INTERPROFESSIONAL LEARNING READINESS AMONG LEARNERS OF HEALTHCARE PROGRAMS: A CROSS-SECTIONAL STUDY

MAHFUZA AKTER

FACULTY OF MEDICINE
UNIVERSITI MALAYA
KUALA LUMPUR

2024

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MAHFUZA AKTER

RESEARCH REPORT SUBMITTED TO THE FACULTY OF MEDICINE UNIVERSITI MALAYA, IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF MEDICAL EDUCATION

2024

UNIVERSITI MALAYA

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Registration No: 22073490

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Field of Study: Medical Education

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INTERPROFESSIONAL LEARNING READINESS AMONG LEARNERS OF HEALTHCARE PROGRAMS: A CROSS-SECTIONAL STUDY

ABSTRACT

Interprofessional Learning (IPL) is crucial in healthcare education, promoting collaborative practice among various healthcare professions to improve patient outcomes. This study assesses the readiness for IPL among healthcare learners at Management and Science University (MSU). This cross-sectional study utilized a descriptive survey design, targeting undergraduate learners from programs such as Medicine, Pharmacy, Nursing, Biomedical Science, Cardiac Technology, Nutrition Technology, Optometry, and Bio-Medicine. Data were collected from 219 students using the Readiness for Interprofessional Learning Scale (RIPLS), which measures perceptions of teamwork and collaboration (TWC), positive professional identity (PPI), negative professional identity (NPI) and roles and responsibilities (RR). Responses were gathered via Google Forms and analysed using IBM SPSS Statistics version 26.0. Descriptive and comparative statistics were employed to evaluate IPL readiness and differences across programs, year of study, age groups, gender, and academic performance. Results indicated high overall readiness for IPL, which shows positive attitudes toward IPL, and female learners have higher readiness compared to their male counterparts (P = 0.033). The total RIPLS mean score was 3.78, with high mean scores for PPI (4.36) and TWC (3.90) but moderate scores for RR (3.59) and lowest for NPI (3.31). There is a significant positive correlation between the TWC, PPI, and RR (P = 0.00). The findings highlight a generally positive readiness for IPL among MSU healthcare learners. The healthcare learners generally hold positive attitudes towards IPL, particularly regarding TWC and PPI. However, there are areas of variability, especially in NPI and RR. Continued efforts to enhance interprofessional learning, clarify roles, and address negative perceptions are essential to fully integrate collaborative practices into healthcare training.

Key Words: Interprofessional learning, Readiness for Interprofessional Learning Scale, Healthcare learners.

KESEDIAAN PEMBELAJARAN ANTARA PROFESIONAL DI KALANGAN PELAJAR PROGRAM PENJAGAAN KESIHATAN: KAJIAN KERATAN RENTAS

ABSTRAK

Pembelajaran Antara profesional (IPL) adalah penting dalam pendidikan penjagaan kesihatan, mempromosikan amalan kolaboratif di kalangan pelbagai profesion penjagaan kesihatan untuk meningkatkan hasil pesakit. Kajian ini menilai kesediaan untuk IPL dalam kalangan pelajar penjagaan kesihatan di Universiti Pengurusan dan Sains (MSU). Kajian keratan rentas ini menggunakan reka bentuk tinjauan deskriptif, menyasarkan pelajar sarjana muda daripada program seperti Perubatan, Farmasi, Kejururawatan, Sains Bioperubatan, Teknologi Jantung, Teknologi Pemakanan, Optometri dan Bio-Perubatan. Data dikumpul daripada 219 pelajar menggunakan Skala Kesediaan untuk Pembelajaran Antara Profesional (RIPLS), yang mengukur persepsi kerja berpasukan dan kolaborasi (TWC), identiti profesional positif (PPI), identiti profesional negatif (NPI) dan peranan dan tanggungjawab (RR). Jawapan telah dikumpulkan melalui Borang Google dan dianalisis menggunakan IBM SPSS Statistics versi 26.0. Statistik deskriptif dan perbandingan digunakan untuk menilai kesediaan dan perbezaan IPL merentas program, tahun pengajian, kumpulan umur, jantina dan prestasi akademik. Keputusan menunjukkan kesediaan keseluruhan yang tinggi untuk IPL, yang menunjukkan sikap positif terhadap IPL, dan pelajar perempuan mempunyai kesediaan yang lebih tinggi berbanding rakan lelaki mereka (P = 0.033). Jumlah skor min RIPLS ialah 3.78, dengan skor min tinggi untuk PPI (4.36) dan TWC (3.90) tetapi skor sederhana untuk RR (3.59) dan terendah untuk NPI (3.31). Terdapat korelasi positif yang signifikan antara TWC, PPI, dan RR (P = 0.00). Penemuan ini menyerlahkan kesediaan yang umumnya positif untuk IPL di kalangan pelajar penjagaan kesihatan MSU. Pelajar penjagaan kesihatan umumnya mempunyai sikap positif terhadap IPL, terutamanya mengenai TWC dan PPI. Walau bagaimanapun, terdapat

kawasan kebolehubahan, terutamanya dalam NPI dan RR. Usaha berterusan untuk meningkatkan pembelajaran antara profesional, menjelaskan peranan dan menangani persepsi negatif adalah penting untuk menyepadukan sepenuhnya amalan kolaboratif ke dalam latihan penjagaan kesihatan.

Kata kunci: Pembelajaran antara profesional, Kesediaan untuk Skala Pembelajaran Antara Profesional, Pelajar penjagaan Kesihatan.

ACKNOWLEDGEMENTS

First, I would like to thank Allah, The Almighty, for giving me strength and letting me through all the difficulties. I have experienced Your guidance day by day.

I would like to thank University Malaya for accepting me as a candidate to pursue my Master Degree in this medical education field.

I would like to acknowledge and give my warmest thanks to my supervisor, **Professor Dr. Jamuna Vadivelu,** her guidance carried me through all the stages of writing this research project. Also, I acknowledge the efforts and advice from my supervisor **Associate Professor Dr. Vinod Pallath** who made this work possible.

Lastly, I want to extend my appreciation to MSU team and Prof Dr Sohayla M. Attalla as helping me in collection of the data necessary for this work.

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LIST OF SYMBOLS AND ABBREVIATIONS

IPL	:	Interprofessional learning
RIPLS		Readiness for Interprofessional Learning Scale
RR	:	Roles and Responsibilities
PPI	:	Positive Professional Identity
NPI	:	Negative Professional Identity
TWC	:	Teamwork and Collaboration
WHO	:	World Health Organization
MBBS	:	Bachelor of Medicine, Bachelor of Surgery
BPH	:	Bachelor of Pharmacy
BMS	:	Bachelor of Biomedical Science
BCT	:	Bachelor in Cardiac Technology
BNT	:	Bachelor of Nutrition Technology
BOP	:	Bachelor of Optometry
BBM	:	Bachelor of Bio-Medicine
SLT	:	Social learning Theory
ELT	:	Experiential Learning Theory
AAMC	:	Association of American Medical Colleges
IOM	:	Institute of Medicine
IPEC	:	Interprofessional Education Collaborative
CIHC	:	Canadian Interprofessional Health Collaborative
ACA	:	Affordable Care Act
AACP	:	American Association of Colleges of Pharmacy
IEPS	:	Interdisciplinary Education Perception Scale
IPAS	:	Interprofessional Attitudes Scale

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CHAPTER 1: INTRODUCTION

1.1 Introduction

This chapter contains the study's problem statement, research objective, and research question. In this chapter, operational terms used for the study have been defined and the importance of the study was described.

Interprofessional learning (IPL) is increasingly recognized as essential in healthcare education, fostering teamwork and collaboration among diverse healthcare professionals (Rogers et al., 2017). IPL equips students with the skills needed for teamwork, communication, and mutual respect, all of which are essential for improving patient outcomes and reducing errors (Leadbeater et al., 2021). Despite its acknowledged importance, the integration and effectiveness of IPL in educational curricula vary widely across different regions and institutions (Rogers et al., 2017). In Malaysia, particularly within private universities, the implementation of IPL and the readiness of students to engage in such collaborative learning experiences remain underexplored areas. This study aims to assess the readiness for IPL among healthcare students across various programs in a Malaysian private university.

1.2 Problem Statement

Interprofessional Learning (IPL) is becoming more widely acknowledged as an essential part of healthcare education, encouraging cooperation across different healthcare specialities to enhance patient outcomes. Nevertheless, the ability of learners from various healthcare programs to effectively participate in interprofessional collaboration is a prerequisite for the successful implementation of IPL. Designing and implementing successful educational interventions requires understanding learners' perceived readiness preparation for IPL.

The necessity for interdisciplinary health care services has arisen recently due to the increasing demand for better medical care. Thus, interprofessional practice (IPP), or

teamwork between healthcare providers with diverse backgrounds, is crucial to guaranteeing better patient care. (Ahmed et al., 2022).

Today's healthcare is complicated, aiming to promote health. This necessitates efficient cooperation between different healthcare experts. It requires proper communication, relationships between specialists, trust among team members, and valuation of the responsibilities played by other health professionals. (Lestari et al., 2016).

Healthcare professionals don't comprehend and interact with one another as much because traditional healthcare education is divided into silos. There isn't a single, universal paradigm for healthcare professionals and learners to be ready to work across disciplines. (Clark, 2018). This may result in a communication and knowledge gap among healthcare providers, which could have a negative impact on patient outcomes. Interprofessional learning (IPL) may help to lessen the prevalence of institutionally defined professional silos and borders in the majority of health systems and professional education programs. (Bonello, 2020). IPL would help IPP reduce medical errors, patient length of stay, treatment costs, and readmission rates while promoting higher family satisfaction and high-quality care (Ahmed et al., 2022).

Studies have shown that health professionals receiving teamwork training in an interprofessional learning context throughout their undergraduate studies are significantly more likely to collaborate proficiently in a professional clinical setting later on. Despite its examination in a variety of settings, IPL's implementation and use have not received much attention in the Asian region (Lestari et al., 2016).

One essential strategy for getting learners ready for entry into the health professions is IPL. Numerous global health organizations have advocated for IPL to improve patient care quality and health outcomes. Universities are starting to develop and maintain inclusive, genuine IPL programs in response (Van Diggele et al., 2020a). One of the main obstacles to Malaysia's interprofessional learning (IPL) is the lack of curriculum

integration within the current profession-specific medical education. IPL is a critical issue that has to be addressed in Malaysia in tandem with the global medical education movement of "Learning together to work together for health."(Thangarajoo et al., 2021).

It has been demonstrated that, when IPL is used in the early phases of training, it improves collaborative team behavior and lowers clinical error, hence better preparing learners for IPC in clinical practice. Learners need to be ready and keen to participate in cooperative learning alongside other learners for IPL to be a successful experience. Therefore, a crucial initial step in developing and implementing stage-matched educational interventions and ensuring the success of such events is comprehending the attitudes and views of learners prior to their involvement in IPL activities. The success of this teaching strategy depends on how prepared and accepting the learners are of IPL, but it is difficult to assess learners' opinions of and preparation for IPL because there aren't many thorough assessments available (Oliveira et al., 2023).

Although the value of interprofessional Learning (IPL) in healthcare training is becoming increasingly apparent, little is known about how prepared learners from various healthcare programs are to work effectively in interprofessional collaboration, especially in the context of Malaysian private universities. According to our knowledge, limited studies have been done in Malaysia regarding IPL readiness among medical learners. Aye et al.'s (2020) study uses the Readiness for Interprofessional Learning Scale (RIPLS) as a survey tool to examine undergraduate learners' preparedness for interprofessional learning (IPL) at two Malaysian medical universities, but the study excluded the viewpoints of learners enrolled in other healthcare programs and concentrated only on undergraduate medical learners. Another study conducted by Ashok Kumar et al. (2020) aimed to compare the attitude of preclinical to clinical-year medical learners toward IPL. None of the studies address the need for assessing other health profession education learners' readiness for IPL in the context of Malaysia along with medical learners as being

all members in the healthcare team. Therefore, the current research will evaluate undergraduate healthcare learners' readiness for IPL.

Insights about learners' readiness for IPL will help curriculum designers and educators shape and integrate the IPL activities inside the healthcare curriculums to have effective IPL, which will be reflected later on in the graduate's effective IPP and subsequently ensure high-quality healthcare services.

1.3 Research Questions

The research questions of this present study are:

i. Are learners of healthcare programs ready for IPL?

ii. Is there a perceived difference in readiness for Interprofessional Learning (IPL) among the learners from different healthcare programs?

1.4 Research Objectives

The research objectives of this present study are:

i. To measure the level of perceived readiness for Interprofessional Learning (IPL) among learners of healthcare programs.

ii. To investigate the differences in perceived readiness for Interprofessional Learning (IPL) among the learners from different healthcare programs.

1.5 Significance of the Study

The study's potential contribution to the realm of medical and health science education makes it significant. This study seeks to provide significant insights by assessing learners' readiness for interprofessional learning (IPL) and their understanding of communication, professional identity and roles and responsibilities using the Readiness for Interprofessional Learning Scale (RIPLS).

The study's findings can inform curriculum planners and educators about the attitudes and readiness of medical, nursing and pharmacy learners towards interprofessional

learning. This will guide the development of effective interprofessional learning sessions by identifying areas for improvement in the curriculum and educational approaches, ultimately enhancing the preparedness of future healthcare professionals for interprofessional practice (Girard, 2021). By examining the variations in readiness for IPL among MBBS, nursing and pharmacy learners, the research will provide program-specific recommendations that improve the general standard of interprofessional healthcare learning and practice.

The study's findings will be very helpful in understanding the significance of understanding learners' preparedness for interprofessional learning. The study findings will also have potential implications for future healthcare education. This study can offer insightful information that is relevant to the larger field of healthcare education as well as the unique setting of Malaysian medical schools. The study's possible implications for curriculum development and the promotion of interprofessional collaboration emphasized the importance of it for enhancing healthcare education and, ultimately, patient-centred care delivery (Witti et al., 2023).

1.6 Operational Definitions

Interprofessional learning (IPL): The World Health Organization (WHO) Framework for Action on Interprofessional Learning and Collaborative Practice (2010), states that "Interprofessional learning occurs when two or more professionals learn about, from and with each other to enable effective collaboration and improve health outcomes" (World Health Organization, 2010). The process of training professionals in tandem to achieve a shared objective is known as interprofessional learning. Learners from various health professions will undoubtedly learn and train together to become more collaborative workers. (Mohammed et al., 2021). There is a global consensus that Interprofessional learning (IPL) is the best way to prepare health professional learners for practice (Van Diggele et al., 2020).

1.6.1 Learning Readiness

The term "learning readiness" describes a person's mental, emotional, and motivational state of readiness for learning activities (Maddox, 2000).

1.6.2 Readiness for Interprofessional Learning Scale (RIPLS):

RIPLS is an instrument created to evaluate healthcare professionals' and undergraduate learners' perceptions regarding interprofessional learning. The questionnaire has been standardized and widely used all over the world. We adopted it for this research due to its ease in administration and free availability. This tool has been used by previous researchers in Malaysia. (Ashok Kumar et al., 2020; Aye et al., 2020).

A three-factor structure was identified by Parsell, G., & Bligh, J. (1999) in their original research. They developed RIPLS as a means of testing the popular conceptualization of preparedness in the literature. The factors are duties and responsibilities, professional identity, and teamwork and collaboration.

McFadyen et al. (2005) developed a four-factor model in response to concerns about the reliability of this instrument, specifically with relation to the domains of professional identity and duties and responsibilities. This model seems to be significantly more trustworthy than the initial three-component construct. The characteristics of roles and responsibilities, negative professional identity, positive professional identity, and teamwork and collaboration were all represented by the four-factor construct. (Boeren & Roofnarine, 2020).

1.6.3 Teamwork and Collaboration

Learners studying medicine and health sciences should be able to work well in teams, communicate properly, and help achieve shared objectives (Rosen et al., 2018).

1.6.4 Professional Identity

Professional identity for healthcare learners refers to the self-concept and internalized values, beliefs, and norms that they develop as they progress through their education and training (Holden et al., 2015).

1.6.5 Roles and Responsibilities

In the context of interprofessional learning, roles and responsibilities refer to the specific functions, duties, and expectations assigned to each member of a healthcare team. (Parsell & Bligh, 1998).

1.6.6 Healthcare Learners

This study includes the learners (learners) studying healthcare programs, including Bachelor of Medicine, Bachelor of Surgery (MBBS), Bachelor of Pharmacy (BPH), Bachelor of Nursing, Bachelor of Biomedical Science (BMS), Bachelor of Cardiac Technology (BCT) Bachelor of Nutrition Technology (BNT), Bachelor of Optometry (BOP), and Bachelor of Bio-Medicine (BBM).

1.7 Chapter Summary

This chapter introduces Interprofessional Learning (IPL) as a crucial element in healthcare education, focusing on its role in enhancing collaboration and patient outcomes. It outlines the problem of limited research on IPL readiness among healthcare learners in Malaysian private universities and sets the stage for the study's objectives: to assess IPL readiness and explore differences across healthcare programs. The chapter also highlights the significance of the study for curriculum development and defines key terms like IPL and RIPLS to ensure clarity throughout the research.

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

The goal of this chapter is to present a thorough knowledge of learning as a continuous process throughout life. By exploring the definitions, overviews, and many methods of learning, we can acquire an important understanding of this basic human experience. This information can be used in a variety of settings, such as training and education, as well as personal growth, enabling us to become better learners and make sense of the constantly shifting environment we live in.

2.2 Overview of Learning

Learning is a continuous process that starts at birth and continues until death, requiring both stimulus and innate dispositions like emotional and instinctual responses. People continuously learn through constructing and/or reconstructing experiences under these influences throughout life (Lachman, 1997).

It can be challenging to define learning because it has many dimensions and unique features, making it tough to come up with a single definition. Depending on the context, the word "learning" itself can indicate several things (National Research Council, 2015). Washburne (1936) defined learning as "an increase, through experience, of problem-solving ability. Showkeen (2022) discussed many other definitions; Gales defined Learning as the behavioral modification which occurs as a result of experience as well as training. According to E.A. Peel, Learning can be described as a change in the individual which takes place as a result of environmental change. Crow and Crow defined learning as the process of acquisition of knowledge, habits and attitudes. Then Showkeen (2022) concluded that learning is permanent behavioral modifications resulting from experience or practice.

One of the earliest scholars to demonstrate that learning leads to alterations in behavior was John B. Watson. Watson is credited with founding the behavioral school of thinking, which grew in popularity or became more widely accepted in the first part of the 20th century (Writers, 2023).

Learning is a comprehensive and diverse process that includes acquiring behaviors, skills, and knowledge in various ways. It is an essential component of how humans evolve and adjust to their surroundings (Privitera et al., 2023).

There are various ways to learn, and some people might find some ways to learn more straightforward than others. Understanding how different learning styles differ can help us better understand how people's environments affect their learning. (İlçin et al., 2018).

2.3 Learning theories

Learning theories provide a framework for understanding how individuals acquire, process, and retain new knowledge, skills, and behaviors. These theories offer valuable insights for medical educators seeking to create effective learning environments and optimize learner outcomes (Kaufman, 2003). In the context of medical education, understanding learning theories is crucial, as medical learners and trainees must not only master a vast amount of complex content but also develop the clinical reasoning, problem-solving, and interpersonal skills necessary for effective patient care. By aligning instructional strategies with established learning theories, medical educators can better support the unique needs and preferences of adult learners (Abela, 2009).

This discussion will explore several key learning theories and their applications in medical education, including Cognitivism, Constructivism, Adult Learning Theory (Andragogy), Experiential Learning and Social Learning Theory.

2.3.1 Social learning theory

Social learning theory proposes that people can learn new behaviors by observing others, especially through modeling, mentoring, and role-playing. This theory is highly relevant in medical education, where learners learn a significant amount through observing and emulating the behaviors, attitudes, and skills of their teachers and senior colleagues (Arab et al., 2015; Tore et al., 2006).

Recent research has explored the applications of social learning theory in clinical settings. Studies have highlighted the importance of role modeling, where learners observe and internalize the professional behaviors of experienced clinicians (khushk et al., 2022; Mangal et al., 2024). Additionally, collaborative and cooperative learning approaches, such as problem-based learning and case discussions, allow learners to learn from their peers through discussion, debate, and shared problem-solving (Mangal et al., 2024). By incorporating principles of social learning theory, medical educators can create rich learning environments that leverage the power of observation, interaction, and collaboration to develop well-rounded, practice-ready professionals (Mangal et al., 2024; Tore et al., 2006). Recent research continues to emphasize the importance of social learning theory in optimizing learning environments and enhancing professional development in medical education (Mukhalalati et al., 2022).

2.3.2 Adult learning theory

Adult learning theory, also known as andragogy, focuses on the unique characteristics and needs of adult learners. Pioneered by Malcolm Knowles, andragogy proposes that adults learn best when they are self-directed, draw upon their prior experiences, and apply learning to real-life situations (Abela, 2009).

In medical education, understanding adult learning theory is crucial for designing effective instructional strategies that optimize knowledge acquisition and skill

development (Taylor & Hamdy, 2013). Recent research has explored the applications of adult learning theory in medical education. A study by Abela (2009) highlights the importance of extrinsic motivation and reflective practice in adult learning, which are insufficiently addressed by andragogy alone. The author proposes that transformative learning, which gives prominence to reflection, may be a more appealing alternative in medical education. Another review by Merriam (2017) discusses the evolution and future directions of adult learning theory, including andragogy, self-directed learning, and transformative learning. This review emphasizes the shift from individual-focused theories to approaches that attend to the social and political context of adult learning.

By incorporating principles of adult learning theory, medical educators can create learning environments that cater to the unique needs and preferences of adult learners (Taylor & Hamdy, 2013). This involves building upon learners' prior knowledge and experience, making learning as applicable as possible, teaching through problem-solving, and involving the learner using active teaching techniques (Merriam, 2001). Applying adult learning theories consistently and carefully can help learners become part of the healthcare profession and lay the foundations for a career of lifelong development (Mukhalalati & Taylor, 2019).

2.3.3 David Kolb's Experiential Learning Theory (ELT)

Experiential Learning Theory (ELT) by David Kolb's (1984) is a holistic framework that describes the process of learning through experience. This theory is based on the idea that learning is a continuous process grounded in concrete experiences, which are then followed by reflective observation, abstract conceptualization, and active experimentation. These stages form a cycle that individuals use to internalize and apply new knowledge and skills. Piaget, Lewin, and Dewey's experience writings serve as the foundation for ELT. Experience is essential to the ELT process, in contrast to behavioral

and cognitive learning theories, which place more emphasis on cognition than emotion and exclude the relevance of consciousness and subjective experience in the learning process, respectively. ELT aims to be a comprehensive, adaptable learning process that integrates behavior, perception, experience, and thought (Mccarthy, 2016).

The first stage of Kolb's model involves Concrete Experience, where learners encounter a new experience or situation. This could be anything from a hands-on activity to a real-world problem. The next stage is Reflective Observation, where learners reflect on their experiences, considering what happened, why it happened, and how it relates to existing knowledge and beliefs. This reflection is crucial as it helps learners make sense of their experiences and extract meaningful insights (Pal et al., 2022). Following reflection, learners move to Abstract Conceptualization, where they develop new ideas or concepts based on their reflections. This stage involves forming theories or generalizations that explain the observed phenomena and integrating these insights into their existing knowledge framework. Finally, learners engage in Active Experimentation, applying their newly formed concepts in practical situations or testing their theories to see how well they work in real-world contexts (Davitadze et al., 2022).

2.3.4 Cognitivism

Cognitivism is a learning theory that focuses on how information is processed by the brain and emphasizes the role of mental processes in learning. Unlike behaviorism, which primarily focuses on observable behaviors, cognitivism examines the internal mental structures and processes that mediate learning (Fuller & Woods, 202; Schunk, 2012). Key principles of cognitivism include the idea that learning involves the active processing of information, organization of knowledge into mental models or schemas, and the use of strategies like attention, memory, and problem-solving (Fuller & Woods, 2021).

One fundamental concept in cognitivism is schema theory, which suggests that individuals organize knowledge into schemas, or mental frameworks, based on their experiences. These schemas help learners interpret new information by providing a structure through which new knowledge can be integrated and understood. For example, when learning a new concept, learners may relate it to existing schemas and modify these schemas as new information is acquired (Qiao et al., 2014). Another central idea in cognitivism is information processing theory, which compares the human mind to a computer that processes information through stages such as input, encoding, storage, and retrieval. This theory explores how sensory input is perceived and transformed into meaningful information, stored in memory, and accessed when needed. Understanding these cognitive processes helps educators design learning experiences that optimize encoding and retrieval of information (Qiao et al., 2014).

In educational practice, cognitivist principles inform instructional strategies that promote active engagement, critical thinking, and metacognitive awareness among learners. By understanding how learners process information, educators can design learning environments and activities that align with cognitive processes, fostering deeper understanding and application of knowledge. Thus, cognitivism continues to be a foundational theory in education, guiding effective teaching practices and contributing to ongoing research on learning processes and cognitive development (Schunk, 2012a).

2.3.5 Constructivism

Constructivism is a learning theory that emphasizes the active role of learners in constructing their own understanding and knowledge of the world through experiencing and reflecting on their experiences. This theory posits that learners build new knowledge and skills based on their prior knowledge, experiences, and interactions with the environment. Unlike traditional teaching methods that emphasize passive reception of

information, constructivism promotes hands-on, inquiry-based learning where learners actively explore and discover concepts for themselves (Kaufman2018, n.d.; Jafari Amineh & Davatgari Asl, 2015). One of the key principles of constructivism is that learning is inherently social and collaborative. Learner's construct meaning through interactions with others, such as discussions, collaborative problem-solving, and sharing perspectives. Social constructivism, an extension of this principle, emphasizes the importance of social interactions in knowledge construction. It suggests that learning occurs within communities of practice where learners engage in authentic tasks and negotiate meaning together (Rillo et al., 2020).

Another fundamental concept in constructivism is the idea of scaffolding, proposed by Vygotsky, where educators provide support and guidance to learners as they progress through increasingly complex tasks. Scaffolding helps learners bridge the gap between their current abilities and the desired learning outcomes, facilitating cognitive development and deeper understanding. This concept underscores the importance of adjusting instructional support based on learners' needs and abilities (Y. Kim, 2024).

In summary, constructivism continues to shape educational practices by emphasizing the active, learner-centered approach to knowledge construction. By recognizing learners as active participants in their own learning process, constructivist theories inform pedagogical strategies that promote deep understanding, critical thinking, and lifelong learning skills essential for success in the 21st-century knowledge economy (Dennick, 2016; Kamel-ElSayed & Loftus, 2018).

2.4 Learning Styles

The term "learning style" describes how a learner naturally perceives, processes, stores, and recalls knowledge in a range of contexts with comparable demands. This happens without conscious thought (Caulley et al., 2012).

Common learning styles encompass various preferences and approaches individuals use to acquire knowledge efficiently. These learning styles are often categorized into different types, including visual, auditory, reading/writing, and kinesthetic styles (Jamani et al., n.d.). The literature review indicates that visual learning is a common preference among healthcare learners. Visual learners prefer learning through visual aids like diagrams, charts, and graphs. (Hernández-Torrano et al., 2017). Learning through written materials and note-taking, are likely prevalent among healthcare learners (Nachiappan, 2022). Auditory learning styles, which involve learning through listening and verbal instruction, are also common among healthcare learners (Koohestani et al., 2020). Kinesthetic learning is also a significant preference among healthcare learners due to the practical nature of healthcare education (Shakeri et al., 2022). Overall, the literature review suggests that healthcare learners may exhibit a variety of learning style preferences, including visual, auditory, reading/writing, and potentially kinesthetic styles. Understanding and accommodating these preferences in educational settings can enhance the learning experiences and outcomes of healthcare learners (Hernandez et al., 2020).

Besides these skills, healthcare learners need the general skills needed by any learner such as understanding, learning, and remembering skills or knowledge that are greatly influenced by environmental, cognitive, emotional, and past experiences. Motivation is considered the driving force behind initiating and maintaining an activity in order to accomplish a goal, and it plays a significant part in facilitating the learning process. (Gandhi & Mukherji, 2023).

2.5 Learning Readiness

The term "learning readiness" describes a person's mental, emotional, and motivational state of readiness for learning activities (Maddox, 2000). Learning readiness is a critical concept in educational psychology and pedagogy, referring to the extent to which learners

are prepared to engage successfully in a learning process (Chorrojprasert, 2020; Maddox, 2000).

2.5.1 Concept of learning readiness

The concept of learning readiness encompasses various dimensions including cognitive, emotional, and motivational that influence an individual's ability to learn effectively. (Chorrojprasert, 2020; Maddox, 2000). Cognitive Readiness includes the intellectual capabilities and prior knowledge that learners bring to the learning experience. Cognitive readiness determines how well learners can process new information, understand concepts, and apply knowledge in different contexts (Bransford, et al., 2000). Emotional Readiness, related to the emotional state and attitudes of learners towards learning. Positive emotions such as curiosity, interest, and confidence can enhance readiness, while negative emotions like anxiety and fear can hinder it (Pekrun et al., 2002). Learning readiness is greatly influenced by motivation. Intrinsic motivation, driven by personal interest and the inherent enjoyment of learning, often leads to higher engagement and better outcomes. Extrinsic motivation, driven by external rewards or pressures, can also impact readiness, although its effects may vary (Deci & Ryan, 1985).

2.5.2 Factors influence the learning readiness

Several factors influence learning readiness, which can be broadly categorized into individual, contextual, and instructional factors:

2.5.2.1 Individual Factors

Learners with relevant background knowledge and experiences are typically more prepared to engage in new learning activities (Ausubel, 1968). General intelligence and specific cognitive skills, such as critical thinking and problem-solving, influence learning readiness (Sternberg & Grigorenko, 2001). Learners who manage stress and emotions well are often more ready to learn (Zeidner et al., 2006).

Learning preparedness is a complex idea that can be affected by individual, contextual, and instructional factors in addition to cognitive, emotional, and motivational factors (Buot & Buot, 2023). Educators may create and execute strategies that improve learners' readiness by having a better understanding of these aspects and how they interact (Al-Maskari et al., 2024). This will ultimately result in more meaningful and successful learning experiences. Subsequent investigations are required to continue examining innovative methods for evaluating and developing learning preparedness in a variety of educational environments (Rohayani et al., 2015).

2.5.2.2 Contextual Factors

An environment that is rich in resources and supportive can improve preparedness. These include physical settings, availability of learning materials, and technological resources (Hattie, 2009). Clinical skills laboratories, simulation centers, and access to up-to-date medical libraries are essential components that contribute to a conducive learning atmosphere in medical education. These facilities provide a safe and structured environment for learners to practice essential clinical skills before interacting with real patients (Sebiany, 2003). Simulation centers further enhance interprofessional learning by allowing learners to engage in realistic, team-based scenarios. These centers utilize advanced technology to create immersive experiences that require learners to communicate and collaborate effectively. Studies have shown that simulation-based education can lead to better patient outcomes and improved teamwork skills, as learners learn to navigate complex clinical challenges together (Ahmed, 2009).

Encouragement and support from family, peers, and instructors can positively affect learning readiness (Wentzel, 1998). Family support, such as parental involvement and academic socialization, creates a positive home environment that enhances learners' motivation and academic performance (Grolnick & Ryan, 1989). Peer support also plays

a crucial role; positive peer interactions and friendships boost learners' motivation to learn and engage in school activities (Ryan, 2001). Learners who perceive their peers as supportive are more likely to show prosocial behavior and greater school engagement (Wentzel, 1998). Instructors also significantly impact learning readiness through their ability to create a supportive classroom environment. Teachers who provide autonomy support and meaningful feedback foster intrinsic motivation in learners, leading to higher engagement and improved learning outcomes (Deci et al., 1991). Trust and emotional support in teacher-learner relationships are linked to increased learner engagement and motivation (Ruzek et al., 2016). So, collectively, these social support systems help learners feel valued and capable, enhancing their readiness to learn.

2.5.2.3 Instructional Factors

Effective instructional strategies, such as active learning, differentiated instruction, and scaffolding, can improve learning readiness (Tomlinson, 2001). According to Tomlinson (2001), this approach not only caters to the varied learning needs of learners but also maximizes their educational attainment and engagement. Scaffolding complements this by providing temporary support to learners as they develop new skills, effectively bridging the gap between their current capabilities and the learning objectives set for them. Vygotsky's (1978) concept of the zone of proximal development underscores the importance of scaffolding in helping learners achieve tasks that they might not be able to complete independently. Well-structured curricula that align with learners' needs and interests can foster readiness (Wiggins, 2009). Formative assessments that provide feedback and guide learners can enhance their readiness by helping them understand their learning progress and areas for improvement (Black & Wiliam, 1998). Regular formative assessments significantly contribute to improved educational outcomes by keeping learners consistently engaged and informed about their learning trajectories (Bennett, 2011).

Recognizing individual differences in readiness allows for personalized learning experiences that cater to the unique needs of each learner (Heacox, 2012). Fraser, (2012) emphasizes the need for educational settings that support learners' psychological and emotional needs, facilitating a safer and more conducive learning atmosphere. Positive social interactions among peers and between learners and instructors also play a critical role in creating environments that support emotional well-being (Fraser, 2012). Research by Dyrbye et al. (2015) shows that supportive social environments in medical schools can reduce stress and burnout, thereby improving learners' readiness to learn and perform.

2.6 Interprofessional Learning among healthcare learners

2.6.1 Concept of Interprofessional Learning

In general, interprofessional learning refers to a method of teaching and learning that encourages cooperation between two or more healthcare professionals. Interprofessional learning is an established approach to learning together that addresses the issues of healthcare delivery fragmentation and professional separation (Olenick et al., 2010).

Interprofessional learning can aid in the development of basic competencies for interprofessional collaborative practice among learners in healthcare, social care, and teacher education programs (Leadbeater et al., 2021). Research done by Rani et al., 2021 highlighted the need for interdisciplinary teams working together to provide excellent patient care in the clinical setting. In order to accomplish shared learning objectives, the study outlined how IPL seeks to bring learners from various programs together to learn with, from, and about one another. Furthermore, a 2017 review published in the Journal of Interprofessional Care examined the value of interprofessional cooperation education and learning experiences for nursing learners, emphasizing how these activities help them get ready for the realities of being part of multidisciplinary healthcare teams (Garnweidner-Holme & Almendingen, 2022). Focused IPL sessions can positively

influence learners' attitudes towards interprofessional collaboration and readiness to work with older adults, highlighting the importance of such educational initiatives in healthcare training (Y. J. Kim et al., 2019).

In the healthcare profession practice, there are many professions collaborating for one objective which is serving the patient. These professions include physicians, nurses, pharmacists, dietitians, and so on. All those are working together so should learn together, this is the concept of IPL in healthcare (Rani et al., 2021). IPL in healthcare has its roots in the mid-20th century, driven by the recognition that collaborative practice among healthcare professionals can significantly improve patient outcomes (Cadet et al., 2023).

In the UK, in the late 1960s, with advancements in primary care, there was a shift from the concept that medicine played a key part in patient care to the idea of IPL. Since then, IPL in healthcare has undergone significant evolution over the past few decades. In the late 1960s and 1970s, early IPL initiatives were largely based on the concept that teamwork and collaboration not only help to better meet the needs of patients but also help to resolve tensions between professions practicing in close proximity. These early efforts were mostly across the United Kingdom and the United States (Cadet et al., 2023; Van Diggele et al., 2020; Zechariah et al., 2019). The need for IPL has been recognized internationally since the mid-1980s (Buring et al., 2009). The IPL movement became energized in the late 1980s through two WHO reports, "Continuing Education for Physicians" and "Learning Together to Work Together for Health" (Carpenter Et al., 2016).

The IPL concept gained mainstream recognition in the early 2000s (Kim et al., 2021). This evolution marked two distinct phases: the pioneering phase from 1966 to 1999 and the promotional phase since 2000 (Barr H. 2010). IPL, which was originally run by doctors, changed to a more inclusive model that included social workers, nurses, and

allied health professionals. During the promotional phase, which began at the turn of the century, IPL gained mainstream recognition in professional education, moving from post-experience studies to being integrated into pre-registration programs (Green, 2013). The scale of IPL expanded significantly, accommodating thousands of learners and transitioning from a bottom-up to a top-down approach (Buring et al., 2009). The development of IPL faced obstacles related to status differentials, historical inequalities, and cultural differences among professions. The establishment of partnerships are crucial for fostering collaboration (Barr H. 2010).

Additionally, the concept of "common learning" emerged as a central theme, emphasizing shared values and understanding of policy and organizational contexts. However, difficulties emerged in establishing a balance between the requirement for individualized practice application and common learning. (Mohammed et al., 2021; O'Keefe et al., 2017).

The concept of Interprofessional learning in medical education has gained momentum due to endorsement by the Association of American Medical Colleges (AAMC) and the Institute of Medicine (IOM). It is recommended to be introduced early in training to shape young minds and prevent biases. (Zechariah et al., 2019). The World Health Organization (WHO) Framework for Action on Interprofessional Learning and Collaborative Practice (2010), states that "Interprofessional learning occurs when two or more professionals learn about, from and with each other to enable effective collaboration and improve health outcomes."

The WHO IPL model emphasizes the significance of IPL and collaborative practice in the healthcare industry. The model aims to improve patient care outcomes, foster a team-based approach to healthcare delivery, and encourage more collaboration among healthcare professionals (WHO, 2010). Preparing a health workforce ready to engage in

collaborative practice within a strengthened healthcare system is the aim of interprofessional learning. This will improve health outcomes by enabling the workforce to provide optimal health services. (Van Diggele et al., 2020).

2.6.2 Frameworks of Interprofessional Learning

Interprofessional learning frameworks are structured approaches designed to facilitate effective collaborative learning among learners from different health professions (Mohammed et al., 2021). These frameworks provide guidelines and strategies for implementing interprofessional learning in health professions curricula, aiming to improve teamwork, communication, and ultimately patient care (Thistlethwaite et al., 2014).

The key frameworks for interprofessional learning include Interprofessional Education Collaborative (IPEC) Core Competencies, the World Health Organization (WHO) Framework for Action on Interprofessional Education and Collaborative Practice, and the Canadian Interprofessional Health Collaborative (CIHC) National Interprofessional Competency Framework.

2.6.2.1 Interprofessional Education Collaborative (IPEC) Core Competencies

The IPEC core competencies are designed to prepare healthcare professionals for effective, collaborative practice. Interprofessional communication, teams and teamwork, roles and responsibilities, and values and ethics for interprofessional practice are the four core domains that these competencies cover. The values/ethics domain fosters trust and cultural competency among healthcare professionals by emphasizing respect for one another and shared values. To promote clarity of role and flexibility to adjust to team and patient demands, roles and responsibilities focus on understanding and appreciating the unique tasks and duties of diverse health professions. Effective communication, highlighted in the Interprofessional Communication domain, is crucial for maintaining

open dialogue and ensuring a unified approach to patient care (IPEC, 2016; Reeves et al., 2016).

The Teams and Teamwork domain underlines the importance of team dynamics, collaborative problem-solving, and reflective practices to enhance team performance and patient outcomes. These competencies collectively aim to integrate the expertise of different professions, ensuring comprehensive and patient-centered care. The IPEC framework not only enhances individual professional development but also improves overall healthcare delivery by fostering an environment of mutual respect, effective communication, and shared goals (IPEC, 2016; Thistlethwaite, 2012). The IPEC competencies provide a common framework that can be adapted across various health professions programs. By adhering to these core competencies, healthcare professionals can better navigate the complexities of modern healthcare environments, ultimately leading to better health outcomes and improved patient satisfaction (Kenaszchuk et al., 2011; Oandasan & Reeves, 2005).

2.6.2.2 World Health Organization (WHO) Framework for Action on Interprofessional Education and Collaborative Practice

Key Components of the WHO, 2010 Framework for Action on Interprofessional Education and Collaborative Practice are Supportive Policies to Encourage governments and institutions to develop policies that promote IPE and collaborative practice. Organizational Culture: for fostering a culture that values and supports interprofessional collaboration. Education and Training; to Incorporate IPE into health professions curricula and continuous professional development. Mechanisms for Collaboration; for Establishing structures and processes that facilitate interprofessional teamwork in clinical settings. The WHO framework aims to strengthen health systems and improve health outcomes through effective interprofessional collaboration. It provides a global

perspective on IPE and highlights the importance of integrating IPE into health systems (WHO, 2010).

2.6.2.3 Canadian Interprofessional Health Collaborative (CIHC) National Interprofessional Competency Framework

The Canadian Interprofessional Health Collaborative (CIHC) National Interprofessional Competency Framework identifies six core competency domains essential for effective interprofessional collaboration in healthcare. These domains include interprofessional communication, patient/client/family/community-centered care, role clarification, team functioning, collaborative leadership, and interprofessional conflict resolution. Effective interprofessional communication involves clear, respectful dialogue among health professionals, fostering mutual understanding and promoting collaborative practice. Central to this framework is the emphasis on patient-centered care, which integrates patients' values and preferences into the healthcare decision-making process, recognizing them as key partners in their care (CIHC, 2010; (Hepp et al., 2015).

Role clarification is another critical component, ensuring that healthcare providers understand their own roles as well as those of their colleagues. This clarity helps in defining responsibilities and enhancing teamwork. Effective team functioning is facilitated by understanding team dynamics and engaging in shared decision-making, which is vital for coordinated and comprehensive care. Collaborative leadership encourages shared leadership practices that support and promote interprofessional collaboration, while conflict resolution skills are necessary for managing and resolving disputes constructively. These competencies collectively aim to improve patient outcomes, enhance healthcare delivery, and promote a collaborative healthcare environment (Orchard et al., 2005; D'Amour et al., 2005).

2.6.3 Importance of Interprofessional learning among healthcare learners

Interprofessional Learning is crucial for enhancing patient care by promoting collaborative learning among healthcare professionals. IPL involves learners from different professions learning with, from, and about each other, emphasizing patient-centered care and collaboration (Çelik et al., 2024). Interprofessional learning (IPL) aims to prepare healthcare professionals for collaborative practice, emphasizing teamwork, communication, and mutual respect (Torsvik et al., 2021).

IPL is crucial for healthcare professions, with the World Health Organization recognizing it as essential for every health professional's education which involves engaging multiple healthcare professions in integrated learning environments to foster collaboration and improve health outcomes (T et al., 2015; Zechariah et al., 2019).

The healthcare landscape, influenced by the Affordable Care Act (ACA), emphasizes value-based care and interprofessional collaboration to improve patient outcomes and reduce costs. Collaborative practice involves professionals from various disciplines working together with patients and communities to deliver high-quality care (Clark, 2018).

IPL is crucial for advancing health professional education, endorsed by the Institute of Medicine and the American Association of Colleges of Pharmacy (AACP). Evidence supporting IPL includes positive outcomes on patient satisfaction, teamwork, mental health competencies, and care delivery (Buring et al., 2009).

The WHO advocates for IPL to enable effective collaboration among healthcare professionals and improve patient outcomes (van Diggele et al., 2020). IPL is a significant and popular educational strategy that helps learners from many health professions become collaborative and high-quality healthcare providers. Using IPL is based on the belief that

once medical professionals have studied together, they can collaborate effectively towards the shared objective of giving their patients high-quality treatment (Abdelaziz et al., 2021).

The advantages of IPL, such as increased mutual respect, improved understanding of professional roles, effective communication, increased job satisfaction, and positive impacts on patient outcomes, influence the effectiveness of interprofessional learning among healthcare learners. These benefits motivate learners to engage in collaborative practice and enhance their interprofessional competencies (Olenick et al., 2019).

Most health professional education is uniprofessional in nature, where the main goal is to develop in depth of disciplinary knowledge necessary for the newly qualified graduate to be prepared for their future practice. (Van Diggele et al., 2020b) And the goal of IPL is to prepare healthcare learners for collaborative practice by developing the knowledge, skills and attitudes needed for interprofessional teamwork. (Talwalkar et al., 2016).

Healthcare professionals often develop strong identities within their own professions, which can lead to a sense of "us vs. them" when it comes to other professions. This can create barriers to effective collaboration and teamwork. Overcoming these barriers requires a shift in mindset and a focus on shared goals and values (Afridah, 2023).

It is essential that healthcare professionals with diverse backgrounds collaborate as an integrated group to enhance patient outcomes, provide the best possible treatment, cut expenses, and elevate organizational performance. (Reeves et al., 2016). But negative attitudes and perceptions between different healthcare professions can hinder effective collaboration and communication. These barriers can stem from historical rivalries,

power dynamics, and misunderstandings about each profession's roles and responsibilities. (Lestari et al., 2018).

Aligning and harmonizing the curricula of various healthcare professions is crucial for successful IPL. However, differences in educational approaches, priorities, and accreditation requirements can make this coordination challenging (Mloka et al., 2023).

Addressing these challenges requires a multifaceted approach that includes institutional support, faculty development, curriculum redesign, and a focus on changing attitudes and perceptions. (Buja, 2019). By overcoming these barriers, healthcare education programs can create a culture of interprofessional learning and collaboration that ultimately leads to better patient outcomes.

2.6.4 Factors affecting Interprofessional Learning among healthcare learners

The commitment of healthcare program faculties to interprofessional learning plays an essential role in shaping the success of IPL initiatives. Faculty support and engagement are essential for creating a conducive and successful learning environment (Aladwani et al., 2023). Learner competencies recommended for IPL include team organization, intrateam communication, leadership, conflict resolution, and setting common patient care goals (Buring et al., 2009).

Key competencies such as effective communication, teamwork, and interprofessional collaboration are fundamental for successful interprofessional learning. These competencies are essential for healthcare professionals to work together effectively in complex healthcare settings (Wei et al., 2019; Homeyer et al., 2018). These factors collectively shape the landscape of interprofessional learning among healthcare learners, emphasizing the importance of faculty commitment, key competencies, the benefits of IPL, challenges for sustainable implementation, and learners' readiness for collaborative

practice (Wong et al., 2019). Readiness for interprofessional learning is an individual's attitude towards receiving interprofessional education (An et al., 2024). IPL readiness refers to the preparedness and willingness of healthcare learners and professionals to engage in collaborative learning and practice with members from other healthcare disciplines (Oliveira et al., 2023). This concept is crucial in the context of healthcare education, where the goal is to produce professionals who can work effectively in multidisciplinary teams to improve patient outcomes (Zaher et al., 2022). IPL readiness encompasses several dimensions: Attitudinal Readiness involves positive attitudes towards other professions and the value of teamwork. Learners must believe in the importance of collaboration and respect the roles of other healthcare professionals. (D'Costa et al., 2022). Behavioral Readiness includes the ability to engage in behaviors that promote effective teamwork, such as communication, cooperation, and mutual support (An et al., 2024). Cognitive Readiness entails the understanding of one's own role and the roles of other professionals, as well as the knowledge of how collaborative practice can enhance patient care (Talwalkar et al., 2016).

Several factors influence IPL readiness among healthcare learners and professionals. These can be broadly categorized into individual, educational, and organizational factors (Huyen et al., 2023). Previous exposure to interprofessional settings can enhance readiness by providing practical insights and a clearer understanding of different healthcare professionals' roles and contributions into collaborative practice (Zaher et al., 2022). Personality Traits such as openness to experience, agreeableness, and emotional stability are associated with better teamwork and collaboration. (Bar et al., 2018). Strong Professional Identity with one's own profession can sometimes hinder IPL readiness due to professional silos (Best et al.,2018). Curriculum Design that incorporates IPL principles and provide opportunities for interprofessional interactions can significantly enhance readiness (Lucas et al., 2020). Variations in readiness levels exist across different

healthcare disciplines. For example, nursing learners often show higher readiness levels compared to medical and other healthcare learners. These differences can be attributed to the nature of the curriculum and the emphasis on interprofessional competencies within each discipline (Talwalkar et al., 2016; Huyen et al., 2023).

Active learning strategies, such as case-based learning, simulations, and team-based projects, promote better interprofessional understanding and cooperation (Aldriwesh et al., 2022). Continuous assessment and constructive feedback on interprofessional competencies help in reinforcing IPL behaviors and perceived readiness for IPL (Shakhman et al., 2020).

Although IPL has a paramount importance in healthcare practice there are some common barriers which need to be addressed for successful IPL implementation. Medical learners identified time constraints and scheduling conflicts as barriers to engaging in IPL courses (Zechariah et al., 2019). Poor communication within healthcare teams often prevents members from actively engaging in collaborative decision-making, which is a barrier to effective interprofessional learning (Lestari et al., 2016).

Unclear boundaries between health professionals' roles and role conflicts, especially between nurses and doctors, complicated interprofessional collaboration and were reasons for some learners to have negative perceptions of IPL (Gillani et al., 2022). Medical learners caused insecurity and disengagement in learners from other professions, which hindered interprofessional learning (Zechariah et al., 2019). IPL anxiety was brought on by the belief that physicians would always be superior to other health workers, including nursing and midwifery learners. They believed that their planned career was less 'prestigious' than medicine and that their academic standing was lower (Lestari et al., 2016). Important differences in baseline readiness for interprofessional learning emerged

among learners from different healthcare professions, suggesting the need to consider these differences when designing IPL curricula (Talwalkar et al., 2016).

2.6.5 Importance of measuring IPL readiness

Assessing interprofessional learning readiness helps in preparing healthcare learners for effective collaboration in clinical practice. Understanding learners' readiness for interprofessional learning allows educators to tailor educational experiences that promote teamwork, communication, and mutual respect among different healthcare professions (Melka et al., 2024). Measuring readiness for interprofessional learning helps in identifying baseline attitudes and perceptions of learners towards collaborative practice. This information is essential for educators to design interprofessional education curricula that address the diverse needs and attitudes of healthcare learners, ultimately enhancing their preparedness for collaborative teamwork (Talwalkar et al., 2016). Effective interprofessional learning plays a key role in preparing healthcare professionals for future collaborative healthcare practice. By assessing learners' readiness for interprofessional learning, educators can ensure that learners are equipped with the necessary skills and attitudes to work together effectively in multidisciplinary healthcare teams, leading to improved patient care outcomes (Oliveira et al., 2023). Measuring readiness for interprofessional learning helps in identifying potential challenges and barriers that learners may face in collaborative practice. By assessing learners' perceptions and attitudes towards interprofessional learning, educators can address these challenges proactively and provide support to enhance learners' readiness for effective teamwork and collaboration in healthcare settings (Lestari et al., 2016).

A study at an American university found that first-year medical, nursing, and physician associate learners demonstrated readiness for interprofessional learning early in their academic programs. However, nursing learners scored significantly higher than physician

associates and medical learners after controlling demographic factors. These findings suggest that educators should consider baseline attitudes of learners when designing IPL curricula and use caution when extrapolating data from other geographies or cultures (Talwalkar et al., 2016). Another study in Canada used a mixed-methods approach combining Likert scales and Q-methodology to assess readiness for interprofessional learning among first-year undergraduate and graduate health science learners. The results showed that learners from graduate programs demonstrated higher readiness for IPL compared to undergraduates. Additionally, three factors emerged from the Q-methodology analysis, indicating that learners' learning priorities differed based on their program specialization (Oliveira et al., 2023). A cross-sectional study in Saudi Arabia explored healthcare learners' attitudes toward interprofessional education. The study found significant differences in the readiness for interprofessional learning among learners from different healthcare disciplines (Al-Qahtani, 2016). So, healthcare learners' interprofessional learning readiness must be measured in order to identify baseline attitudes, improve patient care outcomes, prepare them for collaborative practice, customize educational approaches, and address interprofessional learning challenges (Atwa et al., 2023; Oliveira et al., 2023). In order to effectively prepare healthcare learners for interprofessional collaboration in healthcare settings, these components work together to improve the learners' entire educational experience and outcomes (Homeyer and others, 2018).

If interprofessional learning readiness is not measured among healthcare learners, it can lead to several consequences; Educators may design ineffective IPL curricula that do not address the specific needs and baseline attitudes of the learner population. Without understanding learners' readiness, it is challenging to tailor IPL experiences to optimize learning outcomes (Guinat et al., 2024). Differences in readiness between learners from different healthcare disciplines may be overlooked. Failing to identify and address these

differences can hinder effective interprofessional collaboration and teamwork (Atwa et al., 2023). Learners who require additional support to engage in IPL activities may not be identified. Assessing readiness helps educators provide targeted interventions for learners who may struggle with interprofessional learning due to a lack of prior experience or advanced degree (Judge et al., 2015). The development of competencies needed for effective collaborative practice may be hindered. Readiness for interprofessional learning is an important precursor to the acquisition of these essential skills. Without measuring readiness, educators may miss opportunities to foster these competencies early in learners' training (Mohammed et al., 2021). Improvements in patient outcomes, patient safety, and quality of healthcare may be compromised. Interprofessional education and practice have been linked to enhanced patient care. Failing to measure readiness can lead to suboptimal IPE implementation and limit the potential benefits for patients (Judge et al., 2015).

In summary, not measuring interprofessional learning readiness among healthcare learners can result in ineffective IPL curricula, overlooked differences in baseline attitudes, lack of targeted support for struggling learners, delayed development of collaborative competencies, and missed opportunities to improve patient care outcomes. Assessing readiness is a crucial first step in designing and implementing successful IPL programs that prepare learners for effective teamwork and patient-centered practice.

2.6.6 Tools to measure attitude, perception and readiness towards IPL

IPL is crucial in healthcare education, where professionals from various disciplines learn with, from, and about each other to improve collaboration and the quality of care. Several validated tools and questionnaires have been developed to assess the effectiveness and readiness for IPL (Luecht et al., 1990; McFadyen et al. 2006; Norris et al., 2015). These tools measure different aspects, including attitudes, perceptions, and

readiness towards interprofessional education and practice (Luecht et al., 1990; McFadyen et al. 2006; Norris et al., 2015).

2.6.6.1 The Readiness for Interprofessional Learning Scale (RIPLS)

The Readiness for Interprofessional Learning Scale (RIPLS) is a widely used instrument to measure healthcare learners' readiness for interprofessional learning. Developed in 1999, the RIPLS is a 19-item, 5-point Likert scale self-reporting tool that assesses perceptions of healthcare learners' knowledge, skills, and attitudes towards interprofessional learning. Three subscales were formed from the components in the initial RIPLS version. Nonetheless, a version released by McFadyen et al. in 2005 and 2006 notably credited with conducting the instrument's first subsequent psychometric testing with four subscales proved to be more effective. The RIPLS examines several key dimensions related to interprofessional learning readiness. RIPLS consists of a series of statements that respondents rate on a Likert scale, typically ranging from strongly agree to strongly disagree. These statements are grouped into several subscales that measure different dimensions of readiness (Binienda, 2015). To evaluate learners' preparedness or readiness for the IPL, the RIPLS is a reliable and validated instrument. Roles and Responsibilities (RR), Positive Professional Identity (PPI), Negative Professional Identity (NPI) and Teamwork and Collaboration (TWC) are its four subscales. (Huyen et al., 2023). Each subscale provides insights into specific aspects of interprofessional readiness. For instance, the teamwork and collaboration subscale assess the belief in the benefits of working with other healthcare professionals, while the professional identity subscale examines the perception of one's own professional role in the context of a team (Talwalkar et al., 2016). One of the key strengths of RIPLS is its ability to highlight areas where learners or professionals may need more support or training in order to effectively engage in interprofessional collaboration (Soriano, 2019). By identifying these areas,

educators can tailor their IPE programs to address specific needs, thereby enhancing the overall effectiveness of the education. (Guraya & Barr, 2018).

The RIPLS has been validated across diverse healthcare learner populations, including medical, nursing, pharmacy, and public health learners. Studies have demonstrated the scale's strong internal consistency and construct validity, making it a reliable tool for evaluating interprofessional learning readiness. The study done by Atwa et al., (2023), The reliability study of the collected data showed excellent internal consistency (Cronbach's α = 0.819). Research done by Huyan et al., (2023) found the overall RIPLS's internal consistency was 0.78. For TC (α = 0.81), NPI (α = 0.84), and PPI (α = 0.77), the subscales' Cronbach alpha values were good; however, RR (α = 0.52) had low values. It is not surprising that the "roles and responsibilities" subscale has low consistency considering the three roles which are represented by the three subscale items represent several acceptable categories of responsibilities in a professional setting.

Learner involvement is a key factor in establishing successful interprofessional learning. This can be operationalized by studying learners' 'Readiness for interprofessional learning'. Readiness is considered a precursor of a learner's intention and willingness to participate in the IPL (Alruwaili et al., 2020). One of the main challenges in IPL is the formation of a distinct identity within a group, which can impact collaboration and teamwork. (Abdelaziz et al., 2021). Engaging in interprofessional education groups has an opportunity to influence the formation of a professional identity by raising awareness of one's own domain-specific competencies and facilitating socialization into a professional role. The dynamic social process of interprofessional education is linked to learners' affiliations with IPL-groups. (Haugland et al., 2019). Insufficient resources, including faculty, funding, and curriculum space, pose significant challenges to the effective implementation of IPL in healthcare education programs

(Homeyer et al., 2018). Designing curricula that integrate multiple healthcare professions is a complex task. It requires aligning learning objectives, teaching methods, and assessment strategies across different disciplines (Van Diggele et al., 2020).

2.6.6.2 Interdisciplinary Education Perception Scale (IEPS)

The IEPS is another prominent tool used to measure perceptions towards interdisciplinary education among healthcare professionals. This scale assesses factors such as competence and autonomy, perceived need for cooperation, actual cooperation, and understanding of others' value (Luecht et al., 1990). The IEPS provides insights into how healthcare professionals perceive interdisciplinary education and their willingness to engage in such activities. Its broad application in various settings has shown it to be a reliable and valid measure of interdisciplinary education perception (Luecht et al., 1990).

2.6.6.3 Interprofessional Attitudes Scale (IPAS)

The IPAS is designed to measure attitudes towards interprofessional education and collaborative practice among health professions learners. It evaluates key areas such as teamwork, roles and responsibilities, patient-centeredness, interprofessional biases, and diversity and ethics (Norris et al., 2015). The IPAS has been validated across multiple institutions, demonstrating its reliability and effectiveness in assessing interprofessional attitudes. Its comprehensive approach makes it a valuable tool for understanding the multifaceted attitudes that influence IPL (Norris et al., 2015).

2.7 Chapter Summary

This chapter synthesizes key insights on learning as a lifelong process, emphasizing the importance of aligning educational strategies with established learning theories to enhance outcomes, particularly in medical education. It highlights the critical role of learning readiness, influenced by cognitive, emotional, and contextual factors, in creating effective educational environments. The review underscores the importance of

Interprofessional Learning (IPL) for improving healthcare collaboration and patient care and stresses the need for reliable tools like RIPLS to assess IPL readiness and guide curriculum development.

CHAPTER 3: CONCEPTUALISATION OF THE STUDY

3.1 Introduction

The conceptual and theoretical frameworks of the research are covered in this chapter. The ideas and theories that will provide the current study's framework will be covered in this third chapter. The Social learning theory (SLT) and Professional Identity Theory (PIT) will be discussed, pertinent to the current study. We'll show how the hypotheses from the literature review relate to one another in this discussion. Additionally, an illustration of the conceptual framework of this study will be provided.

3.2 Theoretical Framework

Interprofessional Learning is a critical component in the education of healthcare professionals, aimed at fostering collaboration and teamwork across various healthcare disciplines (David et al., 2024). This theoretical framework explores the underlying concepts and theories that inform the readiness of healthcare learners for IPL, emphasizing the importance of preparing healthcare learners for effective interprofessional practice (Rani Mary Beth et al, 2017). The RIPLS is a widely utilized tool designed to assess the attitudes and perceptions of learners and professionals towards IPL (Rich et al., n.d.). The theoretical underpinning of RIPLS integrates concepts from social learning theory and professional identity theory, to explain how individuals from different professional backgrounds can be prepared for and engaged in interprofessional learning (Lie et al., 2013).

Several key points can be highlighted to justify the selection of SLT over other learning theories for explaining the theoretical framework of interprofessional learning readiness. SLT, proposed by Albert Bandura, posits that learning occurs through observation, imitation, and modeling of others' behaviors, which is particularly relevant in interprofessional settings where learners learn from and with peers from different

healthcare disciplines (Stanley et al., 2020). Unlike purely cognitive theories that focus on individual mental processes, SLT emphasizes the role of social interactions, role modeling, and collaborative learning experiences in shaping attitudes and behaviors. This aligns well with the goals of interprofessional education, which aims to foster collaboration, teamwork, and mutual respect among healthcare professionals.

Moreover, SLT emphasizes the importance of reinforcement and motivation in learning, suggesting that learners are more likely to adopt behaviors that are positively reinforced or modeled by others. In the context of interprofessional learning readiness, SLT can explain how exposure to positive interprofessional interactions, mentorship, and shared learning experiences can enhance readiness by influencing learners' perceptions, attitudes, and self-efficacy in collaborative practice (Zaher et al., 2022).This socio-behavioral approach contrasts with purely cognitive or individualistic theories by acknowledging the social context and interpersonal dynamics inherent in interprofessional teamwork. Thus, SLT offers a robust theoretical framework for understanding and enhancing interprofessional learning readiness through its emphasis on observational learning, social modeling, and the reciprocal influence of behavior and environment (Stanley et al., 2020)

Integration of a profession's knowledge, abilities, attitudes, and behaviors with an individual's preexisting identity and values is known as professional identity formation (Mount et al., 2022). "Professional Identity Theory" is not typically classified as a traditional learning theory in the same sense as cognitivism, constructivism, or SLT theory. Instead, it is a theoretical framework that focuses on understanding how individuals develop and maintain their professional identities within specific occupational or organizational contexts (Findyartini et al., 2022). PIT is recognized as a complex multifaceted, continuous, and transformative process through which individuals

internalize roles, values, beliefs, and norms associated with their profession. It considers how individuals integrate their personal identities with their professional roles and identities, often through a process of socialization, experience, and reflection (Mount et al., 2022). While not a learning theory in the traditional sense of explaining how individuals acquire knowledge or skills, professional identity theory does intersect with learning theories in several ways. For instance, it acknowledges that learning and identity development are interconnected processes (Findyartini et al., 2022). Professionals learn not only technical skills and knowledge but also the norms, values, and behaviors that define their profession. This learning is often facilitated through apprenticeship, mentorship, and participation in communities of practice, aligning with principles of social learning and constructivist learning theories (Monrouxe, 2010).

3.2.1 Social Learning Theory (SLT)

Albert Bandura's SLT emphasizes the importance of observing, modelling, and imitating the behaviors, attitudes, and emotional reactions of others. Bandura proposed that learning can occur through the observation of others, without direct reinforcement or punishment, which marked a departure from traditional behaviorist theories that dominated psychology. According to Bandura, there are four primary components to observational learning: attention, retention, reproduction, and motivation (Bandura, 1977; Koutroubas, 2022).

Attention is the first step and involves focusing on the behavior of a model. Factors influencing attention include the model’s characteristics, such as attractiveness, competence, and similarity to the observer, as well as the observer's own cognitive capabilities. Retention involves remembering what was observed, which requires encoding the behavior into memory (Leman et al., 2021; Schunk, 2012). This can be enhanced through mental rehearsal and organization of the observed behaviors.

Reproduction is the process of imitating the observed behavior, which requires the observer to have the physical and mental ability to replicate the actions. Finally, motivation is crucial for observational learning to translate into actual behavior. Motivation can be influenced by external reinforcement (rewards or punishments observed) (Bandura, 1977), internal reinforcement (self-satisfaction) (Bandura, 1986), and vicarious reinforcement (observing others being rewarded or punished) (Schunk, 1987). These factors collectively determine whether the observer will perform the learned behavior.

Bandura also introduced the concept of self-efficacy, which refers to an individual's belief in their ability to succeed in specific situations or accomplish a task. Self-efficacy influences how people think, feel, and act. Higher self-efficacy leads to greater motivation and resilience in facing challenges, while lower self-efficacy can result in avoidance and decreased effort. Additionally, Bandura's principle of reciprocal determinism suggests that a person's behavior is influenced by personal factors, environmental factors, and the behavior itself, all of which interact and influence each other in a dynamic way (Leman et al., 2021).

SLT has wide-ranging applications, including in education, where it informs teaching strategies that leverage modeling and imitation. In therapeutic settings, it is used in cognitive-behavioral therapy to modify maladaptive behaviors through modelling and reinforcement (Bahn, 2001). The theory also has implications in organizational behavior, particularly in training and development programs that emphasize mentorship and observational learning. Despite its broad acceptance, social learning theory has faced criticism for overemphasizing the role of environmental factors at the expense of biological influences on behavior (Gibson, 2004). Nonetheless, it remains a foundational theory in understanding human learning and behavior.

SLT offers a robust framework for understanding how individuals learn through observation and social interaction. Its emphasis on modelling, vicarious reinforcement, self-efficacy, and reciprocal determinism provides valuable insights into the complexities of human learning and behavior (Rumjaun & Narod, 2020). While it has faced criticisms, SLT's integration with contemporary research continues to enhance its relevance and applicability in various fields, from education and therapy to organizational behavior and public health. As our understanding of human learning evolves, SLT remains a foundational theory that bridges the gap between behaviorist and cognitive perspectives, offering a comprehensive view of the social dimensions of learning (McCullough Chavis, 2011).

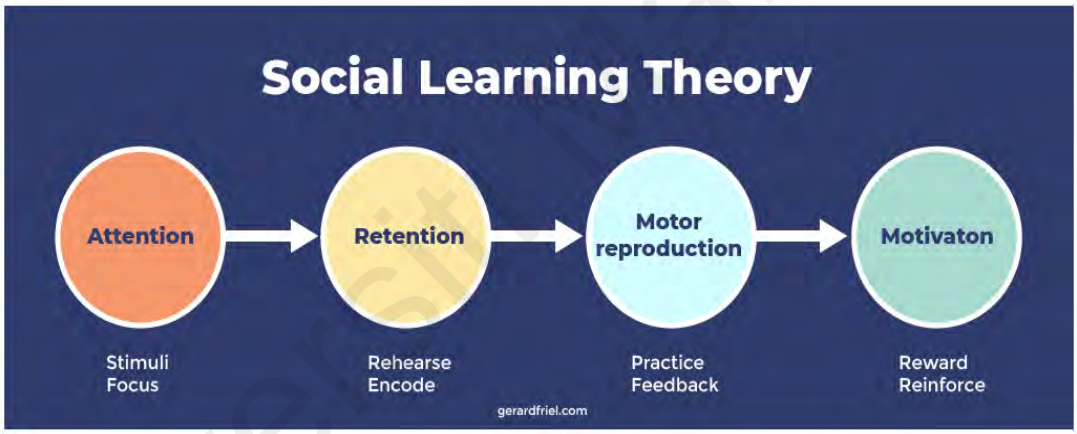

Figure 3.1: Social Learning Theory by Bandura 1977. Friel, G. (n.d.), adopted from https://www.gerardfriel.com/instructional-design/social-learning-theory/

3.2.2 Personal Identity Theory (PIT)

Professional identity theory explores how individuals internalize their roles, values, and beliefs related to their professional lives (Hitlin, 2003). This process shapes how professionals perceive themselves and how they are perceived by others within their field, influencing behaviors, ethics, and interactions in the workplace. Key components of professional identity include self-concept, which involves internalizing professional roles and values; core values and beliefs that guide professional behavior; and role perception,

which is the understanding and integration of one's roles within a professional context (Fitzgerald, 2020; Stets & Burke, 2000). The formation and development of professional identity are influenced by education, socialization, and professional experiences. Academic institutions play a crucial role by imparting knowledge, skills, and ethical standards through formal education. Mentorship and role models significantly impact professional identity by providing guidance and exemplifying professional behaviors. Additionally, workplace environments and real-world professional experiences solidify the application of theoretical knowledge and ethical principles, reinforcing professional identity (Cruess et al., 2014).

Challenges in forming a professional identity include identity conflicts, such as internal conflicts between personal values and professional demands and role conflicts arising from balancing multiple professional roles (Trede et al., 2012). Organizational factors like lack of support, inadequate resources, and high levels of stress can hinder the development of a positive professional identity (Walder et al., 2022). Moreover, societal expectations and rapid technological advancements require continuous adaptation, presenting additional challenges. To strengthen professional identity, strategies such as reflective practices, mentorship, and professional development programs are essential (Montemayorr et al., 2020). Encouraging self-reflection and peer reflection helps professionals examine their values, beliefs, and behaviors. Effective mentoring and coaching provide personalized support while continuing education and professional development opportunities ensure that professionals stay current with advancements in their field. Creating a supportive work environment that values professional growth and recognizing professional achievements can further enhance professional identity. A robust professional identity not only benefits individuals by enhancing job satisfaction and motivation but also contributes to the overall effectiveness and cohesion of professional teams and organizations (Toh et al., 2022).

Figure 3.2: A model of professional identity formation (Deggs, 2023) adopted from https://www.linkedin.com/pulse/professional-identity-tool-navigate-workplace-aaliyyah-dyani-/

3.2.3 Application of Social Learning Theory and Professional Identity Theory to Explain IPL Readiness

Interprofessional Learning (IPL) involves learners and professionals from various disciplines learning together to promote collaborative practice and improve patient outcomes. To understand IPL readiness, integrating Social Learning Theory (SLT) and Professional Identity Theory provides a comprehensive framework that explains how individuals prepare for and engage in interprofessional learning (Atwa et al., 2023).

3.2.3.1 Social Learning Theory and IPL Readiness

Albert Bandura's SLT posits that individuals learn through observation, imitation, and modelling, which are critical components in the context of IPL. Key aspects of SLT relevant to IPL include attention, retention, reproduction, and motivation. In IPL, learners observe the behaviors, attitudes, and practices of professionals from different disciplines. This observational learning allows them to understand various roles and responsibilities, enhancing their ability to collaborate effectively. For instance, nursing learners learning

alongside medical learners and pharmacists can observe and internalize best practices in patient care coordination (Bandura, 1977). For IPL to be effective, learners must pay attention to the interactions and behaviors of their peers and mentors from other professions. Retention of these observations is facilitated through reflective practices, discussions, and interprofessional simulations that reinforce learning (Lapkin et al., 2013). Learners must be able to replicate the collaborative behaviors observed in IPL settings. Motivation to engage in IPL can be driven by understanding the benefits of collaborative practice, such as improved patient outcomes and enhanced professional competence. Vicarious reinforcement, where learners see the positive outcomes of effective collaboration, further motivates them to adopt similar behaviors (Schunk, 2012). Self-Efficacy: Bandura's concept of self-efficacy plays a crucial role in IPL readiness. Belief in one's ability to succeed in collaborative tasks influences engagement and persistence in interprofessional activities. Higher self-efficacy leads to greater confidence and a willingness to participate in interprofessional learning (Bandura, 1986).

3.2.3.2 Professional Identity Theory and IPL Readiness

PIT explores how individuals internalize their professional roles, values, and beliefs, influencing their readiness for IPL. Key components of professional identity that affect IPL readiness include self-concept, values and beliefs, and role perception. Professional identity is shaped through education, socialization, and professional experiences. In IPL, learners and professionals develop a sense of self that includes understanding their role within a collaborative team. Mentorship and role models from various disciplines enhance this self-concept by demonstrating the importance of interprofessional collaboration (Trede et al., 2012). Core professional values, such as respect, integrity, and responsibility, are essential for an effective IPL. These values guide interactions and ensure that professionals approach collaboration with a shared commitment to patient-centered care. Beliefs about the importance of teamwork and the recognition of the unique

contributions of each profession foster a collaborative mindset (Adams et al., 2006). Understanding and integrating multiple professional roles within a team are crucial for IPL readiness. Professionals must be aware of their responsibilities and how they complement those of their peers. Effective IPL involves role clarity and the ability to adapt to various team dynamics, promoting seamless collaboration (Wenger, 1999).

3.2.3.3 Integration of SLT and PIT in IPL

Integrating SLT and PIT provides a holistic approach to understanding IPL readiness. SLT emphasizes the mechanisms of learning through observation and imitation, while Professional Identity Theory focuses on the internalization of roles and values. Creating Supportive Learning Environments: Educational institutions and healthcare organizations should create environments that support observational learning and the development of professional identity. This includes providing opportunities for interprofessional simulations, mentorship programs, and reflective practices that reinforce collaborative skills (Hazrati et al., 2024). Enhancing Self-Efficacy and Role Clarity: Interventions aimed at enhancing self-efficacy, such as positive feedback and success experiences, can boost confidence in collaborative tasks (Nørgaard et al., 2013). Clear role delineation and interprofessional training can ensure that all team members understand their contributions and how they fit into the larger team (Chiocchio et al., 2016). Promoting Reflective Practices: Encouraging reflective practices allows professionals to examine their behaviors, values, and roles in the context of interprofessional collaboration. Reflective discussions and journaling can help integrate learning experiences and reinforce professional identity in a collaborative setting (Wackerhausen, 2009).

Applying SLT and PIT to IPL readiness provides a comprehensive framework for understanding how professionals prepare for and engage in interprofessional education. By leveraging observational learning, enhancing self-efficacy, and fostering a strong professional identity, educational programs and healthcare organizations can improve IPL readiness, ultimately leading to better collaborative practice and patient outcomes.

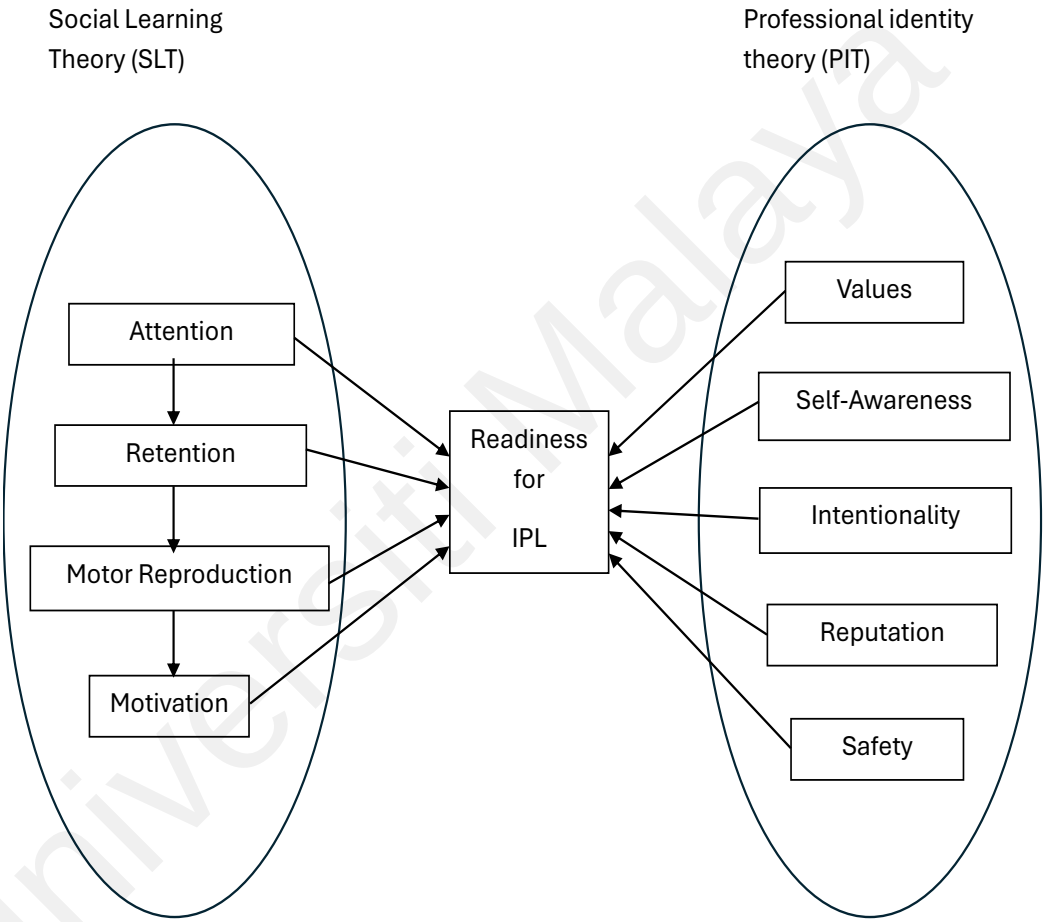

Figure 3.3: Integration of SLT and PID to explain IPL readiness

3.3 Conceptual Framework:

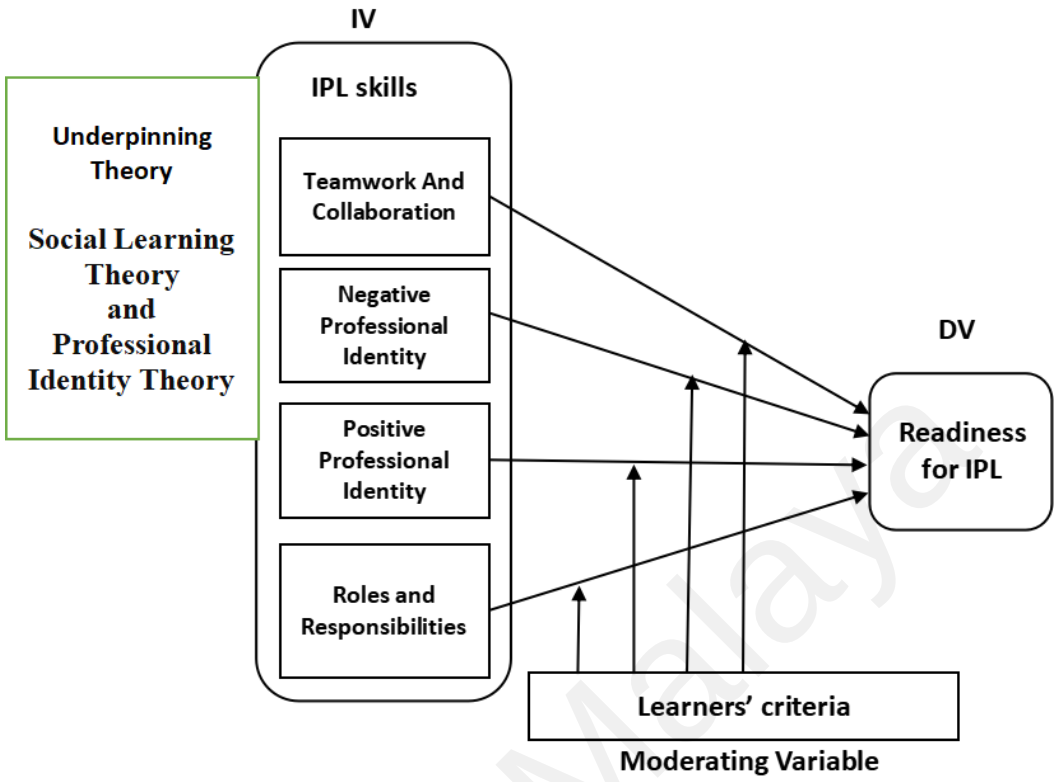

Figure 3.4: Conceptual framework of readiness for IPL

Figure 3.4 illustrates the conceptual framework of the study. The conceptual framework is grounded in two theories: Social Learning Theory and Professional Identity Theory. These theories guide the understanding of how IPL skills influence readiness for IPL. The framework identifies four key IPL skills (TWC, NPI, PPI and RR) as independent variables. These skills are the constructs in this conceptual framework, representing different aspects that contribute to IPL readiness. These four key IPL skills highlighted in this conceptual framework are directly aligned with the constructs measured by the RIPLS questionnaire. The dependent variable in this framework is Readiness for IPL which was measured by this 19-item RIPLS questionnaire (research objective 1). Learners' criteria serve as a moderating variable. This implies that the impact of IPL skills on readiness for IPL may vary depending on certain criteria related to the learners (age, gender, year of study, CGPA, and different healthcare programs). While the RIPLS might not measure

this directly, the results can be analyzed with demographic data to understand these variations. So, this is aligned with the 2nd research objective (To investigate the differences in perceived readiness for Interprofessional Learning (IPL) among learners from different healthcare programs).

Overall, the alignment ensures that the RIPLS questionnaire accurately measures what it is intended to, based on the conceptual framework's constructs, providing a reliable assessment of IPL readiness (figure 3.4).

3.4 Chapter Summary

In summary, this chapter outlined the conceptual framework for the investigation and explained the theory underlying it. The study's methodology is covered in the upcoming chapter.

CHAPTER 4: METHODOLOGY

4.1 Introduction

Research methodology is a method used in conducting research or study. There are numerous approaches to study or perform research. This chapter aims to illustrate the research approach that will be applied to collect and analyze data utilizing the survey instrument from the previous research project. Every approach used in the research is covered in this chapter, beginning with the research design and ending with the types of data and methods for obtaining them. The goals of this research are intended to be achieved by the design of this study. In addition, the population will be determined, and the chosen sampling strategies will be covered. It will also highlight the kind of analytic software that has to be utilized. Ethical considerations of this study were described.

4.2 Study Design

This study used a cross-sectional and quantitative data collection approach to achieve the objectives of the study. The cross-sectional design was chosen because it allowed us to collect data from different groups at one time, making it easier to compare IPL readiness across programs. The study used a descriptive survey design that involved distributing a questionnaire to the study sample.

4.2.1 Target population

The population in this study included all healthcare program learners who undertook the IPL courses as part of their curriculum from February to July 2024 at the Management and Science University (MSU).

The Management and Science University (MSU) offers a wide number of healthcare programs, including Bachelor of Medicine, Bachelor of Surgery (MBBS), Bachelor of Pharmacy (BPH), Bachelor in Nursing (BN), Bachelor of Biomedical Science (BMS), Bachelor of Cardiac Technology (BCT), Bachelor of Nutrition Technology (BNT),

Bachelor of Optometry (BOP), and Bachelor of Bio-Medicine (BBM) Management and Science University (msu.edu.my) Every program ensures learners acquire the skills and knowledge required for their chosen professions by combining demanding academic study with hands-on training. Core subjects cover medical sciences, clinical skills, pharmaceutical practices, diagnostic techniques, and therapeutic exercises, with extensive hands-on experience gained through clinical placements, internships, and laboratory work. MSU's healthcare programs are distinguished for their incorporation of IPL. Learners across various healthcare professions are offered the chance to collaborate and communicate with one another through these IPL courses. Learners acquire excellent teamwork skills through multidisciplinary workshops, simulated patient scenarios, cooperative research projects, and combined clinical placements. This method enables them to provide comprehensive and coordinated patient care, which reflects the team-based nature of contemporary healthcare environments (*International Medical School (IMS)*, n.d.).

4.2.2 Sampling methods

In our study, we decided to use purposive sampling to collect data. We specifically selected learners who have enrolled in IPL courses. Using this strategy, we can focus on individuals just beginning their IPL journey, ensuring that our data precisely represents their initial readiness towards interprofessional learning. By choosing purposive sampling, we can gather detailed and relevant information from those who are about to engage with IPL. This helps us understand their readiness for interprofessional learning right from the beginning of their coursework. We assume this approach is the most appropriate for our study, even though we are aware that it might limit how broadly our findings can be applied to all healthcare learners.

4.2.3 Sample size calculation

The sample was calculated by the online Raosoft sample size calculator with a margin of error of 5%, Confidence level of 95%, and Population proportion ($\hat{p}$) of 0.5 (assuming a 50% response rate). Population size for this calculation: 500 (number of learners enrolled for IPL courses in February semester 2024), so, the recommended sample size was 218.

4.2.4 Inclusion criteria

1) Learners above 18 years old.

2) Learner enrolled in a healthcare program that includes Bachelor of Medicine, Bachelor of Surgery (MBBS), Bachelor of Pharmacy (BPH), Bachelor of Nursing (BN), Bachelor of Biomedical Science (BMS), Bachelor in Cardiac Technology (BCT), Bachelor of Nutrition Technology (BNT), Bachelor of Optometry (BOP), and Bachelor of Bio-Medicine (BBM). Who have undertaken IPL courses offered in the curriculum at MSU.

3) Learners who consent to participate in the study.

4.2.5 Exclusion criteria

1) Learners under 18 years old.

2) Learner enrolled in a healthcare program other than that of Bachelor of Medicine, Bachelor of Surgery (MBBS), Bachelor of Pharmacy (BPH), Bachelor of Nursing (BN), Bachelor of Biomedical Science (BMS), Bachelor in Cardiac Technology (BCT) Bachelor of Nutrition Technology (BNT), Bachelor of Optometry (BOP), and Bachelor of Bio-Medicine (BBM), who have not undertaken IPL courses offered in the curriculum at MSU.

3) Learners who do not consent to participate in the study.

4.2.6 Recruitment procedure

The study sample was recruited from the MSU learners enrolled for the IPL courses during the February semester of 2024 at the Management and Science University (MSU).

4.3 Questionnaire

4.3.1 Data Collection Method

The questionnaire was distributed as a Google form to the target population through their WhatsApp group, where it will be posted by their trainer, who is also a co-investigator in this project and a professional colleague of the Learner Principal Investigator, will explain the voluntary nature of the questionnaire response and explain to the learners the purpose of the study and highlight the confidentiality of their responses. Since the questionnaire will be anonymous, it will not gather any information allowing the respondents to be identified, including name, phone number, email address, and personal identity number (including the learner's identification number). Moreover, the declaration of voluntary participation and confidentiality of data will be stated at the beginning of the Google form. Reminders were given at least twice to the learners to enhance the response rate.

4.3.2 Study Instrument

This study adapted the Readiness for Interprofessional Learning Scale (RIPLS)) by McFadyen et al. (2005) to measure the Interprofessional Learning readiness among learners of healthcare programs. This is an open excess tool. In addition to this scale, a section on respondents' demographic data was included in the questionnaire. The questionnaire utilized Google Forms as a platform of distribution and in this platform, the questionnaire is divided into two sections (Appendix A):

a) Demographic data

b) Readiness for Interprofessional Learning Scale (RIPLS))

4.3.2.1 Demographic Data

This section included information on the participant's Sociodemographic factors, such as age, gender, year of academic study. This data enables us to gain an understanding of the participants and the possible influence of their backgrounds on their IPL preparation. According to the study conducted by Talwalkar et al. (2016), nursing learners showed a higher level of preparedness compared to medical and physician associate learners, for interprofessional learning early in their training. Female learners demonstrated more positive attitudes towards IPL than their male classmates. The study done by Ashok Kumar et al. (2020) at MSU for IPL readiness for medical learners, included 436 learners, whose mean age was 22. Preclinical years accounted for 170 of them, whereas clinical years accounted for 266. While clinical learners outperformed preclinical learners in identifying their duties and comprehending professional identity, both groups received good marks for teamwork. Overall, demographic data makes our study more comprehensive and our findings more reliable.

4.3.2.2 Readiness for Interprofessional Learning Scale (RIPLS)

The Readiness for Interprofessional Learning Scale (RIPLS) is a widely used instrument to measure healthcare learners' readiness for interprofessional learning. Developed in 1999, the RIPLS is a 19-item, 5-point Likert scale self-reporting tool that assesses perceptions of healthcare learners' knowledge, skills, and attitudes towards interprofessional learning. The RIPLS examines several key dimensions related to interprofessional learning readiness. RIPLS consists of a series of statements that respondents rate on a Likert scale, typically ranging from strongly agree to strongly disagree. These statements are grouped into several subscales that measure different dimensions of readiness (Binienda, 2015).

For the present study, we adopted the 4 subscales model developed by McFadyen et al. (2005). The RIPLS consists of 19 components that are divided into 4 subsets: (1) collaborative and teamwork, which includes items 1 through 9 and has a maximum score of 45; (2) negative professional identity, which includes items 10 through 12 and has a maximum score of 15; (3) positive professional identity, which includes items 13 through 16 and has a maximum score of 20; and (4) roles and responsibilities, which includes items 17 through 19 and has a maximum score of 15. A 5-point Likert scale is used for each question, with the options being "strongly disagree (1)" to "strongly agree (5)." (Alghamdi et al., 2023).

(a) ***Items measuring the teamwork and collaboration***

1. Learning with other learners will help me become a more effective member of a healthcare team.
2. Patients would ultimately benefit if healthcare learners worked together to solve patient problems.
3. Shared learning with other healthcare learners will increase my ability to understand clinical problems.
4. Learning with healthcare learners before qualification would improve relationships after qualification.
5. Communication skills should be learned with other healthcare learners.
6. Shared learning will help me to think positively about other professionals.
7. For small group learning to work, learners need to trust and respect each other.
8. Team-working skills are essential for all healthcare learners to learn.
9. Shared learning will help me to understand my own limitations.

(b) ***Items for testing negative professional identity***

10. I don't want to waste my time learning with other healthcare learners.

11. It is not necessary for undergraduate healthcare learners to learn together.

12. Clinical problem-solving skills can only be learned with learners from my own department.

(c) ***Items for testing positive professional identity***

13. Shared learning with other healthcare learners will help me to communicate better with patients and other professionals.

14. I would welcome the opportunity to work on small-group projects with other healthcare learners.

15. Shared learning will help to clarify the nature of patient problems.

16. Shared learning before qualification will help me become a better team worker.

(d) ***Items for roles and responsibilities***

17. The function of nurses and therapists is mainly to provide support for doctors.

18. I'm not sure what my professional role will be.

19. I have to acquire much more knowledge and skills than other healthcare learners.

4.3.3 Data Analysis

The final analysis includes 219 respondents who completed the questionnaire in total (as per sample size calculation required sample size was 218). For preliminary analysis, the Google Form responses were downloaded into Microsoft Excel. Version 29.0 of IBM SPSS Statistic was used to analyze quantitative data after exporting Microsoft Excel data.

Descriptive statistics was used to achieve research objective one and comparative statistics (the Kruskal-Wallis H test) was used to investigate research objective two.

4.3.3.1 Descriptive statistics

The study participants' demographic profile was examined using descriptive analysis. Descriptive statistics facilitate the conversion of gathered data into indices that describe the data. The participants provided information on their age, gender, year of study and the healthcare program they are studying to provide demographic data. For demographic variables used in this study, a frequency analysis was done.

Measurement of healthcare learners' interprofessional learning readiness was done with the 19-item RIPLS. Typically, participants rate each item on the RIPLS by rating how much they agree with each statement on a Likert scale. RIPLS use a Likert scale with values ranging from 1 (strongly disagree) to 5 (strongly agree) (Binienda, 2015) (Roopnarine & Boeren, 2020) Each of the 19 items on the RIPLS corresponds to a statement related to IPL, and participants rate their agreement on a 5-point Likert scale. This results in individual item scores ranging from 1 to 5. The total score for the RIPLS is obtained by summing the scores of all items, with higher total scores indicating a greater readiness for IPL (Visser et al., 2018).

For descriptive Statistics of the 19-item RIPLS, we attempt to determine the views of learners toward IPL by examining the descriptive statistics of the 19-item RIPLS. The first thing we do is look at the average scores (Mean) for each item, which indicate the general agreement. For example, if a teamwork-related question has a high mean score, it indicates that most learners see working in teams favorably. They could fail to feel as positive about it if it's low. Additionally, we examine the standard deviation, which reveals the range of replies. A small standard deviation indicates that the majority of

learners' responses were consistent, whereas a big standard deviation indicates that the learners' responses were inconsistent.

4.3.3.2 Comparative statistics

In this study, the Kruskal-Wallis H test was used in this analysis because it is a non-parametric method suitable for comparing the distributions of ranks across multiple independent groups. The use of the Kruskal-Wallis H test is advantageous in educational settings, as it allows for the analysis of ordinal data or data that do not follow a normal distribution, which is common in survey-based research (Field, 2018). It is ideal for situations where the data non-normally distributed or are unequal like our study population groups (MBBS (148 / 69.9%), BPH (33 / 15.1%), BBM (13 / 5.9%), BMS (8 / 3.7%), BCT (14 / 6.4%), and others (3 / 1.4%) so, the Kruskal-Wallis H test was a valid choice for analyzing the differences in their IPL readiness rank distributions.

4.3.3.3 Reliability Testing

Reliability in statistical analysis refers to the consistency and stability of a measurement instrument or a set of measurements over time. It ensures that the data collected is dependable and reproducible under similar conditions. Common reliability tests include test-retest reliability, inter-rater reliability, internal consistency, and split-half reliability (Streiner et al., 2015). In medical education research, reliability is essential for ensuring the validity of assessment tools and the consistency of educational interventions. Conducting rigorous reliability tests helps in refining and improving measurement instruments, leading to more accurate and credible research findings (Downing, 2004).

Reliability testing is essential in our study to make sure the data we collected is reliable and consistent regarding healthcare learners' interprofessional learning preparation. To

do this, we emphasize on internal consistency, a crucial component of reliability that evaluates how effectively scale items measure a similar underlying concept. The internal consistency reliability of the 19 items in RIPLS was tested using Cronbach's Alpha coefficient. The reliability test was done after all the items' scores had been recoded into their respective scoring. For item number 10, 11, 12 and 18 we used reverse coding as these items are negatively worded.

Reverse coding is a technique used in Likert scales to address potential response biases and improve the reliability of a measurement scale. It involves transforming the scores of negatively worded items so that high scores consistently indicate the same level of agreement or disagreement as positively worded items (Suárez-Alvarez et al., 2018). To evaluate the internal consistency of the RIPLS, we calculate Cronbach's alpha for the overall scale and its subscales. Typically, the Cronbach's Alpha value is presented as a range of numbers between 0.00 and 1.0. A score of 1.0 indicates perfect consistency in measurement (Olaniyi, 2019). A Cronbach's alpha value above 0.70 is generally considered acceptable, above 0.80 is good, and above 0.90 is excellent. whereas a value of 0.00 indicates a lack of consistency in measuring (Olaniyi, 2019).

4.4 Ethical Considerations

The research design ensured that the participants would declare their informed voluntary consent before participation in this research and be aware of the extent of data confidentiality. No personally identifiable information, including names, email addresses, phone numbers, identity numbers, or learner ID numbers, was gathered to maintain the anonymity of the survey. Since this was a volunteer study, the respondents' consent was acquired before they could complete the questionnaire. There was no direct advantage or hazard to the responders from this study. Furthermore, all of the study's data were stored in an encrypted file that required a password to get access, making them only accessible

to the current researcher and their supervisors. The University Malaya Research Ethics Committee gave its clearance for this investigation. (UMREC) (Ref No: UM.TNC2/UMREC_3497). We also received ethical permission from the Management and Science University Ethics Committee (Reference code: EA-L1-01-IMS-2024-07-0024)

4.5 Chapter Summary

The study design, data collection procedures, and data analysis techniques were all covered in this chapter. This chapter covered ethical considerations as well. A discussion of the study's findings and results will be covered in Chapter Five.

CHAPTER 5: RESULTS AND DISCUSSIONS

5.1 Introduction

This research is applied to study the IPL readiness among healthcare learners using the RIPLS which includes four subscales: TWC, NPI, PPI and RR. For this study, Cronbach's Alpha value for RIPLS was 0.87 which indicates a good internal consistency.

5.2 Results

5.2.1 Demographic Characteristics of the Study Participants from healthcare programs learners

The studied sample included 219 learners including 153 (69.9%) females, and 66 (30.1%) males. The age distribution of the study participants is 53 (24.2%) are between 18-20 years old, 152 (69.4%) are between 21-25 years old, and 14 (6.4%) are above 25 years old. The learners who responded were from various healthcare programs, with the majority (148 or 69.9%) enrolled in the MBBS. Other programs and their respective percentages are BPH (33 or 15.1%), BBM (13 or 5.9%), BMS (8 or 3.7%), BCT (14 or 6.4%), and others (3 or 1.4%). (Table 5.1).

Table 5.1 Demographic Characteristics of the Study Participants

Gender	**Females**	**Males**				
No.	153	66				
%	69.9	30.1				
Program	**MBBS**	**Pharmacy**	**BBM**	**BMS**	**BCT**	**Others**
No.	148	33	13	8	14	3
%	67.6	15.1	5.9	3.7	6.4	1.4
Age (Year)	**18-20**	**21-25**	**>25**			
No.	53	152	14			
%	24.2	69.4	6.4			
Year(s) of study	**Year 1**	**Year 2**	**year 3**	**Year 4**	**Year 5**	
No.	53	119	15	31	1	
%	24.2	54.3	6.8	14.2	0.5	

5.2.2 The Healthcare Programs Learners' Responses to the TWC Skills in the RILPS:

Table 5.2 shows the descriptive statistics of the healthcare program learner's responses to the teamwork and collaboration (TWC) skills in the RILPS. It shows that the majority of learners agreed or strongly agreed 192 (87.5%), with a mean response of 4.34 that learning with other learners will help them to become a more effective member of a healthcare team. Also, there is a high level of agreement 193 (88.1%) with a mean response of 4.44 that Patients would ultimately benefit if healthcare learners worked together to solve patient problems.

Table 5.2 Descriptive Statistics of the Healthcare Programs Learners' Responses to the TWC

Item	Strongly Disagree (%)	Disagree (%)	Neutral (%)	Agree (%)	Strongly Agree (%)	Mean	SD	Min-Max
TWC1	1(0.5)	0 (0)	26(11.9)	88(40.2)	104(47.5)	4.34	0.72	1-5
TWC2	2(0.9)	0 (0)	24(11)	67(30.6)	126(57.5)	4.44	0.76	1-5
TWC3	1(0.5)	0 (0)	25(11.4)	80(36.5)	113(51.6)	4.39	0.72	1-5
TWC4	2(0.9)	2(0.9)	27(12.3)	76(34.7)	112(51.1)	4.34	0.8	1-5
TWC5	1(0.5)	2(0.9)	23(10.5)	75(34.2)	118(53.9)	4.4	0.75	1-5
TWC6	1(0.5)	1(0.5)	27(12.3)	76(34.7)	114(52.1)	4.37	0.75	1-5
TWC7	2(0.9)	0(0)	20(9.1)	73(33.3)	124(56.6)	4.45	0.74	1-5
TWC8	2(0.9)	0(0)	20(9.1)	73(33.3)	124(56.6)	4.45	0.74	1-5
TWC9	1(0.5)	2(0.9)	27(12.3)	77(35.2)	112(51.1)	4.36	0.77	1-5

TWC1: Learning with other learners will help me become a more effective member of a healthcare team
TWC2. Patients would ultimately benefit if healthcare learners worked together to solve patient problems
TWC3. Shared learning with other healthcare learners will increase my ability to understand clinical problems
TWC4. Learning with health care learners before qualification would improve relationships after qualification
TWC 5. Communication skills should be learned with other healthcare learners
TWC 6. Shared learning will help me to think positively about other professionals
TWC 7. For small group learning to work, learners need to trust and respect each other
TWC 8. Team-working skills are essential for all health care learners to learn
TWC 9. Shared learning will help me to understand my own limitations

The pattern of high agreement continues across the remaining items measuring TWC, with the majority of learners agreeing or strongly agreeing with the statements with mean value as follows; Shared learning with other health care learners will increase my ability to understand clinical problems (4.39), Learning with health care learners before qualification would improve relationships after qualification (4.34), Communication skills should be learned with other health care learners (4.4), Shared learning will help me to think positively about other professionals (4.37), For small group learning to work, learners need to trust and respect each other (4.45), Team-working skills are essential for all health care learners to learn (4.45), Shared learning will help me to understand my own limitations (4.36) (Table 5.2).

5.2.3 The Healthcare Programs Learner's Responses to the NPI Skills in the RILPS

Table 5.3 shows the descriptive statistics of the healthcare programs learners' responses to the NPI skills in the RILPS. It shows the response to NPI1 (I don't want to waste my time learning with other health care learners) a relatively high percentage of learners either strongly disagree 75 (34.2%), disagree 36 (16.4%) or neutral 34 (15.5%) about the statement. 36(16.4%) learners agree with the NPI 1 statement while 38 (17.4%) learners strongly agree with the statement The mean response is 2.66, indicating a moderate level of disagreement on average. A similar pattern is observed for the NPI2 (It is not necessary for undergraduate healthcare learners to learn together), with a high percentage of learners either strongly disagreeing 68 (31.1%), disagreeing 27 (21.5%) or being neutral 32 (14.6%). The mean response is 2.67. The third NPI statement (Clinical problem-solving skills can only be learned with learners from my own department) shows, a higher percentage of 64 (29.25%) learners strongly disagreeing, 50 (22.8%) disagreeing and 24 (11.0%) remaining neutral. The mean response is 2.75.

Table 5.3: Descriptive Statistics of the Healthcare Programs Learners' Responses to the NPI

Item	Strongly Disagree (%)	Disagree (%)	Neutral (%)	Agree (%)	Strongly Agree (%)	Mean	Std. Deviation	Min-Max
NPI1	75(34.2)	36(16.4)	34(15.5)	36(16.4)	38(17.4)	2.66	1.51	1-5
NPI2	68(31.1)	47(21.5)	32(14.6)	34(15.5)	38(17.4)	2.67	1.48	1-5
NPI3	64(29.2)	50(22.8)	24(11)	39(17.8)	42(19.2)	2.75	1.51	1-5

NPI1. I don't want to waste my time learning with other healthcare learners
NPI2. It is not necessary for undergraduate healthcare learners to learn together
NPI3. Clinical problem-solving skills can only be learned with learners from my own department

5.2.4 The Healthcare Programs Learners' Responses to the PPI skills in the RILPS

Table 5.4 presents the descriptive statistics of the healthcare programs learners' responses to the PPI questionnaire. For the first PPI statement (Shared learning with other health care learners will help me to communicate better with patients and other professionals), there is a high percentage of learners who agree 71 (32.4%) or strongly agree 115 (52.5%) with the statement, with a smaller percentage being neutral 28 (12.8%). A similar pattern is observed for the PPI 2 (I would welcome the opportunity to work on small-group projects with other healthcare learners), with a high percentage of learners agreeing 69 (31.5%) or strongly agreeing 117 (53.4%). The mean response is 4.36. The third PPI statement (Shared learning will help to clarify the nature of patient problems) shows an even stronger level of agreement, with a higher percentage of learners strongly agreeing 112 (51.1%) and a lower percentage being neutral 27 (12.3%). The mean response is 4.37. In response to PPI4 (Shared learning before qualification will help me become a better team worker), there is a high percentage of learners agreeing 83 (37.9%) or strongly agreeing 108 (49.3%). The mean response is 4.34, which is consistent with the overall pattern of high agreement.

Table 5.4: Descriptive Statistics of the Healthcare Programs Learners' Responses to the PPI

Item	Strongly Disagree (%)	Disagree (%)	Neutral (%)	Agree (%)	Strongly Agree (%)	Mean	Std. Deviation	Min-Max
PPI1	2(0.9)	3(1.4)	28(12.8)	71(32.4)	115(52.5)	4.34	0.82	1-5
PPI2	2(0.9)	1(0.5)	30(13.7)	69(31.5)	117(53.4)	4.36	0.80	1-5
PPI3	1(0.5)	0(0)	27(12.3)	79(36.1)	112(51.1)	4.37	0.73	1-5
PPI4	2(0.9)	1(0.5)	25(11.4)	83(37.9)	108(49.3)	4.34	0.77	1-5

PPI1. Shared learning with other healthcare learners will help me to communicate better with patients and other professionals
PPI2. I would welcome the opportunity to work on small-group projects with other healthcare learners
PPI3. Shared learning will help to clarify the nature of patient problems
PPI4. Shared learning before qualification will help me become a better team worker

5.2.5 The Healthcare Programs Learners' Responses to the RR Skills in the RILPS

Table 5.5 provides descriptive statistics for the healthcare programs learners' responses to the roles and responsibilities subscale of RIPLS. In response to RR1 (The function of nurses and therapists is mainly to provide support for doctors), there is a relatively high percentage of learners who agree 64 (29.2%) or strongly agree 82 (37.4%) with the statement, with a smaller percentage being neutral 47 (21.5%). While RR2 (I'm not sure what my professional role will be), shows a more varied distribution of responses, with a significant portion of learners disagreeing 57 (26%) or being neutral 40 (18.3%), and a smaller percentage agreeing 35 (16%) or strongly agreeing 46 (21%). The mean response is 2.87. while the RR3 (I have to acquire much more knowledge and skills than other health care learners) has a higher percentage of learners being neutral 55 (25.1%) compared to the other two items, with a moderate percentage agreeing 68 (31.1%) or strongly agreeing 70 (32%). The mean response is 3.79.

Table 5.5: Descriptive Statistics of the Healthcare Programs Learners' Responses to the RR

Item	Strongly Disagree (%)	Disagree (%)	Neutral (%)	Agree (%)	Strongly Agree (%)	Mean	Std. Deviation	Min-Max
RR1	14(6.4)	12(5.5)	47(21.5)	64(29.2)	82(37.4)	3.86	1.17	1-5
RR2	57(26)	41(18.7)	40(18.3)	35(16)	46(21)	2.87	1.49	1-5
RR3	9(4.1)	17(7.8)	55(25.1)	68(31.1)	70(32)	3.79	1.10	1-5

RR1. The function of nurses and therapists is mainly to provide support for doctors
RR2. I'm not sure what my professional role will be
RR3. I have to acquire much more knowledge and skills than other healthcare learners

5.2.6 Overall responses of the Healthcare Programs Learners to each skill in the RIPLS

Table 5.6 shows the total score for each subscale of RIPLS. The total RIPLS mean is 3.78 and a standard deviation of 0.54. The mean for the total score for TWC, NPI, PPI, and RR is 3.9±0.59, 3.31±1.44, 4.36±0.73 and 3.59±0.54 respectively.

Table 5.6: Descriptive Statistics of the Healthcare Programs Learner's es to each skill in the RIPLS (n=219)

Item	Mean	Std. Deviation	Min-Max
Teamwork and collaboration	3.90	.59	.89 – 4.44
Negative Professional Identity	3.31	1.44	1.00-5.00
Positive Professional Identity	4.36	.73	1.00-5.00
Roles and Responsibilities	3.59	.61	1.33-5.00
Total RIPLS score	3.78	.54	2.31-4.86

5.2.7 The relationship between the RIPLS responses from the Study Participants and their Programs

Table 5.7 summarizes the results of a Kruskal-Wallis H test, which was conducted to compare the distributions of ranks across six independent groups: MBBS, Pharmacy, BBM, BMS, BCT, and Others. The sample sizes vary across these groups, with the MBBS group having the largest sample size (N = 148) and the Others group the

smallest (N = 3). The mean ranks indicate that the BCT group has the highest mean rank (131.93), suggesting that this group tends to have higher values compared to the others, and the others group has the lowest mean rank (92.33), indicating a tendency towards lower values, while other programs come in between, BMS (121), MBBS (109.79), BBM (104), and BPH (102.7).

The overall Kruskal-Wallis H test resulted in a test statistic (H) of 2.693 with 5 degrees of freedom, yielding a p-value of 0.747 which is not statistically significant. This implies that there is no statistically significant difference in the distributions of ranks across the six groups. Therefore, the observed differences in mean ranks are likely due to random variation, and the groups are considered similar in terms of the program variation. (Table 5.7)

Table 5.7: Kruskal-Wallis Test for RIPLS responses from the study respondents in different healthcare programs

Group	Sample size(N)	Sum of Rank	Mean Rank
MBBS	148	16249	109.79
BPH	33	3390	102.73
BBM	13	1359	104.54
BMS	8	968	121.00
BCT	14	1847	131.93
Others	3	277	92.33
Overall Test	**H = 2.693**	**df = 5**	**p = 0.747**

5.3 Discussion

5.3.1 Introduction

This research aims to study the readiness of the learners in healthcare programs for interprofessional learning using the RIPLS. Most of the study participants were enrolled in the MBBS program (67.6%), followed by BPH (15.1%), and smaller percentages in BBM, BMS, BCT, and other programs (BOP, BNT).

5.3.2 RIPLS score among the study participants

This research uses the Readiness for Interprofessional Learning Scale (RIPLS) in assessing the participants' responses toward four items; teamwork and collaboration (TWC) skills, positive professional identity (PPI), negative professional identity (NPI) and roles and responsibilities (RR).

The overall mean RIPLS score of 3.78 reflects a generally positive attitude towards interprofessional learning among healthcare learners. The standard deviation (0.54) suggests moderate consistency in responses. A study by Talwalkar et al. (2016) reported a mean RIPLS score of 3.95 among medical learners. and a study by Maharajan et al. (2017) found a mean RIPLS score of 3.84 among healthcare learners in Malaysia. Other studies found a much higher mean score like the study by Lairamore et al. (2018), which got mean RIPLS score of 4.21 among US health professions learners., Woolley et al. (2019), got a mean RIPLS score of 4.07 among Australian healthcare learners.

It is previously concluded that IPL is generally well-received by learners and plays a crucial role in preparing them for collaborative practice in healthcare (Olson & Bialocerkowski, 2014 ;Reeves et al., 2016)

5.3.2.1 Teamwork and Collaboration (TWC)

The mean scores for all items assessing the TWC skills range from 4.34 to 4.45, indicating that the majority of respondents either agreed or strongly agreed with the statements. This suggests that healthcare program learners have a positive attitude towards the importance of teamwork and collaboration in their education and future practice, which matches with a previous study which reported that healthcare learners who participated in IPL activities demonstrated improved teamwork skills, communication, and understanding of other professions' roles (Hamilton et al., 2021a). Moreover, a systematic review concludes that IPE interventions can lead to positive changes in learners' attitudes and perceptions towards interprofessional collaboration (Reeves et al., 2016).

The respondents in the current study strongly agreed that shared learning with other healthcare learners would benefit them in various ways, such as becoming more effective team members (TWC1), understanding clinical problems better (TWC3), and improving relationships after qualification (TWC4). These findings align with the conclusions drawn by Lapkin et al. (2013), who conducted a systematic review and meta-analysis of the impact of IPE on learners' attitudes and perceptions. They found that IPE interventions can positively influence learners' attitudes towards interprofessional collaboration and their readiness for teamwork.

The respondents also emphasized the importance of communication skills (TWC5) and the need for trust and respect among learners for small groups learning to work effectively (TWC7). These findings are consistent with the recommendations of the WHO, (2010), which highlights the importance of effective communication and

interpersonal skills in interprofessional collaboration for improving patient care outcomes.

Furthermore, the emphasis on communication skills and the need for trust among learners for effective group learning aligns with broader educational goals in healthcare. Studies indicate that early exposure to IPL not only improves learners' collaborative competencies but also enhances their readiness for professional practice (Zechariah et al., 2019). The integration of IPL into healthcare curricula is crucial, as it prepares future professionals to navigate the complexities of patient care effectively (Buring et al., 2009). However, challenges remain in implementing these programs, such as curriculum space and resource allocation, which need to be addressed to maximize the benefits of interprofessional learning (Bogossian et al., 2023 ; O'Keefe & Ward, 2018). Overall, the current findings contribute to the growing body of evidence supporting the implementation of IPL as a vital component of healthcare education.

The overall mean score of 3.90 for teamwork and collaboration suggests a generally positive attitude among learners towards working with others in a team-based environment. The relatively low standard deviation (0.59) indicates consistency in responses. This aligns with recent studies, such as those by Reeves et al. (2016), which emphasize the importance of interprofessional teamwork in enhancing patient care and improving health outcomes. The high mean score indicates that learners recognize the value of effective collaboration in healthcare settings.

5.3.2.2 Negative Professional Identity (PPI)

Regarding the NPI, a significant proportion of respondents strongly disagree (34.2%) or disagree (16.4%) with the statement in NPI1, indicating a generally positive attitude toward learning with other healthcare learners. However, a notable minority still agree (17.4%) or strongly agree (6.4%) with the negative sentiment, suggesting that some learners see interprofessional learning as a waste of time. The relatively high standard deviation (1.51) indicates considerable variability in responses, reflecting diverse opinions among learners. This aligns with previous research results. Healthcare learners generally possess positive attitudes towards IPL, recognizing its importance in fostering teamwork and improving patient care outcomes (Curran et al., 2008).

A similar pattern of responses is observed with NPI2, with a significant portion of learners strongly disagreeing (31.1%) or disagreeing (21.5%) with the necessity of interprofessional learning which indicates recognition of its importance. However, the presence of agreement (15.5%) and strong agreement (17.4%) reflects persistent reservations among some learners. The mean response (2.67) and standard deviation (1.48) suggest that, while many learners appreciate interprofessional education, there is still a substantial number who question its necessity. This resistance is consistent with findings from Tunstall-Pedoe et al. (2003), who reported that some learners perceive IPL as less relevant to their professional identity and learning needs, leading to lower engagement levels.

Regarding NPI3, while a large proportion of learners strongly disagree (29.2%) or disagree (22.8%) with the statement, indicating that they value learning clinical problem-solving skills in an interprofessional context, a significant minority still agrees (17.8%)

or strongly agrees (19.2%). This suggests that some learners believe that clinical skills are best learned within their disciplines. The mean (2.75) and standard deviation (1.51) indicate mixed feelings, with a slightly higher mean than the other NPI items, reflecting a somewhat greater resistance to interprofessional learning in the context of clinical problem-solving.

The influence of professional identity on attitudes towards IPL is a recurring theme in the literature. Hallin et al. (2009) highlighted that learners often feel more comfortable and confident learning clinical skills within their discipline, which can hinder the effectiveness of IPL initiatives. This finding parallels our study's observation that some learners believe clinical problem-solving skills can only be learned with peers from their department. The negative attitudes towards interprofessional collaboration often stem from departmental silos and a lack of understanding of the benefits of shared learning experiences (Margalit et al., n.d..; O'Carroll et al., 2019) Additionally, a systematic review identified that misconceptions about the value of IPL contribute to resistance among learners, particularly when they believe that their discipline's training is superior. This resistance can limit opportunities for developing critical teamwork and communication skills to address complex clinical problems in a collaborative environment. Addressing these negative perceptions through targeted educational interventions and fostering a culture of collaboration may be essential for enhancing interprofessional readiness among healthcare learners (Thistlethwaite & Moran, 2010)

The overall mean score of 3.31 for negative professional identity indicates a moderate level of agreement with negative statements about interprofessional learning. The high standard deviation (1.44) reflects significant variability in learners' responses, suggesting

mixed feelings about the integration of interprofessional education. This finding is supported by research from Tunstall-Pedoe et al. (2016), which found that while some learners see the benefits of interprofessional learning, others hold reservations, often influenced by traditional professional identities and educational experiences.

5.3.2.3 Positive Professional Identity (PPI)

On studying the PPI, the overwhelming majority of learners agree (32.4%) or strongly agree (52.5%) that shared learning improves communication with patients and other professionals (PPI1), indicating strong support for IPEL. The high mean score (4.34) and low standard deviation (0.82) suggest a consistent positive attitude among learners which is supported previously by Spencer et al., (2019), who highlight that shared learning experiences enhance communication skills and improve PPI in healthcare learners.

Responses to PPI2 indicate a strong willingness to engage in small-group projects with peers from other healthcare disciplines, with 53.4% strongly agreeing and 31.5% agreeing. The mean score (4.36) and low standard deviation (0.80) underscore the general enthusiasm for collaborative projects. This aligns with research by Bridges et al. (2011), which found that interprofessional small-group activities foster teamwork and collaborative skills among healthcare learners.

Regarding PPI3, of most learners strongly agree (51.1%) or agree (36.1%) that shared learning helps clarify patient problems, indicating that learners recognize the practical benefits of interprofessional learning. The mean score (4.37) and low standard deviation (0.73) further emphasize the positive perception. A deeper understanding of patient care

through shared learning experiences is supported by IPL (Noguchi-Watanabe et al., 2019).

Responses to PPI4 reflect the strong agreement that shared learning before qualification enhances teamwork skills, with 49.3% strongly agreeing and 37.9% agreeing. The high mean score (4.34) and low standard deviation (0.77) indicate a consistent belief in the benefits of IPL for teamwork. The role of IPL in preparing learners for collaborative practice in healthcare settings has previously highlighted (Hamilton et al., 2021).

The data presented in the current study regarding PPI skills among healthcare program learners indicate a strong endorsement of collaborative learning practices. These results are in line with recent literature that underscores the importance of IPL in developing a positive professional identity among healthcare learners. For instance, a study by Baker et al., (2018), highlights that engaging in IPL not only improves learners' collaborative skills but also fosters a sense of shared responsibility for patient care. Additionally, it is confirmed that positive attitudes towards IPL are associated with better communication skills and a greater willingness to collaborate across disciplines (Hamilton et al., 2021).

The overall high mean score of 4.36 for positive professional identity reflects strong agreement with positive statements about interprofessional learning. The relatively low standard deviation (0.73) indicates consistent positive attitudes among learners. This is consistent with the findings of Bridges et al., (2011) and Hamilton et al., (2021) which showed that learners generally recognize the benefits of IPL for their professional development and future collaborative practice.

5.3.2.4 Roles and Responsibilities (RR)

Roles and Responsibilities which is the fourth item included in RIPLS are assessed among the study participants where the majority of learners agree (29.2%) or strongly agree (37.4%) with the statement that nurses and therapists primarily provide support for doctors. This suggests a hierarchical perception of roles within the healthcare team. However, the mean score (3.86) and relatively high standard deviation (1.17) indicate varied opinions. Nancarrow et al. (2013), emphasized the evolving role of nurses and therapists, advocating for a more collaborative and integrated approach to patient care, which contrasts with the traditional view reflected in the responses.

Responses to RR2 indicate uncertainty among a significant portion of learners regarding their future professional roles. While 26% strongly disagree and 18.7% disagree with the statement, indicating clarity in their professional roles, a notable minority agree (16%) or strongly agree (21%) with the statement. The mean score (2.87) and high standard deviation (1.49) suggest significant variability. This finding is in line with the research by Furr et al. (2020), which discusses the need for clearer role definitions and guidance in interprofessional education to help learners understand their future roles in healthcare.

The majority of learners agree (31.1%) or strongly agree (32%) that they need to acquire more knowledge and skills than other healthcare learners (RR3). The mean score (3.79) and moderate standard deviation (1.10) reflects a prevalent belief among learners about the demands of their training. This sentiment is supported by findings from studies like Frenk et al., (2010) which highlights the intensive nature of healthcare education and

the perception among learners that their discipline requires a broader and deeper knowledge base.

These findings resonate with literature that highlights the challenges of role clarity in interprofessional education. A study by Reeves et al. (2016) emphasizes that unclear professional roles can hinder effective collaboration and communication among healthcare teams. Furthermore, misconceptions about professional roles contribute to the persistence of traditional hierarchies in healthcare settings, which can limit the effectiveness of interprofessional collaboration (Eichbaum, 2018).

The overall mean score of 3.59 for roles and responsibilities indicates a positive but less strong agreement compared to other domains. The standard deviation (0.61) suggests moderate variability in learners' perceptions. Studies like those by MacDonald et al., (2010) and Furr et al. (2020), highlight the ongoing need for clear role definitions and guidance within interprofessional education to help learners understand their professional roles and responsibilities better.

5.3.3 The relationship between the study program of the learners and their readiness for IPL

The Kruskal-Wallis H test was conducted in this study to explore the differences in median ranks across the six groups of the involved healthcare programs: MBBS, Pharmacy, BBM, BMS, BCT, and Others. There are no statistically significant differences among the groups. These findings suggest that, despite the varying mean ranks observed across the groups, these differences are likely due to random variation rather than any substantive underlying differences between the groups.

The lack of statistically significant differences across these educational programs could have several implications in the context of medical education. First, it suggests that students from diverse educational backgrounds may have similar attitudes, knowledge levels, or perceptions concerning the subject matter being evaluated. This aligns with findings from prior research, which indicates that educational interventions in medical and allied health programs often result in similar outcomes across different student cohorts (Johnson & Mighten, 2005). This could be due to the standardized nature of educational curricula, which aim to ensure baseline competency across different disciplines (Harden, 2001).

Moreover, the non-significant results may reflect the inherent similarities in educational experiences across these groups, especially when it comes to the interprofessional learning environment. Previous studies have highlighted that IPL tends to level the playing field by providing a common platform for students from various health professions to engage in collaborative learning (Reeves et al., 2016). This can result in a convergence of learning outcomes, as students gain a shared understanding of healthcare practices, regardless of their specific professional program.

5.4 Chapter Summary

This chapter reveals the findings of this study, and a discussion of the findings is presented. In the next chapter, the conclusion of this study is discussed.

CHAPTER 6: CONCLUSION

6.1 Introduction

This chapter briefs on a summary of the findings, limitations of this study, implications and recommendations for further research, and finally, the conclusion of the study is presented.

6.2 Summary of the Findings

The current study investigated the readiness for interprofessional learning (IPL) among healthcare learners at Management and Science University (MSU), utilizing the Readiness for Interprofessional Learning Scale (RIPLS). The findings indicate a generally positive readiness for IPL, with an overall mean score of 3.78 out of 5. Notably, learners demonstrated strong attitudes towards teamwork and collaboration, as well as a positive professional identity, with mean scores of 3.90 and 4.36, respectively. BCT learners showed the highest readiness, followed by BMS and MBBS learners, indicating a widespread appreciation for IPL across different healthcare disciplines.

However, the study also revealed some variability in readiness, particularly concerning roles and responsibilities and negative professional identity, with moderate scores in these areas. Some learners expressed uncertainty about their future professional roles, highlighting ongoing challenges in fully integrating IPL into healthcare training. These insights emphasize the need for tailored IPL activities that address specific program needs, clarify professional roles, and mitigate negative perceptions. By focusing on these areas, educators can enhance IPL readiness, better prepare healthcare learners for collaborative practice and ultimately improve patient care outcomes.

6.3 Study Limitations

Despite the valuable insights gained from this study, several limitations should be acknowledged. Firstly, the study's cross-sectional design captures a snapshot of IPL readiness at a single point in time, which may not fully reflect changes in attitudes and perceptions throughout the learners' education. Longitudinal studies are needed to track the evolution of IPL readiness and its impact on professional practice over time.

Secondly, the sample size, while sufficient for initial analysis, was limited to learners from a single institution (Management and Science University). This may affect the generalizability of the findings to other institutions and contexts. Expanding the study to include multiple universities and a more diverse sample could provide a more comprehensive understanding of IPL readiness across different educational settings. Additionally, the use of qualitative methods, such as interviews or focus groups, could provide a more nuanced and accurate assessment of attitude. Finally, future research should explore the specific curricular elements, teaching methods, and institutional cultures that influence IPL readiness, allowing for targeted interventions to enhance interprofessional education effectively.

6.4 Implications and Recommendations of the Study

Building on the findings of this study, several avenues for future research are recommended for further understanding and enhancement of IPL in healthcare education. Firstly, longitudinal studies are essential to examine how IPL readiness evolves and to assess the long-term impact of IPL initiatives on professional practice and patient care outcomes. Tracking learners from the beginning of their education through to their professional careers would provide valuable insights into the enduring effects of IPL.

Expanding the scope of research to include multiple institutions and a more diverse sample of healthcare programs can improve the generalizability of findings. Comparative studies across different universities, regions, and countries would help identify universal and context-specific factors influencing IPL readiness. This broader perspective can guide the development of tailored IPL strategies that accommodate diverse educational and cultural contexts.

Additionally, future research should incorporate a mixed-methods approach, combining quantitative measures like the RIPLS with qualitative methods such as interviews, focus groups, and observational studies. This would provide a more comprehensive understanding of learners' attitudes, experiences, and challenges regarding IPL. Qualitative data can uncover nuanced insights into the barriers and facilitators of effective interprofessional education, informing more targeted and effective interventions.

Investigating the specific curricular elements and teaching methods that contribute to higher IPL readiness is another important area for future research. Studies should explore the role of various pedagogical approaches, such as simulation-based learning, case-based discussions, and collaborative projects, in enhancing IPL. Understanding the impact of these educational strategies can help in designing more effective IPL curricula that foster collaboration and teamwork among healthcare learners.

Lastly, examining the role of institutional culture and support in promoting IPL is crucial. Research should assess how different institutional policies, resources, and faculty development programs influence learners' readiness for interprofessional collaboration.

Identifying best practices and successful models of IPL integration can provide valuable guidance for educational institutions aiming to improve their IPL programs.

In summary, future research should aim to longitudinally track IPL readiness, expand the diversity of study samples, employ mixed methods approaches, investigate effective curricular elements, and explore the role of institutional culture in fostering interprofessional education. These efforts will contribute to a deeper understanding of IPL and support the development of more effective strategies for preparing healthcare professionals for collaborative practice.

6.5 Conclusion

In conclusion, our study reveals that healthcare learners at Management and Science University (MSU) exhibit a generally positive readiness for interprofessional learning (IPL). The overall high mean RIPLS score of 3.78 reflects this positive attitude, particularly in terms of teamwork and collaboration, and positive professional identity. Medical (MBBS) learners demonstrated the highest readiness scores, followed by Pharmacy and other healthcare programs, indicating a broad appreciation for the value of IPL across different disciplines. These findings are consistent with the global trend that recognizes the importance of IPL in fostering collaborative skills crucial for effective healthcare delivery.

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