thistlethwaite & Vlasses, 2021).

Research in interprofessional education has covered a broad range of topics, from educational frameworks (Brashers et al., 2020), to systematic reviews of interprofessional education programs (Kirkpatrick et al., 2023), to researching the minutiae of whether one teaching method is better than another (Haruta & Yamamoto, 2020) among many others. Many researchers, such as Danielson and Willgerodt (2018) discuss the importance of developing theory-based interprofessional education frameworks to help identify and achieve the competencies required for interprofessional practice. As discussed in the last chapter, a significant amount of work has been done in Australia in education and curriculum development (Dunston et al., 2018), the next section discusses exactly what those competencies should be.

What Should Interprofessional Practice Education Cover?

Some of these competencies include understanding what different health professions do and what services they can provide so that team members can draw on knowledge in specific areas as required (Barr, 2013). The adage 'learning with and from one another' becomes especially important as it fosters equality and the support of team members (Barr, 2013).

It can be argued that interprofessional practice, at its core, is centred around good communication, again, a skill that may need to be taught. Health professionals will find it difficult to work together when their communication is flawed. Thus, another significant field of research in interprofessional practice education is related to appropriate communication, and much of the education in the field is centred on teaching individuals the skills for better communication with colleagues. In their systematic review, Cheng Han et al. (2020) highlighted the need for individualised, longitudinal, competency-based education to improve communication. While systematic reviews, such as Paxino et al. (2022b), have emphasised the importance of formal communication interactions, they also showed that interprofessional

communication often shows a lack of communication directly from the client in many interactions. In their systematic review, Gleeson et al. (2023) explained how hierarchical structures within hospital settings can hinder proper communication; hierarchical structures can result in the most senior staff making decisions with subordinate staff less likely to contribute, opposite to the aims of interprofessional practice.

It is not just direct verbal communication involved in interprofessional practice; notes and information sharing also play a role; education on how to create effective handover notes in shared care settings is crucial, and interprofessional practice can play a role in improving this process via greater sharing of information and encouraging discussion (Abraham et al., 2023). In many clinical settings, digital record-keeping is becoming more prevalent, and education in creating proper notes is required (Randall et al., 2022). Further forms of communication are being explored, such as clients creating their own data using apps and being able to send messages to their health professionals via those apps to support greater levels of communication. However, Lordon et al. (2020) found that incorporating this data into a client's record can be complex, and the apps themselves did not assist in this process, indicating that the technology in this area needs further development.

The article by O'Keefe et al. (2017) addresses the need for standardised interprofessional education (IPE) competencies among health profession students in Australia. The authors conducted a comprehensive analysis of existing national and international IPE frameworks to identify common competencies essential for effective collaborative practice. The study identified six core competency domains essential for interprofessional education (IPE) among health profession students: professionalism, communication, teamwork, roles and responsibilities, conflict resolution, and reflection. These competencies were aligned with the Australian

Learning and Teaching Council's learning outcome statements, ensuring their relevance to the Australian context. The authors emphasised that these domains represent common themes across national and international IPE frameworks, highlighting their importance for effective collaborative practice. The study proposed a unified competency framework to guide curriculum development, assessment, and accreditation processes, aiming to standardise IPE across health profession programs and promote consistent, high-quality collaborative practice among future healthcare professionals.

How to Teach Interprofessional Practice

How to teach interprofessional practice is another well-researched area, especially with students undergoing healthcare training. Much has been discussed in the field of interprofessional education and research. Work such as that of Rogers et al. (2017), helps to formulate a consensus on how interprofessional education and assessment should occur. With an ever-growing number of institutions incorporating interprofessional education into their curricula, it could be argued that it is important that there is a level of consistency so that when graduates from different institutions meet, they all have similar requisite interprofessional skills.

Consistent with past research findings, interprofessional education usually follows the format of understanding its theory, learning via simulation activities, and practising under supervision (Danielson & Willgerodt, 2018; Fifolt et al., 2023). The skills taught might include specific teamwork techniques such as TeamSTEPPS®, which involve learning about teamwork (discussed further in the next section below) and communication. Assessment is an important part of education, and tools to assess interprofessional competencies, such as the Individual Student Teamwork Assessment Tool (The iTOFT Consortium Australia, 2015), test teamwork knowledge to ensure that the interprofessional education has been adequately understood. Fifolt

et al. (2023) suggest that simulation activities are a safe and effective way to teach and practice interprofessional skills. Those simulations can lead to students practising their skills with members of the general public. Programs such as The Leicester Model of Interprofessional Education allow students to integrate their interprofessional education with the real-world experience of working with clients (Anderson & Lennox, 2009). Student work placements external to teaching institutions can also be used to reinforce learnt skills, and service-learning (where practice helps the community) can have the added benefit of practising these skills in community environments to further good citizenship (Moran et al., 2024).

Wilhelmsson et al. (2009) detail the development and implementation of IPE programs designed to foster collaboration among healthcare students. They highlighted the integration of IPE into curricula, the establishment of interprofessional training wards, and the emphasis on teamwork and communication skills. The study reported positive outcomes, including enhanced interprofessional competencies and improved patient care. The authors concluded that Linköping's IPE model serves as a sustainable and innovative approach to healthcare education, offering valuable insights for institutions aiming to implement similar programs.

Researchers have also argued that interprofessional education should not be a one-off experience, Nyoni et al. (2021) highlighted the importance of continual education in the field. Education is about training both those becoming healthcare practitioners and those who have been practising for many years and want to learn to take a more interprofessional approach. As interprofessional practice also includes reflective practices, asking the individuals to reflect on their performance within the team, an individual's knowledge gaps can be identified and education used to fill the gaps; thus, education is ongoing and part of the health practitioner's continual development (Brock et al., 2013).

Resources already exist for continual development. While educational materials are not the focus of this model development, it should be highlighted that multiple sources of information are available. The Interprofessional Education Centre hosted by ANZAHPE (Australia and New Zealand Association for Health Professional Educators, 2023) highlights the research educational resources available. There are conferences (All Together Better Health) and entire journals (such as the Journal of Interprofessional Care) focusing on sharing interprofessional education knowledge. Repositories of educational information are held by groups such as Interprofessional Global (Interprofessional.Global, 2023b), and projects such as the Curriculum Renewal Studies Program undertaken in Australia (The Interprofessional Curriculum Renewal Consortium Australia, 2013), help set a standard for introducing interprofessional practice into health courses; these initiatives highlight the research produced in this field. More specifically, for this study, educational research needs to be reviewed in the context of the primary practice setting.

Education in the Context of Interprofessional Practice and Primary Care Settings

The aim of curriculum design is to give students the skills they need for the workforce, in this case, primary healthcare settings. Authors such as Ryan et al. (2016) have discussed approaches to make health education more applicable, such as identifying future workplace needs. Gum et al. (2013) focused on teaching interprofessional capabilities to healthcare students in a primary healthcare setting. The study utilised an action-based methodology with three cycles. The first was to explore an interprofessional practice framework, refine it, and make recommendations. The framework incorporated three main areas: awareness of their own and other professional scopes and roles, how to best utilise collaborative skills to improve teamwork and being client-focused so that they are working in partnership with clients rather than simply

informing them of what to do. While these skills are essential, the issue of how to translate them to those who are already working in the field and have not had interprofessional practice training needs to be taken into consideration; studies such as (Bielska & Hampel, 2013) have shown that established healthcare professionals can quite easily fall back into traditional patterns.

Flood et al. (2014) also focused on the educational component of interprofessional practice in primary healthcare. They do so by considering Kotter's eight-step change model, which can be used to help guide and establish organisational change. While the study showed the effectiveness of Kotter's model in introducing change, it was undertaken in New Zealand, which has a slightly different health system from Australia and was part of a student clinic; therefore, it is not entirely applicable to Australian primary health clinics. Students may be more open-minded to learning new approaches to healthcare. In contrast, individuals who have been working in the industry for many years may be more set in their ways. Asking these experienced professionals to adopt a new approach to healthcare provision could be more difficult (Johansson et al., 2014). This suggests that promoting new ideas in certain environments might be particularly challenging.

A study by Braithwaite et al. (2012) took the idea of promoting interprofessional practice and allowing health care practitioners to utilise it as they choose rather than forcing them to undertake interprofessional training. This four-year study involved thousands of healthcare practitioners. Practitioners agreed that there was an increase in knowledge between professions and improved quality of client care, but professional rivalries had not lessened, and trust between professions had not improved. Also, they noted that doctor centrality increased instead of decreasing in interprofessional practice. This was again an action-based research study undertaken in Australia, but it highlights that simply providing funds and education is not

enough to create change in clinics; barriers to why some changes are not occurring need to be explored, and then a model can be created that guides clinical implementation.

Knowledge Gaps in Interprofessional Education

Based on the research reviewed, it would seem that while education is an integral part of interprofessional practice, less research has been carried out in the primary healthcare setting. In the primary healthcare setting, education would need to be varied between more recent graduates in healthcare who may have had some training in interprofessional practice and those who have never had interprofessional practice training and have been working in a "non-interprofessional" way for many years. This highlights the need for flexibility and the ability to direct clinics to the abundant resources available to their staff. Further research is needed to understand why these materials are not being utilised. Educational programs have been introduced, but it seems the change to interprofessional practice is not sustainable and needs further investigation.

The Literature on Teamwork, Roles, and Responsibilities

In addition to researchers highlighting the importance of interprofessional education, a review of the literature indicates that another key theme is the importance of teamwork in interprofessional practice (Reeves et al., 2018b). Interprofessional practice is teamwork, but teamwork can take many forms. Teamwork can be effective, but its goals may differ from those of interprofessional practice, such as making the healthcare service the most money, which may not be client-centred. Teamwork in an interprofessional sense needs to work towards the goals of interprofessional practice, of which the client is at the centre.

What Does Interprofessional Teamwork Entail?

Successful collaboration requires clear roles, effective communication, mutual respect, and shared decision-making (Reeves et al., 2018a); again, these concepts do not automatically

form when a group is created; there needs to be processes around how these concepts are

applied. Much of the literature on interprofessional practice discusses the importance of having

some structure regarding team meetings and collaboration (Nguyen et al., 2021). Casual

conversations might be more relaxed and can occur ad hoc, but they can also potentially miss

important information (Bentley et al., 2018). Instead, meeting with clear goals and a framework

can help to ensure that the team is more effective and, hence, is more beneficial for the client.

As discussed earlier, TeamSTEPPS® is often used as a framework to create an effective

teamwork environment. TeamSTEPPS® is based on the following ideas: leadership - that the

most relevant person leads, rather than the most senior in the hierarchy; good communication –

allowing everyone to speak and voice concerns; mutual support – so that everyone in the team

feels that they can share their views and situation monitoring – which involves being aware of

anyone in the team that feels uncomfortable (Welsch et al., 2018). By having this framework,

team dynamics can be improved.

Teaching effective teamwork can lead to better team dynamics, as the systematic review

by Spaulding et al. (2021) showed, but not everyone knows the importance of team dynamics.

The systematic review by Sigmon et al. (2023) suggested that clients and families were largely

unaware of interprofessional practice and teamwork collaboration amongst health professionals

but were supportive when they understood interprofessional practice. Teamwork skills can also

be applied via simulation activities. In their systematic review, Wooding et al. (2020) showed

that simulation activities can be an excellent way to build these teamwork skills. Thus, education

on teamwork skills is an important element in developing effective teamwork; clear roles and

responsibilities within the team are another.

Roles and Responsibilities

For an interprofessional practice team to function effectively, clear professional roles and responsibilities must be established (Gunaldo et al., 2020); this ensures that every team member knows what to do. It is also essential for team members to have a comprehensive understanding of the goals of meetings. Proper collaboration amongst different professions is essential as it allows for the utilisation of unique expertise and contributions while avoiding conflicts related to professional boundaries; by recognising each person's area of expertise, other team members can encourage them to lead the conversation at relevant points during the discussion (Hajjar et al., 2021).

The leadership role within the team in interprofessional practice is often not fixed and can change throughout the session; there is also the role of note taker, with the rest as contributors and observers. This change in leadership used in interprofessional practice is reflective of the situational theory of leadership (Chatalalsingh & Reeves, 2014), whereby leadership takes a much more fluid and adaptive role, depending on the team's circumstances and needs. Therefore, an expert in one area may assume team leadership because their expertise is most relevant to the discussed topic. Moreover, Forman et al. (2015) discuss other factors that impact interprofessional leadership such as emotional intelligence, communication, and coaching abilities; a leader can benefit the group if they have better communication skills so that they can express ideas to the group and help others express those ideas, emotional intelligence helps with awareness of the emotional state of others, and coaching can help get the best out of others in the group.

Responsibilities within interprofessional practice refer to the individual performing the duties required to perform in the team. Some of these duties relate to the role they have been given, such as note taker or team leader; others are general, such as engaging in situational

awareness, whereby if one individual is dominating the conversation, another might speak up so that those intimidated might feel more comfortable to communicate their views; this way everyone in the group is situationally aware of what is occurring within the conversations (Jonsson et al., 2021).

The other responsibility that people have within an interprofessional context is to speak up if they have concerns about what a team member is saying. Sometimes, people feel intimidated about offering views contrary to those they perceive as in higher authority, so actively speaking up and hearing those concerns is essential (Herge & Hass, 2023).

Teamwork, Roles, and Responsibilities in the Context of Interprofessional Practice and Primary Healthcare Settings

Roles and responsibilities must also be established within teams that work across organisations. A systematic review by Lisy et al. (2021) considered barriers and facilitators to shared care between primary and specialist cancer teams. While this is somewhat outside the scope of primary healthcare, it is a challenge that primary healthcare clinics face in sharing information between the primary health clinic and the specialist centre. Again, the ideas of clearly defined roles, training clarity and protocols, and guidelines for follow-up care were shown to be necessary. This review also identified that electronic records were used as communication tools to help make sure that there was rapid and accurate communication between clinics. The importance of developing policy to reduce fragmentation of service was also noted. While this review showed some integration of care, highlighting the importance of communication and the sharing of information via electronic medical records, there was a lack of discussion and team meetings, which is at the heart of interprofessional communication.

While studies such as Lisy et al. (2021) highlighted the importance of communication in interprofessional practice, others such as Lawn et al. (2015) focus on some of the communication challenges. Lawn et al. (2015) identified the importance of participant consent for communication and the need for an operational framework to support some existing mechanisms, such as care plans. This study reiterates the importance of putting time and resources into open communication and outlines some strategies for improving team care; for example, it discusses overlapping care plans, where different healthcare workers will have their treatment plans, whereas one comprehensive care plan for the client may be more beneficial.

Currently, within an Australian context, clients have a Medicare-funded 'care plan' they can implement. However, there are limitations, such as how much can be paid to the clinic to develop that care plan, that it only allows for five sessions, with a minimum of two practitioners, and that it is only for specific clients (Commonwealth of Australia, 2023c). The study by Lawn et al. (2015) suggests a comprehensive treatment plan that includes all allied and specialist practitioners is needed so that practitioners are aware of the treatment goals and team; this would help solve the issue of non-care plan listed practitioners not being involved nor aware of the overall treatment goals. However, the study then asks how such a plan would be created. Comprehensive care plans would need to be designed by the clinic and agreed upon by all involved; the Australian healthcare system does not have such a comprehensive plan that is widely available, nor does it fund one. Successful teamwork becomes even more important without a comprehensive care plan to guide all practitioners.

Nancarrow et al. (2013) reported on ten characteristics of good interdisciplinary teamwork. The characteristics include positive leadership and management, suitable communication structures, personal reward, training and development, appropriate resources and

procedures, appropriate skill mix, supportive team climate, individual characteristics, support of interdisciplinary teamwork, clarity of vision, quality of outcomes, and respecting and understanding roles. The study reflects many of the studies in the field and adds to the body of knowledge in that it explains and clearly defines what is required but not how it might be implemented. From a practical perspective, clinics may find it challenging to implement such knowledge; they may not have the requisite knowledge to apply the characteristics, hence the need for frameworks and models to help implement interprofessional practice.

Many studies identify what would help introduce interprofessional practice, but none go into enough detail for a clinic to develop and implement it without significant work and further research. Hepworth and Marley (2010) write about a practical framework for teamwork integration, but they give general tips rather than specifics of what could be done; for example, they discuss the importance of asking questions such as who makes up the team, what are the team goals, and discuss different types of meetings, but do not ask where they meet, who pays for the participants' time, what are the ethical and legal ramifications of shared information and where is information stored. Studies like this highlight the importance of teamwork, but without answers to other questions, it falls short of helping clinics implement interprofessional practice.

Similarly, a case study by Sibbald et al. (2020) focused on what makes a good interprofessional network, and they found four characteristics and five critical junctures. The four characteristics were a growth mindset and quality improvement focus, having clear team roles that were strength-based so team members know their roles, play to their strengths, and that there is a shared leadership and a shared success model. No one is in charge, and the team operates with the ethos of transparent communication. The junctures acknowledge a need for interprofessional practice, creating a shared vision, receiving external validation, and

demonstrating improvement of client outcomes. Again, there is a discussion of what is needed but not how it can be achieved.

Knowledge Gaps in Teamwork

As indicated in the literature review, the areas of teamwork, roles, and responsibilities have been extensively researched. Quite nuanced knowledge exists regarding improving teamwork and what works best. There are systematic reviews that highlight what makes a good interprofessional team. But with this knowledge, again, the question must be asked: why do we not see interprofessional practice occurring in primary healthcare clinics as much as we should? There would seem to be something missing between the knowledge base and the practical application; the barriers to this application warrant further research.

The Literature on Social Identity

Much has been written about the issue of identity and professional roles and identities in interprofessional practice (Gunaldo et al., 2020). Teams and communication involve people, and each person brings their professional identity and personal attributes with them; this can be defined as part of their social identity.

Tajfel and Turner's Social Identity Theory (Pecukonis, 2014), explains how the individual's social/professional identity can affect their perceptions, attitudes, and behaviours towards other team members. For example, an interprofessional team meeting comprising senior medical doctors with limited interprofessional practice experience and recent graduates from allied health might have issues. This scenario may encounter issues with hierarchy, where those considered more senior may take charge of the meeting and give less opportunity for new graduates to voice their opinions and participate in decision-making, or the new graduates may be less inclined to speak up in such an environment.

However, it has been argued that these issues in professional identity affecting team dynamics can be addressed through better interprofessional education on team dynamics (Spaulding et al., 2021). If power imbalances are evident, behaviour can be addressed if team members are educated on how to do so. Understanding social identities can greatly enhance interprofessional relationships and collaboration. Any model seeking to foster the implementation of interprofessional practice will need to consider identity and collaboration because of the ramifications that can occur when roles are confused and an individual's professional identity is challenged. At best this can result in an ineffective interprofessional team; at worst, it could cost a life.

Social Identity in the Context of Interprofessional Practice and Primary Care Settings

Part of the exploration of social identity requires an understanding of the professions of possible team members. Freund et al. (2015) investigated who makes up the interprofessional team. In primary care, this is a mix between medical doctors, allied healthcare professionals, and nurses. There are significant differences in funding and education worldwide for these roles. Nurses were identified as the prominent non-medical-doctor interprofessional team members. This study discussed the shift to more interprofessional practice care; as they reported, there was a worldwide shortage of medical doctors at the time, which led to people in other fields being able to provide services. The study did not consider other allied health professionals in great detail but mainly focused on nursing. It did not consider the number of psychologists, dietitians, physiotherapists, and other allied health team members working in health settings. While this study helps to give insight into interprofessional teams and highlights the importance of nurses, it missed out on further insights about allied health team members even though the aim was to consider the primary care workforce.

The role of nursing in interprofessional practice is essential due to the broad scope of activities that nurses perform in the primary practice setting. Thus, they can be integral to interprofessional practice. The paper by Pearce et al. (2011) explains that nursing roles in the private practice setting are very much limited by fee structure and policy. They used a multimethod study, which included interviews, observations, and detailed case studies involving doctors, nurses, and managers. Of course, the study has limitations, as it did not consider allied health; however, the implications for funding are still the same: interprofessional roles are hard to sustain without proper funding.

Many studies considered the role of doctors and nurses in interprofessional practice. Schadewaldt et al. (2014) examined the collaboration between nurses and medical practitioners in primary healthcare. They found that "Despite the large number of definitions and models describing the ideal of collaboration, the real-world experience is often a traditional model of uni-disciplinary patient care under different levels of hierarchy" (p.1189). This quote highlights what many other studies say: while interprofessional practice is the goal, most clinical work seems to fall back to traditional models. The field has sufficient research and training, but the clinical application is not at the level where it could be; what the barriers are is something this research will investigate.

Having already discussed the importance of nursing, Chua et al. (2023) discuss a novel approach whereby the clinic is nurse-led. The clinic in this study was primarily for people from culturally and linguistically diverse backgrounds who might have had trouble navigating the healthcare system. In this case, by making the clinic nurse-led and assigning case managers to coordinate client healthcare, they could better provide support and services to their clients. This positive support was reflected in the feedback of clients and healthcare professionals, as there

was an improvement in healthcare quality, accessibility, and system efficiency. However, this study also suggests that further studies must be conducted to confirm the benefits in other settings and provide a cost analysis of having such roles in place.

Another study focusing on the general practitioner and nurse roles was the study by McInnes et al. (2017). This qualitative study, conducted in general practice settings, found four main themes. The first was interpreting collaboration in general practice, which was related to the participant's understanding of collaboration. Modes of communication were supposed to be reflected as clear and open communication, whereas they described most communication as ad hoc or informal. The facilitators of collaboration were seen as education and training in the use of inclusive language. Collaboration in practice was low, with nurses and doctors working in isolation while nurses worked on task attainment that alleviated GPs' workloads; again, this study showed a more traditional approach to the nurse / GP relationship than being truly interprofessional.

Further focusing on nurses, Henderson et al. (2014) reviewed nurses' viewpoints in primary healthcare settings. They pointed out the critical role of the primary healthcare setting in reducing the burden of chronic disease. Their study also highlighted that while there is a want for a more significant role for primary healthcare in chronic disease management and for nurses in particular to support that, it has been hampered by private business funding and medical opposition, whereby some doctors may not necessarily want nurses to take on some of their roles. From an interprofessional practice perspective, this again highlights some of the issues of funding, defined roles, and teamwork. However, the limitation of this paper is that it only considers nurses' perspectives, whereas interprofessional practice covers a much broader scope of health practitioners, such as allied healthcare professionals.

A study that does consider allied healthcare is that by Seaton et al. (2021), which states that it is the first methodologically inclusive literature review exploring allied healthcare professionals' perceptions of primary healthcare. The study found five themes related to their perception of primary healthcare. The themes were shared philosophy, communication and clinical interactions, physical environment, power in the hierarchy, and financial considerations. They highlighted the importance of informal communication; informal communication may be the only way interprofessional practice can occur when there is no funding available for formalised meetings; thus, the allied health professional and those who were geographically separated found interprofessional practice more difficult. Understandably, informal communication is more common, but it would seem that this results from a lack of funding as opposed to the preferred way to function. The informal meeting should not be disregarded entirely; it should be part of interprofessional practice, but not the only form of interprofessional practice.

While studies have focused on medical doctors, nurses, and allied healthcare professionals, many did not include complementary and alternative medicine practitioners, such as Traditional Chinese Medicine. The study by Chung et al. (2012) considers some of the issues related to healthcare practitioners in this field, who might use different language and approaches to healthcare. In principle, they identified that interprofessional practice operates similarly, but preserving their approach, which may differ from other forms of healthcare, will be the biggest challenge. It could be argued that Traditional Chinese Medicine should potentially be included because acupuncture is covered by Medicare when performed by a medical doctor and is covered by many forms of health insurance in Australia. With the possibility of a care team with medical,

allied health, and complementary members, the role of a care coordinator should be considered in managing such diverse groups.

A care coordinator can be an important part of chronic disease management; Parker and Fuller (2016) reviewed the efficacy of nurses playing the care coordinator role. Again, due to the different duties that the practice nurse can perform, they would seem to be well suited to the role of care coordinator, but this study found that the discipline from which the care coordinator comes does not necessarily make a difference; what was more important was whether the person had training as a care coordinator. This is important because it means that the role of the care coordinator is not limited to nurses and can be performed by others if they have appropriate training. There would be limitations if a person comes from an administrative background rather than a health background, and ensuring that they do not overstep in providing health services instead of just ensuring that the individual participates in the interprofessional practice program.

Knowledge Gaps in Social Identity

This section highlights that much of the work in social identity focuses on the nurse and medical doctor roles. Some healthcare professionals may find their role more challenging or in conflict with other healthcare professionals, as with Traditional Chinese Medicine practitioners. The nurse's role is important, and possibly even more so is the role of a care coordinator, who could be the person who ensures that roles are being maintained not only amongst healthcare professionals but also that the client is taking part in their care. Research does focus on particular fields in allied health, such as physiotherapists and their perspectives on interprofessional practice in primary health care (Lewis & Gill, 2023), but the research lacks the broader perspectives of multiple allied health across teams in primary healthcare. This study will attempt

to gain a broader understanding of the challenges faced by various allied health practitioners in primary healthcare when trying to perform in an interprofessional manner.

The Literature on Systems

Healthcare organisations are complex systems with interconnected parts (Willis & Parry, 2012). Therefore, interprofessional practice requires a systematic approach that considers the broader context of healthcare professions and policy frameworks; this might include considering the organisational structure, available resources, and aspects that can facilitate or hinder collaboration (Naccarella et al., 2013). In this study, systems and resources will refer to interprofessional practice's requirements and the means needed to allow it to run. When introducing a new practice model, aspects such as cost and laws must be considered with change management processes. Policy, logistics, technology, and ethics are some of the things involved in systematic change, and any of them has the potential to stop that change from occurring (Lewis & Gill, 2023). For example, if it were economically unviable to operate in an interprofessional practice manner, it may discourage many practitioners from participating; therefore, change might need to occur in multiple areas, such as how services are funded and the logistics around them.

Systems theories in interprofessional practice help explain the relationships between these multiple areas; two theories often considered are activity theory and complexity theory (O'Leary & Boland, 2020). In the context of interprofessional practice, activity theory helps analyse and explain the complex dynamics and interactions that occur when health professionals work in an interprofessional manner. It focuses on the activities, goals, and motivations of individuals within the group, considering the roles, tools, and environment in which they are operating can refer to (Byerly et al., 2021). Complexity theory is less linear than activity theory

and acknowledges that healthcare is a complex adaptive system involving multiple health

professionals, patients, organisations, policies, and environmental factors. It emphasises the

interconnectedness, emergence, and unpredictability of interactions within this system. Rather

than trying to simplify or control the system, complexity theory encourages understanding and

embracing complexity to improve collaborative practice and client outcomes (Hilts et al., 2013).

Due to the complexity of the interconnectedness of systems in trying to introduce

interprofessional practice, a framework was needed to help conceptualise the different areas

involved in implementing interprofessional practice.

Selecting a Framework

The Social-Ecological Model: A Framework for Prevention (Perkinson et al., 2007) helps

highlight the interplay between individuals, their relationships, community, and broader society.

See Figure 1.

Figure 1

The Social Ecological Model: A Framework for Prevention

Note. Image sourced from The Centers for Disease Control and Prevention.
(https://www.cdc.gov/violence-prevention/about/index.html)

This social-ecological model was originally developed to help stop violence in

communities by identifying that such problems have complex and interrelated parts that all need

to be considered when developing solutions (Perkinson et al., 2007). It can be applied in health

and interprofessional contexts because of its focus on the interplay between individuals, their relationships with others, the broader community, and society (Cowan et al., 2021; Nonyel et al., 2021; Plusch & Jane Muir, 2023; Ryan et al., 2021). More specifically, this research will consider The Social Ecological Model from the following perspectives:

Individuals – would refer to both clients receiving care and the health practitioners and administrative staff involved in that care. Thus, the individual factors must be taken into consideration.

Relationships – the health practitioners and administrative staff will have factors relating to their relationship that may impact the service provision of interprofessional practice. Together with this, there are also the relationships between the clients and the healthcare staff. Moreover, if multiple organisations are involved, it may also relate to how those organisations relate to one another.

Community – can refer to their workplace community and the local community to which they belong. Changes in those environments may be required for interprofessional practice to occur more effectively.

Societal – this level looks at broader societal factors, including laws, health policy, and funding. It may also focus on the societal acceptance of interprofessional practice, whereby it is more well-known in the broader community.

Identifying these different levels may mean that change needs to occur within them; as such, how change occurs within a system should also be considered.

Implementing Change

A new idea, practice, or technology is usually not immediately adopted and takes time to spread within a system (Miranda et al., 2016); this would also hold true for adopting and

implementing collaborative approaches and disseminating successful models. The diffusion of innovation is often seen when new technologies are being implemented; it can also be observed in social systems (Zhang et al., 2015). Essentially, there must be a critical mass of acceptance and uptake before the technology, idea, or model becomes a regular part of practice (Sanson-Fisher, 2004). According to the law of diffusion of innovation, the tipping point is usually around 18% of uptake before many others want to utilise that innovation. At that point, enough of a critical mass is created that many people become more open to new ideas and decide to participate. It is then that innovation becomes quite widespread, leaving only those resistant to change not taking to the innovation (Çakıroğlu et al., 2022). It is difficult to determine the exact percentage of healthcare practitioners implementing interprofessional practice and to what degree. However, as more interprofessional education is being incorporated into curriculums, more graduates will be equipped with the knowledge of interprofessional practice, which will likely lead to an increase in the percentage of professionals who integrate it into their work, which may create the tipping point for healthcare.

Systems in the Context of Interprofessional Practice and Primary Care Settings

The Australian healthcare system provides both public and private services, and the study by McDonald et al. (2011) examined interprofessional practice and the links between private and public sector organisations. In chronic and complex conditions, interventions by large organisations such as hospitals, which often fall under the public sector, are often needed. Surprisingly, this study found collaboration was easier in private sector organisations than between the private and public sectors, and the financial incentives were enough to overcome organisational barriers while maintaining economic sustainability. They also note significant differences in the cost of collaboration depending on the organisation's size, as the size of the

organisation (number of locations and staff) will relate to how easily collaboration can occur. They also found a difference between the organisations' priorities, whereby public sector organisations focused more on population health than the individual, which was more of a focus of the private sector. The researchers also highlight the difference between clearly defined roles and where roles are blurred. The blurred roles were referred to as transdisciplinary team members; for example, this could be a nurse who completes nursing roles and operates as a case manager, coordinating services for the client. Regarding inter-organisational collaboration, they identified the differences between linkage, coordination, and integration; linkage is where the individual might need referrals. Coordination is more of a structured form of sharing clinical information, and integration is developing new structures or entities to manage the team setting. They also highlight the importance of a different payment structure to make the transdisciplinary roles more viable.

From a systems perspective, any interprofessional practice model must adhere to the law. Ries (2017) discusses the legal implications of operating interprofessionally; it should be noted that this paper is an editorial. However, it raises some interesting points in that it makes it clear that past research has identified legal liability fears for many healthcare professionals. They raise the importance of the need for more research from a legal perspective and the complexities of team-based approaches and responsibilities of duty of care. Law and policymakers need to establish models to help clarify this issue. This could be supported by investigating legal disputes and outcomes whereby systematic analyses would help to interpret and form law. Moreover, they suggest this work should be done worldwide in different healthcare systems. From this paper, it is clear that any model developed will not answer all the legal questions and that legal issues may shape future model refinement as they arise. For example, a situation with legal

ramifications might set a legal precedent that changes how interprofessional practice occurs. Ultimately, laws can clarify responsibilities, but it could be argued that to what degree a person follows those laws may relate to their own values.

As people work together, they can better understand or connect with others with the same values; as discussed in Chapter 1, work such as The iTOFT Consortium Australia (2015) helped to explore such issues. The study by Grace et al. (2017) explored some of these concepts. It identified two core values of interprofessional practice: the rights of the client and the capacity of a particular profession to serve the healthcare needs of clients. The clients' rights included advocacy, effective communication, person-centred care, and safe and legal ethical practice. Meanwhile, for the profession, the values included profession-specific knowledge and skills, health promotion and illness prevention, evidence-based practice, primary healthcare, and professionalism. Values can be used to link different groups together and make sure everybody is 'on the same page'. It also should be noted that just because a profession holds these values does not necessarily mean that the practitioners within those professions hold those same values. Any model development should include values to connect healthcare professionals and clients.

One particular value discussed when considering healthcare systems is value-based healthcare, which refers to placing a value on the healthcare outcome and that funding should relate to that outcome (Gray, 2017). Governments are tasked with the responsible spending of public funds. Interprofessional practice could be costly, and while savings could offset this by avoiding more intensive modes of care, it does bring up the issue of the client not engaging and the associated costs. For example, if a clinic engages the interprofessional team and devises a team care plan the client does not engage in, it wastes resources. The client's role and engagement level in that treatment plan becomes crucial (Davidson, Morgan, et al., 2022).

Medicare-funded team care arrangements are one way in which the government in Australia tries to encourage interprofessional practice. Foster and Mitchell (2015) looked at the client's experience with this. They found that the client experience was positive if their expectations and preferences were considered when making decisions as part of the team care arrangements. The financial incentives offered with the team care arrangement did encourage them to take part, and they did enjoy the team component of the care; however, the client needed to want to take part and follow up on what was requested.

Another important aspect to consider, along with economic sustainability, is functional space and resources. Pullon et al. (2016) used a case study design to examine interprofessional practice in New Zealand. The study utilised direct observations and non-participant observation in health-professional interactions. Space was identified as a theme, as was viability, hierarchy, resources, respect and trust. Thus, if a clinic has the appropriate space requirements for team discussions, is economically viable and properly resourced, and has effective teams based on respect, trust and lack of rigid hierarchy, it is much more supportive of interprofessional practice occurring. A highlight of the study was that it looked at the organisational structure and the problems with it. They highlighted the importance of the built environment for team interactions. This study has some issues: observation can change people's behaviours and may not give an accurate picture of what is occurring. Like many other studies, they have highlighted issues but then give vague ideas of possible solutions. However, that may not be enough for a practice that will need more specific information to implement interprofessional practice.

Knowledge Gaps in Systems

Interprofessional practice involves the interplay of many systems; it does not simply relate to one. The balance in this research must be found between a guiding framework that

offers enough complexity to consider different components of the workplace, community, and healthcare systems without becoming so complex that it becomes unworkable for businesses to apply. Hence, the social-ecological model was chosen. It contains the major components related to interprofessional practice without being overly complex. It can show businesses how to easily identify the role of interprofessional practice in a broader healthcare context.

As the above research has shown, interprofessional practice needs people united in sharing the same core values; it needs to be cost-effective, have clear roles and responsibilities, and have an infrastructure and environment that allows interprofessional practice to occur more readily. Past research does not seem to have a clear answer as to how the different parts of the system can be integrated to address the barriers. A model may be able to address this issue. The model will not be static; it will need to evolve and be shaped by the environment in which it exists. In this case, it will be shaped over time by policy, the Australian healthcare system, and those participating in it. At the core of these systems is the client getting treatment, hence why person-centred care is identified as an important part of interprofessional practice.

The Literature on Person-Centred Care

One of the central tenets of interprofessional practice is that it is client-centred (Herbert, 2005). While this might seem apparent initially, as healthcare is fundamentally about caring for people, the healthcare system can make this goal challenging. For example, a life-saving drug should be given to a client in need, but if the healthcare system does not fund such a drug, economics may be at the core of solving the issue for the individual, not the client's needs. In interprofessional practice, there is the need to create person-centred healthcare amid many other competing interests.

Person-centred care emphasises the importance of involving patients as active partners in their care and considers their preferences, values, and goals (Riste et al., 2018). The client should be at the centre of team planning as interprofessional practice is not just the communication between healthcare practitioners but has client outcomes as its goal (Dahlke et al., 2020). Different forms of interprofessional practice can involve the client in different levels and ways.

For example, clinical interviews with the client might be conducted with multiple practitioners present, or if this is not possible when health practitioners meet and discuss a treatment plan, the treatment plan will then be discussed with the client. This approach is different to health practitioners reviewing a client's file, discussing it, and then simply giving a treatment plan to the client without input from them. Healthcare often overlooks the crucial aspect of ensuring clients are comfortable with their treatment plan (Romme et al., 2020b). Clients may struggle to follow a treatment plan that does not suit them or may refuse to follow it. As a result, the plan may go unfulfilled or not be adhered to properly (Davidson, Kelly, et al., 2022). Discussions with the client can alter the treatment plan to suit their needs better. This approach increases the likelihood of the client fulfilling the plan and achieving the desired outcomes (Wenaas et al., 2021). The client may have different wants and needs than the interprofessional team's. The client may not want to participate in interprofessional practice or have little regard for their healthcare, rendering interprofessional team planning challenging.

Person-Centred Care in the Context of Interprofessional Practice and Primary Care Settings

What clients think of interprofessional practice is essential to consider. Davidson et al. (2022) conducted an integrative review of the client's experiences with interprofessional practice using quantitative and qualitative methods. The review looked at 48 studies and it found that most people had a positive interprofessional practice experience. The client's role was vital

regarding their links with their experience. The interaction with their healthcare providers can influence their experience, how convenient it is for them to engage in their healthcare, and their self-care outside of appointments. This would indicate that any interprofessional model needs to include resources for the client and their healthcare practitioner.

Further to Davidson et al. (2022), Banfield et al. (2017) investigated clients' interprofessional practice experience in primary healthcare. This qualitative study, in which semi-structured interviews were conducted with clients and staff, identified that clients like the idea of continuity of providers and the usefulness of shared information. Staff highlighted the need for a cultural shift to enable interprofessional practice, as workplace culture can block interprofessional practice. A strength of this study is that it considers the client's perspective and highlights the benefits; however, this was a pilot study and mainly looked at the idea of integrated care and what that looks like for certain client cohorts. It is also interesting to note that the healthcare centre used in this research was a GP super clinic. Super clinics were supposed to help integrate care. They could be a foundation for interprofessional practice in private healthcare settings, but the research on interprofessional practice and GP super clinics is limited.

It could be argued that one possible solution for getting clients involved with healthcare is to utilise smartphones and symptom checker apps. The study by Wetzel et al. (2022) discusses the ethical, legal, and social implications of using such apps. It reports that there may be issues around overuse and too much information, which could overwhelm those trying to process this extra information. As this study is being conducted in different parts, the next stage of their data analysis has not yet been published to answer some of the questions they have presented in this study.

Some studies on the client's experience focus on a particular condition. Pain cuts across many disorders and conditions; a study by Davies et al. (2011) considered an interprofessional approach to pain treatment. They identified that there needs to be some flexibility in how interprofessional practice is applied, taking into consideration the lived experience of the individual, in this case with pain, and an approach whereby the client's needs are central and fed into the working relationship with the practitioners. In other words, the more engaged the client is, the more likely the practitioner is to engage in the service. However, there are limitations with this study in that it was part of a hospital setting, which may not be directly applicable to the primary healthcare setting, but the findings should still be taken into consideration.

Knowledge Gaps in Person-Centred Care

Person-centred healthcare is central to interprofessional practice, helping to benefit the client. These studies highlight the need for a model that includes the client's involvement because it can enhance outcomes and increase practitioner involvement. However, a client's experience can vary and may change as the client's experience changes. This identifies the need for a model that operates under different contexts and is flexible as situations change.

The literature reflects the complexity of person-centred care. Apart from being clients, very little may connect them; different ages, conditions, personalities, functional capacities, communication styles, and many other factors can influence them and, therefore, how the interprofessional team operates. The literature tries to identify what may work for particular groups of clients, but there is no overall answer. Maybe it is up to the individual clinic to develop what works best for their clients.

The Literature on Applying Interprofessional Practice in Clinical Settings

The research presented in this section explores the uptake and spread of interprofessional practice in clinical settings and the factors that have affected it. Applying interprofessional practice in a clinical setting is more complex than, for example, in a classroom setting. Classrooms have ready groups of people in a more controlled environment; via simulation activities, they can obtain willing participants (often other students) without needing interest from the general public. Classroom simulation does not have the same ethical issues as it does not collect data on individual health care and health outcomes. It could be argued that this makes research around interprofessional practice easier in educational settings. When examining interprofessional practice in clinical settings, it is often conducted in settings where it is already established or is easier to apply, such as in a hospital setting (Gleeson et al., 2023). This logically makes sense because if investigations into efficacy are to occur, they will occur where interprofessional practice is already established in some form.

Hospital settings lend themselves well to interprofessional practice because many healthcare practitioners are located at one site and are usually employed by the hospital. Researchers such as McHugh et al. (2020) have conducted systematic reviews of interprofessional practice in hospital settings. This review highlighted the importance of interprofessional communication in hospital teams. Beament et al. (2018) used the hospital setting to test a client handover tool while using interprofessional practice to enhance its effectiveness. Other research has occurred in other clinical settings such as nursing homes (Sadeq et al., 2022), rural healthcare settings (Croker & Hudson, 2015) and community healthcare settings (Asmara et al., 2021).

This thesis considers an area where interprofessional practice occurs less frequently: primary healthcare (Fox et al., 2021). Primary healthcare does not have the same advantages as a hospital in that practitioners may be working from multiple locations and are not renumerated in the same way. Larger organisations like hospitals or aged care facilities may face challenges different from those in smaller primary care settings.

One of the early attempts to increase interprofessional primary health care was the implementation of the General Practice Super Clinics. Super Clinics were a way to bring together different areas of medicine to make them more of a one-stop shop for primary healthcare. These large clinics with many health professionals co-located at one premise were supposed to foster higher levels of teamwork. Lane et al. (2017) conducted a case study of Super Clinics, which included reviewing practice documents, observations, and in-depth interviews. The study found that although different professional groups were co-located, interprofessional practice was difficult as they had other competing priorities. They found that the program objectives for integrated multidisciplinary care were largely unattainable. This highlights that simply because teams are co-located does not mean they will become interprofessional. This study also emphasises the need for direction or support beyond location. Much of the existing work on interprofessional practice also highlights this: Interprofessional practice requires those involved to be adequately trained and engaged with the process.

The effectiveness of interprofessional practice in clinical settings has been evaluated using metrics such as client safety, healthcare quality, cost, and provider satisfaction (Simmons et al., 2011; Yanshang et al., 2022). Each has its measurement tools and methodologies to identify a particular outcome. For example, effectiveness might be measured via physiological measures such as heart rate or blood tests, which show that interprofessional practice has

improved the client's health. In contrast, other aspects, such as quality of life, might be measured in standardised questionnaires or self-report measures (Bawab et al., 2023). The outcome measures themselves also have their research to test their reliability and validity; for example, Hill et al. (2023) have developed a video observation tool, while other research tries to improve longer-standing issues with measures such as challenges with student assessments (Skinner et al., 2021). The edited book by Forman et al. (2016) gives examples of implementation evaluations of interprofessional practice worldwide.

The literature also acknowledges the influence of contextual factors on interprofessional practice. While there may be an excellent interprofessional program with highly skilled practitioners, contextual factors may impact the program's efficacy. What works in one environment may not translate to another; for example, a program in one country may not necessarily be able to be replicated in another because of different healthcare systems and laws. Other research considers factors such as socio-economic constraints, where a client cannot afford recommended treatments (Bernhardt & Benoit, 2023) or cultural contexts of the client, where language could be a barrier (Brommelsiek et al., 2018) can negatively impact interprofessional practice if not addressed. Legal and regulatory frameworks can limit how interprofessional practice is applied (Hawkins et al., 2021), and health policy initiatives can significantly influence the uptake of interprofessional practice (Girard et al., 2022). Technological issues such as user uptake and access can also influence its application (Brault et al., 2015).

An effective interprofessional program is one that not only works initially but is sustainable into the future (Forman et al., 2015). Implementing change can be resource-intensive. It may take champions of the cause to help create something new. However, the challenges do not end when something is built; instead, plans for sustainability must be included in what is

created (Moran et al., 2020). Sustainability can include ensuring financial sustainability, ongoing resources, education, and succession planning. All of this requires leadership. Forman et al. (2020b) provide many examples of how to include sustainability in interprofessional practice and how different organisations worldwide have met sustainability challenges. These insights aim to suggest possible solutions to those trying to make interprofessional practice more sustainable.

The effectiveness of interprofessional practice is an area that has been well-researched. Without the evidence that interprofessional practice will lead to better client health, interprofessional practice in healthcare would not exist in its current form. In the World Health Organization report (World Health Organization, 2010), which laid the framework for interprofessional practice, drew on several studies that outlined how effective interprofessional practice can be. Of course, this report was produced over ten years ago, and since then, many further studies have also highlighted the effectiveness of interprofessional practice. As some government agencies worldwide began to encourage interprofessional practice, considering the W.H.O. report and some professional bodies pushing for its inclusion as part of their course accreditation criteria, we have begun to see more interprofessional practice in clinical settings.

Seeing interprofessional practice in action has led to further studies examining its effectiveness and, consequently, systematic reviews of those studies. These systematic reviews further confirm that interprofessional practice does lead to better health outcomes (Kirkpatrick et al., 2023; Noel et al., 2022; Wooding et al., 2020).

However, interprofessional practice is not a panacea for all health concerns, nor did it see improvements in all areas; some of the systematic reviews showed increased efficacy in some areas and no differences in other areas of health for the individual. In their systematic review, Yanshang et al. (2022) showed that while there were differences in quality of life and lower

levels of depression, the interprofessional practice did not result in physical changes, such as some bloodwork scores for diabetes clients.

Other systematic reviews, such as that by Kaiser et al. (2022), have not found clear evidence between interprofessional collaboration and client outcomes. This may be due to the difficulties in measuring client outcomes, the subjective nature of some of these outcome measures, and the smaller number of studies examining effectiveness. However, with promising results in recent years, Interprofessional practice has gathered momentum as a clinical research area.

Applying Interprofessional Practice in the Context of Primary Healthcare Settings

As the model created in this thesis will be for application in primary healthcare settings, general issues faced by primary healthcare also need to be considered. Interprofessional practice is still new in these settings and can be fraught with tension if not correctly implemented (Fox et al., 2021). In their scoping review, Endalamaw et al. (2023) highlight the challenges faced in primary health care. They found some difficulty in getting consistent efficacy measures because of differences in quality-of-care indicators worldwide, so it became hard for them to understand what produced quality healthcare. However, some essential elements were identified, such as having enough healthcare providers and equipment with enough funds to offer services. The challenges in developed and developing countries differed in that success for developed countries was based on lower hospitalisation and mortality. In contrast, success in developing countries focused on specific diseases and reducing geographical disparities in health care. When considering having enough healthcare providers, equipment infrastructure, and funds and applying that to the interprofessional practice setting, we need healthcare providers trained in interprofessional practice with enough resources to support it. This may include technological

resources, extra space, and the funds to make it economically viable. This study also highlighted the importance of a model specific to a country's healthcare needs and systems. The model developed in the thesis should then, therefore, be focused on Australia and Australian needs and, as such, may only apply to Australia.

Jordan et al. (2008) also highlighted the importance of infrastructure, systems, and training in primary healthcare. This becomes especially important in the prevention of chronic disease. Jordan et al. (2008) found that 77% of Australians reported having at least one long-term medical condition. However, there was little coordination of self-management activities to enhance interaction between the client and the healthcare professional. One of the fundamental tenets of interprofessional practices is to be client-centred. This paper gives an excellent overview of what government, clients, and healthcare professionals require to provide a more integrated approach. However, like others, it does not give enough detail to apply it on the ground level in a clinical setting. For example, it recommends incorporating self-management interventions into clinical practice guidelines. However, it does not indicate how that could be approached within the limitations of time and finances.

What impacts interprofessional practice in the primary healthcare setting was explored by Wranik et al. (2019). Similarly to Endalamaw et al. (2023), they emphasised context and the differences that arise in different contexts, especially around different healthcare systems worldwide. However, they did find some commonalities related to improved interprofessional practice, such as the importance of shared space, common vision and goals, and definitions of roles and leadership. They also pointed out that the impact on client health is unclear, and more studies need to be conducted in that area; possible reasons for this may relate to how the impact is measured. They also discussed interlinking the organisational structure and the financial

environment. They stated that interprofessional teams "benefited from adding new providers (especially nurses), shared space and equipment, bottom-up policy development, appropriate leadership, and clarity and transparency regarding goals, roles, scopes of practice and procedures" (p.559). However, again, the study did not determine what the processes should be. Despite saying some processes are critical, they did not clarify how they could be implemented. Granted, it would be difficult to give further instruction on how processes can be implemented when clinic context and differences need to be considered, but there needs to be more guidance for clinics than just the idea that processes need to be implemented.

Another important aspect of applying interprofessional practice in clinical settings is the perceptions of healthcare providers and interprofessional practice, such as the one by Yusra et al. (2019). This study used a quantitative approach and found that certain professions, such as nursing, perceived more significant barriers to operating interprofessionally, such as their age and experience. Nurses reported facing more barriers if they were younger and had less experience. However, it should be noted that this study was conducted in a hospital setting and not in Australia.

One of the significant studies examining interprofessional practice in a primary healthcare setting in Australia was by Bentley et al. (2018). This mixed methods study included interviews with 60 managers and practitioners and 154 surveys. The information was based on six primary health centres. They highlighted the importance of the context of the interprofessional team and the need for that context to be considered when applying interprofessional practice. They considered three questions: What is the nature of the interprofessional practice work? What are the barriers to interprofessional teamwork? Moreover, to what extent did relational, professional, organisational and contextual factors affect

teamwork? Much of the interprofessional practice work was informal, but many considered it essential. Relationships, processes, and organisational support in context were shown to be necessary, but this study did not explain how issues with these processes can be addressed. It also highlighted the importance of the setting in which the interprofessional practice occurs, as there is a significant difference between the majority of government-run institutions versus those privately run.

Another study that looked at interprofessional practice in primary healthcare settings was by Schadewaldt et al. (2016). The positive aspect of this study was that it focused on private health practices rather than community centres, which, as most primary practice settings are privately run, is more relevant to this research. Again, this study had findings similar to that of Bentley et al. (2018), there were challenges due to healthcare system structures, policy, and infrastructure at the practice level. It also discussed the problems in funding, especially when discussing mutual clients; who pays for the meeting is unclear. They also highlighted the issue of time and finding time to see clients collaboratively. They also mentioned issues with roles, legal liability, and implementing new routines. However, this study focused on the relationship between medical and nurse practitioners. It did not include allied health, which means that some of the discussions around costs (as nurse practitioners have some Medicare costs covered) do not apply to other allied health. While this study focused positively on private practice, it was too limited because it solely focused on nurses and medical practitioners.

From a broader perspective than that of Australia, Harris et al. (2016) examined interprofessional practice in three countries (Australia, the USA, and Canada). While international perspectives were summarised in Chapter One, this study was included because it highlighted the differences across similar countries. By looking at past studies, they conducted a

secondary analysis and found variations between countries and provinces; the impacts of those variations are not entirely predictable and need to be monitored so that interventions can be adapted locally. For Australia in particular, they found links between clinician referral rates and client-assessed quality of care, which was more common and frequently planned for managing chronic conditions. They found that while there was increased communication, most practices rarely had staff meetings and had poor communication with external allied healthcare providers. New coordination roles for staff were recommended, whereby relationships could be improved but were limited by interprofessional practice knowledge, with doctors tending to remain in control. There was an improvement in work satisfaction because of shared workload and improved client outcomes, but there were issues with the referral process, especially when there were terrible working relationships. This study highlighted the need for a nuanced approach to interprofessional practice and stressed the importance of working relationships.

Some studies introduced a specific interprofessional intervention in a clinical setting and assessed its impact. Chan et al. (2010) use a model called 'Team Link' to assess the effectiveness of an interprofessional practice intervention. The intervention included educational workshops and facilitation using specifically designed materials with telephone support and was delivered to 26 practices. This qualitative Australian study utilised facilitators' observations, GPs' reports, and responses to a survey by allied healthcare professionals. The results showed that there was enhanced information sharing, improved communication, and improved professional collaboration, along with increased client participation. They highlighted that team care arrangements and enhanced primary care subsidies from Medicare are insufficient to create teamwork. They supported the idea of GP-delegated jobs and the use of practice nurses as case managers. While the model does have merit, it does not have enough information about what

allied healthcare professionals, nurses and GPs can do together. The study adds the practice nurses as the case manager to enhance client education and add to the existing referral network. The program does not have one of the critical constructs of interprofessional practice, meetings and discussions between GPs, allied healthcare professionals, and nurses. The program increases teamwork but not necessarily interprofessional practice in its truest sense, where meetings and discussions are core. What is most concerning is that the program seems to have disappeared; there is nothing online that practices could readily find to implement this program should they wish.

Another study looking at implementing an interprofessional intervention in a primary care setting was conducted by Ngangue et al. (2020). Again, this study echoes many other studies that suggest that, generally, interprofessional practice works and that clients and providers support it. This study highlighted the challenge of staff turnover and those who work part-time. This would indicate that any interprofessional practice model needs to be easily adapted to new staff and is position-focused, not person-focused. Due to the recent pandemic, healthcare has seen significant staff turnover and staff shortages; it is another challenge that needs to be considered in model development, one that is easily adaptable to new staff.

As discussed in Chapter One, developing the model in this study is not a case of beginning from a blank slate. There are thousands of pieces of information from books and reports. Moreover, studies help to answer some of the fundamental questions needed to produce a model. For example, work by Moran et al. (2015) and many others helps answer questions about education, leadership, and teamwork. From this knowledge base, frameworks are then developed. Some studies suggest frameworks to assist in implementation. One of the earlier studies in the field was from Mitchell et al. (2008), who conducted a literature review of

planning interprofessional implementation from 1990 to 2006. Like many other studies, they talk about multidisciplinary practice assisting in functional outcomes, but the difficulty in applying that widely is because of many of the complexities previously discussed. This again highlights that the difficulty seems to be the 'how to' at the local clinic level, especially in different contexts that can impact the 'how to'. There is a difference between a framework and a model. While a framework is more general, it is less about the specifics of the 'how to' for a clinic and more about suggested approaches a clinic should take. Significant work has been done at a higher level regarding what Australia needs to do as a country (Dunston et al., 2020). This research aims to move beyond the theoretical frameworks and focus on a 'how to' model at the local level.

Once a model is implemented, it will then need to be tested. In terms of improvement and evaluation, the study by Eljiz et al. (2023) discussed how health systems can be improved and offered a guide and checklist comprising six steps, which included defining the activity, deciding on the outcome of the proposed activity, defining a precise aim, grounding the activity in evidence, and determining the methodology and the scope of the dissemination plan. These factors will help guide the model creation presented in the later chapters.

Knowledge Gaps in Applying Interprofessional Practice in Clinic Settings

Overall, research has discussed frameworks for applying interprofessional practice in clinical settings but less so in how clinics can apply them. Even when models have been created, they do not seem to have lasted or gained a widespread uptake. This may be due to contextual factors and systems issues within the clinical setting. The studies show that there needs to be more guidance for local clinics to implement interprofessional practice. For a model to be

functional, it not only needs to consider past research, but it also needs to fit with Australia's healthcare strategy.

The Australian National Healthcare Strategy

To contextualise the research further, Australia's National Primary Healthcare Strategy needs to be considered. An interprofessional practice model cannot be effective if it runs against the broader healthcare agenda in Australia. The latest ten-year Australian plan was released in 2022 (Commonwealth of Australia, 2022b). The plan focuses on three streams, "future focused health care; person-centred primary health care supported by funding reform; and integrated care, locally delivered", iii. This is very promising for interprofessional practice as it connects with those streams. In particular, the report mentions 'future-focused healthcare', which will support telehealth and virtual care along with digital insights and integrations in healthcare technology. 'Person-centred care' and 'funding reform' will boost team-based care through funding to help people manage their health care, while 'integrated care' is focused on linking services. The report also identifies the importance of primary healthcare in improving overall health outcomes and helping to lower the burden of hospital and secondary care.

This strategy links with much of the work accomplished over the years in Australia (as discussed in Chapter 1), such as skills development in interprofessional practice (Dunston et al., 2020) and in education, such as the work presented by the iTOFT Consortium, Australia. (2015).

Any interprofessional practice model will need to consider existing work in the field and adhere to this national strategy because the federal government has made it very clear that these are the actions it will take. So, any model should find opportunities to fit within these programs planned over the next ten years.

Rationale for Further Research

A review of the literature indicates that there are areas of interprofessional practice that need further exploration. These areas include health economics, generalisability of interprofessional practice, long-term sustainability, allied healthcare outside of nursing and medicine, and interprofessional practice in different settings. These areas are discussed below.

The Health Economics of Interprofessional Practice

The literature review indicated that cost is important in implementing interprofessional practice. However, there is limited research on the economic viability of interprofessional practice (Steketee et al., 2017). While there is a consensus that prevention is better than cure and often costs less, the amount of resources and time put into that prevention can also outweigh the savings. From an interprofessional practice perspective, gathering together many healthcare professionals to discuss a client's healthcare needs may also identify potential problems that can be solved more quickly and easily (and cheaper economically). However, this may not always be the case. Gathering together many healthcare professionals can be costly and thus may not be economically viable for preventive measures.

Economics also does not have a one-size-fits-all approach, as different countries will have economies of scale and costing requirements within their specific healthcare systems. (Queen & Harding, 2023). Hence, health economics around interprofessional practice must be applied directly to the country of origin and how that country of origin applies interprofessional practice within its healthcare framework. Economics will also vary within a country and its different funding models. The economics of a state-funded hospital will vary from that of the privately owned local general practice medical clinic.

Generalisability of Interprofessional Research

Research often occurs in controlled settings and academic institutions, which may limit the generalisability of findings to real-world healthcare. More studies conducted in diverse practice settings involving various healthcare disciplines are needed to enhance the external validity of research findings. This chapter has identified several studies where interprofessional practice is measured in a clinical setting. However, the literature review showed that many studies have been conducted in hospital, community, and educational settings. Some of these studies may have aspects that apply to the primary care setting. However, others, such as cost and resources, may differ; what works in one setting may not be viable in another, so further studies in primary healthcare settings are important.

Long-Term Sustainability

Many interprofessional initiatives and interventions in research are time-limited and lack long-term sustainability. Studies must explore the long-term effectiveness of interprofessional practice and interventions beyond the initial implementation phase and assess the lasting impact on client care, health provider behaviour and system-level outcomes. Again, as previously mentioned, interprofessional practice in primary healthcare is still a relatively new concept in Australia. Long-term sustainability can only be measured when primary healthcare settings have run interprofessional practices for longer.

Health Professions Outside of Medicine and Nursing

As research has focused on hospital settings, it tends to focus on medicine and nursing, with some allied health providers. There is a need for research that encompasses a broader range of healthcare disciplines and beyond, such as support workers and administrators, as they may have valuable insights into client behaviour that is not picked up in the clinical setting. As

discussed, studies are more familiar with some healthcare practitioners and much less so with others. While much has been written about the doctor and nurse collaboration, there is much less so with other healthcare professions such as traditional Chinese medicine, massage therapists and chiropractors. Again, this is changing over time as these health professions start to include interprofessional practice as part of their curriculum. However, it has not yet resulted in significant change in the research.

Interprofessional Practice in Different Settings

While there is a considerable body of research on interprofessional practice in acute care settings, research in other healthcare settings, such as primary-care communities and mental healthcare settings, is relatively limited. More research is needed to examine interprofessional collaboration and its impact across various healthcare contexts. This chapter has discussed the importance of context and the fact that models need to be placed in a particular context to be applicable. It is hoped that developing a model will make it easier for primary care settings to implement interprofessional practice, leading to further research in these different settings.

Overall, the literature reviewed suggests that although significant strides have been made in understanding interprofessional practice and suggestions on how it can work in the primary practice setting, interprofessional practice is still not occurring or only occurs to a small degree in most primary practice settings in Australia. Even when interprofessional practice interventions were introduced, there seemed to be no ongoing research studies highlighting their use or development, or all practitioners have reverted to more traditional modes of healthcare.

The question remains as to why, and from the research above, it would seem that there is no transparent model for clinics to follow at the local level. There are many suggestions on what has been shown to work, but there is nothing that a clinic can readily follow without undertaking

further research. According to this review, a model must be nuanced and flexible. It would need

to take into consideration the context in which the clinic operates and be able to evolve. Of

course, other factors have affected the implementation of interprofessional practice beyond an

individual model, such as funding and government policy. However, as was discussed at the

beginning of this chapter, the Australian Federal Government's current 10-year plan for primary

health care places interprofessional practice in a position where it can be supported through

policy and more funding.

Defining Interprofessional Practice in the Context of this Research

By taking into consideration the literature presented above, there is no one definition of

interprofessional practice, and what is deemed interprofessional practice can be expressed in

different ways. For example, it can involve small or larger groups, be conducted in a formal or

informal way, and operate from within an organisation or involve external organisations. The

skills required can also vary from the more generalist skills that most practitioners would

automatically have, such as keeping notes, to more specialist interprofessional skills such as

those taught via programs such as Team STEPPS ®.

There are highly-regarded definitions of interprofessional practice that are often cited.

However, before collecting data on interprofessional practice for this research, interprofessional

practice needs to be defined in the context of this research.

The terms interprofessional practice and collaborative practice are sometimes used

interchangeably in the literature. For this research, the terms need to be separated. Collaborative

practice will be viewed as a more basic form of teamwork whereby there is some level of

communication between practitioners. This is most often seen in primary healthcare as the

referral letter and response between the General Practitioner and the Specialist/Allied Health

Practitioner/Hospital. The General Practitioner is the central point of contact between the different entities, and the communication is mainly in written form; there is usually very little direct discussion. There is a level of working together, but communication is limited, as not all will have access to all information. In this sense, collaboration is driven more by seeing the client's needs only through the lens of their specialisation or area.

Interprofessional practice, as defined in this research, is based on the CAIPE's definition of interprofessional education, "in our collaborative work and practice we recognise interprofessional education as occasions when members or students of two or more professions learn with, from and about each other to improve collaboration and the quality of care and services". From this definition, interprofessional practice expands from simple collaborative communication about a client to a direct discussion. Discussion, whether by phone, video or in person, allows for greater sharing of information, where viewpoints can be challenged and discussed, and ultimately, a more concise picture of the client's situation and needs can be obtained. The client can also be afforded the opportunity to be involved. In this sense, interprofessional practice differs from collaboration because those involved work together with the client as the primary focus as opposed to practitioners working individually with the client and sharing some information. For example, in collaboration, the GP would be the central point of contact. In interprofessional practice, it may be whoever is working with the client most at a particular time. As such, interprofessional practice can be quite fluid; members of those involved in the team may change, and leadership of the team may change depending on client needs. This leads to a less binary definition of interprofessional practice and one that is more diffuse.

For this research interprofessional practice is viewed on a continuum from simple collaboration (just some elements of interprofessional practice, to ideal interprofessional practice

(incorporating all elements of interprofessional practice suggested in the literature). A 'tipping point' can be identified that can be used to determine if interprofessional practice is occurring. For this research, this point would include involving more than one discipline, at least one direct discussion (phone, video, or in person), and the client's needs are at the core of those discussions. The communication should be respectful, and roles and responsibilities should be clearly defined, even though they may change. This can be visualised in Figure 2 below.

Figure 2

An example of the spectrum of interprofessional elements from the more basic teamwork to the most sophisticated interprofessional practice

Basic Teamwork Elements	Tipping Point for this research	Ideal Interprofessional Practice:
Simple verbal and written communication between practitioners	Interprofessional practice for this research (at a minimum): More than one discipline Direct discussion Client needs at the core	Ideal Interprofessional Practice: All elements previously mentioned plus others outlined in the literature such as reflection, follow up reviews, involvement of the community

Aims and Research Questions

From the literature above, this research will help address the issue of interprofessional practice research being primarily conducted in hospital and community centre settings and assist in its greater uptake in the primary care setting. As this research focuses explicitly on interprofessional practice in the primary care setting, it will be an opportunity to gather information about interprofessional practice from Australia's primary care clinic perspective.

As an Australian-based study, it will add to the body of knowledge of Australian-based perspectives and consider the Australian healthcare system's constraints, nuances and differences. Finally, a case study component of the research will allow for some insights into the economic viability of interprofessional practice within the primary care setting.

The literature review highlighted the limited research that has been undertaken exploring interprofessional practice in a primary care setting in Australia. As discussed, the primary care setting is an important context because it is where most healthcare occurs in Australia. This study will help address this research gap by exploring how primary healthcare clinics can implement interprofessional practice.

This study aimed to establish a way forward for interprofessional practice to be implemented in the primary care setting in Australia. This study was undertaken with two primary aims. The first aim was to explore barriers and potential ways to overcome identified barriers in implementing interprofessional practice in primary healthcare settings in Australia. To achieve this first aim, two research questions were explored:

1. What are the barriers to implementing interprofessional practice in primary healthcare settings in Australia from the viewpoints of health practitioners working in those settings?

2. How can barriers to implementing interprofessional practice be overcome or resolved?

The second aim of this study was to develop a practice model for implementing interprofessional practice in primary health settings. This aim is to be achieved by integrating findings regarding both the barriers and solutions to these identified barriers and will be used to answer a third research question:

3. How can those solutions to the barriers be applied to create a model that clinics can follow to implement interprofessional practice?

It will achieve these aims by collecting the opinions and ideas of those working in the sector in Australia and identifying the reasons why interprofessional practice is not occurring to the extent that it should. It will then explore ways to address some of these blocks and develop a model that clinics can adapt and implement within the context of their own clinical setting. These steps will be discussed further in the next chapter on methodology.

Chapter 3. Methodology

Chapter Overview:

This chapter outlines the methodology undertaken in this study. It discusses the research paradigm, including ontology, epistemology, and methodology. The methods employed to collect and analyse data are also described. Changes to the methodology and methods implemented due to COVID-19 are also outlined. As previously mentioned, the research questions are:

1. What are the barriers to implementing interprofessional practice in primary healthcare settings in Australia from the viewpoints of health practitioners working in those settings?

2. How can barriers to implementing interprofessional practice be overcome or resolved?

3. How can those solutions to the barriers be applied to create a model that clinics can follow to implement interprofessional practice?

To begin to address these questions, the research paradigm must be considered.

The Research Paradigm

The research paradigm is not a specific methodology choice but a lens through which to consider the data. There are three main paradigms: interpretive, positivist, and critical (Hussain et al., 2013). The positivist paradigm approaches research as matter being separate from the observer, that the world operates according to organised rules, and that there is a particular 'best' solution to a problem (Shah & Al-Bargi, 2013). A critical paradigm seeks to be transformative as it breaks down the understanding of a concept via the application of critical thinking and problem-solving (Asghar, 2013). The interpretive paradigms seek to understand the data/experiences of participants in context to be able to provide solutions (Knoblauch, 2013).

The interpretive paradigm underpinned this study as it sought to understand health practitioners' difficulties when introducing interprofessional practice into a primary healthcare setting. This knowledge would help in finding ways to address these barriers and establish a model for introducing interprofessional practice.

To create a model, an in-depth understanding of why interprofessional practice is not being utilised as much as it could be when so many educational resources teaching interprofessional practice are available needs to be developed. Due to the differing nature of primary care settings, the context in which they operate must also be considered. By exploring the issues directly with the participants and understanding their perspectives in context, it is likely that workable solutions to the implementation of interprofessional practice can be found.

Ontology

Ontology refers to an entity's nature of being and the relationships of those entities (Hussain et al., 2013). From a healthcare perspective, it can help to add further structure to the research by understanding the different entities involved in healthcare and how they are interrelated (Notley et al., 2023). This research will consider different entities and define how they relate. The main entities include:

Medical practitioners – are individuals who have obtained a medical degree and are registered to practice medicine; they are usually considered to have a high standing in the healthcare hierarchy because of their level of training and society's viewpoints towards them.

Nurses – are individuals who focus on the human dimensions of health and illness and are also registered health practitioners. In primary healthcare, they tend to work more closely with medical practitioners, providing support and additional services.

Allied health practitioners – are registered through government entities such as AHPRA (Australian Health Practitioner Regulation Agency) or their industry bodies. They include professions such as psychology, physiotherapy, chiropractors, dietitians, social workers, exercise physiology, optometry, paramedics, osteopathy, pharmacists, podiatrists, and speech pathologists, to name but some.

Complementary therapists – these individuals also provide services but may not necessarily be registered or generally considered part of the more mainstream health care. They might include practitioners such as massage therapists and Traditional Chinese Medicine.

Care workers – are individuals who provide support for clients as part of their healthcare. They might provide services such as taking clients to health care appointments, cooking, and cleaning.

Administrative staff – these individuals are involved with the clinic's running, ensuring appointments and billings are completed. They are often the first interaction that the public will have with the clinical setting.

Clients – refers to the individuals receiving healthcare services. From an interprofessional perspective, clients do not simply passively receive healthcare information and treatment but instead participate in their healthcare and treatment planning where possible.

Clinics - The clinic is the context in which healthcare usually takes place, although the borders of the clinic are now less distinct with the introduction of telehealth. The clinic is often where interprofessional practice will take place and may involve the interaction of other clinics. For example, it could involve people from one clinic operating interprofessionally amongst themselves or people from one clinic interacting with people from a different clinic. The clinic is

an entity that must also be supported. If, for example, there are not sufficient funds for the clinic to continue to operate, then it may cause a shutdown of health services.

Communities – also need to be considered; in this research, these could include the local community, the workplace as a community, and the community of practitioners. The workplace community is distinct from the clinic itself because it involves more than the physical infrastructure; it can involve how those who are part of the clinic interact in and outside the clinical setting, such as in social settings with work colleagues. The local community is the clinic's role for those living in the local area. The local community may not only be a source of healthcare but may provide something vital to the community itself, be it as assurances that there is healthcare provision that is not too far away, which could act as an incentive for those wanting to move to the local area and allowing it to grow further. The community of practice would be the associations and professional bodies to which health practitioners belong.

The systems – several different systems form part of the workflow of how services are delivered in the way the above entities interact. They will include the in-house systems from which the health practitioners operate. Within that, there will be varying levels of technology, from keeping electronic records to managing the booking system. Those systems must interact with more extensive system guidelines regarding healthcare provision, such as state and federal laws covering fields such as privacy and the handling of medical information.

As other research has shown, these entities align with the CDC's Social-Ecological Framework (Nonyel et al., 2021; Plusch & Jane Muir, 2023). A starting point for this research could be with healthcare providers such as medical practitioners, nurses, allied health professionals, complementary therapists, and administrative staff. The reason for this is that they are the drivers, at least initially, of whether interprofessional practice is implemented in a clinic

or not. Thus, it stands to reason that the starting point would be understanding their perspectives. Their perspectives can then be considered based on how they relate to one another in an interprofessional framework. For example, it would be essential to consider how health practitioners would like to implement interprofessional practice and what that means for other health practitioners and those who provide support services, such as nurses and administrative staff.

In summary, this research will take a constructivist ontological stance, whereby the experiences and perspectives of key healthcare stakeholders will help provide an in-depth understanding of the potential barriers to implementing interprofessional practice and how these barriers may be addressed or overcome.

Epistemology

To assist in pursuing knowledge, we must also examine the study of epistemology, which concerns *how* knowledge is obtained; it also includes *what* knowledge is, as well as questions of *truth, justification* and *belief* (Quigley & Smith, 2022). The epistemological approach this research will take is one of interpretivism. Interpretivism emphasises understanding the complex world of lived experience from the point of view of those who live it. It suggests that individuals construct knowledge as they engage with the world around them (Lake, 2021).

The fundamental question of this thesis is why interprofessional practice is not occurring in primary healthcare settings as much as it should. The starting point to understanding this is with those who run and work in those clinics. Rather than suggesting the issues, allowing them to share their thoughts to shape and define the issues would be best. As this is qualitative research, the role of the researcher is not entirely distinct from the data collection itself; thus, reflective practice should also be considered.

Reflexivity

As the research is qualitative, reflective practice should be undertaken so that readers can understand the background and influences, how they shaped the design, and how potential biases were managed within the project (Campbell et al., 2021). Before commencing this thesis, I had exposure to interprofessional practice on all levels, as a client of health services, as an academic in curriculum development and teaching interprofessional skills, and as a clinician. I now add this role as an interprofessional practice researcher. The following is my acknowledgement of how my experiences, values and beliefs have influenced the research.

As a Client. Over a decade ago, I experienced severe and debilitating back pain that gradually became worse. Coming from a health background, I looked to the evidence, sought medical advice from my treating doctor, and trialled allied health treatment. Medication was also used to help manage the pain. Those treatments did not work. I was referred to a specialist while also trying to explore other allied health treatments, even those with less of an evidence base, as my desperation grew. Over the course of about 12 months, with my back pain gradually getting worse to the point where it was challenging to walk for more than a few minutes at a time, I had seen the following practitioners: two chiropractors, two physiotherapists, two acupuncturists, two massage therapists, a dietician to try and reduce inflammation in my diet, two rheumatologists, two orthopaedic surgeons and two neurosurgeons. I also tried low-level laser treatments to try and reduce inflammation, and I had a nucleoplasty procedure. I tried to get treatment with more than one practitioner of each modality to avoid practitioner bias. In this process, I discovered a range of viewpoints, some vastly different, from a massage therapist telling me to eliminate all sugars to a chiropractor telling me to take six months off work and to see him three times a week. An orthopaedic surgeon wanted to fuse bones in my spine, while another surgeon said the fusion

was not required. The cost of this in both time, money and suffering was immense and left me with a sense of confusion. Ultimately, I chose a conservative surgeon, and I have been pain-free since.

In hindsight, I would have preferred if these people sat down and discussed my case and developed a solution or treatment plan. While a discussion including multiple health practitioners might be costly, it would have been less expensive than the costs of all the treatments moving from one practitioner to another. What I wanted was for interprofessional practice to occur. Coincidently, the World Health Organisation released its 2010 report around this time.

This experience taught me two things as a client: how beneficial interprofessional practice can be, and a better understanding of clients' frustrations when they hear differing medical views while expecting more communication between health practitioners.

As an Academic. I began my academic career very soon after graduating from my undergraduate program. While I came from a science psychology background, I started to teach psychology in a course related to the skin called Dermal Therapies at Victoria University. I eventually became the Course Chair of the Bachelor of Dermal Sciences and was involved in numerous curriculum development activities. Dermal therapists are allied health professionals who work with cosmetic physicians and plastic surgeons and can also operate as independent practitioners, offering services such as laser skin treatments and basic wound care. During my time in this role, Victoria University introduced interprofessional practice to all health science courses, and as head of the program, it was my role to represent dermal therapies. Here, I began to learn about interprofessional practice and was part of an academic board developing interprofessional units that could be embedded into different health courses at the university.

By teaching students interprofessional theory, simulation, and practice, I saw first-hand how interprofessional practice could affect treatment planning. For example, students were given simulation exercises after learning about interprofessional theory. The simulation activities presented students with a video of actors playing a client and two student interviewers assessing health needs. After watching the video, a group of students from different programs, such as nursing, paramedics, psychology, dermal therapies, dietetics, and social work, would discuss the client's needs and develop a treatment plan. Students would learn more about what other professions did, and this was especially helpful for programs like dermal therapies that needed a higher profile. In adding the different skill sets, they would identify issues the clients needed help with. Where there were uncertainties in what to do or disagreements in approaches, students were given the skills to address these issues using methodologies like Team STEPPS®.

The plan was for students to apply this process in an interprofessional practice clinic linked to the community. Student feedback in the program was very positive; dermal students were particularly pleased with the program and the level of engagement with other disciplines.

However, this also introduced a significant problem, eventually leading to the curriculum's restructuring and a change in the program. These issues, together with my own clinical experience, were to be the inspiration for this thesis. The logistics required in timetabling to have groups of students from different disciplines all in one space simultaneously proved to be very difficult. It was also costly and took time from content already in the discipline-specific courses. Ironically, this occurred before Victoria University's Block Model of teaching and standardised first-year units in health programs were introduced. The Block Model has redesigned subjects to run over four-week blocks, one at a time. The same interprofessional program running today would have had fewer issues with the block model and standard first-year

units. Interprofessional practice could be run in a block in the first year, where different students could enrol in that block at the same time, and because they are not completing any other units during that block, timetabling and resourcing would have been much more accessible. Ultimately, logistics and cost stopped the original program from running. It was disappointing to see the original program stopped when it could be run more easily today at Victoria University; this further highlights the importance of logistics and funding as part of long-term success.

As a Clinician. I have worked casually as a psychologist in a small medical practice for many years. Over the years, I have gained not only experience as a clinician but also experience with how the clinic runs, the guidelines such as accreditation that it must follow, and the challenges it faces working in the Medicare system. It allowed me to practice some 'hallway' interprofessional practice by very quickly being able to contact a doctor and have a conversation with them about a particular client of concern, or conversely, one of the doctors would contact me about concerns that they had with a client and how best to address it. The clinic also had a minimal number of other allied health professionals, and again, it would seem like an excellent opportunity to introduce interprofessional practice.

However, logistics and cost problems were present. Most of the individuals there, similarly to myself, had jobs at other workplaces and were time-poor. Finding time for everyone to meet took much work, and the question of whether or not people were getting paid for this time was also raised. Interprofessional practice was never introduced into this clinic as there did not seem to be a way forward.

These experiences left me with a sense of frustration. I saw how beneficial it can be for a client, that it could be taught effectively, and that more healthcare graduates will have the skills and knowledge in interprofessional practice over time. My concern was what would happen to

these graduates once they began to practice. Would their enthusiasm for interprofessional practice be shot down by the doctor who refuses to participate or the clinic that has never heard of it and does not know how it could be applied? Would interprofessional practice for this graduate be reduced to a casual conversation from time to time?

This frustration led me to the idea for this thesis that clinics needed guidance to create an environment where these graduates could apply their skills. The projects related to the Curriculum Renewal Studies Program (Dunston et al., 2020) which has given direction and resource development that is paying dividends. Governments have started supporting collaborative practice in the last few years, which only became more prominent over a decade ago. However, local businesses still need guidance to encourage them to introduce interprofessional practice. I wanted to hear specifically from them, understand their issues, and then help them find the solutions so they could make it work for them.

Interprofessional practice came too late for my musculoskeletal pain, but the solutions presented in this thesis are timely. The solutions might have differed greatly if this thesis had been completed five years earlier. There might not have been the government support that there is now. Programs such as My Aged Care and the NDIS were very much in their infancy. The widespread introduction of telehealth because of the COVID-19 pandemic has solved part of the logistics issue, and one of the most significant modern disruptors in healthcare, AI, could also add to solving logistics issues.

As part of this PhD, I completed an internship in collaboration with a private company. One of the points reiterated to me repeatedly by the company was the importance of having research output that can be applied to the industry. I wanted to ensure that the outcome of this thesis could do that. For most, a thesis delves into a particular topic and explains something at a

microscopic level. Instead, this thesis will combine my research with existing materials to synthesise a model readily applicable to nationwide primary healthcare clinics.

Methodology

As this project aimed to explore the barriers and potential ways to overcome identified barriers in implementing interprofessional practice in primary healthcare settings in Australia and to develop a practice model, a qualitative approach was selected. Qualitative research allows for a more open, exploratory data collection and is better suited to theory and model building than hypothesis testing (Neuman, 2006). More specifically, an action-based qualitative methodology was chosen to investigate the study's aims and research questions. Action-based research takes the perspective that research questions should involve implementing a plan to collect and analyse data from multiple sources (Sagor, 2005). Those findings are communicated to participants and discussed, and a new refined plan is developed, which is again communicated, discussed, and refined. This spiral process can be repeated several times, further refining outcomes with each iteration (McNiff, 2017; Reason & Bradbury, 2008). Please see Figure 3.

Figure 3

The Action-Based Research Model
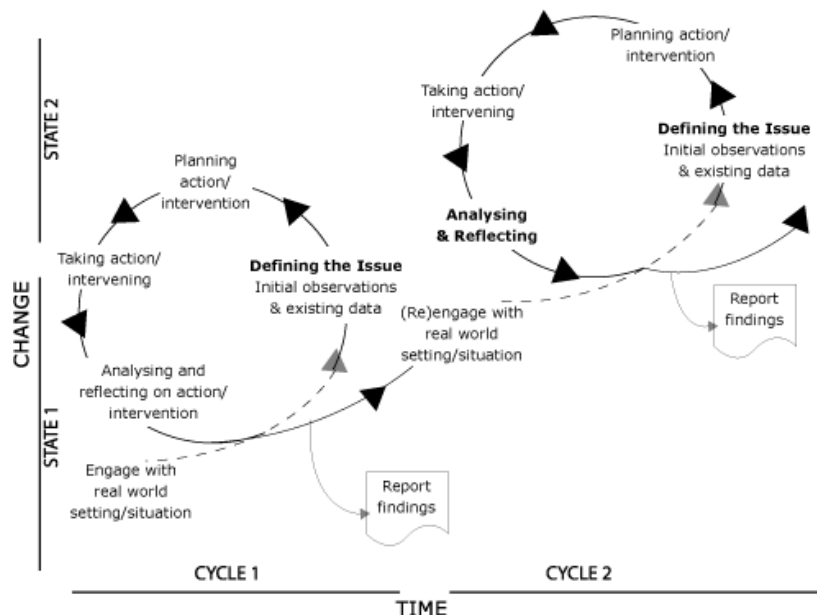
Note. Image sourced from Massingham (2015).

The plan was to collect data in three phases: identification of barriers via interviews with those working in clinics (report on findings), discussion of solutions for a model (report on findings), and model refinement via focus groups including a broader range of healthcare workers and clients (report on findings). These phases would allow for analysis and reflection on the collected data so that findings could be incorporated into the next phase and re-presented to the population of interest, per the action-based research process. After the first phase of data collection, this approach was altered due to the COVID-19 pandemic and the data collected in phases one and two suggested model refinement should be left to individual clinics rather than by focus groups.

Ethics Approval

Ethical approval was sought before the commencement of the study as the research involves data collection from human participants (Ethics approval number HRE15-203). The proposed data collection would involve healthcare professionals or administrative staff in primary healthcare settings. The ethical issues concerned privacy and confidentiality, especially in the focus group setting. In the focus group setting, confidentiality was to be enforced by reminding participants that what is said in the session must remain in the session. Other ethical issues included ensuring no coercive recruitment and power issues within focus group settings. However, because of the pandemic, the focus groups were not conducted. Thus, the ethics issues related to them were no longer a concern. Psychological risks, such as questions that trigger an emotional response, were also considered. These issues were addressed by providing clear information to participants, including a copy of the questions before the interview, and using consent processes.

Methodology and Methods – What Occurred

As the poet Robert Burns famously wrote in his poem 'To a Mouse', even the best-laid plans can come undone. So, when the most significant pandemic in 100 years left its impact in 2020, it also undid part of the plans for the methodology of this research. Fortunately, the Phase One data collection had been completed, and preparations were underway to begin the focus groups in Phase Two.

Phase One – Identification of Barriers to Implementing Interprofessional Practice

This phase of the research went according to plan as it was pre-pandemic. Interviews were conducted, and data were analysed to identify the barriers faced by those working in primary healthcare; it also began to discuss some of the solutions.

Health practitioner networks known to the researcher were approached to share information regarding the study with colleagues and other clinics they work with that may be interested. Participants interested in the study contacted the researcher. Before the interview, participants were sent a list of interview questions to think about before the interview, along with information giving an overview of interprofessional practice, its definition, and its purpose (a link to the CAIPE website was sent). Please see Appendix A for the information sheet sent to participants before the interview. This overview ensured that the participants had an opportunity to understand the term 'interprofessional practice' in the context of this research before the interview. Face-to-face, semi-structured, one-to-one interviews were conducted with all participants. Semi-structured interviews allowed participants to expand and focus on areas they felt were most important to them, as they do not presuppose answers by having set questions; semi-structured interviews allow for some flexibility in exploring information related to an answer (Adams, 2015). Interviewees were asked ten questions about their knowledge of interprofessional practice and the barriers to why it was not occurring in their primary healthcare setting. Interviews were transcribed verbatim and checked for errors; interviews lasted approximately 30-45 minutes.

Participants – Phase One

The sample consisted of 20 purposively selected participants from various medical, allied health and administrative backgrounds who worked in primary healthcare settings in Melbourne, Australia (See Table 1). Administrative staff from these clinics were also invited to participate because some issues could go beyond health practice and include logistic and procedural matters, such as organising team meetings. Apart from the administrative staff and two Doctors, all other participants worked from multiple locations. Participation was voluntary.

Table 1

Number of Participants and Their Background

Background	Number of Participants
Nurses working in medical practices	5
Administrative staff (Practice managers and Reception)	4
Medical Practitioners in General Practice Clinics	4
Dieticians	4
Chiropractors	2
Psychologist	2
Podiatrist	1
Acupuncturist	1
Total	**20**

Action-based research requires reflection after each data collection cycle. After the Phase One data collection was completed, the data were analysed using thematic analysis. Interviews were transcribed and coded; the codes were combined into themes. The analysis process followed that outlined by Braun and Clarke (2006). The data showed clear barriers to the implementation of interprofessional practice. It also identified the issue of context, that primary healthcare clinics can be very different environments and that a single refined model would be impossible to cover the different types of clinics in Australia. Refining a model solely based on the small cohort from this study would most likely result in a model that only applies to clinics

related to the focus groups and would not apply to clinics outside of that small cohort. This is

discussed further in the Themes section in Chapter 4 and in the solutions to barriers in Chapter 5.

The Impact of COVID on Methodology

In the late stages of 2019, the world began to have the first insights into what would be

the first major global pandemic in nearly 100 years. Things began rapidly shifting in 2020, which

I witnessed first-hand as a clinician and an academic. From a teaching perspective, there was a

sudden shift to online teaching, as the area I taught had developed online resources for interstate

students many years ago. The rapid shift was not as arduous as other areas in the university. But

it was still a massive change for both staff and students. As a clinician, I found the situation more

complex, putting all health workers under immense strain. In the early stages of the pandemic, it

was unclear what impact this disease had; there were news reports of hospitals overseas having

to turn away clients because their system had effectively collapsed as health professionals

themselves got sick and many passed away (Carenzo et al., 2020).

The Victorian Health Department was issuing directives regarding how health clinics

should run and how client interactions should occur. This extended to the general public and

involved everything from lockdowns and curfews to social distancing and mask-wearing, as well

as which organisations were allowed to operate under the strict guidelines and which were not

(Basseal et al., 2023; Scott et al., 2023).

Healthcare workers, including myself, needed to make decisions when guidelines were

unclear, such as what constituted essential care for a client and, in doing so, placing yourself and

those you live with at risk. Unsurprisingly, many left healthcare, and certain professions, such as

nursing, were extremely short-staffed. In the small clinic I worked from, there was a sense of

risking your life each time you went to work. The strain from the public added to this pressure,

with some believing the disease did not exist and getting frustrated and angry at those following guidelines. The years 2020 and 2021 were the most stressful that I had ever encountered, both personally and professionally, and I was not on the front lines of healthcare.

Having completed my interviews before the pandemic, it would have been be too difficult to go back to those I have interviewed, run focus groups with some, and get their input on a collaborative way of practice in an environment of social distancing. Not only would it have been irresponsible to take precious time from them, but it would also have likely influenced their feedback as they were not operating in the environment they ordinarily did. The future of that environment was unclear. Therefore, a change needed to be made in terms of this study's methodology.

The Revised Methodology

As outlined, there was a need to revise the methodology. The data collection from the Phase One interviews, which consisted of 20 interviews, was completed before the pandemic. There were issues that practitioners had identified that were impacting the implementation of interprofessional practice, and initial solutions were being formulated. The findings from the Phase One data collection are presented in Chapter 4. Two of the most significant issues that did not have a clear solution were costs and logistics. Based on the uncertainty regarding my ability to run focus groups due to the pandemic, it became apparent that my proposed methodology needed to be revised. A third factor, the different settings the interviewees worked in (as previously mentioned), also raised the issue of context. I began to reflect on whether creating a model using the action-based research cycles was possible. It would help create a model for those involved in the focus groups but may not apply to other clinics in different environments with differing needs or issues.

My reflection and further research of the literature led me to conclude that a different approach would need to be taken, not simply because of the pandemic but because a different approach might yield a model more applicable to a larger number of clinics. This methodology would then be altered so that Phases Two and Three were refined by the clinic wanting to apply the model. The model would then be based on solutions to the issues identified from the literature, and steps would be given to refine the model for individual clinics. See Figure 4 below.

Figure 4

The Updated Methodology

Phase One	Phase Two	Phase Three
Interviews to Identify Barriers	Identification of Solutions	Model Creation
Report	Report	Report
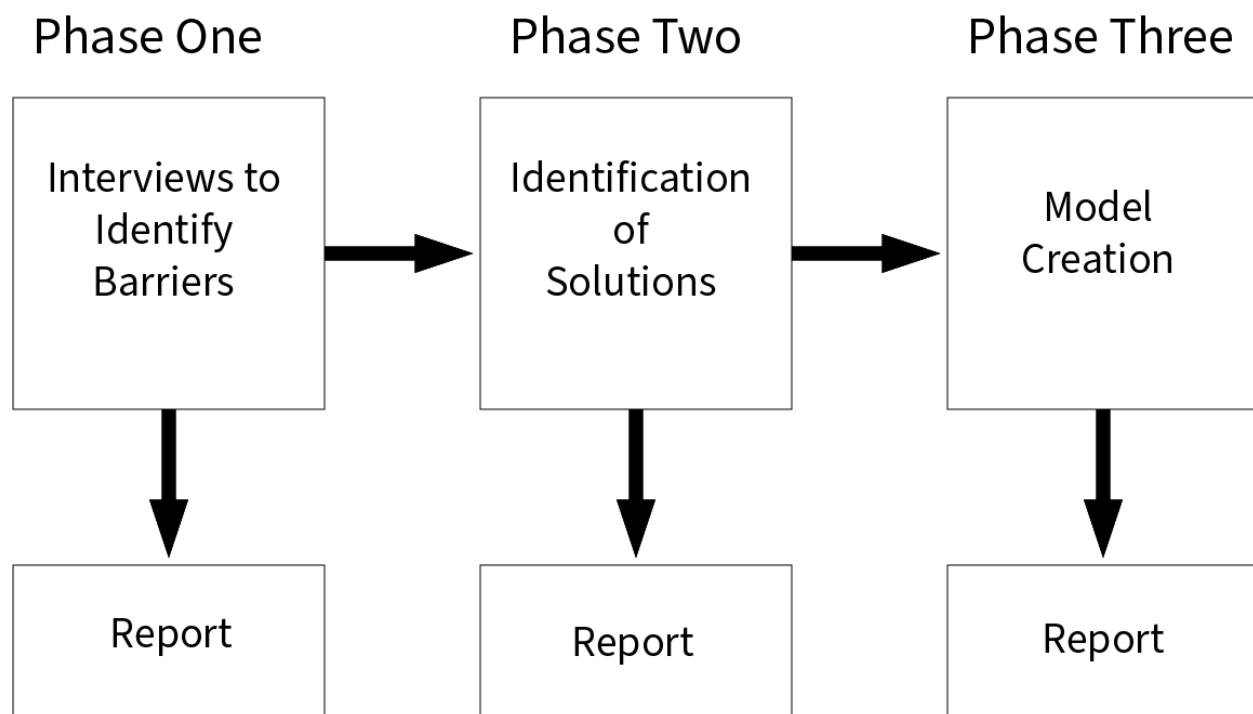
Phase Two Methodology– Solutions to the Identified Barriers

Focus groups for Phase Two were not run as envisaged initially, partly due to the pandemic, but also due to the findings in Phase One. Instead, Phase Two became an in-depth critical literature review identifying what the literature said about possible general solutions to

the identified barriers in Phase One. This literature review is included in Chapter 5, and solutions are discussed in the context of the CDC's Social-Ecological Framework.

There were barriers from the analysis of the interview data identified that did not have clear solutions in the literature; these issues (cost and logistics) would need to be addressed on a more in-depth level. External factors, such as government funding and technological innovations, can more readily impact these barriers. A model would be very difficult to implement if it were not economically sustainable and logistically impractical; a special focus on these issues needed to be explored to find solutions. This coincided with a change in my supervision, with one of my supervisors at the time having expertise in health economics and AI. My new supervisor's guidance could help me address the issue of sustainability via a greater understanding of health economics, and AI could also be explored to help address the logistics issue. Fortunately, at the same time, a PhD internship in these areas became available, for which my supervisors strongly encouraged me to apply. The internship was to develop a costing model for a new AI-enhanced device to encourage interprofessional collaboration in caring for older Australians. As the research involved taking existing data and re-analysing them to develop a costing model, the work could be done without the interference of lockdowns. This internship helped show how introducing technology can save time and cost when providing healthcare. The costing model developed from the internship showed that economic savings could occur with better-managed healthcare. It also showed that the early identification and intervention of health issues with AI support can also lead to economic savings. The internship findings can be considered a 'proof of concept' that interprofessional practice can be economically viable if supported by the right technology. The internship helped to address the second of the action-based cycle as it addressed the two significant issues of economic viability and logistics. The result was an in-depth health

economics report for the grant providers, along with a shortened summary report that was published (Perri et al., 2023). This information is discussed in Chapter 6.

Phase Three – Methodology for Model Development and Refinement

The answer to many of the barriers identified in the interviews could be synthesised by exploring the existing literature. The literature contains many solutions to the barriers, but they had yet to be synthesised and applied to Australia's primary healthcare setting. The third phase was planned to be a refinement cycle to finalise an effective model for the clinics involved in the data collection (and those with similar operations). However, this process would likely miss the needs of many clinics because of the issue of context; thus, if the original methodology had been undertaken, the end model would have been limited to the clinics used in the interviews and focus groups.

Instead, a different approach was taken whereby design and design thinking principles (Norman, 2002) needed to be applied. In understanding design thinking principles, those principles could be applied to the model so that the clinic carries out the final cycles of refinement based on a generalised model, thus making the final model individualised for the clinic and much more likely to work.

Before applying those design principles to a model, I needed to understand more about design thinking, so I completed an Undergraduate Certificate in Design Thinking from the University of Tasmania. As I was designing a model, the principles I learnt in this course helped me consider how to design a model so that it could be contextualised and applied in a wider range of clinics. The original design of the research would have contextualised the model only for the original participants as it was based on their feedback, whereas incorporating design

principles into the final model allowed the final refinement to be adjusted by individual clinics.

The final model is discussed in Chapter 7. See Figure 4 below for an overview of the methods.

Figure 5

An Overview of the Methods
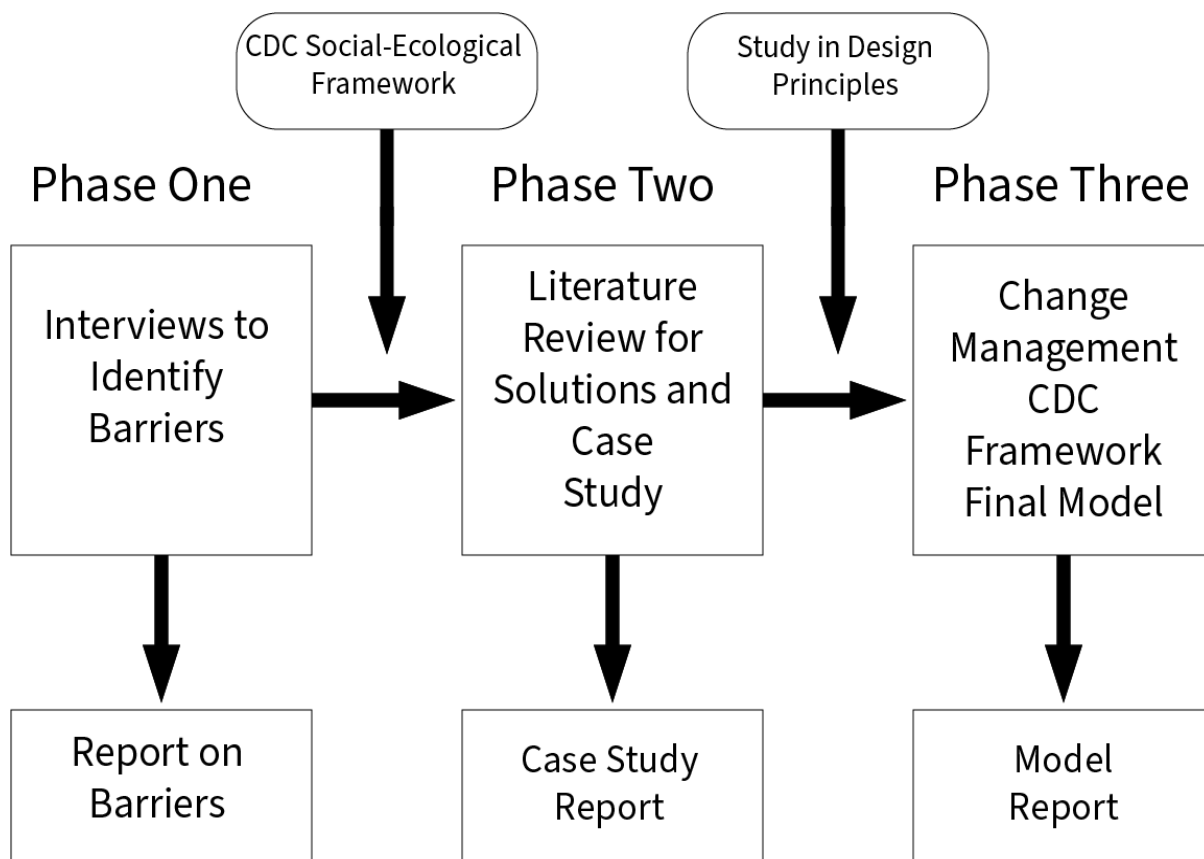
Data Analysis

Data analysis in action-based research goes beyond categorising the data against a set-theoretical framework but instead explores the data to more accurately understand why the participants hold the views they do and that all participants' views are considered and explored (MacDonald, 2012). From this perspective, a grounded theory approach is taken, whereby data are at the core of developing the theories leading to a model (Khan, 2014). In this research, the views explored focused on the issues common to implementing interprofessional practice and

how these issues may be addressed based on the practitioner's experience and understanding. Sometimes, for health professionals, exploring their views may be a new experience as some do not have the time to reflect more deeply on their work practices (Stringer & Genat, 2004). Therefore, the first component of the analysis was to explore any epiphanies within the interview. As I, the researcher, am also a registered psychologist with many years of experience in clinical practice, I am well-versed in gently exploring personal epiphanies. The data were transcribed upon completion of the interviews. The data collected were then coded using the processes listed below.

The transcribed data from Phase One was coded to assist the analysis, as suggested by the research by Thornberg and Charmaz (2014), the process of coding qualitative data used in the research began with a review of the data set to identify the units of meaning that begin to emerge from the data. On a practical level, it was completed using Microsoft Word, as it allows for creating Tables and adding comments. The units of meaning were then clustered into categories that show the relationship between each unit cluster. This was then mapped out according to a 'family tree' approach whereby the data began as one group and was subsequently divided into smaller clusters. Following this, the interrelationships between each cluster were then further identified.

Phase Two data analysis was undertaken by an in-depth literature review identifying what the research had to say about the barriers and possible solutions. The research needed to focus on solutions applicable to Australia and primary healthcare settings. This approach is discussed further in Chapter 5. Chapter 6 discusses the approach used in the secondary data analysis to discuss the health economics and costing models. Essentially, the data analysed from the PhD internship showed that AI could address some of the logistics and cost-based issues, and

a similar costing model could be used to make interprofessional practice more economically viable in primary healthcare. The solution at this point was a base model that would answer many of the issues faced by primary healthcare clinics but lacked model refinement.

Phase Three was focused on model refinement, but as the data evolved, it became clear that individual clinics should undertake refinement, but the clinics would need guidance on refining the base model. This involved the study of design principles so clinics could be shown how to apply the refinement process from a design principles perspective. Again, this involved exploring the evidence in design principles and reflection to synergistically apply it to the interprofessional practice setting.

Relationship to Aims and Contributions to Knowledge

This research aimed to identify barriers to introducing interprofessional practice in primary healthcare settings, identify solutions, and create a new model to assist clinics in that implementation. At its core, it is about investigating the data to find a workable model. Model testing on larger populations could be completed as part of post-doctoral research. The research questions, how they are answered, and how the method will contribute to knowledge in the field are listed below.

This study was undertaken with two primary aims. The first aim was to explore barriers and potential ways to overcome identified barriers in implementing interprofessional practice in primary healthcare settings in Australia. To achieve this first aim, two research questions were explored:

1. What are the barriers to implementing interprofessional practice in primary healthcare settings in Australia from the viewpoints of health practitioners working in those settings?

2. How can barriers to implementing interprofessional practice be overcome or resolved?

The Phase One data collection answered question one via interviews with those working in primary healthcare in Australia and the analysis of those data. The contribution to knowledge is the identified barriers and how they were contextualised in a framework to better understand and address them. This is discussed in detail in Chapter 4.

Question two, how can barriers be overcome, was answered by the Phase Two data addressed in Chapters 5 and 6, whereby an in-depth literature review was undertaken to explore the solutions to those barriers, along with a specific focus on costing and logistics via a secondary analysis as part of a PhD internship. The contribution to knowledge is the contextualised answers to those barriers from a primary healthcare perspective.

The second aim of this study was to develop a practice model for implementing interprofessional practice in primary health settings. This aim was achieved by integrating findings regarding both the barriers and solutions to these identified barriers and used to answer a third research question:

3. How can those solutions to the barriers be applied to create a model that clinics can follow to implement interprofessional practice?

This question was answered in Phase Three by taking the solutions identified previously and using change management and design principle processes (which included further studies in design to understand the concepts), allowing clinics to apply a base model and refine it to their own needs with guidance from the model. A model like this had not existed in this detail in the literature before this work.

Conclusion

There is significant evidence that interprofessional practice can improve health outcomes (World Health Organization, 2010). High-quality work has been completed in Australia on how to train people to perform interprofessionally (Dunston et al., 2020). However, while most healthcare occurs in primary practice settings in Australia (Swerissen et al., 2018), there seem to be barriers to the uptake of interprofessional practice in those settings, which could be greatly improved. One way to improve this would be to develop a model of implementation to address specific barriers to make it easier for primary healthcare settings to implement them. Therefore, this research needed to explore the barriers in greater detail and attempt to address them before a model can tested on the larger population. This study aimed to identify the barriers to implementing interprofessional practice in primary healthcare, examine potential ways to address them and develop a model based on the solutions that clinics can use to implement in their clinic.

Qualitative research is the best approach to exploring these barriers, and action-based research can help refine workable solutions. While initially, three data collection cycles were planned to develop a refined model; the methodology was altered due to the data collected in the first cycle and the impact of the COVID-19 pandemic. The altered methodology still achieved the goal of developing a proposed model that clinics can use to implement interprofessional practice. The first data analysis phase, which identified barriers, is presented in the next chapter.

Chapter 4. Results: Barriers to the Implementation of Interprofessional Practice

Chapter Overview

This chapter consists of the Phase One data collection, identifying the barriers to implementing interprofessional practice in primary healthcare settings. These data were collected before the COVID-19 pandemic. This component of the research aimed to understand healthcare and administrative workers' perspectives on interprofessional practice and, in particular, the issues that they identified as impediments or barriers to the implementation of interprofessional practice. This chapter is presented as an empirical report with a traditional scientific structure because it was edited and then submitted for publication.

Background

Interprofessional practice differs from other forms of team-based health practice, such as multidisciplinary practice, because it involves a more in-depth collaboration between healthcare professionals and expands that collaboration to clients (via client-centred care) and their communities (Forman et al., 2020a). Interprofessional practice has become more popular since the World Health Organization announced its framework report in 2010 (World Health Organization, 2010), outlining the fundamentals of interprofessional practice and its importance in healthcare. It seems logical that improving health practitioners' ability to work together more effectively with clients and the community would lead to better health outcomes, such as increased client safety and lower mortality rates, and systematic reviews generally show this is the case (Kaiser et al., 2022; Spaulding et al., 2021). More specifically, research by Miselis et al. (2022) found that interprofessional practice can improve continuity of care, client-centred communication, and reduce health system error rates.

A review of the literature identifies that much of the research on interprofessional practice is carried out in hospitals, classrooms, and larger community care settings (Schot et al., 2020). This seems to be the case because they are environments where large groups of different healthcare practitioners are more conveniently accessible, communication may be more easily facilitated, and interprofessional practice may already be occurring. However, the majority of healthcare in most Western countries like Australia is carried out in primary care settings (Swerissen et al., 2018). These settings might include local medical practices and allied health clinics, where clients often attend with non-emergency health concerns. These settings are less conducive to interprofessional practice as they have yet to be set up to provide integrated forms of client-centred care (Swerissen et al., 2018), thus making even simple team meetings more difficult due to logistics and cost. Consequently, it is important that more research be conducted in these settings so that research outcomes may help to address the challenges in primary healthcare and encourage its uptake (Pullon et al., 2016).

While interprofessional and collaborative approaches are often used to treat chronic and complex conditions such as diabetes (Lee et al., 2021), the team-based approach can also lend itself to the early identification of more significant health issues (Lam et al., 2013; Palleschi et al., 2014). Primary healthcare settings are often the first to identify potential health concerns that pose significant future health implications. Early identification could also be improved if interprofessional practice occurs in these settings. Generally, early intervention of health issues has a better prognosis (Bargiota et al., 2018), and is also more economical in terms of the cost of treatment (Behan et al., 2020).

While there is some general understanding as to why less interprofessional practice occurs in primary health settings, there is a need to develop a conceptual framework for

interprofessional practice in the primary healthcare setting. A conceptual framework can help

find solutions to the impediments in these complex settings, but to help develop this framework,

the various impediments need to be further identified and explored. This 'Phase One' of the

research explored the health practitioners' perspectives on the barriers preventing

interprofessional practice implementation in primary care clinical settings in Australia. By

interviewing healthcare practitioners, the research investigated these impediments in greater

detail so that the results can be added to a framework discussion and solutions can be developed

in the future. Specifically, this data collection phase aimed to address the following question.

What do healthcare practitioners (e.g. Medical Doctors, nurses, psychologists, dieticians, etc.)

and their administrative staff perceive to be the barriers to implementing interprofessional

practice?

Methods

Design. As this phase of data collection sought to explore health practitioners'

perspectives of the barriers to interprofessional practice, a general qualitative methodology

guided by social constructionism was adopted (Willig, 2016). Social constructionism refers to

meaning arising from dynamic social interaction and is a suitable paradigm for investigating

workplace interactions (McCarty & Schwandt, 2000). The findings represented the constructed

realities of health care practitioners and the challenges they face when working with others. The

researcher who conducted the interviews worked in academia and private practice as a

psychologist. He had experience teaching interprofessional practice to university students and

understanding the framework that primary care practitioners work in.

Participants. The participants comprised of 20 purposively selected adults from various

medical, allied health and administrative backgrounds who worked in a primary healthcare

setting and with others (See Table 2). Administrative staff from these clinics were also invited

because some issues could go beyond health practice and include logistic and procedural matters,

such as organising team meetings. Apart from the administrative staff and two of the Doctors,

all others worked from multiple locations. All participants had been working in their field for

between 5 and 25 years. All participants were given a link to the CAIPE website for further

general information about interprofessional practice. Even with this link, their background

knowledge of interprofessional practice was low for almost all participants, this is discussed

further in Theme 1 of the results section.

Table 2

Number of Participants and Their Background

Background	Number of Participants
Nurses working in medical practices	5
Administrative staff (Practice managers and Reception)	4
Medical Practitioners in General Practice Clinics	4
Dieticians	4
Chiropractors	2
Psychologist	2
Podiatrist	1
Acupuncturist	1
Total	**20**

Procedure. Upon university ethics approval (approval number HRE15-203), health

practitioner networks known to the researcher were initially asked to share the information

regarding the study with their colleagues and other clinics they work with that may be interested.

Participants interested in the study contacted the researcher. They were given a list of questions

to think about before the interview, along with information giving an overview of

interprofessional practice, its definition, and its purpose; this overview ensured that the

participants understood the term 'interprofessional practice' in the context of this research before

the interview. Face-to-face, semi-structured, one-to-one interviews were conducted with all

participants. Semi-structured interviews allowed participants to expand and focus on areas they

felt were most important to them. Interviewees were asked ten questions about their knowledge

of interprofessional practice and focused on the barriers to why it was not occurring in their

primary healthcare setting. The researcher kept a journal, which was completed after each

interview, which included initial thoughts about the interview, the researcher's personal

viewpoints and any potential power dynamics that may have influenced the results. Interviews

were transcribed verbatim and checked for errors; interviews lasted approximately 30-45

minutes.

Analysis. The transcripts were analysed using Braun and Clarke's thematic analysis

method (Braun & Clarke, 2006). Selected quotes were added to a coding sheet where they were

given codes representative of the quote. The coding sheet for each interview was then compared

to coding sheets from other interviews, and reoccurring codes were combined to form major

themes. Third parties (supervisors during and after data collection) checked the validity of the

themes. Coding occurred while data collection was occurring. According to Braun and Clarke's

thematic analysis method, data saturation was monitored during data collection and was achieved

when no new codes were identified from the interviews. From a reflexive perspective, the researcher has worked in primary healthcare for several years; there was an understanding that this would impact the data as their experience in primary healthcare and their academic understanding of interprofessional practice could influence the participants' viewpoints. To minimise this, questions were kept as open as possible without asking the participants about particular issues, but instead asking them what they thought the issues were. The researcher could then use their experience and understanding to help the participant explore and probe the ideas that were being presented. During the coding, the journal was also used to check for potential bias.

Findings

Overall, nine barrier themes were identified and listed in order of significance as mentioned by the interviewees; this was based on the number of times mentioned in the interviews and when the interviewee mentioned them in the interview. If it was one of the first points raised, then it was considered of higher importance to that interviewee. While the interview responses were from an individual's perspective, systems theories suggest they must be considered based on the complexity of their interactions (Yann Foo et al., 2022); as such, each theme was then grouped according to The Centers for Disease Control and Prevention (CDC) Social-Ecological Framework, which is based on four levels: individual, relationship, community and societal (Perkinson et al., 2007). Viewing results from a Social-Ecological Framework can help reveal other factors' influence on themes (Ellison et al., 2021). While each theme will relate to all four levels, each theme is listed with the level it most relates to. See Table 3 below.

Table 3

Barrier Themes, Order of Importance and Their Relationship to the Social-Ecological

Framework

Order of Importance	Barrier Theme	The main Social-Ecological level to which the theme relates to
1	Lack of awareness of interprofessional practice	Individual
2	Support for interprofessional practice	Relationship
3	Prohibitive costs of interprofessional practice	Societal
4	Difficulties in implementing processes and logistics	Community
5	The role of working relationships	Relationship
6	Limitations of technology	Societal
7	Ethical issues in implementing interprofessional practice.	Community
8	States of mind affecting teamwork	Individual
9	Difficulties in implementing change	Societal

Theme 1: Lack of Awareness of Interprofessional Practice. Many participants lacked

knowledge of interprofessional practice. Even though they were given an overview of

interprofessional practice, for many, it was the first time they had considered teamwork from an

interprofessional practice perspective. As one Participant stated, "I mean I might talk to a

colleague about a patient when I'm unsure about something, but I didn't know the extent that it

could be done". This highlighted the first significant obstacle in implementing interprofessional practice, a need for more awareness about its definition and importance. Even experienced professionals who frequently collaborated needed to fully comprehend what interprofessional practice entailed and its difference from a multidisciplinary practice. While many of those interviewed operated from multidisciplinary practices, the level of interprofessional collaboration was low. Few healthcare practitioners were aware of interprofessional practice or were undertaking forms of interprofessional practice within their clinics. However, there were instances where interprofessional practice was occurring.

For example, one interviewee who operated in an interprofessional manner reported that their clinic would have case discussions and invite different healthcare team members (including medical practitioners, nurses, physiotherapists, psychologists and dietitians) to be involved. Healthcare team members would offer insights based on their knowledge and discuss the case with the group. This clinic was the closest example of actual interprofessional practice in the study; it was somewhat different from other clinics involved as it focused on a particular type of health concern with a particular target client population. As they were more of a specialised clinic, they had attracted a range of practitioners interested in that field. These interprofessional team meetings were completed outside of day-to-day work hours; practitioners were not reimbursed for their time and attended voluntarily. Their passion for the field was a driver for their attendance. The interviewee stated, "They don't get paid for it, and they do it after hours; they do it when they can because they are interested and want to learn more". Of course, passion and wanting to know more cannot be the only driver for other clinics to implement interprofessional practice.

Theme 2: Support for Interprofessional Practice. The vast majority of those interviewed supported the idea of interprofessional practice. If they were unaware, they would ask questions about interprofessional practice, and once explained, they could see the benefit, but they still needed more information to convert them to supporters of the idea. Many requested further research evidence of its effectiveness, especially concerning cost, as they could not see how it could be implemented within their current practice. Some also questioned why their professional bodies were not pushing the idea to them if it was an essential part of health care.

In principle, many liked sharing knowledge and could see how it would benefit the client, "I can see why this works, and some clients will like it", stated one interviewee. Many of them already voiced that they worked with several different healthcare providers in more of a multidisciplinary manner. No interviewees operated in their silos without working with other healthcare professionals in some form. It was interesting to note how viewpoints can change through further knowledge and discussion. For example, one of the interviewees who read the material was quite resistant to the idea and had many questions about its effectiveness. As they stated, "Yeah, it makes sense, but is there an evidence base to it?" When their questions were answered, and they understood there was an evidence base to it, they were more open to the idea. Those with a good understanding of interprofessional practice or were practising it in some form were all supportive. Having experience with interprofessional practice and seeing how it functions was more likely to yield interviewee responses supporting its implementation.

Theme 3: Prohibitive Costs of Interprofessional Practice. Cost and who pays for the service were common themes in the interviews. There can be a significant cost involved with implementing interprofessional practice in the Australian system. This is because, in Australia, healthcare professionals' time is usually based on a fee-for-service model. Many pointed out that

costs would increase significantly if every interprofessional team member is paid for their time, and who would bear the cost of that time? As one Medical Doctor stated, "So who pays for the time I spend doing this?" Costs can quickly increase if the client pays for each practitioner's time. For example, in 2023, an interprofessional team consisting of a GP, Psychologist, Physiotherapist and Dietician meeting for 30 minutes could cost anywhere from $AUD 400 - 800 (according to their professional bodies' standard fees for a 30-minute consultation). Interestingly, one doctor mentioned that while there were government funds under Australia's Medicare system available for medical practitioners for case conferencing, the interviewee flagged that utilising too many of these item numbers could result in a Medicare audit, suggesting that it would be unusual for a medical practitioner to use this item number excessively; triggering an audit would be a disincentive to many doctors. A further issue with Medicare is that (at the time of the interviews), these funds were only available to medical practitioners, limiting case conferencing to medical staff. As one participant pointed out "I can't claim this time on Medicare". Fortunately, this has been amended, and some allied health practitioners can use some Medicare funds. While this goes some way to resolving the problem, for many interviewees, the costing issue, if not resolved, was an immovable block for interprofessional practice.

Theme 4: Difficulties Implementing Processes and Logistics. Many interviewees needed clarification on the processes around interprofessional practice if it were to be implemented. Interviewees, especially those working in administration, discussed the issue of finding time for practitioners to meet when most were fully booked and already busy. As one participant stated, "This just looks like more work for me. I'm already busy dealing with phone calls and people walking through the door". Most interviewees worked from multiple locations

or with others working from different locations; this adds complexity to a meeting time, not just when team members are free but also when they are on location. The administrative staff were concerned about the increase in their workload of such programs as it would add another layer of complexity to their duties, trying to get all members together at the one location at the same time and when they are free. One participant stated, "It's hard enough trying to get everyone together for a staff meeting; how are you supposed to get everyone together that work at different places?".

Questions of who runs the meetings, what notes need to be taken, what information can be shared, who decides on attendance, does the client attend, who takes notes, who relays the information to the client, who leads the meeting, where will it be held, what facilities are needed were all raised by interviewees. Research into interprofessional practice has answered some of these issues (such as leading a meeting) (Chatalalsingh & Reeves, 2014), but other questions will be more specific to the clinic, such as where meetings will be held, who takes notes, and where they are stored. Individualised clinic processes would need to be created, again adding workloads to staff, especially in the initial phases.

However, another aspect of administrative staff and processes is the role they can play as part of the interprofessional practice team. While the education and implementation of interprofessional practice tend to focus on the healthcare providers, administrative staff involvement should also be considered in some instances. Some of the interviewees from an administrative background discussed instances of passing on information about a client to healthcare staff. For example, one interviewee mentioned that they sometimes develop friendly relationships with regular clients who might open up to them about occurrences in their life, such as relationship breakups (that they do not tell their doctors) that could put them at risk in certain

circumstances. As one participant stated "A patient the other day told me not to tell the Doctor but they were going on a short holiday, they said the doctor told them not to travel…what am I supposed to do then?". Administrative staff might also have insights into the general demeanour of a client that the client is hiding from medical staff, or they may be the first to note changes or cancellations in appointments.

Significant problems with logistics and processes can override even the most positive and enthusiastic healthcare providers' desire to implement interprofessional practice. Without workable solutions, this can lead to its non-implementation.

Theme 5: The Role of Working Relationships. A theme highlighted in the interviews and well reflected in the literature is the importance of relationships in interprofessional practice (Gittell et al., 2013). In cases where some forms of interprofessional practice occurred, it was mainly driven because of the good relationships among the healthcare professionals. One interviewee stated, "It's easier when you know a colleague and what they are like; it can make things more informal". As interprofessional practice requires good communication that is open and collegial, it stands to reason that a good working relationship with colleagues will assist that. Implementing interprofessional practice will be much more complicated in clinical settings with staff that have poor working relationships and tend to operate in a more isolated fashion. This would then be further compounded if there is conflict between staff. One of the interviewees mentioned that they thought interprofessional practice would be impossible in their clinic because of the conflict between two staff members. In comparison, in the clinic with interprofessional meetings, the interviewee mentioned that the staff were both collegial and had the common goals of finding solutions for the client and developing their understanding of the field by learning from others. As one participant explained, "We have a really good team;

everyone gets along well and is interested and wants to learn more". This becomes especially important when interprofessional practice is voluntary, or there is no payment associated with the service being provided; the idea that people can have genuine positive conversations with colleagues becomes essential.

Theme 6: Limitations of Technology. Technology was mentioned in all the interviews. While technology may solve some of the themes mentioned earlier, it also raises issues. For example, some interviewees mentioned that video technology and virtual meetings could save the problem of having everyone together at the exact physical location. Still, many interviewees talked about the lack of technological literacy and infrastructure. One participant explained, "I guess video meetings or teleconferences can help when everyone can't be together in the one place, but I know some staff will struggle with the technology; I've been in meetings where half the time is wasted trying to get technology to work". Before COVID-19, this was much more of an issue as Medicare had limitations on telehealth consultations and meetings. Due to increased familiarity, this now appears to be less of an issue because of changes to Medicare telehealth funding and an individual's ability to use the technology. However, some have been operating as healthcare providers for many years, are familiar with their processes, and are reluctant to embrace new technological advances. For these individuals, there might also be issues in technology uptake, even if it were to solve some issues, such as cost and logistics.

It is worth noting that technology has its limitations in Australia due to strict privacy laws. Specific information cannot be emailed unless it meets stringent privacy requirements. This is why Australia's medical sector still relies heavily on fax machines to avoid privacy litigation. While this approach may seem cumbersome, it is currently necessary to keep sensitive information secure.

It is not an insurmountable block, but it requires everyone on the team to use safe and effective technology. The Digital Health Agency (Australian Digital Health Agency, 2023a) has been working on an ongoing project to develop a universal healthcare communication system in Australia. The agency aims to have a secure and seamless digital communication system as part of its future framework. This would include not only the sending of records but also a secure messaging service.

Theme 7: Ethical Issues in Implementing Interprofessional Practice. The issue of ethics was raised because some of the interviewees were concerned about the sharing of information. While interprofessional practice aims to improve the client's health outcomes, which can occur more effectively when the health practitioners involved have a complete picture, the question of what must be shared should be discussed. For example, one of the interviewees, a psychologist, was concerned about sharing sensitive personal information about a client that, while it may be medically relevant to the conversation, becomes information more at risk of being made public. They brought up a hypothetical situation whereby a client may have PTSD from past abuse that potential medical treatments may trigger. They questioned to what extent they could share that information. As they were unsure, they wanted to confirm the professional limitations around this with their professional body. Medical Doctors were especially concerned about sharing medical information due to the privacy laws around medical information. However, something mentioned in confidence by the client could significantly impact the treatment planning. Having the client in the team care meeting could address this issue, but it is not always an option. Further guidance is required, as one participant stated, "How much can I say in these meetings? What if I share something that is medically relevant, but the client, in hindsight, didn't want me to say? I'd want clarity that legally I am covered".

Others raised the question of the role of the client and to what extent they should be involved in the meeting. While an individual can be present during an interprofessional practice meeting, this may not always be the case, nor would it always be in the client's best interest. One participant stated, "I don't know if the client being there is a good thing; they might hear something in a discussion that they don't understand or misinterpret". All the healthcare practitioners were registered and had to abide by their registration and professional body's requirements. Those who mentioned these ethical issues would prefer to have clarification from those bodies before participating in interprofessional practice.

Theme 8: States of Mind Affecting Teamwork. Individuals' personalities and attitudes towards interprofessional practice were also mentioned as factors. Interviewees were wary that some individuals at their clinic would resist interprofessional practice simply because they were 'not the type' that would be interested or were 'set in their ways'. This theme was termed states of mind because it related to personality and individual traits that might make a person less likely to get involved in interprofessional practice. Such individuals might resist implementation even though others might be willing (Lawlis et al., 2014). Interviewees spoke about this in the context of managers and their approach to innovation in healthcare. As one interviewee explained, "We had one doctor that wanted to introduce some new software, but Doctor 'X' who has been there a lot longer, was dead against it and kept saying it won't work. Eventually, they just didn't bother". If managers were quite supportive, then it was much more likely for that implementation to be recognised, whereas if managers were not supportive, it was much less likely to move forward. It may be helpful in these cases that there is a champion of the cause to help explain concepts and allay fears so that people may be more willing to accept interprofessional practice in the workplace.

Theme 9: Difficulties in Implementing Change. Change implementation was also recognised because, with the abovementioned factors, a few interviewees mentioned that they did not know what processes were required to implement it or even where to start. One interviewee stated, "Ok, so where is the information on setting this up? Is there a website or a guide? Where do I get more information?" Currently, clinics are left trying to implement interprofessional practice themselves without much guidance. Also, some factors would help implementation but go beyond an individual or clinic's control, such as implementing a unified health communication system in Australia. It becomes a bit of a catch-22 where some individuals may want to wait until more clinics apply interprofessional practice before implementing it. Still, some changes will not happen unless there is a more significant uptake (as in telehealth services during COVID-19) (Saiyed et al., 2021). Fortunately, this may become less of an issue as more interprofessional practice graduates enter the workforce. The challenge here is how to unify the goals of individual practitioners, clinics, professional bodies, government and clients so that they all understand the importance of interprofessional practice and can work together to help implement it.

Discussion and Implications of the Findings

The findings highlighted multiple impediments to interprofessional practice. Based on these findings, it may be prudent to consider these issues from the perspective of who is involved in helping to build and implement those solutions into a framework. This could be summarised in Table 4, which identifies the stakeholders and what they need to do to help implement interprofessional practice. Each stakeholder is considered for their central role in the Societal-Ecological Framework (Perkinson et al., 2007) previously mentioned in Chapter 2.

Table 4

Stakeholders' Involvement in Solutions

Stakeholders	Social-Ecological Level	Role in helping to implement services based on the above themes
Healthcare Practitioners	Individual	As an interprofessional team, there must be training to deal with interpersonal and intrapersonal constraints.
Clients	Individual	Education and agreement to participate
Clinics	Relationships	Would need to focus on the logistics and procedures that would need to be implemented
Professional Bodies	Community	Encouraging or mandating education for interprofessional practice
Community Groups	Community	Education for the community and lobbying for its benefits to the community.
Government	Societal	Would focus on laws and recommendations as well as infrastructure such as secure communication and funding

Healthcare practitioners will play an integral role in implementing interprofessional practice because they are involved in nearly all identified issues. For example, health

practitioners would need to be willing to learn about interprofessional practice, agree to it, agree to the reimbursement of services they provide as part of it, agree to the processes that would be involved, and be willing to build collaborative working relationships with other practitioners. Health practitioners would need to be willing to utilise technology and learn how to use it appropriately, liaise with their professional bodies to ensure that they adhere to the ethical standards of their profession, deal with any personal issues and internal conflicts that may arise as part of their reflective process and ultimately be supportive with the change itself.

Clinics and primarily administrative staff, including management, would focus more on dealing with issues relating to implementation and logistics. The data identified that this plays a vital role because even the most enthusiastic health practitioners may no longer feel the same way about interprofessional practice if they see the implementation fraught with problems.

The impact of professional bodies can already be seen with many accreditation bodies encouraging courses to include interprofessional education as part of the course accreditation. In Australia, this was primarily led by bodies such as the Health Professions Accreditation Collaborative Forum (Health Professions Accreditation Collaborative Forum, 2023). This seems to be shifting from encouraging and positively recognising courses that include interprofessional practice to mandating that interprofessional practice should be part of a course's curriculum. This approach does not account for those already qualified and in practice who did not undergo this training, hence why these professional bodies should do the same with existing practitioners, encouraging them to undertake interprofessional practice to make it a requirement eventually.

Due to the central role of the client within the interprofessional practice model, clients will also need to understand and agree to participate in interprofessional practice. From the Social-Ecological perspective, on an individual level, they will have the choice to take part, and

this may be influenced by their relationships with their healthcare practitioners and the practitioners' involvement in interprofessional practice. Education regarding interprofessional practice and the benefits they would gain as clients could come from community groups and agencies.

From a societal level, the role of government could be the deciding factor in how quickly interprofessional practice is implemented. While the government should not mandate interprofessional practice as it may be too difficult to police, the government can encourage interprofessional practice by supporting services that allow for greater levels of collaboration between health professionals, helping to streamline communication and the sharing of medical information and, of course, funds for education and interprofessional practice services. In Australia, this support is increasing with the implementation of programs like My Health Record (Australian Digital Health Agency, 2023b), which has become a centralised point to store some medical information, along with the recent introduction of MyMedicare (Department of Health and Aged Care, 2023c), which aims to offer better continuity of care, especially for those with complex and chronic healthcare conditions. While limited to Medical practitioners and nurses, the program does offer incentives for primary care practices. Those practices that choose to take up the program and offer higher levels of services to their clients may then reap the benefits of a growing business.

With so many stakeholders, an interprofessional approach is needed to help develop an overall strategy. Projects like 'Securing an Interprofessional Future' (Dunston et al., 2020) help guide governments on such strategies, which are created by taking on board the knowledge of different stakeholders. However, it is not simply the development of these projects; the continuity of these projects supported by the government becomes critical. This government-

supported continuity should be part of any implementation framework; otherwise, they are in danger of not being fulfilled. The evolution of a framework requires taking into consideration further research, along with meetings with stakeholders to discuss the best way forward. Government and professional bodies would need to take the lead to help such meetings and research move forward, establishing the strategy and ensuring it continues.

There were some limitations to this study. Firstly, the data were collected via healthcare practitioners based in Melbourne, Australia. Therefore, some of the information will not apply to other countries, especially considering the differences in healthcare systems worldwide. Future research might involve offering similar questions in different health systems and different user groups such as client and community organisations. Further information from the population via larger quantitative studies might also help to gain insights. Further studies might also look at how to target the solutions to the issues identified in this study more directly.

Conclusion and Next Steps

This study qualitatively explored barriers to implementing interprofessional practice in Australian primary health care settings. Interviews with 20 practitioners suggested that barriers include lack of education, prohibitive costs, and implementation logistics. Based on these findings, solutions to the impediments to interprofessional practice in primary healthcare can be addressed. Still, the process can be expedited if the government drives continued support. In countries like Australia, where the primary healthcare setting is mainly privately owned and thus can choose to operate with certain degrees of freedom (as per most private enterprises), new approaches to healthcare, such as interprofessional practice, can be made more challenging to implement because practices have the choice not to participate. Alternatively, it can make it easier for such healthcare settings to do something different from everyone else. An individual

clinic can set up its version of interprofessional practice if it addresses the above issues. This opens opportunities for primary healthcare settings to set themselves apart from other clinics or become exemplars of the benefits of interprofessional practice to their clients. The next phase of the research was to reflect on these issues and explore the literature for possible solutions, including any solutions offered in this data collection phase.

Chapter 5. Proposed Solutions

Chapter Overview

Chapter 4 analysed the barriers identified in implementing interprofessional practice from the perspective of those working in primary healthcare. This chapter presents potential solutions to these identified barriers based on the analytical extrapolations from the findings in Chapter 4 and the literature review. This chapter further discusses these solutions in light of The Social-Ecological Model: A Framework for Prevention (Perkinson et al., 2007). Taking this approach will ensure that the solutions presented have an evidence base and, therefore, are more likely to produce a successful implementation model, as opposed to solutions solely based on information from a small cohort, which may then only apply to that cohort.

Chapter 4 identified and discussed nine significant themes that needed to be addressed to help ensure the effective implementation of interprofessional practice in the private practice setting. Table 5 below summarises the main issues or barriers to the implementation of interprofessional practice. A critical analysis of the literature was undertaken to develop an understanding of how to best address each barrier. The solutions are then discussed, highlighting what the evidence suggests are ways to address the identified barriers. Discussing these issues and solutions helped to formulate the model presented in Chapter 7.

Table 5

Summary of the Identified Themes Grouped via their Main Social-Ecological Levels

Barrier Theme	The main Social-Ecological level to which the theme relates to
Lack of awareness of interprofessional practice	Individual
States of mind affecting teamwork	Individual
Support for interprofessional practice	Relationship
The role of working relationships	Relationship
Difficulties in implementing processes and logistics	Community
Ethical issues in implementing interprofessional practice.	Community
Limitations of technology	Societal
Difficulties in implementing change	Societal
Prohibitive costs of interprofessional practice	Societal

The Social-Ecological Model: Individual Level Barriers and How They Can Be Addressed

Addressing the Lack of Awareness of Interprofessional Practice

Many healthcare professionals interviewed did not understand what interprofessional practice entailed. While all healthcare professionals understood the concept of working with other healthcare professionals, working in an interprofessional manner seemed unclear to many. Part of the reason for this may be differences in terminology, as has been highlighted by Choi and Pak (2006). The other reason may be that interprofessional practice goes beyond simply working collaboratively. Respondents may not have been clear on what interprofessional practice

entails, but many were working collaboratively, at least to some degree. The other reason for this lack of knowledge may be the relative recency of interprofessional practice being highlighted on the world stage, especially as the interviews took place pre-COVID. It has only been just over a decade since the World Health Organisation released its landmark report (World Health Organization, 2010), and it was less than a decade since that report when the interviews in this study were undertaken.

Addressing this lack of awareness and understanding of the process is ultimately about education. There has been an enormous amount of work in the field of interprofessional education, as previously discussed in earlier chapters. Organisations such as The Centre for the Advancement of Interprofessional Education, the American Interprofessional Health Collaborative, and the Canadian Interprofessional Health Collaborative, to name but some, have helped to build the knowledge base. Authors such as Reeves et al. (2013), Barr (2013), Thistlethwaite (2012), Moran et al. (2015), Dunston et al. (2020), and others have helped to shape the development of interprofessional education. Much of the research on how best to teach interprofessional practice goes beyond the scope of this thesis. However, the research on education mainly targets a specific group: students studying their respective health professions and incorporating interprofessional practice into it (Steketee et al., 2014).

Interprofessional practice is being introduced into curriculums so emerging healthcare professionals can enter their professions with a better understanding of what it entails and the benefits of working interprofessionally (Gum et al., 2013). As such, it would stand to reason that over time, the lack of awareness of interprofessional practice may be resolved simply by the increased emphasis on interprofessional education in curriculums, particularly if further encouraged by health professional accrediting bodies (Health Professions Accreditation

Collaborative Forum, 2023). Educators must adhere to the standards identified by interprofessional practice research so that this is not simply left to the discretion of educators but instead covers the essentials needed for interprofessional practice and is evidence-based (The Interprofessional Curriculum Renewal Consortium Australia, 2013). Accrediting bodies can also help to ensure that interprofessional practice is being taught in the correct manner. It is evident that several professional bodies in Australia are now requesting interprofessional practice be part of the curriculum as part of their accreditation processes (Health Professions Accreditation Collaborative Forum, 2023). This requirement will help ensure future healthcare professionals better understand interprofessional practice. Interprofessional practice could be best implemented in courses if it were mandated. Mandating interprofessional practice in some form could be on the horizon as the Australian Health Practitioner Regulation Authority is currently collecting feedback on a statement of intent regarding interprofessional practice (Australian Health Practitioner Regulation Authority, 2023).

Incorporating interprofessional education into the curriculum will help its longer-term advancement. However, it does not address those who have not had training in interprofessional practice as part of their initial qualifications, as studies such as Zielińska-Tomczak et al. (2021) suggest that older practitioners may be less open to collaboration. Then, there are those who have had training but have not been able to practice it professionally. Without an opportunity to practice, an individual might possibly forget much of what they were initially taught and might need a refresher or specific training on how interprofessional practice is applied in their clinic (Langton et al., 2023). Many healthcare professionals trained ten or more years ago (before the W.H.O. report) make up most senior healthcare positions. For example, the average age of a GP in Australia in 2022 is 51 years (Department of Health and Aged Care, 2023e). This means that

interprofessional practice was likely not part of their initial training, and they are more established in their careers. There will be those in this cohort who embrace interprofessional education and change how they practice, as well as those who are resistant. Again, the solution to educating healthcare professionals might become a requirement rather than a recommendation by professional bodies so that even established healthcare professionals will eventually have this training. Many registration bodies require continuing professional education to maintain registration. While many educational resources exist, encouraging health practitioners to undertake specific training in interprofessional practice may only work so far. Uptake would be much greater if continuing professional education programs included interprofessional practice as mandatory training.

At present, mandatory training is not the case; there is no law or restriction of practice if a health care professional does not have interprofessional training; the need then is for health professionals to want to have training in the area that they see value in being educated. Raising awareness of interprofessional practice may need to come from highlighting the external factors previously discussed that contribute to the encouragement of interprofessional practice. In a medical setting, this could be by highlighting programs such as My Health Record or MyMedicare to show that there are government-supported programs that encourage information sharing, that professional bodies are moving towards becoming more interprofessional, and that it will be a growing part of the future healthcare workforce (Commonwealth of Australia, 2022b).

However, stating facts may be insufficient to create change; individuals will have their own drives and challenges. For example, someone at the end of their career may be less motivated to change how they practice than someone with many years ahead of them in the

workforce (Sherwood & Bismark, 2020). A clinic might then need a lead person to help drive information sharing and address some of the concerns individuals might have (Barker et al., 2005). This links to another well-researched area beyond interprofessional practice: change management. Change management and other identified themes will be discussed later in this chapter.

Education is fundamental to implementing interprofessional practice; there is a wealth of research on how best to describe, teach and assess interprofessional practice, along with educating those concerned about its implementation. For some, it may be as simple as linking them with this information stored on resource sites like ANZAHPE (Australia and New Zealand Association for Health Professional Educators, 2023). In future, this may be less of an issue with the incorporation into the curriculum, but clinics operating today might need their own version of a curriculum.

Training in healthcare and interprofessional practice sometimes includes the model of explaining theory, followed by simulation, followed by practice (Forman et al., 2014). These components help to increase client safety while giving those participating opportunities to enhance their knowledge in different scenarios. A similar process could be carried out in clinics. A general overview of interprofessional practice and how it will be implemented in the clinic could be presented. Live or recorded clinical interviews with actors and simulation activities would follow this. The practice component could start with some identified clients who may benefit from the service and would be open to participating. A full rollout could commence once staff are comfortable and issues have been resolved. This process will be more fully outlined in the final model presented in Chapter 7.

The recommendations below are suggestions for ways to increase awareness of interprofessional practice based on the framework from the Social-Ecological Model. While it would mainly focus on the individual, all levels are addressed because the solutions are not limited to one level within the framework. As all levels of the framework are interconnected, all are covered with the main focus on one, which in this case is the individual:

Individual. Addressing this barrier on an individual level is essentially about the education of the individual, the ability of an individual to gain skills and training so that they become aware and educated about the issue at hand; ultimately, it is the individual's choice to accept or take onboard information that is placed before them. Hence, education could be general in the first instance but then more targeted to help address individual concerns that may block incorporating interprofessional practice.

Relationship. This level relates to peers, peers can significantly encourage individuals to engage with the educational information before them. It is the difference between an individual simply watching a video or reviewing a website and conversations between them and a peer who has engaged in interprofessional practice and can speak from their own experience, answer questions, and help allay any fears. Simulation activities allow peers to discuss and explore the educational material, while interprofessional 'champions' can help to distribute more targeted information.

Community. The workplace can encourage education via support in various forms. Regarding the theme of education, the workplace is the leading community. It can allow staff time to engage in professional development activities and group discussions about interprofessional practice and help to provide or pass on materials to staff. It can also assist with the development of how interprofessional practice will be applied in the workplace. It will also

go beyond staff to include clients willing to participate in trialling interprofessional practice activities before implementation.

Societal. As previously mentioned, the role of the accrediting bodies can help push education forward. The role of accreditation bodies in implementing interprofessional practice into the curriculum and the possibility of doing the same as part of continuous professional development is part of this societal change. Education on societal changes related to interprofessional practice, such as MyMedicare and My Health Record, are also important, as they show government support for collaboration. General practice clinics, where the clinic itself can be accredited, thus allowing them to accept further payments from Medicare (such as Practice Incentive Payments), may include some form of interprofessional practice as part of clinic accreditation. For example, MyMedicare payments related to collaborative care may only be available to accredited clinics, and the accreditation process could check that they are operating according to interprofessional principles.

Improving States of Mind That Affect Teamwork

In addition to a lack of awareness regarding interprofessional practice, other individual-level factors such as an individual's experience, attitudes towards and confidence in engaging in teamwork may also impact the implementation of interprofessional practice. An individual's psychological state and personality traits can also influence teamwork. As discussed in Chapter 4, this was referred to as states of mind affecting teamwork. Researchers have found that an individual's self-concept (Swann Jr & Bosson, 2010) and other aspects of personality can influence an individual's openness to engage in interprofessional education and practice (Avrech Bar et al., 2018; Axelsson et al., 2019). In their thesis, Adedipe (2017) found that individuals with higher self-esteem in group settings had more positive attitudes towards interprofessional

education. Higher levels of resilience also were found to correlate with greater levels of acceptance of interprofessional practice (Avrech Bar et al., 2018), as were extroversion and openness (Axelsson et al., 2019). Even aspects beyond personality, such as socio-demographic factors, can play a role in team dynamics (Hallam et al., 2016).

These studies highlight that aspects of an individual's personality may impact how they operate interprofessionally. It does stand to reason that those with traits beneficial to a team-based environment (such as openness and extroversion) may be more naturally suited to the interprofessional team (Axelsson et al., 2019). The question becomes how to better assist those lacking those traits who may be more resistant to the team or function less effectively in a team. For example, a massage therapist with recently obtained qualifications may have exceptional knowledge about the muscular pain a client is experiencing. Still, if they lack self-confidence and are less extroverted, they may be less inclined to speak up or challenge a more senior health professional with many years of experience.

Interprofessional education may be able to address some of these states of mind that affect interprofessional practice, such as building self-esteem by teaching the skills needed to better communicate in a team-based environment. Examples such as TeamSTEPPS® (Welsch et al., 2018) can help provide a framework whereby someone with less self-confidence or who is less socially adept may be able to provide feedback in a way in which they have been taught is acceptable. But sometimes education is not enough. In the above example, there will be those who can learn and work in an interprofessional team effectively, but for others, education and training will not be enough because of other mental health factors, such as social anxiety, which may need to be addressed through professional assistance.

Some of these issues may be identified via self-reflection and reflective practice, which could help the individual seek professional support. Self-reflection is often discussed as essential in healthcare (Ooi et al., 2021). Observing oneself and reflecting on one's performance and interactions with others offers the health professional the chance to improve and grow. Interprofessional practice also encourages reflective practice (Domac et al., 2016; Parrott et al., 2023), as it is essential to review how one deals with group dynamics. Self-reflection should be strongly encouraged, and if there are issues that the individual identifies, they should be addressed through professional counselling, coaching, or mentorship. The recommendations based on a social-ecological model would mainly be focused on the individual level, but again, all levels are addressed below:

Individual. This level is about assisting the individual in identifying any psychological or personal issues affecting their ability to participate in group activities. The individual needs to recognise that they want to change. Self-reflection will help in the recognition, and education may help to provide the skills needed to create the change. Again, in some instances, more profound issues may lead to resistance to that change and prove too much of a barrier for them to participate in interprofessional practice (Ganotice Jr et al., 2023). In extreme cases where these personal issues cannot be resolved, taking part in interprofessional practice may need to be reconsidered.

Relationship. Mentorship, guidance, and coaching may help individuals overcome personal challenges that prevent them from engaging in interprofessional practice, and relationships can play a part in these areas. Suppose an individual has good relationships with colleagues; they may be more interested in accepting advice on further guidance and other

possible solutions to what is stopping them from making the necessary changes than if they felt more isolated from the rest of the team (Colbert et al., 2016).

Community. Workplaces can provide mechanisms for mentorship, coaching, and interprofessional education that may be needed for individuals. If an organisation is small and does not have the required resources, it may be able to guide the individual to where they can find the required support (Lankau & Scandura, 2007).

Societal. Some support for change in this area will come from existing educational interprofessional practice resources (such as voicing concerns in meetings) (Maneval et al., 2020). Professional associations could have these resources on hand to increase the interprofessional knowledge of their members. If the problem is more personal in nature, such as in the case of social anxiety, the individual may access societal support mechanisms such as Medicare funding via a Mental Health Care Plan to help provide psychological counselling to deal with the issue.

The Social-Ecological Model: Relationship Level Barriers and How They Can Be Addressed

Fostering and Increasing Support for Interprofessional Practice

While individual issues can affect the acceptance of interprofessional practice, most people interviewed generally had an optimistic viewpoint. Some health practitioners, however, had concerns with its implementation. If these concerns are not addressed, then this lack of support becomes a further barrier to its implementation. While any staff member not supportive of interprofessional practice can cause an impediment to implementation, some roles within organisations may carry more weight than others and, therefore, have a more significant effect on

implementation. For example, the viewpoint of a senior manager can play a significant role in terms of the effectiveness of the implementation of interprofessional practice through their attitudes and their ability to bring others on board with the idea (Bareil et al., 2015). A manager or director may mandate that interprofessional practice be incorporated into service offerings or outright reject it.

Therefore, questions about the validity of the implementation of interprofessional practice must be addressed wherever they are raised. Change management theories can significantly assist in overcoming barriers to implementation. The study by Schmutz (2022b) used 'Kotter's 8-step model for organisational change' to implement interprofessional practice in a hospital setting. Regarding individuals blocking implementation, the suggestions were to ensure an alignment with structures, skills, and supervisors, then to 'win over' smaller entities and enable peer feedback. This could be done in several ways, as previously suggested, and as suggested by Schmutz, being that in addition to the lead individual, an organisation implements particular champions of the cause to help answer questions and to address fears of those who are more resistant to the implementation of interprofessional practice.

Simulation activities can also help to shift attitudes. Carrick-Hagenbarth and Maton (2023) showed that medical doctors' attitudes to preconceived ideas changed when placed in simulated environments. From an interprofessional practice perspective, this may be done by showing them a case video and getting them to jot down what they think. Then, compare that with answers from other healthcare professionals to highlight the difference of what they could have missed. Then attempting a similar exercise working interprofessionally as a team. If properly supported and done encouragingly, showing someone where knowledge is lacking can be a way to pique their interest in improving their service (Lee et al., 2024).

Another way to overcome barriers in support may be to align the clinic's values with an individual's values and wants. Tsou et al. (2015) compared the values associated with interprofessional practice and those of professional associations. They identified that interprofessional values included altruism/caring, excellence, ethics, respect, communication, and accountability. While the majority of the associations shared these, there will be some individuals who do not share those values. For example, they may be primarily driven by financial or status incentives, which override all others. As such, that individual may impede implementation if the values of interprofessional practice are contrary to their own personal values. An individual's values can be changed, but the process is not always easy or indeed possible (Russo et al., 2022). Therefore, a clinic must be very clear in articulating its goals and values so that those with opposing values may choose to either reevaluate their values or move on to another workplace that better aligns with them.

Clinic size and type are also factors to consider when trying to increase support for interprofessional practice in an organisation, as Australia has many different types of primary healthcare settings with different needs (Swerissen et al., 2018). A clinic with many staff might find deploying information and having conversations with individual staff to encourage support more difficult than one that is smaller. The basic process should be the same: encourage clinic support and have leadership approval and champions to help encourage conversations around implementation. Education and simulation activities can help shift opposing viewpoints, and clear clinic values can help encourage individuals to reflect on the alignment of their values.

The recommendations to address the support issues based on a social-ecological model would mainly be focused on relationships, but all levels are addressed below:

Individual. Support for interprofessional practice will ultimately be decided on by the individual, as no one is ultimately forced to comply. Some personal factors, such as values and those discussed in the previous section, will affect support for interprofessional practice. Reflection, as previously discussed, is encouraged to allow the individual time to alter their value system more closely to the clinic or move to another workplace that more closely aligns with it.

Relationship. Relationships can be vital in helping to overcome blocks to interprofessional practice support. Information needs to go beyond a general brochure or website to create change. Champions engaging with staff, addressing concerns, and running simulation activities may help to challenge negative perceptions (Carrick-Hagenbarth & Maton, 2023; Schmutz, 2022b). The relationships that champions have with other staff may influence the dynamic around the conversations about interprofessional practice, as they can more directly address concerns and help build support.

Community. The workplace community can also be essential in fostering these relationships between colleagues and identifying where people stand on implementing interprofessional practice. So, while conversations are needed to help people address their fears and concerns about implementing interprofessional practice, they need to be done in some managed way. The workplace community can use workplace culture to improve discussions regarding change (Al-Hadrawi, 2023). Workplaces, like any organisation, have the potential of falling into the trap of having clear values but not applying them; great strides can be made by leading by example and creating a workplace culture that follows identified values, making it easier for others to align to it (Singh et al., 2011).

Societal. Creating societal support for interprofessional practice should be approached from an evidence-based perspective, and, as a society, we continue to build the evidence base.

As healthcare professionals are trained in evidence-based practice, many want clear evidence before changing their practice. As discussed in previous chapters and the data collection in the last chapter, some will be swayed by the evidence base and may need it to be shown to them. Another societal aspect is focused on funding (Kuchta & Zabek, 2011). Even with an evidence base, some healthcare professionals may not support interprofessional practice because it is simply cost-prohibitive for their practice, or it works but is not financially sustainable in the long term (McDonald et al., 2011). As a society, we must encourage the government to support interprofessional practice financially in some form; this will be discussed later in this chapter and in the next.

Improving Working Relationships

In the literature and interviews, working relationships play a vital part in the effectiveness of interprofessional practice (Mischo-Kelling et al., 2021). Feeling comfortable with those you are working with is crucial as it can foster better communication and impact health outcomes (Gleeson et al., 2023). While some relationships naturally grow with time, others will need more assistance in their natural development and nurturing when there are interpersonal issues. As some interview participants pointed out, logistics and processes are more manageable if you work with the same people; building relationships is easier because you interact with those people more regularly.

There is, of course, the possibility of relationship issues with those we interact with more regularly. Orellano (2024) suggested that leaders within the organisation can play a significant role. The Leader-Member Exchange (LMX) theory is one of many that identifies this importance and that leaders who nurture positive behaviours and trust in others can foster that across the organisation.

Also, it should be noted that teams change and that a team that functions well may no longer function as members leave. This highlights the importance of a positive team culture led by senior staff, as a new staff member is more likely to follow the culture that exists (Garrow & Martin, 2012).

The recommendations based on a social-ecological model would mainly be focused on the relationship level, but all levels are addressed below:

Individual. Each individual brings with them their personality, beliefs, and particular feelings that they have towards other workmates. As previously discussed, states of mind affect teamwork and relationships. The level of impact this would have on interprofessional practice will vary from person to person. Workplaces can help individuals improve relationships by encouraging prosocial behaviour (Alan et al., 2023).

Relationship. Relationships will play a role in model implementation because there will need to be some agreement regarding differences in what individuals want in a model and how the model should be implemented for their particular clinic. The importance of relationships and positive relationships come into play here. It will be much easier to decide on processes if those discussing it are amenable to change and are working as a team instead of team members in conflict trying to decide on aspects of implementation (Bala et al., 2021).

Community. The workplace culture comes from the workplace community (Holmes et al., 2007). As mentioned, workplace culture will significantly impact working relationships and is dependent on senior management's leadership. If senior management is supportive and helps to foster a supportive community, then relationships are more likely to improve.

Societal. As interprofessional practice gains popularity, society has increased recognition via funding by introducing team-based item numbers from Medicare and MyMedicare, as well as

case conferencing via Workcover, TAC, NDIS, and My Aged Care. Government departments appear to be moving towards a less siloed approach to healthcare. Consequently, working in teams may become more prevalent, and learning how to function with others in an interprofessional manner will continue to gain importance.

The Social-Ecological Model: Community-Level Barriers and How They Can Be Addressed

Addressing the Difficulties in Implementing Processes and Logistics

Even if money were no object and a client wanted interprofessional practice to occur with a group of medical and allied healthcare practitioners, arranging the interprofessional meeting would still need processes and logistics. A suitable time for all parties, setting out how the meeting will occur, where it will occur, the points of discussion, who will lead the meeting, and where notes will be stored are just some of the planning requirements (Coss et al., 2021). Logistics and processes must be identified and understood before the commencement of interprofessional meetings.

Logistics will be clinic and practitioner-specific. Thus, solutions should be considered first from an exploratory perspective of what is needed for those particular practitioners and clinic(s). Previous research has highlighted the importance of context when creating solutions (Bentley et al., 2018). Clinics are advised on what should be considered, allowing the clinic to explore their solutions rather than providing specific instructions for all. The following have been identified by researchers as logistic points for consideration.

Location. The first question would be where meetings could be held. While interprofessional practice meetings can occur on an informal basis via the brief hallway chat, the more formal interprofessional practice meeting would need an appropriate setting (Kilaberia &

Merighi, 2023). Logically, if all health professionals are located in one location, the meeting should occur there at that location; the question then becomes one of suitable time and space. The interprofessional practice meeting could be performed online or electronically if not all participants are available from one location. If one considers the idea of fee-for-service, travel time takes away from client consultation time. It may be easier to offer their input virtually and return to client interactions than to include travel time. Meetings could be virtual if not all practitioners are at the same site simultaneously.

Virtual meetings. Virtual meetings offer another advantage beyond location and travel time. Practitioners in front of their own set of notes can access, check and add notes from the meeting as the meeting progresses, reducing the time needed at the end of the meeting to add notes and possibly miss previous information they had stored (Davis et al., 2021). Virtually all video-sharing software also allows sharing screens so that a person in the meeting could easily share radiology images or blood test results with the group for discussion. In a face-to-face setting, this becomes more difficult unless the individuals carry a laptop or tablet to take notes on the go and the room is set up for presentations to share images with a group.

However, this reliance on virtual meetings requires individuals to know how to use the technology and possess the appropriate technology to interact with others (Eines et al., 2023). The quality of the audio and video stream can also impact the effectiveness of a meeting. Internet lag, dropouts, and poor audio and video quality can be very detrimental to the meeting, at best taking away valuable meeting time and, at worst, not clarifying important health information (Wootton et al., 2020). It is also crucial that virtual communication occurs in a safe and private environment; even the home setting would need to be as private as an office setting.

It is also recommended that people undergo training in using this technology before meetings so that they are familiar with it and any issues such as internet lag can be mitigated. Meeting times should not be wasted while people set up equipment or adjust audio settings. Since the COVID-19 pandemic, the use of telehealth has increased dramatically, and what was once met with much resistance has become a legitimate form of interaction for many health practitioners (Caffery et al., 2022). Virtual meetings as a solution to the logistical issue of location would have been more difficult before COVID-19; now, its implementation would not be as much of an issue.

Timing. Time pressures were mentioned in the interviews and the research (Riste et al., 2018). Having similar times earmarked for interprofessional practice might allow opportunities for interprofessional practice to occur. The times may not necessarily be blocked out for interprofessional practice but instead earmarked for interprofessional practice, which can be utilised for clients if no interprofessional practice sessions are running. These times could be at the beginning, midday or the end of the day. Morning meetings could run similarly to business breakfasts, whereby having a function outside of the usual work hours or at the start of the usual work hours is more conducive to having people able to attend those times (Aston et al., 2005). It may be challenging to find a time that suits everyone, and even if there were such a time, it would impact other clients obtaining health services because their practitioner time may be used in an interprofessional practice meeting.

As such, the recommendation is to have a set time, and that time is agreed upon by others who might commonly work as part of the interprofessional practice team (Paxino et al., 2022a). There may be a more significant issue with timing if participants work from different locations and work at different times or if some work part-time. If there is no possibility of having all

treatment team members able to meet at one time, other avenues could be explored, such as sending a summary of points instead of attending or a video or audio recording of the meeting. The meeting should not be overly lengthy and should have a set agenda with what needs to be discussed (Vestergaard & Nørgaard, 2018). Meetings could then operate according to the general guidelines of any interprofessional practice meeting, such as TeamStepps®.

Agenda. Once a location and time have been established, costing and payments have been determined, more specific aspects of the meeting need to be decided, such as who will lead the meeting, what needs to be covered and the goals of the meeting, note taking, and communication of outcomes to the client (van Dongen et al., 2018). Again, some of these can be determined before the meeting starts and can form part of a background of information provided before the meeting. Agendas can help to keep meetings on track. The agenda could be utilised as most meeting agendas, clarifying time, location, participants, length of the meeting, the client name, background client information, salient points raised by any member of the treatment team and outcomes (Smart et al., 2018).

Follow up. Interprofessional activities should not simply be a once-off meeting, leaving clients to care for themselves moving forward. Instead, follow-up meetings should be part of the process; however, this is not always easy because of client autonomy, and they may not want to fully comply with the treatment plan (Poivret et al., 2021). The follow-up becomes another factor in organisation, not just organising the follow-up meeting but also ensuring that the client has complied with the recommended tests and treatments to be reviewed. Again, someone needs to be appointed to take charge of this role.

Organisation. Of course, all the points above require staff to organise them and to find suitable times, organise locations, send out meeting information, compile information, send out

virtual links, and notify apologies, to name but some. The organisation could be best left to clinic administration, but in some cases it may involve multiple clinics, in which case, one clinic would need to take the lead role. The central point between allied health and specialists is the general practice clinic, and in cases of multiple clinics, the role could fall to them in the first instance. Still, there are variances in how much of a role the admin person can play depending on the structure of their clinic and the amount of other duties they need to perform (Greenhalgh et al., 2007). The administration cost should be factored into the session's cost, just as every health practitioner service covers the cost of administration staff.

With all these logistical challenges to the implementation of interprofessional practice in primary healthcare settings, part of the solution may be in recent technological advances, such as AI. For example, organising a suitable meeting time, preparing an agenda, scanning notes for potential issues that need to be discussed, and writing summary notes of the meeting could all be handled by AI (Lyrebird Health, 2024; Otter.ai, 2023). The AI does not replace any team members but provides a draft of meeting notes that can be checked and edited, saving considerable time; while this technology is new, it will continue to improve.

The recommendations based on the discussed evidence to address the identified issues based on a social-ecological model would mainly be focused on the community level, specifically the workplace community, but all levels are addressed below:

Individual. To address process and logistical difficulties in implementing interprofessional practice, individuals' needs must be considered. Simply deciding when and how interprofessional practice would occur would need to begin with understanding different individuals' availabilities, locations, and how they wish to work, such as virtually or face-to-face.

Relationship. Relationships will play a role in implementing the processes and logistics related to interprofessional practice because there will need to be some agreement where there are differences in what individuals want. The importance of positive relationships comes into play here. It will be much easier to decide on a process as to how interprofessional practice should function if those discussing it are amenable to changes than if they are in conflict. It is also essential to include and identify others who should be involved in the implementation process, such as relevant administrative staff who will play a vital role.

Community. The main focus will be on the workplace community, as the clinic will ultimately need to decide on these processes and services. Managing the implementation process must include collecting viewpoints from individual practitioners and clients, understanding the relationships between those who work at the clinic and considering government requirements and funding models. Someone would need to orchestrate this process and consider all this information. Such individuals must be identified to ensure they can provide the required outcomes.

Societal. Societal shifts in technology, primarily via the use of telehealth and the increase in interest in using AI in healthcare, may address many of the issues that may have been insurmountable in the past. For example, as AI becomes more accepted in healthcare delivery, logistics such as planning meetings and taking notes will become easier.

Addressing Ethical Issues in Implementing Interprofessional Practice

Ethics in healthcare can pose challenges to any healthcare professional; those challenges can be compounded in the team-based environment as they impact individual decisions and raise the question of ethics, team dynamics, and protocols for sharing information (Manspeaker et al.,

2017). The ethics of how an interprofessional team operates must be taken into consideration. While the team itself must operate within its ethical guidelines, those guidelines will be affected by other ethical considerations based on other components of the team, such as the ethics of the healthcare profession to which the person belongs, ethics of the clinic from which they work, and an individual's ethics (Engel & Prentice, 2013). Bringing these components together can help shape the ethics of the interprofessional practice team. While there will be commonalities amongst these ethical considerations, differences should be discussed to help formulate the ethics and guidelines of the interprofessional practice team.

      Professional Ethics. This is the most fundamental form of healthcare ethics, as healthcare professionals in Australia are registered either by the government via AHPRA or have their self-accrediting bodies (Australian Health Practitioner Regulation Agency, 2023). Part of the development of these professional bodies and associations is that they have formed their ethical guidelines. Practitioners, especially members of these bodies, must adhere to these ethical guidelines; otherwise, they may face disciplinary action. Even without professional ethics, healthcare is focused on the well-being of the client and acting responsibly and ethically as a healthcare practice should occur as it is the right thing to do. Previous work by Tsou et al. (2015) has suggested commonalities among associations' ethical guidelines. As previously mentioned in this thesis, these associations also encourage the implementation of interprofessional practice. Of course, there will be nuanced differences in what practitioners should and should not do within the scope of their profession. These differences may impact an interprofessional team. For example, the scope of practice and behavioural expectations of sharing information could fall into this area.

Ethics of the Clinic. Larger organisations may have policies and codes of conduct that help shape ethical decisions or guide behaviour in certain circumstances. This may not always be the case for small clinics but, even then, there is scope for these smaller clinics to have mission statements or guiding principles to help identify what they stand for as a clinic (Perlis & Shannon, 2012).

Such statements do not carry much weight unless the workplace culture reflects them; this can make the difference between a document that carries very little weight and something that has a pivotal role in shaping workplace culture and processes. They can also help to attract and guide new staff. For example, a clinic that highlights that it operates interprofessionally might be more likely to attract staff with the same beliefs and values (Hahtela et al., 2015).

Ethics of the Individual. An individual can be shaped by their ethics and values by factors that may go beyond the professional. Personal ethics develop over time and might be shaped by religion, upbringing, and personal experience, to name but a few (Causapin et al., 2022). These ethics may contrast with their professional ethics in influencing their behaviour. For example, there is the issue of doctors not providing some forms of care, such as contraception or abortion, because of their religious beliefs. Thus, personal ethics and values must be considered (Reichlin, 2022).

The changes that can occur with introducing interprofessional practice may lead to re-evaluating long-standing professional ethical guidelines. For example, part of the ethical guidelines from the Australian Medical Association states in the section relating to the sharing of information, "2.2.2 Maintain the confidentiality of the patient's personal information including their medical records, disclosing their information to others only with the patient's express up-to-date consent or as required or authorised by law. This applies to both identified and de-identified

patient data." Regarding clinical independence, it states, "4.2.1 Uphold professional autonomy and clinical independence and advocate for the freedom to exercise professional judgement in the care and treatment of patients without undue influence by individuals, governments or third parties". (Australian Medical Association, 2016). While these guidelines come from a professional body and not from the Medical Board of Australia, they can only be enforceable to some degree to its members. Nonetheless, these instructions in that code of ethics raise questions on how to behave interprofessionally. A member might question whether this means that a GP must specify precisely what information will be shared in an interprofessional meeting and gain consent for each piece of information. Does a discussion in an interprofessional meeting constitute an external influence on the GP's decision-making? As mentioned in the interviews, some were reluctant to go against what their ethical guidelines had advised them to do because, technically, they could face severe consequences. This is not an insurmountable issue, but it needs to be addressed or clarified with professional bodies, and some professional bodies are discussing how adaptations can be made (Young, 2023).

From the clinic's perspective, its ethics and guiding principles regarding its involvement in interprofessional services should be very clear. The ethical principles or policies should link with the clinic's mission statement, processes, and logistics for care delivery. For example, suppose the clinic operates on the policy that any client wanting interprofessional practice support must sign consent forms for information sharing. In that case, those forms must be created and incorporated into the workflow and processes.

Addressing the ethics of the individual and the differences between professional and clinical ethics may be more challenging. Interprofessional ethics could be clarified, allowing individuals to choose whether they engage or participate in interprofessional practice. While

there may be some cases of individuals who might change their viewpoints and values when presented with new information (Manspeaker et al., 2017). Others' ethics may not fit the ethics of interprofessional practice. Certain ethics, such as some religious ethics, may not be possible to change, and in such cases, if solutions cannot be found, it might be best to find a clinic that better matches their ethics.

While the focus has been on ethics, legal requirements should also be discussed. Legal requirements can be considered clearer than ethical guidelines, as they are mandated and, as such, may be easier to apply. As mentioned in the paper by Girard (2021), the law has yet to see, and has not had to deal with *all* the legal issues that may arise through the implementation of interprofessional practice. Using precedent law, laws might evolve from findings in particular cases. This problem is not unique to interprofessional practice but is encountered in many areas of medicine where technology evolves, and education and law play catch up.

One of the most likely ethical issues will be what level of information to share (Allison & Ewens, 1998). There may need to be an ethical decision made by healthcare practitioners as to whether to share particular information that may or may not impact the individual's health. For example, if a psychologist was part of the interprofessional practice team and they were aware of the client having been assaulted, is that something that then the psychologist should share with the interprofessional practice team, especially if the person has not permitted them to discuss this? Here, the solution might be to give limited information to the interprofessional practice team and get clarification from the client on how much information should be shared with the rest of the team. This may fall back to processes and logistics, whereby as part of the process in notetaking, the client is given clear advice that information may be passed on to the interprofessional practice team and if there is any information that they do not wish to be

divulged to the team then that is expressed. This might be something that healthcare practitioners might need to reinforce with their clients, mainly when more sensitive matters are being discussed. Health practitioners should also check their professional bodies to ensure they can share information about a client in an interprofessional setting if the client has given permission.

The recommendations to manage potential ethical issues in the implementation of interprofessional practice based on a social-ecological model would mainly be focused on the community level, but all levels are addressed below:

Individual. As has been discussed, individual ethics may override other forms of ethics, such as professional ethics. The number of health professionals facing disciplinary charges for breach of conduct highlights that simply writing down a Code of Conduct does not mean practitioners will abide by the code. Their different ethics (or lack thereof) will override it. Due to the complexity of how an individual develops their own ethics, it may be too difficult to change in some circumstances; it may be better to highlight the ethics in place and let them choose whether they want to participate in the interprofessional team.

Relationship. In this case, relationships are about the discussions that need to occur across professions, within the clinic, and the team. As mentioned above, associations may need to fine-tune or clarify some of their Codes of Conduct to distinguish between sharing information in general and in an interprofessional setting. The processes the clinic uses for consenting to share information will need discussion amongst the team members, and then the clinic must develop guidelines for providing interprofessional practice related to its logistics and processes.

Community. There are multiple communities related to ethics, and they can help formulate a consensus or outcomes of discussions. In the area of ethics, the two main communities will be the workplace community (clinic) and the professional community

(associations). Professional associations that hold discussions around ethical conduct may then develop official ethical guidelines and may need to arbitrate when there are questions about issues with ethical conduct for its members. In the clinical setting, the interprofessional practice team is the community. Various discussions with the team will have shaped its ethics. It, too, can be used as a focal point to ensure that the team operates ethically and that the team members abide by those ethics.

Societal. Ethics change over time via societal and environmental factors and what is culturally and not culturally appropriate at a particular time (Clark et al., 2007). Society's role in developing ethics is to influence the discussion. Ethics must evolve and change as society changes; for example, telehealth was highly restricted in its use until the pandemic. Society, in this case, was forced to make a change, but the result was the evidence base supported it, as did much of society, so it stayed, and in many areas of health today, it is ethically ok to use.

The Social-Ecological Model: Societal Level Barriers and How They Can Be Addressed

Improving the Cost-Effectiveness of Interprofessional Practice

The cost of implementing interprofessional practice was a concern raised in many of the interviews. Many health practitioners interviewed operate on a fee-for-service model. Therefore, their mentality is one of providing a service (be that in an individual setting or as a group setting). As they are still providing a service, it should be remunerated. If they were not being paid for their time providing interprofessional practice then, for some of them, there may be less of an incentive to take part in interprofessional practice, especially if they can be earning money while providing individual services and they have a backlog of clients. Cost is not as much of an issue in organisations such as hospitals, where a health practitioner may not be paid on a fee-for-service but rather hourly. This may be one of the reasons why interprofessional practice tends to

occur more commonly in those settings. From the primary healthcare perspective, interprofessional practice often operates in a fee-for-service model and should be reimbursed where possible.

This could work with the support of funding models outside the traditional fee-for-service Medicare model. Healthcare models that offer greater levels of flexibility in payment systems, such as that of My Aged Care (Department of Health and Aged Care, 2023a) and the NDIS (National Disability Insurance Agency, 2023), where funding is allocated to the individual based on individual needs and offers a much broader scope of payment for differing services, including payments for coordinating services. Services that improve or help people live their daily lives can be funded. If interprofessional services can show the ability to increase functional capacity or slow the deterioration of a person's health status, then they may be funded.

Private Health insurance agencies can fund interprofessional practice activities but currently do not. However, they have funded programs that offer some form of support coordination. Medibank Private has its CareComplete program (Medibank, 2016), which includes CarePoint. CarePoint provides clients with a care coordinator to help manage complex conditions and keep them out of the hospital for longer. This shows that private health insurance companies have the capacity to fund such programs if they can be shown to reduce future healthcare costs.

Public Insurance agencies, such as the Transport Accident Commission in Victoria (Transport Accident Commission, 2023) and the Victorian Workcover Authority (Victorian WorkCover Authority, 2021), do offer some payments for case conferencing, which at least allows some communication across health professionals; even though a case conference is not truly interprofessional practice, it does show that these organisations see enough value in this

extra communication to fund it. Finally, while not possible for all, some clients will privately fund their interprofessional sessions if there is scope for this within the clinic.

The question of cost is guaranteed to arise by those wanting to know more about the implementation of interprofessional practice. It is strongly recommended that a costing model be developed or at least proposed early in the implementation discussions. A model can be altered and adjusted along the way, but initially, it should at least give an overview of its viability. This will be clinic-specific and depend on how the clinic operates and its target market. For example, a clinic catering to a higher socio-economic group with a strong focus on preventative medicine and wellness might have a client group willing to self-fund interprofessional practice team meetings. There may be those who have been frustrated by the medical system and would like the clarity of an agreed treatment plan by having an interprofessional meeting as a once-off. Many people frustrated by medicine sometimes turn to alternative or non-evidence-based practitioners (Chatterjee, 2021). Self-funding an interprofessional team meeting may be a way to get the answers or clarity they seek without turning to non-evidence-based practitioners.

Of course, not all clinics cater to these cohorts, or the numbers are so small that they are not economically viable to run an ongoing interprofessional practice program. Clinics that are mostly bulk billing or have clients that are much more limited in the finances they can put towards their healthcare would not be able to apply such a model. Instead, these models would need to consider where government funding is available to at least offset some of the cost. For example, Medicare item numbers are now available for allied healthcare practitioners discussing clients with the client's GP (Department of Health and Aged Care, 2023b). These funds are set so the clinic and the practitioners involved must calculate costs to ensure economic viability for the clinic and those involved. MyMedicare (Department of Health and Aged Care, 2023c) was

also recently introduced to help fund more coordinated healthcare. That could incentivise less busy practitioners to increase hours; for example, they would see the client and the revenue associated with that, followed by the team meeting and the revenue associated with that team meeting. There may also be a mixed billing approach, whereby the client pays for the session but can then obtain a rebate from Medicare; this could be introduced if the government-funded model does not entirely cover the costs needed by the clinic. The issue of costing is essential and can quickly fluctuate depending on changes in the economy and government funding; as such, it is looked at in greater detail in the next chapter.

The recommendations to address costs based on a social-ecological model would mainly be focused on the societal level, but all levels are addressed below:

Individual. This level needs to be considered because, again, ultimately, each individual's decision regarding earnings and possible changes to earnings needs to be considered with regard to their personal circumstances. Some health professionals may be under high financial strain and may find it more challenging to participate in interprofessional practice if it is not funded and other forms of practice are more lucrative.

There are others where cost is of no issue, and they already perform interprofessional practice services without reimbursement. Whatever the case, each individual should consider personal viewpoints on cost and the provision of services. However, to do so, they will need a costing model presented to them.

Relationship. Relationships play much less of a role in cost. However, they should still be considered, as workplace relationships could be affected if there is a difference in remuneration or where that difference is seen as unfair. How individuals choose to work professionally must also be discussed to formulate a costing model. For example, is time being

taken away from other income-earning activities, and how will cost be determined based on each individual's time?

Community. The workplace must determine the clinical cost of interprofessional practice to the client and the remuneration for the health practitioners. The clinic must consider its target client group as part of its clinical costing model. While government funding provides some resources, for some clinics and individuals, this may not be enough to cover the costs, which may result in introducing private fees, which may even be too high for their clients. Nonetheless, these discussions must occur, and the clinic must decide as a community.

Societal. The societal role can be pivotal in the uptake of interprofessional practice by covering, or at least mainly covering, the cost of providing services via government funding. This would have a twofold effect. One is that it would increase the uptake of interprofessional practice as it would be financially viable to provide the service more often, even for those who support interprofessional practice but are hamstrung by financial constraints. The second is that the increased uptake itself would lead to greater public awareness, which would most likely lead to a further uptake or interest from the public. The flow-on effect would be a more significant level of research highlighting its effectiveness. The cost from a societal level should not be seen as a sunk cost but rather an investment saving the government money in future by identifying issues earlier. There are programs highlighting this, such as the Northern Hospital Patient Watch program, whose aim is to reduce hospital admissions and, therefore, costs by spending on looking after clients with repeat hospital admissions. This program is now part of the Victorian Government's Better at Home Initiative (The Victorian Government, 2023). The economic benefits of the program are still being analysed.

Overcoming the Limitations of Technology

Technology offers several solutions for interprofessional practice. As mentioned previously, with logistic issues, simply having telehealth videoconferencing with appropriate facilities, access to shared calendars and bookings and, of course, electronic records can significantly streamline planning and communication. Overcoming the logistical issues can and does make interprofessional practice much easier (Barr et al., 2017); however, some things need to be considered, such as security, information overload, and the need for training.

Security. Information stored or transported electronically has the potential to be accessed by others outside of the team. Theoretically, information that travels online (video stream or email) has an even greater risk. Online information can travel to servers in different countries before arriving at its final destination (even if that destination is in the same country).

Australia has strict health privacy information laws that must be considered (Office of the Australian Information Commisioner, 2023). A simple email from one practitioner to another stating the client's name and conditions that travel to and are stored on a mail server in another country is enough to breach the law. It also has more potential to be hacked. Australia is slowly building a more secure health communication system (Australian Digital Health Agency, 2023a), but this is still not universal. One electronic record-keeping system cannot always talk to another, though in-roads are being made with systems like Argus (Telstra Health, 2023), where notes can be sent securely and electronically. The recent rollout of e-scripts and electronic pathology and scan requests are also gaining traction. Video communication is also improving with systems such as CoViu (Coviu, 2023), which is backed by the CSIRO. Data is kept within Australia and encrypted, offering the ability to share secure screens and files. The key to this is that all parties

involved in the interprofessional team are using systems that can communicate with each other, and over time, this is becoming less of an issue.

Information overload. Another aspect of technology is how much information is being sent and shared. Each healthcare practitioner will have their own notes. Technology can also collect information via wearables such as fitness watches. Health apps are also beginning to link with electronic records (Bouchelle et al., 2023). If all that information was shared, even with the client's permission, that could significantly increase the amount of information that other health practitioners would need to review. At present, the health practitioner's role in an interprofessional practice meeting may be to summarise their notes and findings and discuss their own notes and findings with the team, allowing others to do the same.

AI may be able to help reduce information overload; however, the role of AI in interprofessional practice is yet to be fully developed. It is still much of an unknown, but there are possibilities for its inclusion as part of the team. It should not be a replacement for the interprofessional practice team. Instead, it may be a 'member' of the interprofessional practice team that could offer extra insights to be considered by the team. For example, health practitioners' notes could be given to AI to identify particular issues when those notes are combined with research in those particular fields. That information could then be given to the interprofessional practice team for discussion and used as part of treatment planning (Siemon, 2023). Software assisting workflows for oncology team meetings already exist (Halligan et al., 2023), such software can give all team members the background of the client, test results, shared notes and links to research related to the client's issues. Software like this, along with AI support, can be adapted for interprofessional team meetings in the primary healthcare setting. The market already has companies such as Lyrebird® (David, 2024), which can listen to human interaction

and, from the automated transcription, write clinical summary notes of the appointment. From the client summary notes, it can also write referral letters if required.

Technology Training. All technology requires some form of training. All technology efficiencies can quickly come undone when they are not used properly, and all participants spend valuable time in meetings trying to fix technological issues (Love & Carrington, 2021). Part of the use of technology then requires proper training and that technology to be user-friendly. Technology needs a suitable user interface, equating to ease of use and better design.

The recommendations to address potential technological issues in the implementation of interprofessional practice based on a social-ecological model would mainly be focused on the societal level, but all levels are addressed below:

Individual. From an individual perspective, technology can elicit some strong views, and this has always been the case for any new technology; there will be those who are resistant and worried about what the change means for them and their work (McLoughlin et al., 2018). One potential way of addressing resistance is through education and support. The aim of technology is to lead to efficiencies in how work is done. There should be based on an evidence base for this, highlighting that rather than replacing human insight, it reduces the workload of employees.

Relationship. The use of technology is ultimately about streamlining processes. By allowing health practitioners to connect better, share information, and help identify aspects of the individual's health care, technology should help foster relationships with health practitioners, especially those who work in a more isolated environment.

Community. Consensus needs to be reached across workplaces on the types of technology that should be used. For example, would a system like Argus be used to send information? Would an AI note taker be used, and if so, which one? This involves consensus

amongst the team. A lack of consensus can lead to significant issues if not addressed, as technology may be created but cannot be integrated across systems.

Societal. Australia is in the process of redefining its health communications safely and effectively. This is a societal change and would need to be the main focus because without this change and without it being led from a societal level, there is no one common language for the different forms of technology to speak to one another securely.

Overcoming the Difficulties in Implementing Change

The model created from this thesis is targeted towards clinics that want to introduce interprofessional practice. As has been discussed, there are several challenges that, while they can be addressed, are not always easily solved and may require changes in many areas affecting multiple individuals. Consequently, this requires a change management process. Change management models include long-standing models such as Lewin's change management model, which includes the three main steps of 'unfreeze' (preparing for the change), the 'change' (where the change is implemented), and 'refreeze' (where the new system is established), (Lee, 2006). Mckinsey's 7-S model discusses aligning strategy, structure, systems, shared values, skills, styles and staff (De Jesus & Alvarez, 2022). The ADKAR model (Jaaron et al., 2022) or Bridges' Transition Model (Samuel & Tsapayi, 2023) could also be used.

While all change models have their merits, for introducing interprofessional practice, this thesis chose Kotter's 8-step change model as a framework. Kotter's change model has steps that link to many of the issues identified in this chapter and have been used to implement interprofessional change in other studies (Eve, 2014; Kumar et al., 2018; D. J. Noble et al., 2011; Sattler et al., 2019; Schmutz, 2022a; Su, 2016). Kotter's eight-steps (Kotter, 1996), and how they are linked to the solutions presented in this chapter are discussed below.

Step 1. Emphasising importance in the sense of urgency—this could be highlighted to staff via the numerous examples of changes to healthcare that incorporate teamwork. These could include the shift from Medicare services to NDIS, My Aged Care services, and the introduction to team care item numbers and MyMedicare (Department of Health and Aged Care, 2023c).

Step 2. Building a guiding coalition—This chapter has discussed the importance of interprofessional champions, leaders, and senior staff working together to help guide others (Schmutz, 2022b). The role of the guiding coalition is to help lead the change and to encourage others to be part of that change.

Step 3. Forming a strategic vision – the importance of how interprofessional practice will work within a clinic needs to be explained clearly, and this will come from a strategic vision developed by that guiding coalition (Vale et al., 2022). It should be emphasised that the vision should not be set in stone; it should be revised based on any relevant information raised by staff.

Step 4. Communicating the vision – Values and ethics were discussed (Engel & Prentice, 2013) and in change management, can be incorporated into mission statements and policies that tie into the strategic vision's processes and logistics. Educational materials and workplace discussions are essential in communicating this vision.

Step 5. Removing obstacles and empowering action—Once the vision has been communicated, some may offer resistance due to a misalignment of ethics, unclear understanding of the processes, or other personal issues. Once the obstacle has been identified, it is important to offer solutions or work with the individual to develop a solution (Flood et al., 2014).

6. Creating short-term wins—Change processes can be stressful, even if they lead to a positive outcome. Acknowledging successes when they occur can be beneficial. This may occur when an

individual gains knowledge, such as learning from colleagues and what their different professions can offer (Gupta, 2011).

Step 7. Consolidating gains would occur in a simulation and early adoption stage where the interprofessional practice is trialled with selected clients. Seeing the benefits of interprofessional practice, how it works, the solutions that can be offered, and the advances it has over operating in a silo, can help to strengthen individual support for its implementation (Kumar et al., 2018).

Step 8. Anchoring new approaches in the culture - this can take the form of addressing issues as they arise to finesse the changes being implemented, finalising mission statements and policies, costings, logistics and processes, having a training program or training steps in place, and ensuring that staff are supportive and engaged with the change. Finally, highlighting this culture to clients and potential new staff can be a way to work with people whose values are aligned (Su, 2016).

Kotter's steps have components that align with the very basis of interprofessional practice. The steps involve discussion with all parties, just as in interprofessional practice, discussion with the team and the client helps to formulate a treatment plan. Kotter's steps are not a top-down directive approach but integrative and are meant to address needs as they arise.

The recommendations to address difficulties in implementing change based on a social-ecological model would mainly be focused on the societal level, but all levels are addressed below:

Individual. Individuals play an essential role in the change process as they can be the cause of issues or solutions. In building the guiding coalition, individuals might be identified as those who may be more supportive and can help guide change with other individuals by

addressing concerns. Individuals might also form obstacles that may be very relevant and need to be addressed before a model can be trialled. Thus, even resistance can be a valuable source of information.

Relationship. As Kotter's steps strongly emphasise discussion, relationships will play a vital role. Those who feel isolated may be less likely to engage in those discussions, possibly leading to future issues. Therefore, relationships must be maintained and encouraged as best they can so people feel free to give input.

Community. For the particular change to last in a workplace, a sense of community through changes in the workplace culture is needed. An established work culture that achieves its initial aims would identify that the change management process has been successful.

Societal. The more significant aspects of change result from the societal changes that occur from implementing interprofessional practice across many clinics over time. The majority of healthcare in Australia occurs in primary healthcare settings. Yet, at present, the uptake of interprofessional practice is limited in these settings, creating a model of practice will make it easier for the uptake to occur. This allows more clinics to introduce interprofessional practice, eventually leading to societal shifts where it may be an expected part of healthcare.

Conclusion

The proposed avenues or solutions to address the identified barriers to the implementation of interprofessional practice cover many different research areas. Much of the research's depth goes beyond this thesis's scope; a specific area, such as teamwork, could be a thesis and, in some cases, is a thesis produced by others. For the clinic that wants to implement interprofessional practice, it may not need to go into the depth required for an entire thesis on a specific topic. Instead, it needs to take the most salient points from these different research areas

and formulate them into a model that can more readily be applied in the workplace, which is the aim of this thesis.

This chapter has shown that evidence-based solutions to the barriers exist in the literature and raising awareness of the potential benefits of interprofessional practice can be addressed through education and discussions. Those with a mindset against interprofessional practice could be challenged by discussions to understand why they hold those viewpoints. Mentorship and guidance can be given to those who request it. Support for interprofessional practice could be garnered by getting those new to interprofessional practice involved in interprofessional practice activities so that they can see how it works firsthand. Working relationships can be improved by helping to change a workplace culture. Rapid changes in technology are making the implementation of interprofessional practice easier. Complex ethical issues can be identified through reflection and discussion, which would need to be carefully worked through. While technology can also help reduce costs associated with interprofessional practice, there will be those who resist its use. Overall, the implementation can be enhanced if it follows a change management framework, which any model should adhere to for greater chances of success. A model will not solve all the issues nor guarantee implementation, but it will give some clinics struggling with implementing interprofessional practice a way forward.

However, even with the discussed solutions to the barriers, two barriers warrant further investigation. These areas are technology, namely AI, and cost.

AI has become more mainstream and accessible to the general public and healthcare in recent times (Kasula, 2024). AI is what some in the technology sector might call a 'disruptor', something that can significantly change the status quo and completely change how people operate. It can solve some of the more complex issues in interprofessional practice, such as

logistics and processes, and thus should be explored in greater depth as part of this thesis because of its potential for significant change.

The other issue is cost; as previously mentioned, if something is not economically viable, it may not be sustainable even if it is effective. Costings can quickly change and do change because of government decisions, which can be driven by national economics. Governments may see the possibility of funding something that may save money and lives if costs show viability in doing so.

Due to more recent changes in these areas (for example, the rise in popularity of the use of AI and changes in funding with programs like MyMedicare), these two concepts will be discussed in greater detail in the following chapter. They will be drawn together by explaining how AI may reduce some healthcare costs and how it could be applied in an interprofessional setting. It will highlight this by providing a costing model based on a study whereby the provision of AI assisted in reducing the cost of healthcare to potentially provide better long-term health outcomes more efficientlydoee.

Chapter 6. Cost and Logistics

Introduction to the Chapter.

Chapter 5 reviewed the existing literature to find solutions to the barriers identified in implementing interprofessional practice from the perspective of primary healthcare workers. This chapter continues the Phase Two analysis by focusing on two solutions that have seen recent significant changes that may impact the relevance of previous solutions in the literature. The two solutions, technology (as a way of improving logistics and processes) and cost modelling (showing economic viability), have been impacted by the recent uptake in the use of AI and recent changes in government funding for interprofessional-related services, respectively.

This chapter further discusses how these two solutions are connected in that technology is often used to help streamline administrative processes and reduce costs. It does this by presenting a case study whereby AI-assisted technology was used to achieve healthcare cost savings, as shown via an economic analysis. This economic analysis was part of a PhD internship program.

As such, this chapter will provide further discussion of these solutions by addressing the following:

1.   Further outlining why cost is an issue in providing interprofessional practice

2.   Reviewing the current funding models for health in Australia and where interprofessional practice could currently be funded within those funding sources

3.   Considering the future direction of the Australian health care system and where it could be funded within that future framework

4.   Outlining how more recent technological advances can play a part in helping to reduce the costs of interprofessional practice.

5. Provide a case study showing how technology can be used in a real-world scenario to lower costs and collect, process and share information across different health practitioners.

6. Based on the case study and the information above, initial funding models for interprofessional practice will be proposed.

Then, conclusions will be drawn from the points above and how this could be applied to the broader perspective of interprofessional implementation in private practice.

A Further Exploration of Technology and Cost

The following section addresses points 1-4 listed above.

Why Cost is an Issue for Financial Viability – Themes from Phase 1 Data Collection

Finances and costs were among the main themes in the initial interviews. They were issues that many of the respondents expressed concern about. To participate in any form of coordinated care with other practitioners requires time. That time, if not funded, reduces the income of that health provider for that particular service and prevents them from undertaking other services that could be providing an income. While this is less of an issue where several health practitioners are employed within the one organisation, it is much more of a problem in private practice whereby medical and allied health practitioners are commonly employed as contractors and paid via the number of services they provide via a percentage (Cheng et al., 2012). The question then becomes who pays for the service and how practitioners are reimbursed appropriately.

The answer in private practice primary healthcare (from the Phase One data) was often that no one could be identified as paying for this interprofessional practice apart from the client. Some participants who participated in interprofessional practice would do so voluntarily outside

their work time without reimbursement. As reported, they would often do this to expand their

knowledge and professional development as they would gain insights from their colleagues. Of

course, this approach would not be viable in a broader systematic implementation. Funding this

type of work is necessary. Other respondents did not or would not engage in interprofessional

practice if it were not financially supported. As will be explored, Australia's current healthcare

system provides some avenues for financial compensation of interprofessional practice and co-

ordinated care, but it may not be to the extent sufficient to cover the needs required for

interprofessional practice to be implemented. However, reducing costs in some areas may be

possible via improved efficiencies, making it viable. Current healthcare funding systems related

to interprofessional practice will now be discussed.

Current Health Funding in Australia

Australia's current funding systems can be divided into two main areas: public and

private sector funding. Within those two areas are client or self-funded care, insurance funding,

government funding (federal, state, and local) and funding via charities and volunteers. Each will

be explored for their potential for interprofessional funding.

Charity and Volunteer Funding. Charity and volunteer funding refers to someone

donating (time, resources or finances) for a particular service. From the Phase 1 data, this is how

some interprofessional practice was occurring within clinics; that is, clinicians voluntarily,

without compensation, met to discuss client cases. Of course, there is no compulsion for health

practitioners to undertake this type of career learning; it relies on the clinician volunteering their

time. Usually, this form of interprofessional practice is done outside of work hours and with

minimal cases, as there is not enough time to cover many client cases. While this approach can

work on a smaller scale or, in particular instances, with practitioners with similar value systems,

this model is unviable for large-scale implementation. A model cannot rely on individuals volunteering their time for coordinated care.

The other form of donation is by the organisation, which could be a charity or not-for-profit. The contribution could be from public funds, or the organisation could provide the funds from their finances, which is then used to pay for the health practitioners' time. This type of funding is not specific to the interprofessional practice itself; donations are generally given to the organisation to manage as they see fit. Interprofessional practice financing is then at the organisation's discretion and the importance it places on it occurring; this leads to a lack of consensus amongst organisations, with some choosing to make it part of their operations while others do not. This inconsistency leads to less uptake in interprofessional practice as it is not seen as a standard form of care. While charitable funding could cover the costs of interprofessional practice in some instances, other funding sources must be considered for it to be viable.

Insurance Funding. Insurance schemes are where individuals pay into an insurance program, and the insurance company, with its program, then covers the treatment costs for an individual who qualifies for that insurance coverage. There are both government-mandated and private insurance companies. The government-mandated insurance companies include transport accident insurance, such as the Transport Accident Commission in Victoria ("TRANSPORT ACCIDENT ACT 1986," 1986). Premiums for this form of insurance are usually funded via motor vehicle registration fees. This insurance can finance healthcare support involving any transport accident where an individual is injured, whether within the vehicle or struck by a vehicle. WorkCover insurance is another government-mandated insurance covering workplace accidents ("WORKERS COMPENSATION ACT 1958," 1958). With WorkCover, companies with employees will pay the insurance company a premium to cover costs associated with

workers injured at work and manage those claims. Both these forms of mandated insurance have a legal requirement to assist the injured individuals and manage claims.

A level of coordinated care can occur with these types of insurance organisations. Usually, this is a case manager who allows case conferencing involving different health practitioners (Bronner et al., 2003). The issue here is that case conferencing is infrequent and at the discretion of the case manager (Vest et al., 2021). However, the system allows for interprofessional practice to occur. The fact that insurance companies can do this as part of an individual's return to health shows that there is a health and economic merit in having someone coordinate care according to the insurance company.

Non-mandated insurance is usually the domain of private insurance companies that provide insurance that the general public can voluntarily purchase. They cover several areas, including property, life and health. What are commonly termed as 'health insurance companies' aim to provide funding and services when an individual becomes unwell and, more recently, support health behaviours. At the same time, they have acts of parliament related to their governance ("HEALTH INSURANCE ACT 1973," 1973). Several national and multinational organisations have health insurance schemes, such as BUPA, Medibank, HBA and a range of others across Australia. Here, an individual elects to be part of the insurance scheme; they pay into the program. If they become unwell, they are covered by that health insurance according to the limitations of their policy. The funding for health care comes from the insurance company, which has a choice as to what extent it will cover particular services. While they will all have guidelines regarding the extent to which services may be covered, as the insurer is paying for the services, there is some flexibility in paying for a level of coordinated care.

Some private insurance companies have shown an interest in care coordination; for example, Medibank has established the CareComplete program to help better manage chronic health conditions (Tinning, 2018). This includes three main programs: CarePoint, which assists clients with chronic and complex needs; CareFirst, a behavioural change program to assist chronic conditions; and CareTransition, which assists clients transitioning from a hospital setting back to the home setting (Tinning, 2018). This program can cover the costs of Medibank clients' nursing services in medical clinics. The nurse coordinates and manages the client's care, keeping them on track to achieve their healthcare goals.

Again, there is a health and economic reason for this; implementing a nurse in this role and financing it themselves may save future claims and further healthcare costs. This highlights that an investment in case management and coordinated care can result in fewer claims in future. Initial research into the outcome of this program shows that it is worthwhile in that it provides better health outcomes at a lower cost (The Australian Government Productivity Commission, 2017). Overall, insurance funding should be explored to fund interprofessional practice, but it may need to be more consistent in how insurance agencies apply it. This could be an area for future research for a possible model for implementation for insurance agencies.

Self-Funded Healthcare. Another alternative to possible funding models for interprofessional practice is the client self-funding the case management. This is rare as no formalised processes or general practice guidelines exist for clients to undertake this in a clinical setting. Instead, the client would have to liaise with the individual health practitioners to organise a suitable time and then pay for their collective time. This could result in costs of thousands of dollars depending on the number and the level of specialist health practitioners required. However, nothing precludes the client from organising and paying for this to occur. There could

be members of the general public quite willing to fund such meetings, even at a high cost, if it improved health outcomes or helped to address chronic and complex conditions. While this approach could be viable, processes and logistics as to how it would occur would need to be in place.

Government Funding. Public health funding in Australia is defined as funds from federal, state or local government budgets. These funds are paid through schemes such as Medicare or directly to particular organisations (Mortimer & Harris, 2009). Each form of government funding will be looked at separately below.

Medicare. In the 2019-2020 financial year, Australia spent around $33 billion on Medicare (Parliment of Australia, 2019). Medicare is a national program where the federal government provides funding to clients receiving approved services if they hold a Medicare card. Medicare cards are available to Australian citizens and permanent residents. The government lists Medicare item numbers for a range of particular services, which need to be quoted if money from the Government is to be provided ("HEALTH LEGISLATION AMENDMENT ACT 1983," 1983). One way this occurs is if the client pays for the service themselves and then can claim back the funds allocated for that service by the Government through Medicare. Another way this service is provided is via the client giving approval for the Medicare payment to be given directly to the service provider; this is usually done by approving or signing documentation. This is known as 'bulk-billing', and some service providers will provide bulk-billed services; that is, they will receive the Medicare amount only for the service. Alternatively, the service provider can charge a higher amount, which the client will pay, leaving the client to claim back then the Medicare amount themselves so that the service cost is less to the client (Boxall & Gillespie, 2013).

Regarding the Medicare items, there are clear definitions of what can and cannot be provided for, the circumstances for providing services and who can provide them. Most Medicare item numbers can only be utilised by medical practitioners holding a Medicare provider number (Commonwealth of Australia, 2023b). This creates the first issue with interprofessional practice: For many years, only a few item numbers related to case conferencing could be used for interprofessional practice, and only medical practitioners could utilise those numbers. While the medical practitioner could get paid, allied health and other practitioners would need to seek funding in other forms. This greatly underutilised the item numbers for case conferencing in Medicare. However, this has recently changed with the addition of item numbers for some allied health case conferencing.

Most private practice medical services involve Medicare item numbers (Windle et al., 2018). Making Medicare viable for interprofessional practice would require item numbers specific to a broader range of health practitioners, who would need to be registered with Medicare provider numbers. The addition of these new item numbers now makes Medicare more amenable to interprofessional practice, but it does not solve all the issues for interprofessional funding.

National Disability Insurance Scheme (NDIS). The National Disability Insurance Scheme (NDIS) commenced on July 1 2013 ("NATIONAL DISABILITY INSURANCE SCHEME ACT 2013," 2013). There has been a steady rollout of the program over subsequent years. The program is aimed at those with a defined disability and complex care needs. There has been a recognition that those with complex care needs may not be suitably catered for in a service provision model such as Medicare. An individual may be unwell, attend a medical clinic, and have a doctor-provided service to treat that condition, covered via Medicare.

However, if the individual has complex needs, a more coordinated care approach may be better suited to that client (Cant & Foster, 2011). This means that services beyond what a medical doctor provides may be needed, which, as previously mentioned, is not often provided by Medicare.

Many social determinants of health can significantly impact and improve a person's life and reduce the severity of symptoms that do not require the skills of a doctor but could be provided by someone with different qualifications at a lower cost (DiMatteo, 2004). The NDIS and the National Disability Insurance Agency (NDIA) can take government funds and then pass on those funds to service providers who manage the client's overall care. This could include nursing services, home care and social services. The reasons for implementing the scheme are twofold: one is that it provides better quality of care, and two, by providing a better quality of care and better-managed care, it is less likely that the client would require more extensive and, therefore, more expensive care (Productivity Commission, 2011). While the budget for the NDIS is now over $20 billion per annum (Dale & Buckmaster, 2015), the program is still somewhat underutilised as providers adapt to this new funding model and clients gain better insights into their care options.

There is undoubtedly scope for interprofessional practice within an NDIS framework as it is an insurance scheme whereby the provider (the company or individual appointed by the NDIS) manages the care. The provider can allocate funds for interprofessional practice, similar to the case conferencing examples outlined earlier. To what extent interprofessional practice occurs in the NDIS provider setting remains relatively unclear. Still, funds for interprofessional practice can be allocated if the provider sees they fit with NDIS guidelines.

My Aged Care. Australia's aged care sector has undergone significant changes in recent times. Consumer-directed care legislation was recently passed (Commonwealth of Australia, 2016), moving from a model where the Government provided funds to aged care providers to allow for a more consumer-driven model. Similar to the NDIS, where a provider can manage care, funds are provided for the individual, which a service provider then manages. The idea is again around the complexity of chronic disease, which is more prevalent in the elderly, and how such conditions can be much better managed with better health outcomes and lower costs outside the Medicare model.

Funding comes from support packages provided to over a million Australians. While a significant proportion receives Commonwealth Home Support Packages, which provide approximately $2000 per annum, a much smaller proportion receive Home Care Packages, which are rated from level I to level IV, depending on the individual's needs and can provide up to $52,000 (Commonwealth of Australia, 2023a). Again, there are multiple reasons for this change, not only for better-managed care but also because it is more economically viable to keep the older adult in their home than enter a residential aged care facility. In addition, most older adults prefer not to enter a residential facility (O'Keeffe & David, 2022).

Interprofessional practice is possible in this setting because the provider has some flexibility to determine how the funds should be spent, which could involve interprofessional care. However, similar to the NDIS, the extent to which interprofessional practice occurs is unclear.

Hospitals. There are public and private hospitals in Australia, just as in many other parts of the world. For private hospitals, funding can be directly paid for by the client or insurance companies, or it can sometimes be a combination (Collyer & White, 1997). The government

funds public hospitals, and they also have specific Medicare item numbers and can also have privately funded components (Duckett, 1998). Those working within hospitals can be directly employed by the hospital or work as their contracted practitioners, as they would in private practice.

If the hospital directly employs the healthcare practitioner, there may be a greater chance of interprofessional practice. Again, they do not face the constraints of the fee-for-service Medicare system in having to apply particular services related to Medicare item numbers about their income. Instead, the hospital employs them to perform particular duties, which could include liaising with other healthcare practitioners.

There are already examples of hospital systems where interprofessional teams have been formed to treat patients; for example, in the case of cancer treatments where clinical teams will be formed from different areas of healthcare. This process is often used in oncology because of the seriousness of the conditions and the goal to achieve the best possible outcomes for the client (Abernethy et al., 2006; Ellis, 2012). As such, it should not be the decision of one health practitioner regarding what treatment is applied, but rather, the best outcomes can be achieved via discussion. Interprofessional practice asks that this type of healthcare not be left to the most challenging and life-threatening situations but rather be applied early on to avoid and minimise the chances of these most difficult life-threatening situations. The hospital setting is one where interprofessional practice is currently most prevalent because of the range of practitioners that the hospital employs; the logistics are easier because they are all within the same organisation (Reeves & Lewin, 2004; Zwarenstein et al., 2009). It can be an area where, with appropriate support, interprofessional practice could be expanded.

Community Funded Clinic. Community clinics and organisations are other avenues where interprofessional practice can and sometimes does occur (Taylor et al., 2014). Interprofessional practice often occurs naturally in rural settings and local community clinics. It is done so because, again, the practitioners are employed by the organisation, and a range of practitioners may work at the clinic. However, rural locations and community clinics also have the advantage of not being as large as hospitals, whereby contacting particular practitioners may be more difficult because of the sheer number of staff (Morris & Matthews, 2014; Munro et al., 2013). Instead, the rural and community settings are where interprofessional practice occurs naturally and is sometimes necessary as practitioners may need to provide multiple levels of care (McNair et al., 2005). Similar to hospitals, it is an area of possible interprofessional expansion.

The Future HealthCare System and Value-Based Healthcare

The Australian population faces healthcare challenges both in the growing size of the population and Australians' greater longevity (Schofield & Earnest, 2006). With age comes a greater propensity for chronic conditions and complex care needs. This will mean that Australia's healthcare costs will continue to rise (Harris & Sharma, 2018). The solution is not only allocating more funds but should include ways to utilise these funds better. Healthcare can address this change via a value-based healthcare model. Essentially, value-based healthcare ensures that value for money is obtained from particular healthcare services (Catalyst, 2017).

Medicare is based on service delivery rather than the service outcome model. For example, a person can see a doctor on multiple occasions; whether that doctor was helpful or provided appropriate care for the condition is not checked or validated. The practitioner is paid for the service of having seen the client. In some instances, Medicare tries to limit this by limiting the number of services it will pay for within a particular timeframe. For example,

Medicare item numbers for psychologists are limited to 10 sessions per calendar year. (This was recently extended to 20 sessions per year due to the Covid pandemic but has been reduced back to 10) (Commonwealth of Australia, 2022a). It does not consider the success of those treatments, and if the client is progressing well but requires further sessions within that timeframe, it does not fund further sessions.

Value-based healthcare takes a quality rather than a quantity approach (Catalyst, 2017). While it is still in its early stages as a concept within the Australian healthcare system, the NDIS and Aged Care legislation models are steps towards value-based healthcare. In these models, the service provider (funded by the Government) is now accountable for maintaining their client's overall health; they have more flexibility in how those funds can be best utilised for the client. Quality assurance checks can be implemented to ensure the client receives the value of care for the services provided. The government has been reluctant to expand Medicare, especially with allied health providers and beyond medical services (Duckett, 2018). However, it seems to understand the need for different funding models (hence the Consumer Directed Care legislation). Thus, the future of healthcare in Australia may rely more on a value-based healthcare system and less on Medicare.

Interprofessional practice funding fits more efficiently with a value-based / coordinated care system. As the emphasis of interprofessional practice is on the best outcome for the client and it does so by taking in different perspectives, there is a greater chance that the treatment plan moving forward will be successful (again, this is part of the reason why it is often used in oncology). There is undoubtedly scope for interprofessional practice to be funded in future healthcare models that are more integrative, such as aged care, NDIS and a value-based healthcare system.

Technology and Cost-Saving

Economics must also be considered together with technology. Technology is continually playing a more significant role in healthcare, and recent advances have given technology the ability to automate specific processes and make some tasks faster and less expensive via better medical equipment, information systems and other technological advances (Sorenson et al., 2008). Therefore, when considering solutions to reduce the financial cost of coordinated care and improve logistics, a discussion of how technology can be better utilised will be needed.

The costs of services are not simply made up of practitioners' time, even though that is how the cost is allocated in fee-for-service models. Instead, costs include duties outside of the appointment time, such as writing or responding to referrals, administering bookings, and liaising with other practitioners or clients, along with many other costs associated with business practice in Australia. Technology has the potential to solve some of the issues in these areas by helping to streamline processes and, in doing so, save time, which can then translate to cost savings. For example, note-taking software can reduce the time it takes to write notes and referrals post-appointment (Lyrebird Health, 2024), lowering administrative costs (especially if other staff are utilised) and freeing up time for the practitioner to potentially see more clients. If interprofessional costs can easily inflate because of the number of health practitioners involved and extra organisation required compared to seeing one practitioner, then it stands to reason that technology should be used to keep costs down and save time. With the advent and expansion of AI, more opportunities to save time and costs will arise as it develops as a technology, which has the potential to make interprofessional practice much more accessible.

The case study below will show how coordinated care can occur better and more cost-effectively via technology. It will focus on aged care clients with chronic and complex needs.

The aged care setting is funded under My Aged Care, which, as previously discussed, is more flexible in funding interprofessional practice. Coordination of care services can occur more readily as they have an allocated care coordinator. The case study below is a proof of concept, showing that AI can reduce costs and improve processes.

In this case, the AI is used almost as a 'member' of an interprofessional team; its job is to monitor for behavioural changes based on movement and alert the care team so that action can be taken quickly to resolve issues before they become more problematic and more costly. The following paper was submitted for publication and was published in the Journal of Health Management in 2023, (Perri et al., 2023). A declaration of authorship and a copy of the published paper is attached in Appendix B. A summary is provided below.

The Economic Viability of an In-Home Monitoring System in the Context of an Aged Care Setting – Case Study Summary

The paper demonstrated the potential of AI in reducing healthcare costs and improving the logistics of interprofessional practice. The case study highlighted AI's ability to analyse data to enhance early detection and prevention of health issues and identify risks before they escalate into serious, costly medical emergencies. This predictive capability reduced the financial burden in emergency interventions and hospitalisations and enhanced patient outcomes by enabling timely, preventive care. AI also automated routine tasks, such as monitoring vital signs and managing patient data, which reduced the administrative workload and staffing costs. Furthermore, it optimised resource allocation by ensuring healthcare facilities and teams focus their efforts on high-priority cases, using available resources better and maximising time.

AI significantly improved communication and coordination by providing a centralised platform for integrating and sharing patient data. This shared access to comprehensive health

information ensured that all team members were updated in real time, fostering collaboration and reducing delays in decision-making.

AI also played a critical role in optimising workflow, assigning tasks based on team members' expertise, availability, and urgency, thereby avoiding redundancies and inefficiencies. Additionally, AI-powered decision-support systems offered evidence-based recommendations, helping healthcare teams make informed choices and reducing the cognitive load on individual members. Remote collaboration tools, driven by AI, further enhanced teamwork by enabling geographically dispersed healthcare professionals to work together effectively and provide coordinated care.

By streamlining operations, enhancing team dynamics, and promoting proactive care, AI could address two significant challenges in healthcare: rising costs and inefficiencies in team logistics. These innovations led to cost savings and improved the quality and accessibility of care.

Cost Modelling For Interprofessional Practice

While the above case study in this chapter focused on aged care clients and in-home monitoring, it does have similarities with interprofessional practice in the clinical setting. Firstly, aged care operates more collaboratively than general medical care. The client has a care coordinator and a team of people to assist in their care. Aged care is also person-centred, with the client having input into their health and welfare goals. The support team can face challenges similar to those in medicine and healthcare, whereby information is gathered from multiple sources but can be missed through lack of communication.

The research in this chapter has shown that it is possible to use technology and AI to address some of the logistics issues, consequently resulting in cost savings. While AI is still in

the early stages of its introduction into healthcare, its power is exponentially growing, and the extent of its application in healthcare is yet to be fully conceptualised. However, even without AI performing a role as part of the interprofessional team, cost modelling of interprofessional practice can still be undertaken. As per the presented case study, AI was shown to streamline activities and create efficiencies; therefore, it is possible that it will do the same when it becomes a greater part of mainstream medical and allied healthcare.

A technology-based interprofessional practice model could solve some of the more traditional issues of interprofessional practice by being a repository of health information from multiple sources, for example, medical notes, personal care worker notes, social worker notes, data measures from monitoring systems and any others involved in that person's care could be entered into a system. AI can then analyse patterns and become a discussion point where issues can be automatically flagged. Practitioners can receive data summaries for discussion with others, making for a better-informed treatment plan.

These technologies can be added to workflows to make interprofessional practice easier and less costly. Programs such as NAVIFY®, which is a tumour board portal, can help to share information amongst specialists before the board meeting; it also houses discussion points, suggests potential clinical trials and treatment planning (Hammer et al., 2020). Programs such as this could become more common and be utilised in general practice, further reducing cost and making interprofessional practice easier to navigate.

As for any economic modelling, certain assumptions must be made before a model can be created. Changing those assumptions could affect the outcome of the modelling. There will, of course, be many scenarios that this thesis cannot cover. Thus, three scenarios will be presented as initial support for the idea that costs for interprofessional practice can be covered and be viable.

Costings such as these can be used as initial discussion points to show health practitioners the implementation of interprofessional practice is financially viable.

This model does not consider the set-up costs related to the initial implementation of interprofessional practice. These are not part of running costs but rather an initial investment as required when implementing a new system. This will vary greatly between clinics depending on their current infrastructure. Nonetheless, set-up costs, including training, infrastructure, and staff time, should be noted.

Scenario One – The Fully Funded Client Model with Employed Practitioners

In this scenario, the client will be fully funding the interprofessional service. There may be clinics where clients are willing to fully fund services as their socio-economic background allows them to do so. This model was selected first as it also offers the most freedom in the application of interprofessional practice because, in Australia, healthcare practitioners are free to set their charges and have less restrictive reporting mechanisms if the cost does not involve Medicare or other government agencies. As such, this scenario would give an overview of the initial costs, whereas further scenarios could look at cost reductions with the introduction of government funds.

Assumptions. The assumptions for this model would be that this is a small, privately owned medical practice, everyone involved has had training in interprofessional practice, and technology and infrastructure were in place. It assumes an implemented system with clients ready to engage with interprofessional service. The cost will also be affected depending on who is involved. Some of the more commonly utilised health practitioners and staff will be included in this scenario. This scenario assumes the following staff: a medical practitioner, practice nurse, reception staff member, psychologist, physiotherapist, and pharmacist. It also assumes that the

client will be present for the meeting. There is also an assumption that not all individuals operate from one location, so a virtual team meeting is utilised as the meeting point. This also removes the requirement for a meeting space and can add to the time flexibility because it removes the need to travel. It assumes that the required technology is in place, fully functional, and all involved know how to use it. As a standard GP visit is around 12 to 15 minutes, the meeting will be considered to run based on 15-minute blocks. This, of course, could be extended in time by multiplying the number of 15-minute blocks required.

Costs. Some fixed costs need to be taken into consideration. While these costs need to be paid regardless of the in-clinic activity, they need to be covered because removing income-generating activity within the clinic with a non-income-generating activity will reduce clinic income. These costs include utilities, land taxes or rent, and other associated overheads. Again, this will vary greatly depending on the size of the clinic; as this is assumed to be a small clinic, the 15-minute overhead cost will be assumed to be $10. This figure can easily be changed depending on the overhead costs of another clinic, which the bookkeepers or accountants of the clinic should be well aware of.

The 15-minute block cost of healthcare providers can be calculated via the recommendations of their associations, Medicare recommended fees (often a lot less), or data for the average service cost. An average is taken as there are a number of different cost suggestions for the one service, but again, this can be adjusted according to a practitioner's set fees. The assumptions will then be shown in the table below.

For Scenario 1, the assumption would be for a clinic that directly employs all staff hourly. The average hourly earnings in this scenario are based on advertised positions as of 2024.

Seek® is Australia's largest job advertiser and lists each profession's current average hourly rates. Each is listed in Table 6 below.

Table 6

Proof of Concept Costing Model (Fully Employed Practitioners)

Person involved	Source of payment information	Rate per 15-minute
Medical Doctor (GP)	https://www.seek.com.au/career-advice/role/general-practitioner/salary/in-melbourne	$37.50
Nurse	https://www.seek.com.au/career-advice/role/registered-nurse/salary	$10.62
Reception	https://www.seek.com.au/career-advice/role/medical-receptionist/salary/in-melbourne	$7.50
Psychologist	https://www.seek.com.au/career-advice/role/psychologist/salary/in-victoria	$13.75
Physiotherapist	https://www.seek.com.au/career-advice/role/physiotherapist/salary	$11.85
Pharmacist	https://www.seek.com.au/career-advice/role/pharmacist/salary	$11.85

While the reception staff would not be included in the meeting, there would be an assumption of at least 15 minutes spent organising the meeting and processing payments, taking the payment from the client and disbursements to the practitioners. Adding the 15-minute block amounts equates to $93.07. In addition to this, as employees, they would need the addition of

employment costs and holidays, which, as added on-costs, is estimated to add another 30%, bringing the total to $121. Including the previously mentioned overhead costs of $10 per 15 minutes, plus the addition of a profit margin of 10%, creates a total of $144.10. A profit margin of 10% was used as an example of funds expected after all costs were deducted. It does not have to be 10%; a not-for-profit may consider reducing this figure; a for-profit enterprise may want more than 10% profit. In this example adding these amounts would then equate to $288.20 for a half-hour meeting. These amounts are not set; they are based on averages, and if, for example, a GP earned significantly more per hour, then that would need to be factored in. However, as a proof of concept, it is economically reasonable.

This amount is not particularly excessive, especially in light of the costs of some medical specialists, which can be well over $200 for 15 minutes in some circumstances. However, the cost could multiply if specialists were added to this calculation.

It would strongly be recommended in this scenario that interprofessional sessions occur sequentially, for example, seeing four clients within a one-hour block. This would reduce setup and shutdown times and make bookings much easier and less time-consuming.

Scenario Two – Partially Medicare-Funded Model with Contracted Staff

This scenario takes a different approach. The Medicare model is service-based, and many practitioners in private practice operate on a contracted payment-for-services system (whereby they may work from multiple locations and get paid as a percentage of who they see). Instead of an hourly rate, it would be costed on what they would charge as a contracted practitioner for that 15-minute block of time. For example, if the cost to see a GP ordinarily would be $95 for 15 minutes, then that is the cost that would be used for the calculation. The costs below include Medicare rebates as of January 2024; see Table 7 below. This scenario uses the newly introduced

Medicare item numbers for Allied Health Multidisciplinary Case Conferences (Commonwealth of Australia, 2021). Medicare has stringent guidelines; based on those guidelines, the client would need a chronic disease management plan.

Table 7

Proof of Concept Costing Model (Contracted Practitioners)

Person involved	Rate per 15-minute	Medicare Rebate	Medicare Item /
Medical Doctor (GP)	$95 (ABC News, 2023)	$58.40	735
Nurse	$10.62	$0	N/A
Reception	$7.50	$0	N/A
Psychologist	$53.75 (Help Link, 2024)	$45.70	10955
Physiotherapist	$62.50 (Australian Health Professionals, 2024)	$45.70	10955
Pharmacist	$11.85	$0	N/A

Requirements include having a chronic disease management plan before the session. Nurses do not seem to be listed in Medicare as part of the allied health care team even though, according to interprofessional research, they play a vital role. Pharmacists also have very little access to Medicare item numbers, even though they can play a role in interprofessional practice.

In this scenario, the GP, psychologist and physiotherapist are treated as contractors providing a service and thus are not subject to the employment on-costs; the service fee for them would be $211.25. The nurse, receptionist, and pharmacist would follow the same costing previously mentioned; with oncosts, their total would be $23.55, bringing the total to $234.80, plus overheads of $10, and a profit of 10% would equal to $269.28. However, rebates from Medicare would total $98, leaving the client an out-of-pocket cost of $171.28. Again, this is potentially viable.

Scenario Three – Fully Bulk-Billed Model

The question should also be asked: is it possible to have a fully bulk-billed model with no out-of-pocket costs for the client? This would involve clinics that ordinarily bulk bill fully or partially to some client groups, such as healthcare cardholders. As there are health practitioners that do bulk-bill and the bulk bill amount for a case conference is larger than that for seeing a client, it may still be viable. For example, the Medicare bulk billing amount for a psychologist is $93.40 for a session lasting at least 50 minutes, whereas for a psychologist, seeing clients once using the case conference item number every 15 minutes would result in a payment amount of $182.80 in an hour.

Part of the purpose of bulk billing is to increase the number of clients being seen. Thus, starting with a bulk billing program would not be recommended initially, as a clinic could easily get overwhelmed with too many clients and systems not being correctly implemented. However, once systems are properly implemented and the clinic has identified a need, especially if they already offer bulk billing, it may be altered by removing some health practitioners who are not eligible for a rebate. This, of course, limits the interprofessional team and may reduce its effectiveness, but a partial team may be better than none at all. Some practitioners may not get a

fee but would still be interested in participating either on a volunteer basis or that may result in further income for them later. For example, while a pharmacist may not be able to receive any bulk billed funding, they may take part on the basis that the client would take part in a home medication review, which would earn money for the pharmacist. Alternatively, they may not participate because of the lack of funds, and a smaller team may be used. The bulk billing amount for a smaller team would be as follows (see Table 8).

Table 8

Proof of Concept Costing Model (Bulk-Billing)

Person involved	Rate per 15-minute	Medicare Rebate	Medicare Item /
Medical Doctor (GP)	$95 (ABC News, 2023)	$58.40	735
Psychologist	$53.75 (Help Link, 2024)	$45.70	10955
Physiotherapist	$62.50 (Australian Health Professionals, 2024)	$45.70	10955
Total:		**$149.80**	

In this case, the clinic would receive $149.80. The time costs of a nurse (if included), reception, running costs, and profit would all need to come from this amount. Depending on those amounts, that may or may not be viable. These figures can still be used as a way to commence discussions about implementation.

Other Forms of Funding

Other forms of funding also exist, such as the NDIS and My Aged Care; these systems are more flexible and could be used for case conferencing. For example, both systems fund allied health; however, the client's care plan manager must negotiate and approve a session. Similarly, government-mandated insurance such as Transport Accident and WorkCover already use case conferences. Approval and confirmation of funding would need to be sought from the individual agency before the session's occurrence. Clinics might consider these forms of funding or a hybrid form of funding, where some in the team might be covered (for example) by NDIS funding while others may be covered by Medicare funding. There are regulations in place, and if they are adhered to, this might be economically viable; for example, a GP visit could be funded under Medicare, whereas allied health could be funded under the NDIS if they meet the criteria. This could potentially make even bulk billing clients financially viable.

Chapter Conclusions

A key tenet of interprofessional practice is the sharing of client information between professionals (World Health Organization, 2010). The idea is that sharing and discussing in-depth client information from multiple sources will result in more effective treatment plans. Better health outcomes also result in less strain on the healthcare system, which creates economic savings (Heath et al., 2024). Cost has been a significant barrier to the implementation of interprofessional practice. Now, it is possible to fund interprofessional practice in a limited way using Medicare Item Numbers, but this may not apply to all clinics and health practitioners. The Australian Government has introduced significant changes to how specific community sectors receive healthcare treatment. This includes My Aged Care and the NDIS. These models focus on greater flexibility of funding services that are more individualised towards client needs.

They also encourage coordinated care planning by having case managers or service providers ensure follow-ups occur and the client's health is properly looked after. Insurance companies have also introduced similar models. Interprofessional practice has a place within these models and can be more easily funded. Interprofessional practice in its more traditional format, where a group of health practitioners involved in client care will meet and discuss, can occur. Still, the economics can be pretty costly, so it is currently used only in more complex cases such as oncology.

Over the past 5 to 10 years, information technology, especially AI, has significantly impacted healthcare. It has done this by providing extra data sources, such as big data, which can then be analysed and utilised as a further data point for health practitioners to discuss as part of the client's care. The case study highlighted how this is possible. Via a simple in-home monitoring device, the system produced further data points to discuss and plan client care and produce economic savings. This chapter has shown that even without AI, interprofessional practice can be economically viable in primary healthcare; technology enhancements shown in the in-home monitoring case study will further streamline logistics with monitoring and sharing of information while reducing healthcare costs. Interprofessional practice can be economically viable, and it will continue to improve on this viability as technology evolves.

Chapter 7. A Model to Implement Interprofessional Practice in Australian Primary Healthcare Settings

Overview of the Chapter

This chapter provides an overall analysis and consolidation of the information discussed in the previous chapters to present a model for implementing interprofessional practice in primary healthcare settings in Australia. Chapter 4 analysed the barriers to introducing interprofessional practice in primary healthcare settings as part of the Phase One data analysis. The Phase Two data analysis was carried out in Chapters 5 and 6. Phases One and Two helped to answer the first aim of the research. Chapter 5 explored evidence-based solutions to those barriers. Chapter 6 focused more specifically on how interprofessional practice can be funded and the role technology can play in helping to reduce costs. It used a case study from a PhD internship to explore the impact of technology on enhancing coordinated care while improving the economic viability of health services.

The previous chapters discussed the barriers and solutions in the context of the CDC's Social-Ecological Framework, which recognises that the barriers are multifaceted; therefore, solutions to address these barriers must be multi-level. The Social-Ecological Framework helped identify the interrelationships between the different entities involved and/or affected by the introduction of interprofessional practice.

As the introduction of interprofessional practice will create change within an organisation, a change management model was used to help guide the solutions into workable steps to help make implementation smoother and more likely to be met with success. Kotter's 8-Step Model (Kotter, 1996) for organisational change was identified and used. Kotter's model

was selected as it had synergies with interprofessional practice and has been used in health previously (Gupta, 2011; Vale et al., 2022).

While exploring solutions, the importance of context was identified. A model could not have a 'one size fits all' approach due to the variety of primary healthcare clinics that exist in Australia. Instead, a created model would need to be refined by the clinics themselves. As models are designed, and the final step in this model would need some design input from the clinic itself, principles in design thinking needed to be properly understood. Thus, I completed an Undergraduate Certificate in Design Thinking from the University of Tasmania (See Appendix C). Completing this qualification gave me the tools to help ensure I was not simply designing a model as I saw fit but that the design process I was using had a theoretical basis to it. Elements of those design processes could also be incorporated into the parts of the model that required refinement from the clinic. This chapter will constitute Phase Three of the research and answer the second aim of creating a model. It will achieve this by combining the identified barriers, solutions to those barriers, the CDC's Social-Ecological Framework, and Kotter's 8-Step Model for organisational change to design principles to create a model to implement interprofessional practice in primary healthcare settings.

The Design Process Undertaken to Create a Model for Interprofessional Practice

A model should not be dictated to a clinic with locked-in steps. There is such a variance in primary healthcare settings that it would be impossible to create a model that covers all aspects of all clinics. For example, a privately owned general practice medical clinic would operate with different needs and requirements to a community centre medical clinic or an allied health clinic. Authors such as Wranik et al. (2019) and Endalamaw et al. (2023) have highlighted

the importance of context when addressing issues. This is also one of the reasons why the

original design of the research changed to remove the refinement stages via focus groups.

Originally, focus groups would have been run with the interviewees after the interviews to

develop and refine solutions. This approach would have created a model for implementation, but

it would have been limited to clinics like those of the interviewees. A model needs to be

contextualised for specific clinics. Consequently, this model for the implementation of

interprofessional practice is partly designed but then gives the clinic instructions on how to refine

it to meet its own needs.

Ultimately, for a model to work, it needs to be well-designed, and a well-designed system

is interlinked with a positive user experience (Norman, 2002). Design is an extensive area of

research, and design principles should be applied when designing systems. In this research, the

design process takes previously gathered research identifying issues and potential solutions,

places it in the CDC's Social-Ecological Framework, and combines it with Kotter's 8-Step

model to create a base model, referred to in Figure 6 below as 'The Base Model'.

The clinic is then tasked to refine this model to its own needs by further applying design

principles by authors such as Norman (2002) and Brown (2010). By collecting feedback and

refining it to make it functional for that clinic, a 'Clinic Specific Model' (see Figure 6 below) is

created. This chapter will discuss the base model and the design principles that need to be

applied to create the Clinic Specific Model.

Figure 6

The Model Creation Process
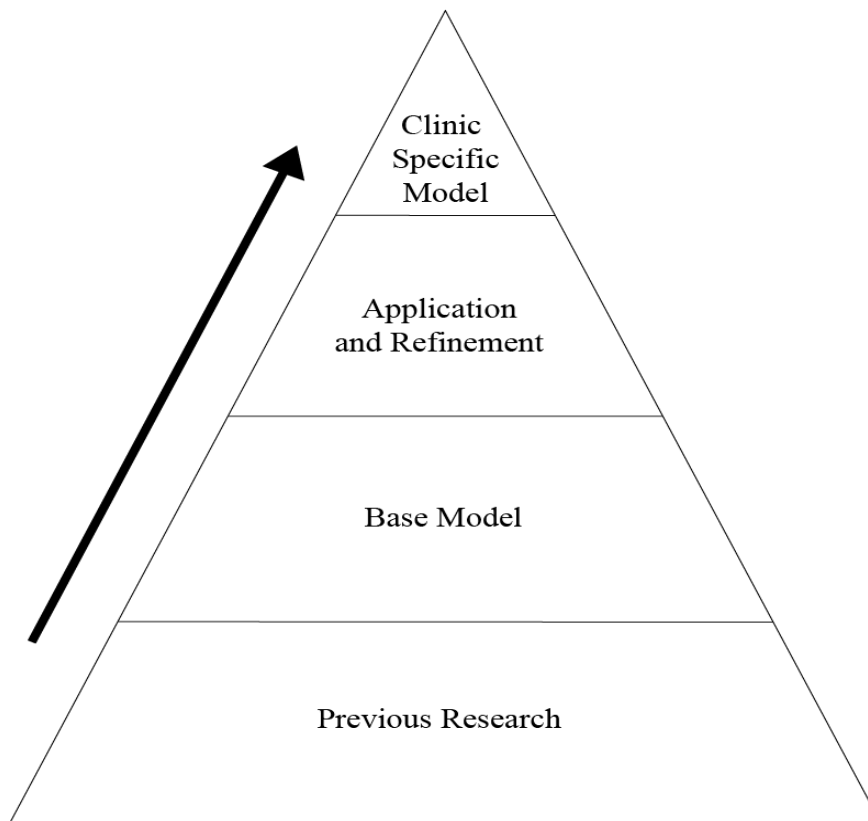
Implementing Change Successfully

Introducing change in a workplace can be stressful and can be met with resistance (Perregrini, 2019); this highlights that a model should not be imposed. Instead, the workplace can help form the change by including those involved in the proposed changes (Mujtaba & McCartney, 2009). When introducing change into a workplace, especially a health workplace, it is essential to look to change management theories to help implement organisational change in a more structured approach. While there are several different change management theories, Kotter's 8-Step change management theory (Kotter, 1996) was chosen for this model because it

aligns with some of the values connected to interprofessional practice, such as approaching

change from a more collaborative perspective. Furthermore, Kotter's model has been used in

healthcare in Australia (Vale et al., 2022). Kotter's eight steps can be summarised as:

1) Helping others see the need for change,

2) Building a guiding coalition

3) Forming a strategic vision

4) Enlisting a volunteer army

5) Removing barriers

6) Gaining short-term wins

7) Achieving sustained acceleration, and

8) Creating lasting institutional change

Together with a structured change process, a framework highlighting the different

components of who is involved in each of those steps in interprofessional practice must also be

considered. The Centres for Disease Control and Prevention (CDC) Socio-Ecological

Framework (Perkinson et al., 2007) was chosen as it highlights the role of the individual,

relationships amongst individuals, the community in which those individuals operate and the

society in which they belong as part of a health care system; these are the 'entities' involved in

interprofessional practice. The complexity of the different aspects involved in interprofessional

practice and their interrelationships can be better understood if they fit within a particular

framework, which the Socio-Ecological Framework helps to identify.

From an interprofessional perspective, the individuals in the CDC model would refer to

the clients and staff (both health professional and administrative), the relationships being the

relationships they have, the communities being the clinic(s) that they work in and with, and their

local community, and society as the broader society in which they operate, including state and federal laws.

The societal aspect will significantly influence any model, as laws and government funding will impact its operations. Even though it is beyond the scope of this model to directly influence the societal component, it is essential to be aware of the role the government can play and, conversely, the influence that individuals and communities can have on government decisions. If a clinic has its own experience of interprofessional practice, it can give more accurate feedback to the government to help shape future laws and funding.

It should be noted that this model development is focused on healthcare professionals and the clinic because, in the initial stages, it will need to be clinic-led. While the role of the client and connected local communities are essential aspects of interprofessional practice and, indeed, the client is central to interprofessional care, the implementation of a model needs to be led by the clinic as, ultimately, it is the clinic that will choose to introduce it or not. Clients and the community will have more significant roles in the application and refinement stage of the model once the clinic has decided to introduce interprofessional practice.

The Identified Issues

Several problems have been identified when trying to implement interprofessional practice (Schot et al., 2020). Further research in this thesis has identified particular issues for primary care providers in Australia in the context of the CDC framework (as discussed in Chapter 4), which are highlighted in Table 9 below.

Table 9.

Summary of the Identified Themes Grouped via Their Main Social-Ecological Levels

Barrier Theme	The main Social-Ecological level to which the theme relates to
Lack of awareness of interprofessional practice	Individual
States of mind affecting teamwork	Individual
Support for interprofessional practice	Relationship
The role of working relationships	Relationship
Difficulties in implementing processes and logistics	Community
Ethical issues in implementing interprofessional practice.	Community
Limitations of technology	Societal
Difficulties in implementing change	Societal
Prohibitive costs of interprofessional practice	Societal

Table 9 highlights the main issues that can be roadblocks to implementing interprofessional practice and thus need solutions for the clinic. A brief background to each is presented below:

Lack of awareness of interprofessional practice. When introducing interprofessional practice, there will be those who are simply unaware of what it is or may confuse it with multidisciplinary care. The correct language and definitions must be used so that all parties know what interprofessional practice is and what it involves.

States of mind-affecting teamwork. Furthering on from the idea of ethics, a person's mental state will affect their level of involvement or engagement. This could include the individual who has social anxiety and is less likely to speak up in a team meeting to the individual who is not fully engaged because of other personal matters affecting their life.

Support for interprofessional practice. Support in this context refers to those who do not understand interprofessional practice and might resist the changes that come with it. The resistance may come from those who prefer to work in a more siloed fashion rather than the team environment, have not considered the research supporting interprofessional practice, or may be aware of interprofessional practice but are resistant because of negative personal experiences or differing ideas.

The role of working relationships. Collaboration can be more difficult if those involved do not have good working relationships. Collaboration can quickly turn to conflict if working relationships are not managed effectively, making participants less likely to engage.

Difficulties in implementing processes and logistics. Many health professionals are time-poor and may find adding another meeting or process to a busy schedule demanding. Processes that form part of organising meetings (both time and location) and who will be responsible for such tasks must also be decided. If the issues of processes and logistics are unclear, it may create further opposition.

Ethical issues in implementing interprofessional practice. When bringing together different healthcare professionals, they will come with the background of the ethical training of the profession to which they belong. They will also have their ethics. In a team-based environment, these differences in ethics may sometimes be the source of conflict.

Prohibitive costs of interprofessional practice. Economic sustainability is crucial. At the same time, many may seek to engage in interprofessional practice; if there is insufficient funding to make it sustainable, some may not support its implementation.

Limitations of technology. While recent strides have been made in the uptake of technological innovation, such as telehealth, some prefer not to use technology and may not be adept at using it. If the interprofessional team relies on technology, disruptions will occur if a member(s) of the team cannot use that technology. Technology must also adhere to health privacy laws.

Difficulties in implementing change. Any change can have the potential to be stressful. Thus, how that change is implemented can affect its level of acceptance, hence the need for a change management theory. This issue is the first to be addressed. In creating the base model, solutions to these issues will be presented, and they will be in the context of Kotter's 8-step change implementation process.

The Identified Solutions

Evidence-based solutions for the above barriers were discussed in Chapter 5. These solutions are summarised in Table 10 below.

Table 10

Summary of the Barriers and their Evidence-Based Solutions

Barrier Theme	Summary of the solutions from the Chapters 5 and 6
Lack of awareness of interprofessional practice	Drawing on the wealth of training materials Discussions with co-workers Implementation into curriculum
States of mind affecting teamwork	Self-reflection to help understand blocks Mentorship Encourage teamwork
Support for interprofessional practice	Interprofessional champions Simulations Aligned values
The role of working relationships	Leadership guidance Building trust with colleagues Cultural change
Difficulties in implementing processes and logistics	Discussion and agreement of processes Structured meetings Technology
Ethical issues in implementing interprofessional practice.	Awareness of professional ethics

	Awareness of clinical ethics and values
	Alignment of personal ethics with the above
Limitations of technology	Discussion of possible fee structures
	Awareness of government funding
	Use of cost modelling
Difficulties in implementing change	Agreement of proposed technology
	Technology training
	Automation via AI
Prohibitive costs of interprofessional practice	Applying change management via Kotter's 8 Steps

The Base Model

It should be noted that this change model is about more than just following the steps below; as previously discussed, introducing interprofessional practice is context-specific, and what may work in a larger clinic may not necessarily work in a small clinic. Each clinic will have its particular issues, thus the need for the application and refinement processes. If followed according to design thinking principles, these processes will make the model context-specific and more likely to yield successful results.

Design thinking is a user-centred, iterative problem-solving process designers use to understand users, challenge assumptions, redefine problems, and create innovative solutions to

prototype and test (Brown, 2010). Accordingly, the base model has taken past research that has identified the common issues faced by users of interprofessional practice and examined the data to find solutions to those issues. Those solutions should then be introduced using Kotter's eight-step change process (to make the change more likely to succeed) and applied to each of the CDC's four framework areas (individual, relationships, community, and society) to ensure that all involved in interprofessional practice have been taken into consideration. As they are introduced, design principles such as prototyping and testing allow the clinic to apply and refine the solutions so they are workable for their particular clinic, ultimately achieving the clinic-specific model.

Introducing The Base Model Using Kotter's 8 Steps

1. Helping Others to see the Change and the Importance of Acting on that Change Quickly.

This first step is about awareness (Kotter, 1996) and links to one of the first issues identified in this research: the need for greater awareness and understanding of interprofessional practice. In a clinical context, this could be overcome by highlighting the problems faced in the current healthcare system and providing education on how interprofessional practice can assist in solving those issues.

Rather than simply supplying written materials on interprofessional practice, first encourage engagement in the problem and potential solutions via discussion, which can help foster ownership over the developed solutions (Miller & Lee, 2001). Highlighting the problem could occur in team meetings or raising it as a discussion point amongst colleagues. There may be examples of clients within the clinic with chronic and complex conditions that would benefit from interprofessional practice who need to progress in treatment or have discrepancies with their treatment plan and differing opinions among their treating practitioners. Raising these cases

with colleagues allows for highlighting the issues. The idea of interprofessional practice can then be introduced.

Organising an informal brief discussion about the client with a small group of colleagues, giving them a 'taste' of interprofessional practice, might result in a solution or new insights that, as individuals, they may not have been aware of or not have been achieved. Consequently, this brief interprofessional experience might encourage further discussion about how this could be formally introduced.

Depending on their background, more formalised educational materials could be introduced; a starting point might be with their professional associations, as some are encouraging interprofessional education (Health Professions Accreditation Collaborative Forum, 2023). Consequently, these associations may have training materials for members and provide them with CPD points if applicable. If associations cannot provide materials, more general materials can be found on sites like Interprofessional.Global (2023b), which can link to country-specific resources; for Australia, the Interprofessional Education Resource Centre (Australia and New Zealand Association for Health Professional Educators, 2023) is a repository for interprofessional resources. They can also be educated about government processes, such as the Medicare Item Numbers related to team care (Commonwealth of Australia, 2021) and the MyMedicare program (Department of Health and Aged Care, 2023c).

Kotter's model (Kotter, 1996) discusses the idea of introducing a sense of urgency at this stage; in the context of this model, this might come from the pressing needs of clients and the opportunities that may benefit the clinic. For example, a client in a more dire health situation might necessitate more immediate collaborative discussions. Alternately, staff may be shown how the government supports collaborative practice via programs like MyMedicare (Department

of Health and Aged Care, 2023c). This program allows clients to sign up for one clinic with MyMedicare. Some clinics might feel a sense of urgency to sign clients to their clinic before they sign to another, which ultimately benefits the client and provides extra financial incentives for the clinic.

At this early stage, it may be more prudent to keep the initial discussions brief and general so that interest can be more clearly gauged and early issues can be identified. Design thinking encourages the idea of creative problem-solving (Norman, 2002); thus, if none of these approaches works or is met with strong resistance, they can be addressed in other ways. This approach will be discussed later in this chapter. From a CDC framework perspective, these steps mainly focus on the individual and relationship levels.

2. Building a Coalition

The next step in Kotter's 8-Steps is building a coalition (Kotter, 1996). Organisational change cannot occur from one person. Instead, it is about building a coalition of those interested in this change (Baum et al., 2007). Those in more senior positions need to be part of this coalition, as they could stop or support the introduction, depending on the viewpoints, especially in the early stages (Cartwright & Baldwin, 2007). It is essential to consider how decisions are made and who makes the decisions within the clinic. If there is resistance or questioning by senior management or key staff, it is vital to identify why they hold that position and what some of their drives and values are for the clinic (Murrar & Brauer, 2019). For example, they may be worried about financial aspects and may need an initial costing model to start discussions and allay fears.

With any new idea, there will be those who are resistant; it is crucial to identify the issues causing resistance and how they could be addressed. It is also essential at this step to work as a

team. When introducing interprofessional practice, it may be worthwhile to approach problem-solving from an interprofessional perspective. In this case, instead of discussing a client and their health issues, it would be about addressing the issue of introducing interprofessional practice within the particular clinic, its problems, and how they can be resolved. Applying these first two of Kotter's steps will help address the first two identified issues (that lack awareness and support). Still, if not addressed, there may be issues that will create resistance and make it difficult to form a coalition with some practitioners. Two of the more commonly raised issues from Chapter 4 are highlighted below.

Financial Concerns. Some may not want to join a coalition because they do not see how interprofessional practice could be financially sustainable. Financial concerns can be addressed by creating an initial costing model; this would depend on each clinic's client base. The options may include having a client-funded model, where the client pays for the time, or a mixed government/client-funded model, where the client may claim back some funds from Medicare. Familiarity with relevant Medicare item numbers and MyMedicare would be essential if government funds are used. In other cases, interprofessional practice may only initially be offered to specific individuals from insurance companies with case management as they may be able to provide some funds. Clinics may already have costing models, which can quickly add interprofessional services. Alternatively, they may need to develop cost models such as activity-based costing models (Kuchta & Zabek, 2011) or a time-based costing model (Mirmohammadi Sadrabadi et al., 2020). Costing at this stage should only be indicative because producing an accurate costing model will be difficult until a model of practice is created. However, initial costing models were produced in Chapter 6 and could be used as a base, and technology can also

help reduce costs (Perri et al., 2023). The following two scenarios could also be used as further discussion points.

  Scenario One – The Client-Funded Model. As discussed in Chapter 6, there may be clinics where clients are willing to fully fund services themselves as their socio-economic background allows them to do so. This scenario would give an overview of the initial costs for clients fully funding their service, whereas further scenarios could examine cost reductions with the introduction of government funds.

  When producing an initial cost analysis, estimates will need to be made. A 'bottom-up' approach was selected to make the costing more specific to the clinic, focusing on local costs specific to the clinic to determine costings, as opposed to a 'top-down' approach where assumptions of costs are already made (Chapko et al., 2009). In this scenario, initial and ongoing costs must be identified, and estimates are made concerning their value. Initial costs could relate to the set-up costs to introduce interprofessional practice. They are usually a once-off cost; they might include training, space creation, and other infrastructure if required. This could vary greatly from clinic to clinic. Clinics may already have the needed infrastructure and a workforce trained in interprofessional practice, resulting in initial costs equating to zero. For others, training time may need to be allocated, and space may need to be created, which could result in initial costs in the thousands.

  Ongoing costs might include the costs of running the sessions, including employment costs of those involved, clinic overheads, and consumables. Variables include the size of the clinic, the size of the interprofessional team, whether it is a for-profit or not-for-profit enterprise and the choice and cost of technology required. Who exactly will be involved in the interprofessional team will need to be considered, along with their employment status. Are they

employees paid an hourly rate, or are they contractors paid on a per-service basis? Other ongoing costs include utilities, land taxes or rent, and other associated overheads.

It may be best to start by determining the ongoing costs, as any profit could be used to repay any required initial costs. In Chapter 6, the assumptions made included no initial set-up costs and an interprofessional team comprised of a medical practitioner, practice nurse, reception staff member, psychologist, physiotherapist, and pharmacist. There is also an assumption that not all individuals operate from one location, so a virtual team meeting is utilised as the meeting point and that the required technology is in place, fully functional, and all involved know how to use it.

Chapter 6 presents a cost analysis based on the above assumptions. If the team members were employed on an hourly wage, the cost for the interprofessional team for a 15-minute block would be $144.10. If some of the practice team were employed as contractors paid on a fee-for-service model, the cost would increase to $269.28. Of course, several different variables could change this amount. As such, based on the Chapter 6 costings, the following table (Table 11) could be inputted into a spreadsheet and used to help calculate costings by entering the amounts.

Table 11

Blank Costing Model

Person / Element	Hourly Rate	Rate per 15-minute
Medical Doctor		
Nurse		
Reception		
Allied Health 1		
Allied Health 2		
Allied Health 3		
Employment Oncosts (for employees@ %)		
Business Overheads and Taxes (from accountant)		
Total Cost to Provide the Service		

The table can be utilised by taking the hourly rate for each individual involved and adding more rows if more individuals are needed. As the standard medical consultation is usually 15 minutes, blocks can be divided into 15-minute blocks. As employees require on-costs such as superannuation, that amount can be added in the appropriate space, as can the overall business overheads obtained from the bookkeeper or accountant. Finally, if a clinic is a 'for-profit' organisation, a profit margin can be added for businesses by adding a profit percentage to the total.

Scenario Two - The Addition of Government Funding. This scenario takes the above

costing and considers Medicare rebates as of January 2024. The scenario in Chapter 6 included

the recent Medicare item numbers for Allied Health Multidisciplinary Case Conferences

(Commonwealth of Australia, 2021). Medicare has quite stringent guidelines, and this is based

on the guidelines that a chronic disease management plan is in place. Not all allied health

professionals are covered by these Medicare rebates. Still, based on the example in Chapter 6,

the total cost was $269.28. The rebates from Medicare would total $98, leaving the client an out-

of-pocket cost of $171.28 for a 15-minute interprofessional discussion.

Fully bulk billing these meetings may be possible if the team was made up of health

professionals covered by Medicare item numbers and a clinic's overheads were low enough.

Other forms of funding, such as a combination of Medicare and NDIS/Aged Care/Insurance

funding, may also help to cover the calculated costs. These costings can show that economic

viability is possible, and that may be enough to keep conversations going to help build the

coalition.

In building a coalition, these costs should be discussed with the team; referring back to

the CDC, individuals will have their own viewpoints on their income and what should be

charged. Good relationships within the team can help foster discussions to create a consensus

within the workplace community, which is affected by societal viewpoints, resulting in changes

in government funding.

Logistics and Processes. If an individual cannot see how something will work on a day-

to-day level, it may be an area of resistance for them. Again, including them in the conversation

where they can form part of the solution may be a way to convert them from resistance to

coalition (Hatane et al., 2021). Initial conversations to flag potential problems should include the

staff involved in the organisation process, such as administrative staff. The use of technology will no doubt play a role in this component. Some clinics might be well-versed in the use of technology, and it will automatically form part of its processes, whereas, for others, it might mean introducing a new system. Computer-based workflow systems are already in use for areas such as tumour boards. NAVIFY (Hammer et al., 2020), which helps specialists from different areas prepare for interprofessional meetings, helping to save time and ensuring that relevant information is presented to all participants. Computer programs like this may be part of the technological revolution that helps to streamline the interprofessional practice workflow.

The Role of Working Relationships. Forming a coalition will be more straightforward if trust and confidence exist with those in the coalition (Guo et al., 2009). Negative interpersonal relationships can hinder interprofessional practice (Schadewaldt et al., 2014). While this can be better managed as the momentum of change increases because more staff are part of the coalition to support it, it can be detrimental in the early stages. Therefore, it may be beneficial to identify those that have productive working relationships to form the initial coalition.

3. Create a Vision

Once the coalition understands what interprofessional practice entails and has given its initial support, it can develop a strategic vision and values towards achieving its goals. Creating the vision is the third of Kotter's steps (Kotter, 1996). This is crucial for long-term success, as it helps to guide the logistics and processes according to the vision. It also motivates future clients and staff members to align with the same vision (Gupta, 2011). This process could be discussed amongst the coalition and then presented to the group for refinement.

Building a vision should come from multiple sources (Al-Shehri et al., 1993). These sources could include the clinic's mission statement and the values and ethics of the professional

bodies to which the healthcare professionals belong. Accordingly, a coalition may be easier to form if the individual's ethics and values align with those of the clinic.

While there should be agreement on many of these values, there may be cases where there is a disagreement, in which case individuals should be asked to reflect on why the differences are occurring. Issues may arise around staff or clients who do not adhere to that vision or have different viewpoints on healthcare. For example, the ethics and vision of the clinic might focus on better health outcomes for clients, whereas for some staff, the focus might be on financial incentives. This becomes a misalignment between what the clinic is trying to achieve and what the individual is trying to achieve, which may cause resistance to implementation.

Self-reflection is essential to healthcare practice (Ooi et al., 2021). By reflecting on their value systems, individuals can choose to alter and align with the clinic's values (if they view them as worthy) or decide that the clinic may not be the best fit for them.

4. Getting More Volunteers

A workplace volunteer is someone who chooses to do something they do not necessarily have to do (Spear, 2016). Via the steps so far, there should be at least a small coalition of individuals who support interprofessional practice, hold similar values and ideals, and have an initial vision of what that would look like within the practice. In Kotter's fourth step, the number of volunteers can be increased by highlighting the vision to other individuals so that others may want to become involved (Kotter, 1996). This process involves utilising the coalition to leverage networks and communicate the vision (Cartwright & Baldwin, 2007). Then, by creating a sense of community via open communication and opportunities for involvement, others can more readily participate in the process and find their relevance (Kotter, 2012).

From an interprofessional practice perspective, these opportunities for engagement can be created by highlighting to the broader clinic the initial discussions regarding the challenges in healthcare and how they can be addressed via interprofessional practice. Again, possible client examples of how it can be applied and how it could work and be sustainable could also be discussed. Discussions can occur, not just as a group but individually, with the coalition having further individual discussions and gauging who might join the coalition to help further discussions with others.

As more individuals become involved, there is also the chance that further resistance can occur. The points raised earlier in overcoming resistance (concerning lack of knowledge, lack of support, finances, logistics, ethical differences and working relationships) can be applied again here in a similar fashion; further to those, others might include:

Limitations of Technology. Technology can be both a support and a hindrance. While technology forms an ever-growing part of healthcare, some issues may need to be overcome. Australia has stringent laws regarding healthcare privacy, which must be considered when using technology (Office of the Australian Information Commisioner, 2023). For example, information shared amongst healthcare professionals should not simply be emailed due to privacy laws. Emails can be hacked, stored on servers outside of Australia, and inadvertently sent to the wrong recipient; they should not be used for interprofessional communication. Part of the discussion with technology would be what systems are agreed upon for secure communication. If all participants in the communication are within the infrastructure of the one clinic, then that in-house filesharing or note-keeping system may be enough. Secure messaging systems, such as Argus (Telstra Health, 2023), may be used if there are external members.

Agreements must also be made on whether telehealth services are utilised and which to use. If they are not using them, individuals would need to be trained and have the systems implemented. It is also essential that the telehealth systems also adhere to privacy laws. It is also an ethical imperative that a health professional respect a client's right to privacy and consent for information exchange. What to share and how much to share would not only need permission from the client but would also need to be limited so that there is not an overload of information presented to all practitioners. Recommendations for technology would be to use systems that comply with Australian standards, are accessible or can be accessed by all team members with the least amount of training needed (Hollander et al., 2018).

States of Mind. Sometimes resistance may come from those who may have had negative experiences with poorly designed interprofessional practice in the past, and those experiences are causing resistance in the present (Lee et al., 2014). An individual's mental state or personality may be affecting their ability to participate as part of the team, for example, if they are more introverted or suffer from social anxiety (Bielska & Hampel, 2013). The reasons for these states of mind are so individualised that it is beyond the scope of this thesis to address them all. The key, however, is to identify what they are for the individual via discussions and encouraging self-reflection to help them identify what would be the best solution for them. Depending on the cause, a solution may be found; if not, the person may choose not to participate in the introduction of interprofessional practice, or a worst-case scenario, if the person is vital, the introduction may not go ahead.

During this stage, the introduction can also move from an internal focus to the inclusion of external participants, which include clients and the local community. Clients and the community must be part of the final model. Reflecting this on to the CDC framework, which to

this point has focused on individuals (now including clients) and their relationships, to now include the local community, which includes the entire clinic itself (clinic community) and the local community, which includes other organisations that may be willing to take part and work with the clinic. Getting clients involved can be approached in a targeted way, identifying those who would most benefit from interprofessional practice and discussing what would essentially be introducing a pilot program (Romme et al., 2020a). It is crucial that these clients offer feedback on the process, as it will be essential in the latter refinement stage. Similarly, local clinics and community centres might be approached, but again, they should be targeted for a pilot program in building the base model.

5. Removing Obstacles

Kotter's fifth step is about removing obstacles (Kotter, 1996). At every step, there is a likelihood that some of the obstacles already mentioned will cause resistance. As more people become involved, there is a greater chance of the obstacles previously mentioned arising again. Discussions may be repeated with different individuals, or specific discussions would need to occur, such as with clients, in terms of cost to them and with other clinics in terms of points, such as forms of communication and logistics.

Removing obstacles begins by identifying the barriers; sometimes, an individual may clearly articulate this or may be resistant, but they are unaware of why that resistance exists and might require further self-reflection; again, discussion is vital (Hughes, 2016). Encourage those highlighting a barrier to offer solutions and encourage others to discuss and propose solutions. Depending on the obstacle, there may not necessarily be a need to remove it initially; it may be an issue identified and adjusted during the refinement stage.

Removing Obstacles with Technology. At the time of writing, technology has the potential to have some of the most significant impacts on healthcare in modern times with the advent of AI and its movement into the mainstream. It is too early at this stage to determine precisely how AI will play a role in interprofessional practice because the nature of AI is that it can continue to evolve. However, two components need to be considered, one being that AI can play a role in automating or at least speeding up human processes. This might include assisting with administration, as AI models are being developed as scheduling assistants (Shih, 2021), and they may also be used to help healthcare professionals make better use of their time. AI could take clinical and meeting notes (Wang et al., 2022) and also be a member of the interprofessional team, not to replace the team, but instead could play the role of scanning through all the health practitioners notes and offering suggestions to the interprofessional team (Harada et al., 2021). It could also combine data from the client by information that is directly inputted or collected via devices such as wearables, combine them with client notes by the health practitioners and compare that against existing research to offer suggestions for interprofessional practice teams to consider (Costantini et al., 2022). While ethics, efficacy, and privacy need to be discussed, it seems that the basis for AI's ability to reduce many of the logistic issues in interprofessional practice is at least possible.

Another aspect of technology is virtual meetings for people who are not co-located, which saves considerable travel time. With the rapid uptake of telehealth during COVID-19, many more health professionals are now at least familiar with the technology. This rapid uptake during the pandemic shows that healthcare can adapt if required.

6. Short-Term Wins

Another way to overcome obstacles and build progress is via the short-term win (Crilly et al., 2024). The clinic would need to consider what constitutes a win and how it can measure it. Positive feedback from staff, clients or the community (in a qualitative or quantitative form) is possible, as is highlighting process improvements (Kotter, 1996; Douglas J Noble et al., 2011; D. J. Noble et al., 2011). As the ultimate 'win' is better health care for the client, it would be recommended that the win come from those improvements of clients in the initial piloted program. Other 'wins' might be staff feeling they are more of a team or gaining knowledge in areas outside of what they ordinarily know via learning from other professions. The wins have the benefit of improving morale and helping build credibility, which can further encourage others to participate. Short-term wins are strategic in that they help get more volunteers by highlighting proof of concept and overcoming some forms of resistance.

7. Sustained Acceleration

With any change process, change can reach a point where it is discussed and begins to be implemented but then falls away if not nurtured, and systems revert to how they have been in the past (Kotter, 1996). Sustained acceleration is about reinforcing the change by maintaining and expanding small wins to bigger wins, dealing with obstacles as they arise collaboratively and allowing employees to feel empowered (Kotter, 1996). In the context of this model, it would be to expand the number of clients provided with interprofessional care.

At this stage, feedback and the user experience component of design come to the fore so that issues can be refined and further improvements can be made. Processes and logistics should be bedded down to make it easier for administrative staff to become more familiar with them.

Health professionals in interprofessional meetings may find meetings more efficient because they are more familiar with processes.

8. Institutional Change

This step occurs over time after the application and refinement stage (discussed further below). Institutional change occurs when the changes are adhered to and successes continue (Kotter, 1996). The successes might be from the better health outcomes achieved by clients; they can also be achieved by being a model of practice for other clinics to follow and possibly even using successes to apply for grants. The changes then become part of the organisation's identity, so the organisation is known for its interprofessional practice (Bokhour et al., 2018). Clients and future work colleagues may be attracted to the workplace because of its vision around healthcare. Finally, it is vital that succession planning also takes place at this stage so that future leaders and staff do not simply remove the model that has been put in place but can evolve it further (Stephens, 2016).

Application and Refinement

Application and refinement refer to applying the base model of interprofessional practice, then the clinic collects feedback and makes the necessary changes to refine the model specific to the clinic. It is an essential component to design and is not a separate step but applied whenever a component is introduced or changed. For example, when discussing obstacles early on, if one approach does not work, a different approach can be refined and reapplied. As the model rolls out, this component will become more prominent as it might involve collecting feedback on a larger, more formal scale and acting on required changes.

Each clinic will have unique issues; the process here is not to provide a solution to every possible eventuality but rather to go through the process of refinement so that clinics can apply it

themselves. The refinement stage should then take the following steps once a sticking point from the base model cannot be overcome or is not working as effectively as possible.

This process follows the design thinking work of Norman (2002) and Brown (2010). The process involves the steps of empathising, defining, ideation, prototyping, testing, researching and refining. Design principles do not solely relate to physical products; they can be applied to the design of systems and many other areas, such as curriculum design (Cuthbert, 2017). To help explain how design principles can be applied to overcoming issues in interprofessional practice implementation, a hypothetical situation is presented in which a clinic gets stuck because one of the key staff members is resistant to the entire process and does not want to see it implemented.

Empathising

Empathising when designing a solution comes from the importance of understanding the users (McDonagh & Thomas, 2010). In this example, it would be trying to empathise with the person's particular situation and understand why they (and others like them) might hold those views. They may be overworked and used to doing things a particular way for many years; they may not see the financial value or see it as a fad. The key is understanding the person's thoughts and why they hold these beliefs. If it involves one person, that might involve talking to them to understand their perspectives better; if it involves a larger group, specific exercises in design thinking could be applied, such as developing a persona of the typical person in that group and trying to understand their experiences and needs.

Define

The next step involves defining the user's needs and clarifying the issues. It is used to reframe the problem and provide a scope of what can and cannot be addressed (Liedtka, 2011). In this context, it might involve more in-depth discussions with the person to clarify why they

hold those viewpoints. Can they be clarified so that the problem is identified? The individual might feel overworked, but they manage because they know what they are doing, but, in introducing new processes, they may feel more significant stress and less productivity and, possibly lose financially. It may become more apparent that the interprofessional practice is not the issue but the potential negative results of implementing something new. The problem, in this example, would be better defined as implementing interprofessional practices so as not to create an excessive workload or hurt finances.

Ideation

The next step involves ideation, similar to brainstorming; ideation begins with encouraging creativity by thinking of solutions that may be completely impossible; the idea is to encourage free thinking that may eventually lead to solutions later (Knight et al., 2019). Creativity and problem-solving can be stifled if critiqued too early, hence being encouraged to think of the most outlandish ideas as part of the process. Others are encouraged to take part, as creativity can occur in groups. All ideas are documented, which then go through a convergence process. Some ideas that could form the basis of a potential solution are selected, and those potentials are discussed in light of the information gathered in the empathise and define stage. In the example, impossible solutions like a robot replacement or cloning the person might be some of the initial outlandish thoughts to encourage creativity, but during convergence discussions, they may lead to possible solutions like workflow technologies and AI support.

Prototypes

The next stage is to develop low-fidelity prototypes (Craft & Marciano, 2024). If the design were for a physical product, this could be interpreted as a rough sketch. It may be a basis for a solution without details when designing a system. The potential prototypes should be

discussed, and feedback should be obtained to select the most appropriate solution. The solution selected, and its feedback can then help produce a high-fidelity prototype with the required details (Altman et al., 2018). A singular high-fidelity prototype may be produced or multiple; the key is that they are introduced and tested further. In the example, one prototype solution might be to begin to involve the individual in a set workflow with rigorous time limits on how much of a contribution is required; another prototype solution might be to gather more proof-of-concept information for them, with another team member performing the duties and showing them that it is viable in the clinic without an excess in workload. Feedback from the individual would determine which would work best for them.

Testing

The next stage is to test the prototype by applying the potential solution to the situation and getting feedback from those involved (Dell'Era et al., 2020). Feedback can be obtained in many forms, from more formalised feedback, such as surveys or interviews, to less formal discussions (Zeh, 2015). It is crucial to understand and collect this information appropriately, as the solution for the individual could eventually lead to this solution being applied to others. In the example, they might agree to trial interprofessional practice with strict limitations on their time, and then they would provide feedback on the experience.

Refinement

Refinement is aimed at the end users and, in design, is a continual process; it should be reviewed when any changes to the system are made. User experience refinement considers feedback and alters the design until an improved solution is obtained (Arbex et al., 2014). If change is required from the feedback, the ideation, prototyping, and testing process may occur again. The end users in this example would be the health professionals, the administration, and

the clients. What might have worked well for the health professional in the original solution

might not work as well if there were changes to administration or when applied to a different

client group, hence the need for refinement.

From an interprofessional practice perspective, it is vital to consider that systems are not

static, and areas of refinement may impact other areas. Refinement should be considered an

ongoing process. In health, there are many ongoing processes to help increase quality and safety,

such as continuing education points for registration and clinic accreditation. Refinement

processes could be incorporated as part of other quality improvement programs as they are

similar.

Other Aspects for Consideration

To begin the process of introducing interprofessional practice, there needs to be at least

one person in the organisation interested in driving this change and taking the initial steps to

begin Kotter's Steps and form the coalition (Kotter, 1996). That person might need to collect

background information, such as identifying resources and initial costs. While the costs of

running interprofessional practice have been mentioned, the costs leading up to its

implementation have not been discussed.

Set-up costs include the initial time needed to complete tasks such as collecting

background information, discussing with colleagues, passing on information and attempting

problem-solving where needed. There may be further costs of educational materials or

consultancy support if needed. The implementation process will require time, and clinics that are

stretched for time and limited in staffing options may not have the resources to continue.

Timeframes to introduction can vary as they depend on how many issues an individual clinic

faces and how quickly they can be addressed. These aspects and the processes involved in the

model creation need to be considered in terms of what it is worth for the individuals and the clinic involved. Again, this should relate to the aims and values of those involved and be considered an investment. Like many investments, it will require some form of expenditure, be it time and money, but it can yield positive returns well into the future.

The model presented links with the work of Greenhalgh and Papoutsi (2019) whose rapid review discusses the spreading and scaling up of innovation. Their rapid review focuses on three elements. The first is Implementation Science, which is a structured, phased strategy to develop, replicate, and evaluate interventions across various settings. The second is Complexity Science, which advocates for flexible, adaptive change processes that can respond to the unpredictable nature of complex systems/ Thirdly Social Science focuses on understanding the social, professional, and organisational factors that influence individual and collective behaviours.

The model covers these three areas as it discusses a more structured implementation in the base model, similar to what is discussed in Implementation Science. The model then takes more of a Complexity Science approach for the clinic-specific section of the model. It does this by considering the individual challenges faced by the clinic and advocates an adaptive approach. Social dynamics were identified and discussed in the themes, and their influence has been incorporated into the model by utilising aspects such as discussions, reflections, and ethics. This approach addresses the Social Science aspect of the review. As the authors have identified these elements are important considerations to help implement and spread innovation, and they have been covered in this model, it would make it more likely this model is successful both in implementation and scaling.

Limitations

Some of the limitations of this model include needing more focus on the client and the community as each of them will have their own set of issues that may cause resistance. For example, this process may result in a fully functional and sustainable practice model for a clinic, producing excellent outcomes for the clients involved. Yet, some clients may drop out and not want to engage with the provided treatment plans.

Another aspect is the refinement and acceptance stage. Staff with differing experience levels will be involved in managing this component and the aspects required for it to occur, such as collecting and analysing feedback. Some are naturally more creative and may have fewer issues with ideating solutions, while others might struggle. Depending on the size of the clinic, this may be something that could be outsourced to an individual who has experience in designing systems if this is a significant issue.

Conclusion

Interprofessional practice has continued to grow since the World Health Organisation released its framework in 2010. Many research articles, books, reports, associations, and organisations cover topics ranging from its efficacy to its education. Governments around the world have increasingly begun to support collaborative care. Yet, despite this, the uptake of interprofessional practice in the local clinic is largely lacking. Primary healthcare clinics face challenges beyond efficacy as they must navigate the health laws and systems in place to apply something new. All the while dealing with issues such as cost and staff resistance to change.

Consequently, clinics may benefit from a model of implementation that helps them address many of the barriers that have stopped them from introducing interprofessional practice in the past. The previous chapters have shown that the barriers are multifaced, and a multi-level

approach was needed to find solutions. By utilising the CDC's Social-Ecological Framework to help understand the interrelationships, solutions could be more clearly applied as a model. However, a model for implementation cannot take a generalised approach due to the differences in primary health settings; instead, a basis for implementation is created, which then allows clinics to apply and refine it as needed.

The steps to undertake this also needed a framework, and utilising change management processes such as Kotter's eight-step change management plan helped identify the steps that should be taken and when to apply the solutions according to those steps. The design process in establishing this model is underpinned by well-established design principles, which help ensure the design is robust.

The next chapter summarises and discusses the model. It concludes by discussing the overall findings, limitations, and potential for future research.

Chapter 8. Overall Discussion and Conclusion

Chapter Overview

In Chapter 7, a model for implementing interprofessional practice in primary healthcare settings was presented and discussed. This model was based on the integration of findings regarding identified barriers and solutions to facilitate interprofessional practice implementation. This chapter reviews the research aims in light of the study's findings; it summarises the model created and provides concluding discussions about the research undertaken in this thesis, its limitations, and potential for future research.

Discussion of the Aims

This study was undertaken with two primary aims. The first aim was to explore barriers and potential ways to overcome identified barriers in implementing interprofessional practice in primary healthcare settings in Australia. To achieve this first aim, two research questions were explored:

1. What are the barriers to implementing interprofessional practice in primary healthcare settings in Australia from the viewpoints of health practitioners working in those settings?

2. How can barriers to implementing interprofessional practice be overcome or resolved?

The second aim of this study was to develop a practice model for implementing interprofessional practice in primary health settings. This aim was achieved by integrating findings regarding both the barriers and solutions to these identified barriers to answering the third research question:

3. How can those solutions to the barriers be applied to create a model that primary healthcare clinics can follow to implement interprofessional practice?

The information presented in Chapters 4, 5 and 6 achieved the first aim. More specifically, the answer to research question one: What are the barriers to implementing interprofessional practice in primary healthcare settings in Australia from the viewpoints of health practitioners working in those settings? Was answered in Chapter 4 via the nine themes of lack of awareness of interprofessional practice, lack of support for interprofessional practice, the prohibitive costs of interprofessional practice, the difficulties in implementing processes and logistics, the issues in working relationships, the limitations of technology, ethical issues, states of mind affecting teamwork and difficulties in implementing change. Those themes were discussed, and evidence was presented for each of them based on the results of the interviews; this constituted Phase One of the research.

The second research question, how can barriers to implementing interprofessional practice be overcome or resolved, was addressed in Chapters 5 and 6. The solutions to these barriers were not simple because the barriers are interrelated with each other. A framework to conceptualise those interrelationships was identified, and the CDC's Social-Ecological Framework was chosen to help identify the entities affected by solutions and the interrelationships between them. The CDC's Framework considers issues from four main levels: the individuals involved, their relationships, the communities they form, and the society to which they belong (Perkinson et al., 2007). More appropriate solutions can be identified by understanding that solutions to the barriers should be examined from multiple levels. For example, the solutions to the cost barrier in a clinic may be explored from the perspective of individual needs or wants, how well those individuals in the interprofessional team relate or work together, the wants of the workplace community (the clinic in which they work) and the influence of societal funding (such as government funding). In Chapter 5, a critical review of the

literature was undertaken to identify evidence-based solutions to the barriers, which took into account the Social-Ecological Framework. In Chapter 6, a case study was undertaken to further explore possible solutions to two important barriers to interprofessional practice: cost and logistics. These barriers were found to be impacted by rapidly changing external factors, such as government funding and the rise of advancing technology, such as AI. The case study findings indicated that AI could potentially address many of the logistical barriers faced in interprofessional implementation and reduce costs. This chapter also presented a cost model to help clinics argue for the economic viability of interprofessional practice. Chapters 5 and 6 encompassed the findings for Phase Two of the research.

The second research aim, to develop a practice model for implementing interprofessional practice in primary healthcare settings, was also achieved. More specifically, the research question of how the identified solutions to the barriers can be applied to create a model that primary healthcare clinics can follow to implement interprofessional practice was answered by developing a model showing how it can be implemented. This also constituted Phase Three of the research. This model integrated the CDC's Social-Ecological Framework with Kotter's 8-Step Change Management theory. The CDC framework was used to conceptualise both the identified barriers and potential solutions to these barriers. Kotter's 8-Step Change Management theory was used to guide clinics in addressing barriers to implementing the model, such as resistance to change. The model has been designed so that clinics can adapt and refine it to better suit their individual clinic needs. In this way, the model is not limited to a specific type of clinic but can be adapted to a much broader range of primary health settings. This adaptation and refinement requires the clinic to design part of the model itself, and the model explains how this

can be achieved. The design of the model and the guidance on how to refine it are based on long-standing design principles to help make it more effective.

Discussion of the Model Creation

As is sometimes the case with qualitative research, the path to the outcome was not the one that was originally envisaged. Initially, the idea was to create a model using focus groups to devise and refine solutions to barriers and build a model based on those solutions, but the literature suggested this may not be the best approach. Authors such as Wranik et al. (2019) and Endalamaw et al. (2023) have highlighted the importance of context when addressing issues in interprofessional practice, and primary healthcare operates in many different settings (Swerissen et al., 2018). A primary healthcare clinic could be a medical or allied health clinic, public or privately owned, be large or small, operate from one or many locations, and be made up of different healthcare providers, just to name a few impacts on the effectiveness of a model.

A model created using focus groups would be more likely to create one that addresses the issues faced by members of the focus groups in their clinical settings but less likely to work in other settings. Instead, it could be argued that a model created from evidence-based solutions in the literature, then incorporating steps for individual clinic refinement, could apply to a broader range of clinical settings.

The impact of the pandemic also needs to be considered in the model's development. The changes in healthcare systems implemented since the pandemic have impacted the model's creation to such an extent that the model might have been different if the pandemic had not occurred. For example, the uptake of telehealth by health professionals and the community and the technologies that arose from them is a testament to the pandemic's impact (Caffery et al., 2022; Ndwabe et al., 2023).

As data were collected in Phase One, it became clear that one refined model for primary healthcare clinics would be impossible because of the different settings in which it can occur. Instead, a base model was created that guides the clinic in implementing interprofessional practice, which is then refined using design principles to meet the clinic's specific situational needs. The model guides the clinic through a well-established change management process and then instructs it to apply well-established design principles in a model refinement phase.

This refinement phase highlights another important aspect incorporated into the model: adaptability. Healthcare systems can change very quickly. The model's refinement does not end, and nor should it. Principles in design (Norman, 2002) ask that reflection and refinement processes continue, especially in light of environmental changes, which are certain in healthcare. A summary of the model is presented below.

The Model Summary

The final model is summarised below. Kotter's Steps are used to introduce the model because they help effectively introduce change. With each of Kotter's Steps, barriers are likely to be confronted. The model summary highlights each step and the likely barrier themes encountered on that step; of course, barriers can occur at any step, but the most likely barrier to the step is listed.

To address the solutions to those barriers, interrelationships need to be considered, and the CDC's Social-Ecological Framework helps to identify those entities most likely impacted by those barriers and solutions within that step. If a clinic faces identified barriers in a particular step, solutions from Chapters 5 and 6 are listed to help the clinic overcome the barrier and move on to the next step. This summary also identifies which parts of the model are part of the base

model and which are part of model refinement. Steps with regard to refinement and design principles are also shown.

The Base Model

The model begins with explaining how to create a base model, as shown in the steps below in Table 12.

Table 12

Base Model Steps

Step	Main CDC Levels	Main Barriers	Possible Solutions
1 – Introduction and urgency	Individuals and their relationships	Lack of awareness of interprofessional practice	General discussions about interprofessional practice and examples of how it could be applied to clients. Leading them to educational resources in the area housed by groups like ANZAHPE. Showing them the evidence base of its effectiveness.
2 - Building a coalition	Individuals and their relationships	Lack of support for interprofessional practice	Not all staff need to be part of the coalition. Identify key staff and discuss possible blocks with them. Common issues may be financial and logistical constraints. Initial solutions could be discussed. Working relationships may help or hinder; those with better working relationships may be selected as part of the coalition.
3 - Building a strategic vision	Individuals and their relationships, and the workplace community	Ethical issues in implementing interprofessional practice	The coalition should initially discuss a vision for the clinic based on IP and professional ethics. What values do the clinic and key staff hold? Do they align with IP values? Obtain feedback and ask staff to reflect on their individual value systems. Differences in ethics

			and values will need to be navigated via further discussions. Outcomes could be that alignment is achieved, or if not, the individual may not be the right fit to participate in IP.
4 - Building a volunteer army	Individuals and their relationships, and the workplace community	Any of the nine identified barriers could need to be addressed here.	Taking the vision to the larger group may cause past issues to resurface, as issues addressed in the past may need to be re-addressed with new people. They can essentially be addressed in the same way. With the involvement of more people, more issues are likely to arise. More of the barrier themes could be involved; each can be addressed via the solutions presented in Chapters 5,6, and 7
5 - Removing barriers	Individuals and their relationships, the workplace community, and society	Any of the nine identified barriers could need to be addressed here.	A more nuanced and individualised approach is needed to deal with particular barriers. Some may be 'parked' until a solution is found. Technology may continue to play a role in helping to addressing barriers. Information might feed back to government organisations on improving interprofessional practice delivery.
6 – Short term wins	Individuals and their relationships, the workplace community, and society	The difficulties in implementing processes and logistics The issues in working relationships The limitations of technology	This stage is about using improvements gained from limited implementation to show that the concept is viable and wins further support. The difficulties could be if there are issues in implementation, so there are no wins. This could be due to logistical issues or issues in working relationships. The solution is to start small and implement it with suitable volunteers to show proof of concept; if it does not, review what occurred and try again.

Model Refinement

By this stage, interprofessional practice is beginning to be implemented in the clinic. The above

steps relate to the base model. From this point forward, the aim is to focus on refinement.

Refinement will make the model more applicable to the individual clinic, as it takes into

consideration the clinic's needs; this will make the model much more likely to be sustainable in

to the future. Please see Table 13 below.

Table 13

Refinement Model Steps

Step	Main CDC Levels	Main Barriers	Possible Solutions
7 - Sustained acceleration	Individuals and their relationships, the workplace community, and society	The prohibitive costs of interprofessional practice The difficulties in implementing processes and logistics The difficulties in implementing change.	This step involves expansion by taking small wins and including more clients and staff in the process. Processes become easier as they become familiar. However, what is done on a small scale may face issues on a larger scale. Costings will now need to be clear, along with processes that work and are not overly onerous for the staff involved. More clients can become involved and community moves from the community workplace, to include other professions in the local community.
8 - Institutional change	Individuals and their relationships, the workplace community, and society	The prohibitive costs of interprofessional practice The difficulties in implementing processes and logistics	The clinic becomes known for its ability to function interprofessionally, and future staff and clients are attracted to it accordingly. Leadership succession supports interprofessional practice. Challenges in this area can come from environmental changes, such as changes to government funding or changes in technology that will impact logistics. The solutions

	The difficulties in implementing change.	previously mentioned might solve those issues, or new clinic-specific solutions will need to be generated.

Each of these steps can face challenges. The challenges may be unique to the clinic, so a model that solves all problems is impossible. However, part of this model involves teaching clinics how to design their own solutions using design principles. These principles are set out below and can be utilised during any of Kotter's steps above where an evidence-based solution has not been provided.

Design Principles

The design principles from Norman (2002) are summarised in the following table (Table 14). They can be used to address clinic-specific problems that have not been addressed in this thesis or where a solution from the base model has been applied but has failed in the context of a particular clinic.

Table 14

Summary of Design Principles Stages

Design Principle Stage	Design Principle Summary
Empathise	Try to understand the problem from the viewpoint of the person experiencing it. This could be achieved by talking to the person or putting yourself in their situation.
Define	This is about more clearly identifying the problem. Sometimes, the issue at hand may have a deep issue behind it. It needs to be identified and put into a question that can be answered.
Ideation	This is essentially brainstorming, but it begins by encouraging creativity, even in solutions that will not work. All ideas are considered at this stage.
Prototype	At this next stage, suitable ideas are refined from a low-fidelity 'rough' idea to a high-fidelity solution.
Testing	This solution is tested, feedback is gathered, and further changes, if required, are made. This leads to a refined solution.

This refinement stage focuses on the user experience to help make solutions more applicable to a specific healthcare setting. It can be used to design a solution to a problem or refine a solution to work more effectively; while these design principles will usually be applied later in the application of the model, they can be used at any stage where there is a barrier.

Conclusions

The findings of this thesis were produced from three phases of research to answer the aims and research questions. Phase One identified the barriers to implementing interprofessional practice in primary healthcare settings; it identified nine main barrier themes that impact implementation according to those working in the field. Phase Two identified solutions to the barriers; rather than considering them from a single perspective, it considered them from the CDC's Social-Ecological Framework to help understand the interrelationships of entities beyond the main ones impacted by the barrier. Phase Three utilised the findings from Phase One and Two. It combined them with a change management theory and design principles to develop a detailed step-by-step guide for primary healthcare clinics in Australia to introduce interprofessional practice.

Considering the amount of research and information in the field, it would seem that interprofessional practice could easily be rolled out. However, its lack of presence in primary healthcare, where most healthcare occurs, shows that something was not working. Barriers to its implementation needed to be identified, as did solutions to those barriers. From those solutions, a model for clinics could be made. The implications and limitations of this research are discussed below.

Implications

The evidence base for interprofessional practice and its benefits is growing (McNaughton et al., 2021). Australia, in particular, has committed much work to the field. An enormous amount of work has gone into developing effective training materials (The Interprofessional Curriculum Renewal Consortium Australia, 2013). There are professional bodies that are encouraging and, in some cases, insisting that interprofessional practice training be part of their

accredited healthcare courses (Health Professions Accreditation Collaborative Forum, 2023). All of this work results in more health professionals graduating with interprofessional skills.

Australia's government also supports interprofessional practice via funding. The introduction of new Medicare Item Numbers and the possibility of interprofessional services via the NDIS and My Aged Care highlight Australia's financial backing, and collaborative practice is one of the cornerstones of Australia's Primary Health Care Plan for the next ten years (Commonwealth of Australia, 2022b). The Australian Health Practitioner Regulation Agency also calls for public feedback on interprofessional practice, which may lead to registration implications (Australian Health Practitioner Regulation Authority, 2023).

With well-trained graduates and financial support, interprofessional practice should be popular. But the reality is that it is not being seen on a day-to-day level in primary healthcare clinics, which provide the bulk of Australia's healthcare (Rawlinson et al., 2021). This indicates that something is missing, and as the area of deficit is with clinics, it may be that clinics are having issues with its implementation, which is what this research has addressed.

It can be argued that one of the goals of research should be that what is produced is translational and others can utilise it. In this case, this study has produced a model directly applicable to clinics. The implications and applications of this research are thus potentially quite significant. The model may help to address one of the main issues stopping interprofessional practice from becoming much more popular, and that is how businesses can introduce and embrace it.

Contribution to Knowledge. This research contributes to knowledge in this field in many ways. It has helped to add to the body of evidence in understanding issues hindering interprofessional practice implementation. More specifically, it helps to understand what health

professionals in primary healthcare settings in Australia believe are the barriers to implementing interprofessional practice in those settings, as identified in the Phase One data. As the introduction of interprofessional practice to a clinic will most likely come from or begin with those working in those settings, their perspective is very important. The nine barriers identified can help answer why interprofessional practice is not seen in those settings as much as it could be.

Further to the identification of these barriers, solutions were put forward. Before exploring solutions to the barriers, the barriers needed to be viewed from interrelationships across different levels. This is because the barriers and subsequent solutions are not isolated phenomena; they impact and are impacted by other entities. The research conceptualised the barriers and solutions using the CDC's Social-Ecological Framework to better comprehend these interrelationships involved in interprofessional practice. This further contributes to knowledge by showing how the barriers and solutions to implementing interprofessional practice fit within a social-ecological model; this was shown in Phase Two.

The third contribution to knowledge is the creation of a model that addresses the barriers and presents evidence-based solutions that apply to the primary healthcare setting. This includes the innovative integration of a socio-ecological model with a change management theory and design principles to develop an interprofessional practice implementation model. The socio-ecological model provided a framework for conceptualising the barriers to interprofessional practice and the need for a multi-level approach to address these barriers. Integrating a change management theory provides further guidance for effectively implementing interprofessional practice in primary healthcare settings. Well-established design principles were applied to help refine the model. Phase Three's contribution to knowledge was the creation of a model for the

implementation of interprofessional practice, combining evidence-based solutions to implementation barriers with a Social-Ecological Framework, change management theory and design principles.

   Contribution to Healthcare. If clinics follow the model published in this research and introduce interprofessional practice, it may result in more primary healthcare clinics offering interprofessional practice. At present, health practitioners with skills in interprofessional practice cannot apply them if the clinic they operate from does not allow for interprofessional practice to occur. However, once interprofessional practice is introduced to a clinic, these health practitioners can readily apply their skills in a supportive environment. This can have a flow-on effect, benefiting more clients as more healthcare professionals offer interprofessional practice. With more clinics incorporating interprofessional practice on a day-to-day level, it will also be a more visible as a form of healthcare within the community, further growing its popularity.

Limitations

   Two main limitations need to be considered. One is the limitation of the model itself; the other is the methodological limitations.

   Model Limitations. Limitations of the final model include the barriers identified as being based on Australian clinical perspectives and may not apply to overseas clinics. Another limitation is that the model does not fully account for the role of AI. While the solutions and the model discuss AI and take it into consideration, it does so based on what we know AI to be today. The issue may be what AI becomes over the next 5-10 years. AI is being debated in terms of its use and its uncertainty (Kissinger et al., 2021). It could be argued that it may have little effect on healthcare or it completely revolutionises how healthcare is performed, in which case the model may need significant modifications.

Methodological Limitations. Several challenges did occur during the PhD process. For example, this research was conducted part-time over many years, which included the COVID-19 pandemic. The impact of the pandemic has already been mentioned. The original focus group methodology was altered accordingly due to the pandemic and to try to address the issue of context in the final model.

Another issue was with the data collected in the Phase One interviews. As it was mainly from doctors and nurses, more allied health professionals from other disciplines could have helped ensure that the perspectives of those not included in the interviews were the same as those that were included.

Future Research

There are many areas of future research that could be developed or explored. Usually, when a model is created, the next step is to test the model. This model could be tested in various ways. It could be tested in terms of how applicable it is and its ease of use, or it could be tested on interprofessional constructs, such as whether it allows teamwork to occur more effectively. There is also the impact on client health; does using a model such as this improve the health outcomes for clients? Ultimately, this is the goal of interprofessional practice.

As the key to overcoming some of the barriers in interprofessional practice is technology-based, this offers significant opportunities for technology firms to develop workflows that incorporate elements of this model and address the issues that it has identified. These workflows could help ensure that information is not missed and might solve logistics issues working from different locations; technology such as Navify® already exists in healthcare (Halligan et al., 2023), and it could be adapted to primary care settings. Other technologies, such as AI transcription of clinical meetings producing summary notes, are also already available (Menon et

al., 2021). There is also the idea of having an AI team member backed by quantum computing resources. Future developments might consider ways the interprofessional team can interact with the AI as a team member, which then accesses literature and information in the field and combines that with clinical notes and personal data points from items such as the client's wearable devices. The components for technology are already in place; they will naturally grow as they are refined and applied in this space.

The client is at the core of the interprofessional practice, and while a system that works for the client can be created, the client must engage in the process, both initially and long term. While research indicates what can help clients engage, more is needed. As this study has shown, logistics and processes play a significant role in engagement, so it is essential that these processes also meet client needs.

The evolution of the model could also occur if broader aspects of health and community are considered. For example, while these models consider health from the physical and mental health perspective, there could also be aspects of a sense of connectedness that may come from a community engagement model. A community-specific engagement model that links with this model. Research in this area could consider the development of a model that helps local communities interact with clinics. Finally, this model could be adapted and tested in other clinical settings, such as hospitals, community and student-led clinics.

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Appendix A – Participant Information Pack

The participants were sent an introduction email containing the following information:

Information to Participants Sheet.

List of questions

Link if they wanted to know more about interprofessional practice

Information to Participants Sheet

◆ **VICTORIA UNIVERSITY**
MELBOURNE AUSTRALIA

INFORMATION TO PARTICIPANTS INVOLVED IN RESEARCH

You are invited to participate

You are invited to participate in a research project entitled 'The Development of an Interprofessional Model for Private Practice Clinics in Australia'.

This project is being conducted by a student researcher, Frank Perri as part of his PhD study at Victoria University under the supervision of Professor Kristine Martin-McDonald and Associate Professor Peter Hartley from the College of Health and Biomedicine at Victoria University.

Project explanation

Today, working together with other medical and health care providers in the private sector primarily consists of referral letters and occasional phone calls between practitioners. This may result in poorly linked communications between the different health practitioners and lower health outcomes for clients. In 2010 the World Health Organisation recommended that health practitioners should work in an interprofessional, client centred manner so that health issues are more comprehensively addressed and complex health issues are better managed. Interprofessional research in the field has primarily focused on hospital and community based settings, however private practice has added complexities such as contractors who may work from a number of locations and great difficulty in sharing notes and information. This study will further explore the issues in interprofessional collaboration in the private practice setting by conducting a series of interviews and focus groups with the aim of developing potential solutions to these issues. The ultimate aim of the research is that a model of interprofessional practice will be developed from these solutions. This model could then be later trialled for effectiveness in private practice clinics in Australia.

What will I be asked to do?

You will be given some background information on potential issues with interprofessional practice in a private practice setting and asked to reflect on this from your own experiences prior to the interview. You will then be asked to participate in an interview to discuss your viewpoints on these issues and how you believe they should be addressed. The interview will consist of 10 general questions, and the interview will be recorded. The interview should take around 45-60 minutes to complete and you can stop or withdraw from the research at any time. The interview can take place at a suitable location of your choice. You may be invited to attend a future focus groups to discuss a draft of the proposed model, although participation in these future focus groups is your choice and by taking part in this interview you are under no obligation to take part in the focus groups.

What will I gain from participating?

As there is a reflective component to the research. You will have the opportunity to gain greater insight in to how interprofessional practice can be implemented within your own practice setting. The model development will go through a number of stages and you are welcome to take part in the future focus groups further enhancing your insight in to interprofessional practice and how a model of practice could operate. Participants will also be offered a $20 voucher to assist with travel costs if required.

How will the information I give be used?

Information from your interview will be recorded then transcribed. The transcribed interviews will then be analysed for particular themes to develop the first draft of a model of practice. The model will be presented to a focus group for further feedback. Any information you give will be de-identified as the model will present possible solutions in a generalised form. The overall findings will be published at part of a PhD thesis and research publications.

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What are the potential risks of participating in this project?

As you will be asked to participate in a one-on-one interview at a location of your choosing with the student researcher, the only potential risk will be that you accidentally give out information in the interview that you otherwise believe is confidential, however if this were to occur the information will be deleted from the recording and will not be transcribed.

How will this project be conducted?

The research is conducted in various sections namely via interviews and a series of three focus groups. This component of the research will be an interview. The information from the interview will be combined to formulate a draft of model, this model will then be presented to the series of focus groups. Each focus group will review the drafts of the model and discuss further improvements until a refined version of a model is formulated.

Who is conducting the study?

This research is being conducted by the College of Health and Biomedicine at Victoria University.

This Chief Investigator of this research is Professor Kristine Martin-McDonald (email kristine.martin-mcdonald@vu.edu.au) and the Associate Investigator is Associate Professor Peter Hartley (email peter.hartley@vu.edu.au).

The student researcher conducting the data collection is Frank Perri Phone 0413 988 821 or email frank.perri@vu.edu.au

Any queries about your participation in this project may be directed to the Chief Investigator listed above. If you have any queries or complaints about the way you have been treated, you may contact the Ethics Secretary, Victoria University Human Research Ethics Committee, Office for Research, Victoria University, PO Box 14428, Melbourne, VIC, 8001, email researchethics@vu.edu.au or phone (03) 9919 4781 or 4461.

List of Questions

1. Please tell me about your background qualifications and experience?
2. What motivated you to enter the private sector?
3. What other disciplines do you liaise with most often?
4. What has been your experience of working with health care professionals in other disciplines?
5. To what extent have you heard about interprofessional practice?
6. In what ways have you experienced interprofessional practice, (if any)?
   a. In private practice / community / acute care
7. Lets discuss some of the common issues in interprofessional practice….What others do you think could be specific or more of an issue in private practice?
8. What would be some ways in which these issues could be addressed?
9. What would you need to be able to implement interprofessional practice in your workplace?
10. Any other comments you would like to make?

Link if they wanted to know more about interprofessional practice
http://www.aippen.net/what-is-ipe-ipl-ipp

Appendix B – Authorship

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OFFICE FOR RESEARCH TRAINING, QUALITY AND INTEGRITY

DECLARATION OF CO-AUTHORSHIP AND CO-CONTRIBUTION: PAPERS INCORPORATED IN THESIS

This declaration is to be completed for each conjointly authored publication and placed at the beginning of the thesis chapter in which the publication appears.

1. PUBLICATION DETAILS (to be completed by the candidate)

Title of Paper/Journal/Book: The Economic Viability of an In-home Monitoring System in the Context of an Aged Care Setting

Surname: Perri   First name: Frank

Institute: Institute for Sustainable Industries and Liveab   Candidate's Contribution (%): 70

Status:
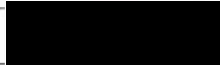Accepted and in press: ☐   Date:
Published: ✔   Date: June 2023

2. CANDIDATE DECLARATION

I declare that the publication above meets the requirements to be included in the thesis as outlined in the HDR Policy and related Procedures – policy.vu.edu.au.

Signature   Date: 4/7/2024

3. CO-AUTHOR(S) DECLARATION

In the case of the above publication, the following authors contributed to the work as follows:

The undersigned certify that:

1. They meet criteria for authorship in that they have participated in the conception, execution or interpretation of at least that part of the publication in their field of expertise;

2. They take public responsibility for their part of the publication, except for the responsible author who accepts overall responsibility for the publication;

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3. There are no other authors of the publication according to these criteria;

4. Potential conflicts of interest have been disclosed to a) granting bodies, b) the editor or publisher of journals or other publications, and c) the head of the responsible academic unit; and

5. The original data will be held for at least five years from the date indicated below and is stored at the following **location(s)**:

> This was a secondary analysis of pre-existing data. The data used is stored on Frank Perri's VU One Drive

Name(s) of Co-Author(s)	Contribution (%)	Nature of Contribution	Signature	Date
Shah J. Miah	10	Paper structure and publication		2/7/24
Steve Zanon	10	Helping with cost modeling		2/7/24
Keis Ohtsuka	10	Editing paper		2/7/24

Updated: September 2019

Article

The Economic Viability of an In-home Monitoring System in the Context of an Aged Care Setting

Frank Perri[1], Shah J. Miah[2], Steve Zanon[3] and Keis Ohtsuka[1]

Abstract

The aged care sector in Australia faces significant challenges. Although many of these issues have been clearly identified, their urgency has been further highlighted during the COVID-19 pandemic. Technology such as in-home monitoring is one way to address some of these challenges. However, the efficacy of technology must be considered together with its implementation and running costs to ensure that there is a return on investment, and it is economically viable as a solution. A pilot programme was run using the HalleyAssist® in-home monitoring system to test the efficacy of this system. This article focuses on an economic analysis to better understand the financial viability of such systems. Using a secondary analysis approach, the findings identified that revenue could be generated by providing carers with additional services such as real-time monitoring of the client, which can foster deeper relationships with the customer, along with savings of healthcare costs to carers, service providers and Government. Savings are related to the earlier intervention of critical events that are identified by the system, as delays in treatment of some critical events can create much more severe and costly health outcomes. Further health costs savings can be made via trend analysis, which can show more nuanced health deterioration that is often missed. The implementation of preventative measures via this identification can reduce the chances of critical events occurring that have much higher costs. Overall, monitoring systems lead to a transition from a reactive to a preventative services offering, delivering more targeted and personalised care.

Keywords

Aged care, Australian healthcare, economic savings, smart home, smart technologies

Introduction

The care of the elderly in Australia faces several challenges; these include a growing ageing population (Piggott et al., 2016), higher numbers of more complex chronic health conditions (Taylor et al., 2019), and an increase in the want of quality services (Gill & Cameron, 2022). These challenges face an increase in care delivery costs. Developing a better understanding of how to improve in-home care while making economic savings in line with the most productive use of limited resources is of high importance. This understanding is currently crucial, as many industry reports, such as those by Stewart Brown, indicate that many aged care service providers are presently unprofitable (StewartBrown, 2020). Along with the financial challenges, aged care service providers must also adhere to ever-stricter quality and regulatory standards while providers compete under the new Consumer Directed Care legislation.

Technology and its continued advancement are often seen as part of, if not the solution to many challenges in healthcare. Although technologies can and often do provide solutions, economic viability must also be taken into consideration if the widespread implementation of that technology is to be considered. Studies such as those by Arrieta et al. (2014) highlight that even well-established technologies should undergo cost-benefit analyses to ensure viability with their implementation.

A pilot research programme[1] was run to trial the benefits of in-home monitoring to assist the provision of client care using the HalleyAssist® smart home system (SHS), the findings of this trial, conducted by the National Ageing Research Institute (NARI) are reported separately. Although the trial was successful in client acceptance and assisting in providing

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better quality care, this report focuses on the economic impact of the use of that technology in supporting in-home aged care services.

This study examines the economics of the implementation that technology can provide both as an additional revenue stream and in cost savings. Potential revenue can be generated by providing carers with extra services and information, while savings in healthcare costs could be made on several levels. Both the client and their in-home carers could achieve fewer out-of-pocket expenses from more effective service provision based on collected data analytics. Service providers can also achieve cost savings via a more nuanced allocation of support services from that same data. Government savings could also be achieved from a more effective allocation of support and by providing measurable outcomes to some forms of treatment. Unobtrusive, objective data collection will also assist in future research outcomes, analysis of big data across multiple sites and public health planning.

Research Background

Several Government reports and research initiatives have been undertaken to highlight the seriousness of these challenges in aged care. Some of the more notable include the current Royal Commission into Aged Care (Royal Commission into Aged Care Quality and Safety, 2019), The Aged Care Roadmap (Aged Care Sector Committee, 2016) and The National Quality Indicator Programme (Australian Government Department of Health, 2019). The effect of COVID-19 on aged care has highlighted that these needs for service improvement must be addressed as a matter of urgency. These reports and investigation outcomes have highlighted the vital role technology will play in the sector, but which forms of technology are practical and economically viable in the longer term are still emerging.

The majority of research in this field has mainly focused on the efficacy of technology in the home or with specific conditions (Amiribesheli & Bouchachia, 2018; Daniel et al., 2020; Lazarou et al., 2016; Vanus et al., 2016). Studies such as these, along with the pilot study to which this analysis is based, measure if the technology is functional, improves health and well-being and accepted by users. In other words, research must ascertain if technology not only works and helps to improve client health but if it is easy to use by the client and their carers. Whilst this type of research is essential to the implementation of technology in the home; economics must also play a role in determining the viability of such systems. A system may work, but it may be too expensive to implement on a broader scale. Technology requires a return on investment so that there is a much larger uptake of that technology. Although there has been some research exploring the more general economics of technology in healthcare (Rahman et al., 2019), more specific cost analyses with

particular forms of technology need to be made. As such, this report focuses specifically on the technology the HalleyAssist® system can provide and the resultant economics. Findings and implications from this study would apply to evaluate other healthcare technology systems if they offer similar features and benefits in functionality, efficacy and useability.

Research Methodology

The study adopted a secondary data analysis of an existing (pilot) project. The pilot project assessed the efficacy of an in-home monitoring system (called HalleyAssist®). A secondary analysis approach is mainly used to reuse existing information to glean new understandings. Secondary analysis is a relatively new approach; it's used to revisit existing data sets or reports that are more widely available online or offline (Tarrant, 2017). Several studies in information systems have formed ways of analysing secondary data in quantitative studies. Examples, such as the study by Campos (2016) used secondary analysis to show existing Facebook advertising data were used to identify the effects of user-generated content. In the same fame, Arnott et al. (2017) point out in the context of their analysis of eight business intelligence systems, the increase in data leads to greater generalisability for developing more measures and is likely to be higher quality when the original researchers are involved. Arnott et al. (2017) suggested that this is due to the original researchers' deep understanding of the data's meaning and further argue that fit between available data and secondary analysis requirement is ensured when similarities in phenomena studied, data collection and unit of analysis apply.

In the current article, a secondary quantitative (economic) analysis was conducted across the case findings from the pilot study. Costs from a service provider were obtained, along with reported Government and industry averages for financial line items such as hourly rates for wages and on-costs, travel and management expenses. This information was used to examine the economics of the implementation that technology can provide both as an additional revenue stream and in cost savings. This article aims to assess the economic viability of in-home monitoring systems, which will be explored further in the following discussions.

Case Context

The HalleyAssist® system uses sensors placed in the client's home and artificial intelligence (AI) to monitor movement and map behaviour. These data are analysed for patterns and can be used to notify and assist with support services as well as to alert family members of critical incidents. Sensors such as movement sensors, door sensors and bed sensors are used

to collect data which is then analysed via the AI. to identify the individual behavioural trends of each customer. This information can then be used to identify significant behavioural variations, critical events and track declines or emerging risk profiles in day-to-day functioning. Alerts are automatically raised when these situations occur.

The system includes data dashboards that provide an overview of the client's activities in near-real-time (see Figure 1). The dashboard is accessible to either (or both) the in-home aged care service provider and one or more family/carers so that they can better monitor and gain insights into their loved one's behaviours. Importantly, the system automatically creates alerts if there are issues of unusual behaviour such as falls or a lack of movement. These alerts can then be acted upon by the service provider and or the family. If there are known conditions that are impacting the consumer's quality of life, sensors can be set to track these issues more closely and provide the earliest possible notification of increasing risk so carers can better plan for early interventions.

This pilot programme was funded by the Commonwealth Department of Health as part of an Innovation Funding Grant to install the system in several residences. A six-week trial from February to April 2020 of 13 client homes was

Figure 1. Example of the HalleyAssist® Dashboard.

undertaken. The trial focused on the acceptability of the technology, measures of the carer burden, the ability to better support clients with specific needs and challenges, well-being and re-enablement. The trial was found to be successful, with formal research findings reported separately by the NARI.

To identify where the primary economic impacts of smart home monitoring systems lie, a detailed financial modelling exercise was undertaken. A series of different scenarios drawn from the trial were examined to offer some 'real-life' examples of the implementation of smart home technology. A sensitivity analysis was undertaken as to how digital technology, in particular, a smart home product could improve the allocation of staff resources and produce financial benefits.

Findings

During the trial, client care events occurred in which the system was able to monitor and alert researchers. Some of these more notable events became scenarios where cost-benefit analyses could be applied based on if the technology was utilised, versus if the technology was not. Because of the commercial-in-confidence nature of the aged care provider's costs, we cannot divulge specific amounts of savings in these scenarios. Instead, these findings will discuss in broader terms, where extra income can be generated, and savings can be made from the analysis.

Family Monitoring

Without a monitoring system, when a potential emergency occurs, family members are often needed to intervene. This check-up activity could include taking time off work and travel expenses. Instead, having information available on a smartphone, where family members and loved ones can observe the status of an individual in real-time would allow them to better identify if an emergency has actually occurred and plan their visit accordingly. In practice, this real-time visibility can minimise carer stress and anxiety, along with the potential to minimise lost productivity.

Day-to-day Monitoring (Visibility) for Families and Carers

Aged care providers could charge for this service by simply providing access to the smart home mobile app for approved consumers at a reasonable rate, thereby increasing revenue. Although savings to family members will be situation-specific, some family members will see the benefits of having access to the monitoring system as they will be much less likely to rush out at times from work when there is no emergency.

An additional income stream over and above monitoring fees can be a (phone or home visit) welfare check prompted by either automated alerts from the system or should the

family identify a concern from what they might see on the mobile app dashboard. A similar financial model is used in security companies that offer alarm monitoring systems which charge a monthly fee for the monitoring and then an additional fee if the company is requested to go out and visit the location.

Minor Events Attended to by Family

A minor event is defined as an incident where a carer needs to check in on the elderly individual, but they did not require significant assistance—for example, not responding to a telephone call and upon checking finding that they are safe. Dependent on the carers cost of time versus the number of times these incidents occur it may be a financial benefit to the family member to utilise the monitoring system in this way, especially if these events are occurring multiple times. There would be a return on investment for the more 'at-risk' customers, but this may not be needed for every client. This baseline calculation can be used by aged care providers to identify the right clients whose circumstances would warrant a further discussion about the system's installation. There is likely to be a selection (target segment) of clients where this service will be of benefit and the customer would understand the rationale for a return on their investment without them being 'sold to'. Alternately, there will also be those family members that would want the service and monitoring solely for their peace of mind, regardless of how many times callouts are needed.

Cost Savings: Potential Major Event

A potential major event occurs when there is an escalation in further assistance such as police and paramedics, which, again, was ultimately not needed. In this situation, without monitoring, an ambulance may be called by the client or the carers as they are unclear on a situation but are concerned enough to request a call out. If the event was a 'false alarm' the ambulance cost to the client or family member can be over $500. Ambulance coverage in insurance policies often does not cover callouts when transportation was not needed, so even with insurance, the client can be left with the bill.

Alternately, with monitoring technology, family members will have more information to decide if emergency services should be called or if they should check on the family member themselves. Due to the higher costs involved in such an event, the return on investment calculation may only need to need to occur 1–2 times a year to cover costs. Again, If the client is known to be 'at-risk' of such events, then the provider can further outline the benefits of the system to them.

Faster Response to Emergencies

A rapid response when a critical incident does occur can have a significant effect on clinical outcomes and quality of life. Critical incidents like falls, heart attack or a stroke, require an immediate response as time plays a vital role in the duration of recovery time and consequent support requirements.

Falls are potentially life-threatening incidents for the elderly, primarily if those falls result in injuries such as broken hips. There is the potential for significant disruption to the individual's health, the negative impact on family members and the economic costs of that care as part of rehabilitation to recover from a fall or other injury. The consumer that falls and cannot contact assistance due to immobility is likely to require significantly more care and rehabilitation than someone whose fall was detected and was attended to quickly.

The system can also trigger emergency services along with notifying family. This automation can ensure more immediate assistance in situations where the fall is more serious, and the client struggles to respond. Devices such as wearables with push-button alarms are not always utilised in emergencies, for example, if the individual is unconscious. The benefits of a passive SHS that does not require activation from the user in such circumstances are clear. The implications for aged care providers are that timely responses and a reduction in unattended falls may negate extra strain on funding packages allowing for the provision of more targeted preventative services.

Given the implications for the broader community concerning the impact on hospital and medical services, the impact on lost productivity of family members taking time off to look after loved ones as well as impacts for the service provider; the costs to the community are high. While this scenario has focused on falls, many health conditions will benefit from a rapid response.

Trend Analysis

Data collected over time can be used as a benchmark to identify when significant changes are beginning to occur. Behavioural changes can more easily be identified, and more specific care supports applied to better manage risk and develop capacity building and or wellness programmes.

Trend analysis offers a service provider the ability to intervene earlier with regards to conditions that may deteriorate slowly over time, such as Mild Cognitive Impairment (a precursor to dementia). Similar to a rapid response scenario whereby an early intervention can mean fewer complications, trend analysis can do the same, but with conditions where changes may be more subtle and over long periods. Using AI, it can identify behaviours that the carer or client may not necessarily notice such as a gradual decline in movement. Where declines occur more slowly and are not readily identified by untrained people, they can be identified with trend analysis software. This change then prompts an opportunity to discuss what might be occurring with the client—to determine if this is part of a more permanent deterioration or where acute care can be provided earlier.

Trend analysis offers a better prediction of when service requirements may increase, and further funding sought; this can help to minimise scenarios whereby the level of funding is not sufficient for the individual. Applications for additional funding can also have a more robust evidence base as data from the system could be used. It also offers the ability to better plan staffing requirements and time allocation. Trending of behaviours can also be positive as a client recovers from illness or injury. By seeing which clients are trending downwards and those trending upwards, staffing allocations may be made more accurate in servicing client needs, directed to where it is needed most.

These savings can be further increased by the avoidance of critical events and deploying capacity building activities to reduce the 'normal' rate of deterioration in a client's capabilities. SHSs then become a data collection tool, which aged care providers can discuss with the client if more specific services may be required, and if additional value-added services might be beneficial. The client may be more willing to pay if they can see a clear benefit.

At a higher level, trend analysis can be combined from multiple clients to understand better the patterns of behaviour and the necessary level of support for larger population cohorts. This 'big data' would assist in identifying patterns in local population health initiatives, many of which are known to be context-sensitive and need local data to adjust service provisioning. Technology-based measurements that are more objective could also be used as part of government calculators, requiring evidence from community implementations of such technology to establish the level of services in funding needed.

Tailored Staff Allocation

As previously mentioned, with better monitoring and data, a more tailored approach to care can be discussed with the client and then applied. The consequence of having access to richer client data is the capability for timelier or 'just-in-time' staff training and more finessed workforce allocation. This scenario considers the economic impact of implementing a more detailed model of staff resources directly in line with client needs. This data can provide more tailored and therefore, effective services, the objective of which is to increase staff productivity and client outcomes. At present staffing allocation of services to the client are generally conducted at routine intervals, with more intensive care applied when an issue becomes significant enough to be noticed. Instead, with the data provided by such systems, visits can be more targeted, increasing when they are needed more, and less so when they are not as necessary.

As one of the most significant line-item expenses in aged care provision, staffing productivity improvements and staff savings is a key area for investigation. By having a range of employees to call on that have broadened their core skills

base with low-cost short courses could mean that more effective care can be achieved from a more traditional 'personal care worker' visit. While there might be a slight cost increase with the session itself, the carer is providing a higher level of service in that one visit so that sending another much higher cost (e.g., clinical level) staff member out at a different time may not be required. That has the potential to then lessen the overall number of visits needed. The cost benefits of a lower number of visits are not merely just the wage savings of that visit, but also include additional travel time and case management.

Upskilling of personal care workers through joint training sessions and education provides an opportunity for personal care workers to participate more effectively as part of a multidisciplinary team, achieving improved customer outcomes and often greater job satisfaction for the worker. With staff members, broadening their skillset more specifically in line with client needs, effective teamwork and goal-directed care can be achieved. In the ageing population, where multiple complex conditions often present, hospital admissions can often be prevented with targeted multidisciplinary team approaches.

Broader Value-added Benefits

In the course of the financial modelling and preparation of this report, the following additional value-added benefits have been identified. They were not included in the financial modelling but are listed as additional benefits with the potential to derive further economic impact. They may provide additional opportunities for income generation or further savings in expenses. These areas are suitable targets for economic analysis.

Building Client Compliance

Medical support is often limited to client compliance. Doctors and healthcare professionals can provide patients with the medication and strategies to improve their health but if they do not comply with taking medication or following through with instructions given by healthcare providers their health will suffer, and in the longer term this has the potential to result in much higher healthcare costs due to more severe outcomes or complications emerging.

There is a significant opportunity here for aged care providers to become client 'health coaches', becoming more of a co-design partner and social-emotional coach in educating and helping customers develop more self-agency in their own care and support. Consumer Directed Care requires greater involvement of the client in their healthcare. Features in SHS such as medication alerts, reminders to put on wearable devices before leaving the home, and customised reminders to exercise, to attend appointments and to drink water can all be ways to increase their engagement in their

own health goals and therefore achieve better quality of life and health outcomes.

Relationship Building

The management of the patients healthcare involves much more than simply instructing the customer what to do and them complying. There needs to be active engagement by clients in their own wellness protocols as part of their own treatment plan. This can be achieved more effectively if they play a more participatory role in the discussions around the benefits of their healthcare plan. Data from a SHS can be used as discussion points for changing behaviour—both in capacity building and decline. For example, if a client is given instructions such as exercise and is then non-compliant according to the data, it can be a prompt for discussion to tease out why they are not complying and to help change their motivation, the exercise or instructions to better suit the client. It can also be used as conversation pointers for clients that say they are exercising when the data clearly shows otherwise. Discussions can be had with the client to delve further into their reasoning to then to help motivate or coach them to be more in train with their own goals.

Case Studies and Client Referrals

The report from the NARI showed that clients had positive attitudes towards this particular SHS. As more systems are installed, and an increasing volume of people use them, there will likely be a growing number of case studies where its effectiveness in critical incidents and identifying early trends to better provide healthcare. These case studies could be used to improve aged care support services and processes. Co-designed case studies will increase the numbers of clients in terms of demonstrating operational effectiveness but more importantly ensuring greater peace of mind. The clients themselves talking to friends and family also increase the word-of-mouth benefits of the system. If aged care providers are seen as having expertise in new technology, and trusted smart home services, in particular, this can attract future clients.

Client Piece of Mind

Living alone and feeling isolated can become stressful for many individuals. Part of this stress can come from the potential ramifications of a critical incident and no one around to assist them. Stress can negatively impact health and can slow recovery from illness. By having a system that is unobtrusively monitoring them in case of emergencies and critical incidents, that can automatically alert friends and family; this can give the client the peace of mind to lower their stress levels. This is a major factor in the quality of life.

Staff Compliance and Dealing with Complaints

The SHS can assist in the quality management of staff in providing their duties to clients. By monitoring door sensors,

providers can check what time a staff member enters and leaves a premises in conjunction with other monitoring such as GPS. This has the added benefit of quickly resolving potential disputes between clients and staff. For example, if a client makes a complaint that a staff member did not spend the entire time required at the client's home, and the staff member instead left early and spent the remainder of the time sitting in their car, the system could identify what time the staff member entered and left the premises by the door sensors. Dealing with even minor complaints can become quite time-consuming and can put additional administrative strains on a business. With better monitoring, this is much more easily resolved.

Discussion

In summary, SHS can provide unobtrusive and objective data collection. A range of sensors placed throughout the home can collect vast amounts of data which can be summarised and analysed using AI technology. Sensors can continually monitor and feed information to AI-based system that can then advise of critical incidents, including those that may require emergency services, the intervention of the provider or the client's family and friends. This same data over time can show clear trends and identify changes to those trends, to which the client and their carers may or may not be initially aware. This trend analysis of behavioural changes can be further utilised to pinpoint where early intervention strategies might assist. Alternately the same trend analysis can be used when treatments are applied to show improvements in behaviour, by checking behaviours before and after treatment, further verifying the effectiveness of those treatments. Importantly, if treatments are not effective, this can be identified early, and care strategies can be updated (see Figure 2).

The Benefits for Our Aged Population and Their Families

As highlighted in the scenarios, there are both peace-of-mind benefits to our aged population and their carers. Merely knowing that if an adverse event were to occur and the client was alone, that the system could intervene and alert emergency response without the need for intervention by the client. The client and their carers ultimately determine the economic value of such a feature, but, it does become a point of discussion and greater engagement with the service provider.

Discussion points based on data generated from such systems foster deeper relationships with the customer as well as providing better health outcomes by actively addressing identified issues earlier.
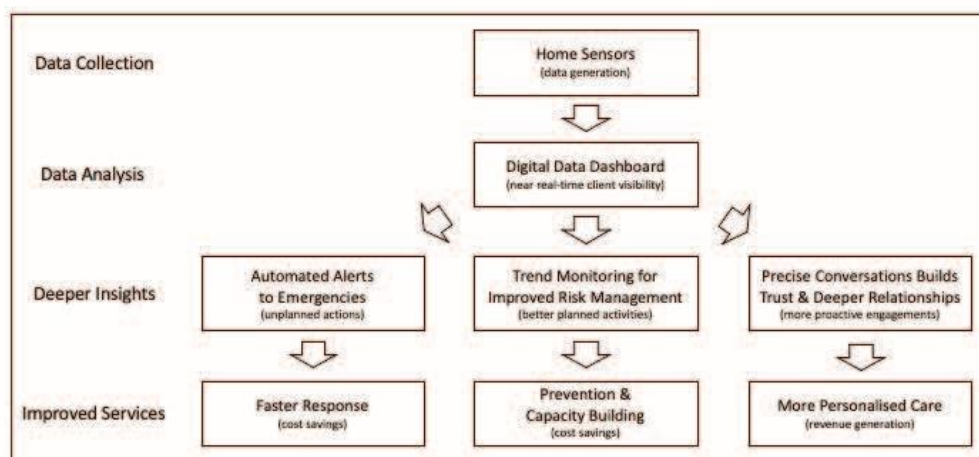
Figure 2. Summary of the Main Economic Benefits.

The National Perspective

SHS may assist on a national level in a number of ways. As a monitoring tool, such systems can support individuals to stay-at-home longer and lessen the burden on residential aged care, which has a much higher economic cost to the Government. It is also clear that for the vast majority of the elderly, the preferred option is for them to live in their own home for as long as possible. Home monitoring systems can assist in achieving this via 24-hour monitoring for emergency/critical incidents and changes in behavioural trends.

Of further significance to Government is the more objective measures that technology can provide.

One of the main challenges for governments is to provide both equitable care for all citizens and the right level of care for each individual under a budgetary constraint. While this is being addressed via more nuanced levels of funding and tools to help determine those levels, subjective interpretations still form a major component of the application of those tools. Objective big data collected over more extended periods of time can show a much more accurate picture of an individual's particular situation.

Although scientific randomised controlled trials applicable to the masses are the foundation of that evidence base, there are opportunities to develop more flexible care programmes for our seniors tailored more specifically to their individual needs. For example, there are many scientific treatments for back pain; these might include medication or physiotherapy. A monitoring system can determine which is working best (or not working) for that individual.

Also, as has been shown as part of this study, there are opportunities to identify behaviours that are gradually changing or have the potential to cause a critical incident and to apply treatments or interventions before they deteriorate further. Then later providing rapid feedback as to if or to what degree the interventions have been effective via monitoring changes in behaviour. Again, this can be done in an objective and unobtrusive way that can easily show the true value of that intervention. This methodology follows the natural progression towards value-based healthcare.

Furthermore, there is the opportunity to combine data from individuals in a de-identified way to provide additional research into new treatments or interventions and help direct where resources are needed most, and which are more effective; this will accelerate healthcare research.

Two areas of caution should be noted. One is the safety of such information. Any online information has the risk of being hacked. This risk needs to be considered against the potential benefits of the collection and storing of such information. While there are examples of the general acceptance of sensitive information being stored and sent online (for example banking), healthcare information being sent and accessed online is an area that is still in the process of gaining acceptance by the community. The second area of caution is the scale of this study. While financial modelling is based on robust principles, the scenario analysis is based on a small number of smart home implementations; this is, in effect, a small-scale study. A much larger cohort of participants is needed to reinforce these findings.

The Benefits to Service Providers

The economic modelling demonstrates that deploying SHS can offer significant economic benefits to age care providers. However, before any technology is implemented, particularly in people's homes, it is recommended that clients be appraised for their suitability. There are characteristics of clients which should be considered when advising potential customers as to the benefits of SHSs. According to the financial modelling, this includes clients likely to better understand their own situational health risks by using this type of technology. These clients would be identified by the service provider as those that would show behaviours that are clearly indicating a risk of critical incidents or that are likely to show a significant deterioration in the not too distant future. The client's financial position and level of funding also need to be included as part of these discussions. The previously outlined scenarios and their returns on investment are suitable case studies in how to position this with clients before requesting to purchase and install a smart home monitoring system.

The other clear category of potential clients is family members or carers that are more concerned with having peace of mind rather than any economic implications of the system. Levels of apprehension in the family are sometimes underappreciated and support around the issues these causes are not often provided. In these cases, the client or their loved ones may cover the cost of the system and its running costs simply to enhance their peace-of-mind.

More specifically, for aged care providers as a business, there are several economic and value-added benefits that will have a positive impact, both from an increase in revenue and to drive cost savings. SHS can improve current service strategies by providing greater visibility into day-to-day client needs and thereby offering the opportunity to develop more personally tailored services with their clients and then more closely tracking the improvement in the quality of services provided. This gives the business opportunities to offer more value-added services because the client and their carers can understand the benefits to them.

There are also opportunities to include new service strategies such as improved client risk management via trend analysis whereby emerging health risks can be discussed with the client, explaining the risks in those emerging trends and deciding on 'wellness' goals and a suitable course of action with the client. Capacity building programmes that mitigate that risk and improve quality of life can then be introduced. Once these programmes are introduced, they then can be measured over time, and clients can review the results.

More client specific insights and prevention strategies can also be discussed with families. At a national level, this aggregated data can begin to be used for input into industry regulation and reporting purposes. This type of technology provides aged care providers with much more detailed insights into each client. These insights allow them to develop trust and deeper relationships as part of the usual schedule of care. As a consequence of this, the client's journey from home care into residential aged care can also be better managed; this is a difficult transition to make—both psychologically and financially. Ideally, for many people, this could be a gentler transition than is often the case today.

With the supporting evidence of behavioural changes over time, aged care providers have the potential to be a more integrated part of each client's lifecycle from a basic home care package to residential aged care. By applying much more personally tailored services as they are needed from an objective behavioural change evidence base, the provider can become a more integrated part of the client journey. This evidence can assist aged care providers in applying for further funding if the client has a demonstrated need for it.

Conclusion

In conclusion, health interventions must include economic analysis; this is especially true of technologies that utilise big data, whereby the greater the level of uptake, the greater the amount of data that can be generated, managed and therefore be utilised. That high level of uptake is impossible if it is not economically viable.

Based on the scenario findings of the pilot study of an in-home monitoring system, the secondary economic analysis of those scenarios show that there are economic benefits along with other valued added benefits in the implementation of such systems. These include the ability to deliver more targeted and personalised care based on big data which is analysed via AI. This more personalised care shifts health delivery from a reactive model to one which is preventative and more actively case managed. Client-centric healthcare is seen in the Australian Aged Care system and the National Disability Insurance Scheme as better in managing chronic and complex conditions. In-home monitoring such as this fit within those models very effectively. It can help foster deeper relationships with the customer, and their carers as data can be used as discussion points highlighting potential issues to the client and ultimately assisting in developing new value-based healthcare models.

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Note

1. The program is based on an industry funded project (Ref: INT—0780) for assessing impact of Care smart home monitoring technology in the home care setting.

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Appendix C – Qualification

UNIVERSITY
of TASMANIA

In accordance with the Rules of the University

Frank Perri

has this day been awarded the

Undergraduate Certificate in Applied Design

dated this seventeenth day of December 2022
in evidence of which this certificate is issued under the Seal of the University

CHANCELLOR

VICE-CHANCELLOR

Award number: 120770