

**HEALTH LITERACY AMONGST AN UNDERGRADUATE UNIVERSITY  
STUDENT POPULATION:  
*A COMPARATIVE STUDY***

by

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submitted in accordance with the requirements  
for the degree of

**MASTER OF ARTS IN PSYCHOLOGY**

at the

**UNIVERSITY OF PRETORIA**

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August 2023

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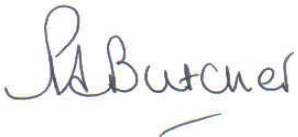
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## Acknowledgements

I would like to express my heartfelt gratitude to all those who have contributed to the successful completion of my Master's of Arts in Psychology dissertation. This milestone would not have been possible without the support, guidance, and encouragement from numerous individuals, institutions, and a higher power.

First and foremost, I extend my deepest appreciation to my esteemed supervisor, Dr S.N. Mostert, whose unwavering support, guidance, and expertise have been pivotal to the successful completion of this dissertation. Her extensive knowledge and experience in the field of health literacy, coupled with their attention to detail and critical feedback, has shaped every aspect of my research. Dr. Mostert's dedication to my academic growth and personal development has fostered a supportive and intellectually stimulating environment. I am forever grateful for her mentorship, which has enhanced my research skills and instilled in me a sense of confidence and determination to overcome challenges.

A heartfelt thank you to Pamela Butcher, who meticulously reviewed and edited my dissertation. Your keen attention to detail, constructive suggestions, and dedication to ensuring clarity and coherence have been instrumental in refining the final presentation of my work. Your expertise has truly elevated the quality of my dissertation, and I am grateful for your valuable contribution.

I would also like to extend my sincere gratitude to the participants who generously dedicated their time and shared their experiences for this quantitative study. Their participation and cooperation have been invaluable, and I am deeply grateful for their involvement, as their contributions formed the backbone of this research.

I am immensely grateful to my mother, Wena Venter, for her unwavering support and encouragement throughout my master's dissertation. Her belief in my abilities, insightful guidance, and selfless sacrifices have been an endless source of inspiration. Her intellectual contributions and emotional support have significantly enhanced the quality of my research and provided me with the strength to overcome challenges. This achievement is a testament to her unwavering dedication and belief in my potential. I dedicate this accomplishment to her



with deep gratitude and admiration for her immeasurable impact on my life. Thank you, Mom, for being my guiding light and biggest cheerleader.

My heartfelt appreciation also goes to my godmother, Sankie Naudé, and godfather, Rudolph Stassen, for their unconditional love, unwavering support, and belief in my abilities. Their constant encouragement, guidance, and love have been the driving force behind my pursuit of higher education. I am eternally grateful for their presence in my life.

I am deeply grateful to my friend, Heinco du Plessis for his unwavering support and dedication during my master's dissertation. His belief in my abilities and relentless encouragement have been invaluable. Moreover, he provided practical assistance by tirelessly making countless cups of coffee and ensuring I had a conducive study environment. Despite the challenges of finding elusive articles and resources, he persistently searched and located them, meeting my adamant requests. His constant presence, love, and willingness to go above and beyond have been crucial to my journey. I am profoundly thankful for his contributions and the immeasurable impact he has had on my academic success.

Furthermore, I want to acknowledge and express my gratitude to God for His divine guidance, blessings, and grace throughout this academic endeavor. His unwavering presence and spiritual support have provided me with strength, resilience, and inspiration during times of difficulty and doubt.

Lastly, I would like to express my gratitude to all the researchers, scholars, and authors whose works have formed the foundation of my research. Their insights, theories, and empirical studies have guided and inspired my own exploration in the field of health literacy.

To all those who have played a role in my academic and personal growth, including Dr Mostert, Ms Butcher, my mom, my godmother and godfather, and Heinco, I offer my sincerest thanks. Your contributions have made a lasting impact on my journey, and I am truly humbled by your support.

Thank you all for being an integral part of this significant milestone in my academic career.

## Abstract

The transition from adolescence to young adulthood, particularly during the undergraduate years, is a critical period for the development of long-term health behaviours. As students begin to take responsibility for their own health and well-being, the choices they make during this time can have lasting effects on their health outcomes in adulthood. Research has indicated that health literacy (HL) is a critical factor in promoting and maintaining health-enhancing behaviours and preventing non-communicable diseases (NCDs). Undergraduate students in South Africa often have limited HL regardless of their background or educational experience. This study delved into the realm of HL among undergraduate university students, specifically examining disparities between students enrolled in the Faculty of Health Sciences and those in the Faculty of Humanities, with a focus on mental health-related disciplines. This study's primary aim was to determine and compare HL levels within these distinct academic trajectories. Using a quantitative research approach, the study employed a comparative research design and collected data through an online survey. The Health Literacy Questionnaire (HLQ) was used to measure HL across nine subscales. The sample included 77 participants registered in different faculties ( $n=77$ ). Descriptive statistics were used to present participants' demographic information and summarize HLQ scores. An independent samples *t*-test and Mann-Whitney U test were employed to examine differences in HL levels between faculties and subscales. The findings revealed that students enrolled in the Faculty of Health Sciences generally demonstrated higher HL levels across certain subscales compared to their counterparts in mental health-related disciplines within the Faculty of Humanities. This research contributes valuable insights into understanding the disparities in HL among undergraduate students across distinct academic faculties, underscoring the importance of targeted interventions to enhance health-related knowledge and skills within specific academic domains.

**Keywords:** Health literacy; health; mental health; undergraduate students

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## **CHAPTER 1: Introduction**

### **1.1 Introduction**

This introductory chapter presents the background to the research study, which examined the health literacy (HL) levels of undergraduate students registered in the Faculty of Health Sciences versus those enrolled in the Faculty of Humanities, specifically in any undergraduate psychology module, at a tertiary institution in South Africa. A brief introduction to the concept of HL and a detailed discussion of the problem statement is provided. Particulars of the research question that guided this study and the aim as well as objectives of the study are also included, followed by a discussion on the rationale for this study. The theoretical framework that guided this study is briefly discussed. The concluding section of this chapter contains a brief outline of this dissertation's chapters

### **1.2 Background of the Study**

The transition from adolescence to young adulthood, particularly during the undergraduate years, is a critical period for the development of long-term health behaviours (Bernardo et al., 2017). This period is characterised by significant changes in various aspects of students' lives, including physical, social, emotional, and financial independence. As students begin to take responsibility for their own health and well-being, the choices they make during this time can have lasting effects on their health outcomes in adulthood.

In the South African context, university students face specific health challenges that warrant attention. Research has shown that they experience high levels of stress due to academic pressures, financial constraints, and societal expectations (Burnhams et al., 2020; Peltzer et al., 2019). Mental health issues, such as anxiety and depression, are prevalent among this population, with studies indicating high rates of psychological distress (Bhana et al., 2010; Tomlinson et al., 2009). Furthermore, there are concerns regarding sexual health, substance abuse, and the impact of socio-economic factors on health behaviours (Reddy et al., 2010; Shisana et al., 2019). These factors contribute to the complexity of promoting and maintaining healthy behaviours among university students in South Africa.

In addition, the prevalence of non-communicable diseases (NCDs) in South Africa is a significant health concern. The World Health Organization (WHO) estimates that the



prevalence of NCDs in the country is two to three times higher than in developed countries (WHO, 2020). Conditions such as cardiovascular disease, diabetes, obesity, and certain cancers contribute to a substantial proportion of morbidity and mortality in the country (Mayosi et al., 2012; Statistics South Africa [Stats SA], 2023). These health challenges highlight the importance of promoting HL among university students to empower them to make informed decisions about their health and adopt healthy behaviours that can prevent NCDs. HL refers to the ability to access, process and understand information about health (Al Sayah et al., 2013; Osborne et al., 2022; Saeed et al., 2018). It is a defining feature of health and involves the social and cognitive elements related to how people understand and use health-related information to manage their health (Barsell et al., 2018; Friss et al., 2016; Rababah et al., 2019; Rueda-Medina et al., 2020), and to make educated decisions about their health.

Research has indicated that HL is a critical factor in promoting and maintaining health-enhancing behaviours and preventing NCDs (Aaby et al., 2017; Nutbeam, 2017). However, undergraduate students in South Africa often have limited HL regardless of their background or educational experience (Joseph et al., 2016; Rababah et al., 2019). Limited HL can result in inadequate knowledge about health-related topics, hinder students' ability to adopt and maintain healthy lifestyles, and affect their understanding of sexual health information, including safe sex practices and prevention of sexually transmitted infections (Simbayi et al., 2019; Cha et al., 2014; Lupi et al., 2015; Papadaki et al., 2007).

Addressing HL among undergraduate students in South Africa is crucial in empowering them with the knowledge and skills needed for making informed health decisions and adopting healthy behaviours. By promoting HL, students can develop a deeper understanding of the factors influencing their health, navigate the healthcare system more effectively, and engage in health-promoting activities (Paek et al., 2014). Enhancing HL among this population is essential for improving overall health outcomes, reducing health disparities, and tackling the burden of NCDs in South Africa.

### **1.3 Rationale and Problem Statement**

Students demonstrate insufficient HL knowledge in several domains. They lack knowledge about using food labels, for example, (Cha et al., 2014), or buying and preparing healthy meals using a restrictive budget (Lupi et al., 2015; Papadaki et al., 2007). Students living away from their families no longer have people who are able to assist them (Vogelpohl & Carpenter,

2013). Research shows that insufficient health-related knowledge may be due to low levels of HL (Buja et al., 2020; Rueda-Medina et al., 2020). Limited HL is widespread and affects all parts of society (Speros, 2005; Kripalani & Weiss, 2006). Even individuals with a good education and sufficient income can demonstrate low levels of HL when they experience something for the first time (Nutbeam, 2015; Moyo & Salawu, 2017; Silva & Santos, 2021). Research shows low HL is particularly evident amongst student populations (Joseph et al., 2016; Rababah et al., 2019; Rueda-Medina et al., 2020), but research about HL within a diverse student sample, i.e., different degree programmes, is limited. This study aimed to explore whether there are differences in the HL levels of undergraduate students across multiple disciplines, particularly amongst students following a health-related career compared to those who do not. Students need to be educated about healthy living, which includes healthy eating, the prevention of health-harming behaviours, how to cope with stress more effectively, and the importance of illness prevention (Vozikis et al., 2014; Steenkamp & Pietersen, 2015; WHO, 2016).

The transition period from adolescence to young adulthood is considered a teachable period where healthy behaviours and knowledge can be instilled (WHO, 2016). If students have the necessary information to empower them to adopt healthier lifestyles, their overall health may improve, thereby minimising the impact on healthcare costs (WHO, 2016). People in need of health care require HL skills to find the necessary information and seek the applicable services. They must be able to express their needs and preferences and acknowledge information and services. Based on the current findings, this study may be used to emphasise the value of HL and to guide the development of interventions to improve HL at an institutional level. The findings may thus contribute to policies to improve HL skills early in higher education and offer an opportunity for students to receive information that will improve their HL (Joseph et al., 2016; Rueda-Medina et al., 2020). Improved HL will alter the perceptions and experiences of individuals about health and their health status (Ayaz-Alkya et al., 2019). Investigating the relationship between HL and health behaviours will provide valuable insights into the factors influencing students' health decision-making and aid in the development of effective health promotion strategies (Ayaz-Alkya et al., 2019). By addressing the research gap in HL levels among undergraduate students, this study can contribute to the formulation of evidence-based policies and interventions aimed at improving HL and promoting healthier lifestyles within this specific population.

The primary aim of this study was to explore differences in HL levels among undergraduate students across various disciplines, with a particular focus on the Faculty of Humanities (encompassing students enrolled for any undergraduate psychology module) and the Faculty of Health Sciences. This comparison is grounded in the premise that students pursuing health-related careers within the Faculty of Health Sciences may demonstrate higher HL levels compared to those enrolled in a mental-health-specific program within the Faculty of Humanities. Anticipating that students from the Faculty of Health Sciences, immersed in coursework related to physiological health, may inherently develop a robust foundation in HL, while students from the Faculty of Humanities (specifically from the Department of Psychology) may draw upon their exposure to psychological principles, potentially contributing differently to their overall HL levels. Exploring HL levels within these specific faculties offer insight into factors influencing HL development and may inform interventions to enhance HL across diverse academic domains.

The rationale for conducting this study stems from the high prevalence of psychological and physical health risks among university students, such as unhealthy eating habits, physical inactivity, excessive alcohol consumption, and smoking (Bernardo et al., 2017). Limited HL among students has been identified as a contributing factor to the adoption and persistence of these health-compromising behaviors. With limited research examining HL levels among undergraduate students in South Africa, particularly within a diverse student sample (Rababah et al., 2019), this study contributes to the existing literature on HL and offers a better understanding of the health-related challenges faced by South African undergraduate students.

#### **1.4 Aim, Objectives and Hypotheses of the Study**

The primary aim of this study was to explore the differences in the HL levels of undergraduate students across various academic faculties. Specifically, the study wanted to investigate and compare the HL levels between students enrolled in the Faculty of Humanities, particularly those undertaking undergraduate psychology modules, and students enrolled in the Faculty of Health Sciences. The main research question guiding this study was: What are the differences in HL levels among undergraduate students enrolled in the Faculty of Humanities and the Faculty of Health Sciences?

**To achieve fulfil the overarching aim, the study outlines the following research objectives:**

- To assess the overall HL levels of undergraduate students within the Faculty of Humanities and the Faculty of Health Sciences.
- To compare the HL levels of students within the Faculty of Humanities to those within the Faculty of Health Sciences.
- To evaluate the HL levels of undergraduate students across the nine subscales of the Health Literacy Questionnaire (HLQ) within the Faculty of Humanities and the Faculty of Health Sciences.

**Based on the main research question, the study puts forward the following hypotheses:**

**H<sub>0</sub>:** Undergraduate students enrolled in the Faculty of Health Sciences demonstrate similar HL levels to those in the Faculty of Humanities.

**H<sub>1</sub>:** Undergraduate students enrolled in the Faculty of Health Sciences exhibit higher HL levels compared to those in the Faculty of Humanities.

**H<sub>2</sub>:** Undergraduate students enrolled in the Faculty of Humanities demonstrate higher HL levels compared to those in the Faculty of Health Sciences.

## **1.5 Implications and Significance**

The present study holds significant implications for the advancement of academic research and knowledge. By examining the variations in HL levels among undergraduate students across different disciplines, this study enhances the current literature on HL in the context of university students (Rababah et al., 2019; Nutbeam, 2008). The findings offer valuable insights into the unique demands and obstacles encountered by students following various academic disciplines, particularly those within the Faculty of Health Sciences compared to those in the Faculty of Humanities.

The implications of this study extend beyond academia and have practical significance for healthcare professionals and public health. Understanding the health behaviours and HL levels of undergraduate students can inform the development of targeted interventions aimed at addressing the specific needs of diverse student populations (Rababah et al., 2019). By identifying lower HL levels in specific disciplines, valuable insights can be gained to develop customised educational programs and interventions that enhance HL in those domains (Nutbeam, 2008). Studies have shown that integrating HL education into the academic syllabus

and providing accessible healthcare services can improve HL levels among students (McDaid, 2016; Paakarri & Paakarri, 2012; St Leger, 2001). This highlights the potential impact of the study's findings in guiding the development of effective strategies for promoting HL among undergraduate students.

Furthermore, the research has policy implications and can guide the formulation of evidence-based guidelines. The results of the study may offer empirically supported perspectives for decision-makers to prioritise HL initiatives in academic establishments (Rueda-Medina et al., 2020). Incorporating HL education and support services into the institutional guidelines can ensure that learners acquire the essential knowledge and competencies to make informed choices regarding their health and overall well-being (Joseph et al., 2016).

## **1.6 Theoretical Framework**

Sørensen's Conceptual Model of Health Literacy (CMHL) is a pioneering theoretical framework that provides a comprehensive perspective on HL. Developed by Kristine Sørensen and colleagues, this model goes beyond viewing HL as a simple dichotomy of being either “literate” or “illiterate” about health information. Instead, it recognises HL as a multidimensional construct that encompasses a range of skills, competencies, and interactions influencing individuals' health-related decisions and behaviours (Sørensen et al., 2012; Nutbeam, 2000).

The CMHL comprises four main components, each representing a distinct dimension of HL including access to health information; understanding and appraising health information; applying health information and engagement with healthcare providers. Sørensen's CMHL offers a powerful framework for comprehensively understanding HL among undergraduate students, as demonstrated by its alignment with the HLQ. This integrated approach aids researchers and educators in tailoring interventions to enhance communication skills, shared decision-making abilities, critical appraisal skills, and overall health-related behaviours among students (Sørensen et al., 2012; Nutbeam, 2000; Osborne et al., 2013). More details on the theoretical framework will be presented in Chapter 2 of this dissertation, specifically in Section 2.9, where Sørensen's CMHL will be elaborated upon.

## **1.7 Chapter Outline**

### ***1.7.1 Chapter 1: Introduction***

This chapter serves as the opening section that provides an overview of the research topic, sets the context for the study, and presents the research problem, objectives, and significance. The theoretical framework is briefly discussed and introduced.

### ***1.7.2 Chapter 2: Literature Review and Theoretical Framework***

The inclusion of a literature review and a theoretical framework are essential elements in research, as they serve to establish a robust basis for the study. The purpose of conducting a literature review is to provide a contextual framework, identify areas of research that have not been explored, and inform the research questions by analysing pertinent information and prior research studies. It is crucial that the process of ensuring that current research is founded on pre-existing knowledge and contributes to the progression of the respective field. The present investigation conducted a comprehensive review of the literature, with a specific emphasis on gathering pertinent information and prior research pertaining to the variables under investigation. The variables under consideration, which are often subject to diverse conceptualisations, necessitated a thorough examination to ascertain the adoption of the most widely accepted definitions and the appropriate operationalisation of the concepts. The researcher ensured conceptual clarity and alignment with the existing body of knowledge by integrating a literature review that explicated the study's notions of health, literacy, and HL.

### ***1.7.3 Chapter 3: Research Methodology***

Research methodology is crucial in conducting rigorous and reliable research. It involves the systematic process of designing, planning, and executing research studies to answer research questions or test hypotheses. Specifics regarding the research design and data collection methods are presented. This chapter describes how the sample was recruited, the measurement instruments used for data collection, and the data collection procedure itself is detailed. The process of statistical analysis is also included in this chapter.

### ***1.7.4 Chapter 4: Findings***

The results obtained from the descriptive and inferential statistical analysis and interpretation of the collected data are presented in this chapter. These findings are based on

the research objectives, research question, and/or hypotheses formulated at the beginning of the study.

#### ***1.7.5 Chapter 5: Discussion***

This chapter offers an analysis and, consequently, an interpretation of the key findings of this study in relation to the research objectives, relevant literature, and theoretical framework.

#### ***1.7.6 Chapter 6: Conclusion, Limitations and Recommendations***

This chapter provides the researcher with the opportunity to delve deeper into the implications, limitations, and significance of the findings and to offer insights and recommendations for future research.

### **1.8 Conclusion**

This chapter provides the roadmap for this research study by providing a clear and concise overview of the research topic, problem, objectives, and significance. A brief chapter outline is supplied to give an indication of the information that is presented in every chapter of this dissertation. An extensive literature review and comprehensive exploration of the theoretical framework employed in this study is provided in Chapter 2.

## CHAPTER 2: Literature Review and Theoretical Frameworks

### 2.1 Introduction

O'German and MacIntosh (2015, p 31) define a literature review as a “comprehensive background of literature within the interested topic area”. Likewise, A theoretical framework serves as the conceptual underpinning for the broader context of a research endeavour, serving as the basis or perspective through which the study is constructed. This framework serves the purpose of establishing a solid foundation for the research focus being examined by including theoretical foundations and providing a structure for data analysis and interpretation (Kivunja, 2018; Nutbeam & Harris, 2004; Swanson, 2013). The primary purpose of using theory in conventional theoretical research is to gain comprehension, provide explanations, and make predictions regarding phenomena (Swanson, 2013). Guiding research endeavours, a theoretical framework informs research questions, data collection procedures, and data interpretation, allowing the selection of a theory to define the research problem and conceptualise variables.

This chapter meticulously delves into the realm of HL, comprehensively exploring a diverse array of perspectives and contextual elements. Progressing through this chapter, the intricate and varied characteristics of health unfold, encompassing its dimensions and substantial impact on human well-being. The chapter navigates the terrain of student health from both the global and South African viewpoints, offering insights into its intricacies within these diverse contexts. Emphasising literacy as a fundamental facet, it delves into the core of HL, analysing definitions, concepts, and significance. Through the exploration of factors shaping HL and recognising its contemporary importance, the groundwork is laid for understanding its pivotal role in health behaviours and equitable health outcomes.

The dynamic phase of emerging adulthood is examined closely, unveiling the complex interplay between HL and the transition to university life. Additionally, the combined global and South African lens exposes wider challenges and opportunities alongside specific contextual complexities. Culminating in this chapter is the revelation of Sørensen's CMHL, which serves as a robust foundation for investigating HL among undergraduate students. This chapter acts as a comprehensive guide, leading through various contexts to establish a base for empirical research that delves into HL complexities within a diverse student population.



## 2.2 Health: A Multidimensional Perspective

Health is a complex and multidimensional concept that encompasses various aspects of an individual's well-being. According to the World Health Organization (WHO), health is defined as “a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity” (WHO, 1948). This definition highlights that health is not just about the absence of illness but also includes a positive state of overall well-being. Health has multiple dimensions, which interact and influence one another. These dimensions include physical, mental, social, and spiritual health (Felman, 2020). Each dimension plays a vital role in an individual's overall health and contributes to their ability to lead a fulfilling life.

Health is a dynamic interplay of various dimensions, with physical, mental, social, and spiritual health all influencing one another. Physical health, which includes factors such as nutrition, exercise, and medical care, directly impacts the individual's overall well-being and quality of life (Felman, 2020). Mental health is closely interconnected with physical health, as emotional well-being affects an individual's ability to cope with stress, make decisions, and maintain healthy relationships (Ciarrochi et al., 2002). Social health, on the other hand, involves an individual's ability to build and maintain positive relationships, connect with others, and participate in the community (Umberson & Karas Montez, 2010). Strong social support networks contribute to better mental and physical health outcomes. Spiritual health, encompassing religious and existential aspects, provides individuals with a sense of purpose, meaning, and connectedness to something greater than themselves (Mohebbifar et al., 2015). A strong spiritual dimension can promote resilience, coping, and overall well-being. Understanding the interplay between these dimensions is essential for designing holistic approaches to health promotion and disease prevention.

Subjective health perception refers to an individual's own evaluation of their health and how they perceive their ability to function in daily life (Araújo et al., 2018). It is influenced by an individual's experiences, beliefs, and cultural background. Subjective health perception is significant because it can influence an individual's health behaviours, healthcare-seeking decisions, and overall well-being. Even if an individual has no diagnosed medical conditions, their subjective health perception can impact their quality of life and engagement in health-promoting behaviours. Positive subjective health perception is associated with better self-esteem, motivation to adopt healthy habits, and improved overall well-being (Bopp et al., 2012). Addressing subjective health perception is essential in health promotion efforts, as it

can help identify areas where individuals may need support or education to improve their overall health and well-being.

Individual lifestyle choices and characteristics significantly influence health outcomes. Engaging in regular physical activity, maintaining a balanced diet, getting enough sleep, and avoiding harmful habits like smoking and excessive alcohol consumption contribute to better physical health (Felman, 2020). Additionally, an individual's personality traits, coping mechanisms, and social skills can impact their mental and emotional well-being (Ciarrochi et al., 2002). Adopting positive health behaviours and developing healthy coping strategies can promote resilience and overall mental health.

Social determinants of health are the economic, social, and environmental factors that influence an individual's health and well-being (HealthyPeople, 2020; WHO, 2017). These factors include income, education, access to healthcare, housing conditions, and social support networks. Higher income and education levels are associated with better health outcomes and access to resources for health improvement (Adler & Newman, 2002). Adequate social support networks can provide emotional and practical assistance during times of stress and illness, thereby positively impacting health (Evans & Stoddart, 1990).

Access to quality healthcare services is crucial for managing health effectively. Healthcare services play a significant role in diagnosing and treating illnesses, promoting preventive measures, and providing essential care for individuals (HealthyPeople, 2020; WHO, 2017). However, healthcare services are not the sole determinant of health. Addressing social determinants and individual lifestyle choices is equally important in achieving better health outcomes and reducing health disparities.

Overall, understanding the multidimensional nature of health and the factors that influence it is essential for promoting health, preventing disease, and improving the well-being of individuals and communities. A comprehensive approach that addresses physical, mental, social, and spiritual health, as well as HL and social determinants, is crucial in promoting a state of complete well-being for individuals and society as a whole.

### **2.3 Student Health: A Global and South African Perspective**

The transition from high school to university marks a significant milestone in students' lives, representing the period known as emerging adulthood (Rababah et al., 2019). This phase, spanning ages 18 to 25, is characterised by the development of adult identities and increasing personal responsibility (Arnett, 2007). However, it also highlights vulnerabilities concerning physical and mental health (Rootman & Galloway, 2013), and sexual health (Compton, 2021; Lechner et al., 2013; von Sadovzky et al., 2006).

During the transition to university, students' physical health becomes a crucial aspect of their well-being. Studies indicate that students often experience negative changes in their diet, such as reduced variety, lower fruit and vegetable intake, and irregular meal patterns (Lupi et al., 2015). Unhealthy eating habits, physical inactivity, stress, alcohol consumption, and smoking can have adverse effects on students' social and physical development, nutritional status, and overall well-being (De Jesus Silva et al., 2016). Weight fluctuations are also common, with some students gaining significant amounts of weight due to poor eating habits and consumption of alcohol, takeaways, and fast food (Sprake et al., 2017). The unhealthy habits developed during college can persist into adulthood, underscoring the importance of addressing these issues during the university years (Rosenbloom, 2016). Enhancing students' HL empowers them to adopt healthier diets and engage in more physical activity, positively impacting their cognitive functioning (WHO, 2016) and academic performance (Reuter et al., 2020). For instance, research has shown that regular breakfast consumption is associated with better academic performance (Reuter et al., 2020).

Moreover, risky sexual behaviour is prevalent among university students (Compton, 2021). Therefore, it is crucial for universities to provide support and services related to sexual health to improve overall health outcomes (Compton, 2021). However, the development of poor health habits in students is influenced by multiple factors, including intrapersonal and environmental factors, stress, and lack of social support (Greaney et al., 2009; Mynhard et al., 2018; Pulz et al., 2017). Additionally, academic commitments and financial pressures contribute to elevated stress levels, depression, and mental health problems among university students (Maqina, 2019; Ribeiro et al., 2018; Stewart-Brown et al., 2000).

The impact of mental health issues on students' academic performance, social relationships, and overall university experience is significant (Compton, 2021). High levels of

stress and student debt make students particularly susceptible to poor mental health (Richardson et al., 2013). Anxiety, depression, and other psychological symptoms are prevalent concerns among college students, highlighting the need for comprehensive mental health support (Bantjes, 2020; Compton, 2021; Maqina, 2019). Therefore, universities must prioritise the offering of comprehensive support and services for mental well-being, in addition to physical health, to enhance the overall quality of students' lives.

When considering students as a vulnerable population, there is an increased risk of adverse health consequences during this critical period of emerging adulthood (De Jesus Silva et al., 2016). Health-related habits often change during the transition to college, influenced by new resources, lack of parental supervision, and a new environment (Reuter et al., 2020). Addressing health behaviours and psychological well-being during this time is crucial, as it sets the stage for long-term health behaviour patterns (Cha et al., 2014). Therefore, understanding students' health requirements and developing effective health promotion interventions is of the utmost importance (Lechner, et al., 2013; Rababah et al., 2019). HL plays a central role in enabling students to make informed lifestyle decisions that support their well-being (Zoellner et al., 2011). Universities should prioritise comprehensive health promotion programs, including education, support services, and creating a healthy environment, to promote the well-being of their student population. Understanding HL and its connection to various health domains is essential for designing effective interventions to support students' overall health and success during their university years.

#### **2.4 Literacy: Understanding the Key Dimensions and Impact on Health and Well-being**

Literacy, as defined by the United Nations Educational, Scientific and Cultural Organization (UNESCO), encompasses a wide range of skills and abilities related to identifying, understanding, interpreting, creating, communicating, and computing with printed and written materials in various contexts (Montoya, 2018). It includes traditional literacy skills such as reading, writing, and numeracy, as well as the use of electronic technology (Hersh, et al., 2015). Advanced cognitive and social literacy skills that enable individuals to actively participate in daily activities, apply new information to changing circumstances, and critically analyse complex information (Marimwe & Dowse, 2019; Nutbeam, 2008) are gained through both formal education and informal experiences (Nutbeam, 2008).

There are two main types of literacy: task-based literacy and skill-based literacy. Task-based literacy focuses on an individual's ability to perform essential literacy tasks, such as reading a basic text or writing a simple statement (Nutbeam, 2009). On the other hand, skill-based literacy centres on the knowledge and skills individuals need to perform these tasks, ranging from fundamental skills like word recognition to higher-level abilities such as drawing conclusions from complex texts (Nutbeam, 2009, 2017). Both task-based and skill-based literacy are essential for individuals to function effectively in various aspects of life (Marimwe & Dowse, 2019).

In addition to general literacy skills, information literacy (IL) is a specific form of literacy that has become particularly relevant in the digital age. Information literacy refers to the ability to recognise when information is needed, locate relevant information, evaluate its quality and reliability, and effectively use it to address a specific need (American Library Association, 2019; Joseph et al., 2016). Given the abundance of information available on the internet, possessing information literacy skills is crucial for individuals to find and assess reliable information amidst the prevalence of misinformation online (Silva & Santos, 2021).

In South Africa, where linguistic and cultural diversity is significant, literacy poses unique challenges. English remains the dominant language of public communication, creating difficulties for individuals with low general literacy skills and linguistic differences to effectively communicate within healthcare settings (von Wühlisch & Pascoe, 2010). The disparity between grade level and literacy level further compounds the challenges, as many individuals struggle to understand health information due to lower comprehension levels in English (Janse van Rensburg, 2020; Reid et al., 2019). Cultural factors also contribute to low literacy levels in South Africa, as there is a tendency to accept information without questioning or fully understanding it (von Wühlisch & Pascoe, 2010). Additionally, socially desirable responses are often chosen over expressing true feelings, particularly on sensitive or personal topics (Grimm, 2010).

Literacy skills have a significant impact on health outcomes and play a crucial role in HL. Individuals with limited literacy abilities receive less health and medical information and have fewer skills to act upon the information they do receive, leading to potential health disparities (Ashcroft, 2009; Rowlands & Nutbeam, 2013). Literacy skills are fundamental for individuals to actively participate in society and access opportunities for personal and

professional growth (Marimwe & Dowse, 2019). Literacy enables individuals to communicate effectively, access information, and participate in education and the workforce (Grossman & Salas, 2011). It promotes social inclusion and empowers individuals to advocate for their rights and interests (Reder & Bynner, 2012). Enhancing literacy levels among populations is not only beneficial for individual well-being but also contributes to social and economic development at community and national levels (UNESCO, 2006).

Being health literate allows individuals to understand health information, make informed decisions about healthcare, and navigate the healthcare system to access appropriate care, thereby promoting better health outcomes (Nutbeam, 2000; Sørensen et al., 2012). HL refers to the skills and abilities required to function effectively in the healthcare system (Marimwe & Dowse, 2019; Nutbeam, 2008; Stormacq et al., 2020).

Increasing the level of literacy within a population positively influences the overall health of the community (WHO, 2007). HL empowers individuals to manage their health effectively, make informed choices, and engage in preventive health behaviours (Nutbeam, 2008). Conversely, low HL has been linked to poorer health outcomes, increased hospitalisations, and higher healthcare costs (Berkman et al., 2011; Paasche-Orlow & Wolf, 2010). Literacy is a crucial determinant of HL, affecting an individual's ability to understand and use health information to promote their well-being (Berkman et al., 2011; Paakkari & Okan, 2020).

In conclusion, literacy encompasses a broad range of skills and abilities related to reading, writing, numeracy, and the use of information in various contexts. It includes task-based and skill-based literacy, as well as information literacy. In the South African context, the challenges of linguistic diversity, low comprehension levels, and cultural factors contribute to lower literacy rates. Literacy skills, including HL, are crucial for individuals to effectively participate in society, access quality information, make informed decisions, and promote their overall well-being. Improving literacy levels can have a significant impact on health outcomes and promote social and economic development in communities.

## **2.5 Health Literacy: Definitions, Concepts and Significance**

In this section, the focus is on exploring the core aspects of HL, including its concepts, definitions, dimensions, and measurement tools. HL is a crucial component in public health

and healthcare, encompassing the knowledge, skills, and abilities required for individuals to access, understand, and apply health information for informed decision-making (IOM, 2004; Nutbeam, 1998, 2000). The section begins by examining various definitions of HL, and understanding how it has evolved over time to address the complexities of health information access and comprehension (Ratzan & Parker, 2000; WHO, 1998). Finally, the section delves into the measurement tools and scales used to assess HL levels, providing valuable insights into an individual's ability to engage with health information effectively (Davis et al., 2002; Parker et al., 1995; Weiss et al., 2005).

HL is the ability of individuals to access, understand, and use information and services to make informed decisions about their health (Rootman & Galloway, 2013). It is a critical factor in promoting health and preventing disease. HL enables individuals to understand health information, communicate effectively with healthcare providers, and navigate the healthcare system. Improving HL is essential for empowering individuals to take charge of their health and make informed decisions about their lifestyle choices, medical treatments, and preventive measures. Health education and communication play a crucial role in enhancing HL and promoting overall health and well-being .

### ***2.5.1 Definition of Health Literacy***

The concept of HL has undergone a significant historical evolution over time. Initially, the term “health literacy” was used in the broader context of general literacy, which primarily referred to the ability to read and write (Nutbeam, 2000). As healthcare systems and the volume of health-related information expanded, the need arose to understand how individuals access, comprehend, and apply health information to make informed decisions about their health.

The modern understanding of HL began to emerge in the 1970s and 1980s when researchers and policymakers recognised the impact of literacy levels on health outcomes (Ratzan & Parker, 2000). The U.S. Department of Health, Education, and Welfare's National Library of Medicine conducted early research on “medical literacy”, which focused on the ability of individuals to understand medical information and instructions (Ratzan & Parker, 2000, as cited in Nutbeam, 2000). This work laid the groundwork for the development of HL as a distinct concept.



In the early 1990s, Parker and Ratzan proposed the term “health literacy” and defined it as “the degree to which individuals have the capacity to obtain, process, and understand basic health information and services needed to make appropriate health decisions” (Ratzan & Parker, 2000; Parker et al., 2003; Ratzan & Parker, 2010). This definition emphasises the importance of an individual’s capacity to comprehend health information and make decisions about their health.

As HL gained recognition as a critical determinant of health outcomes and healthcare utilisation, the WHO took a leading role in shaping the definition of HL. In 1998, the WHO provided a comprehensive definition, describing HL as “the cognitive and social skills which determine the motivation and ability of individuals to gain access to, understand and use information in ways that promote and maintain good health” (WHO, 1998). This definition highlighted the multidimensional nature of HL, encompassing not only cognitive skills but also social abilities that enable individuals to access, understand, and apply health information. It recognised that HL is not solely the responsibility of individuals but is influenced by the accessibility and comprehensibility of health information, the communication skills of healthcare providers, and the health system’s overall support.

Different definitions and conceptualisations of HL exist. On one hand, it can be viewed as the ability to perform specific health-related literacy and numeracy tasks (American Medical Association, 1999). On the other hand, HL is seen as a broader set of cognitive and social skills that enable individuals to engage with health information and actively participate in their healthcare decisions (IOM, 2004; Nutbeam, 1998, 2000).

In conclusion, the historical evolution of the definition of HL reflects the recognition of its importance in health outcomes and decision-making. From its early roots in general literacy, the concept has grown to encompass a multidimensional understanding that considers both cognitive and social skills. The comprehensive definition provided by the WHO has become widely accepted and serves as a foundation for research, policy development, and interventions aimed at improving HL levels and promoting better health outcomes.



### ***2.5.2 Dimensions and components of Health Literacy***

HL is not a unidimensional construct but rather a complex and multidimensional concept encompassing various components and dimensions. Comprehensive HL involves both cognitive processes, such as memory, learning, and language use, and affective processes, including competence, capacity, self-reflection, motivation, trust, well-being, and belief in one's ability to achieve health-related goals (Batterham et al., 2017; Hepburn, 2012; Smith & Kelly, 2015). These affective dimensions play a vital role in influencing an individual's motivation to seek health information, adopt health-promoting behaviours, and effectively manage their health.

In the context of public health models, HL is often described across three main domains:

- **Access and Utilisation of Healthcare Services**

This domain emphasises the importance of individuals being able to navigate the complex healthcare system, find appropriate resources, and understand healthcare information (Nutbeam, 2008). HL enables individuals to access the healthcare services they need, ensuring equitable healthcare utilisation and reducing disparities in health outcomes.

- **Provider-Patient Interaction**

In this domain, HL plays a significant role in facilitating effective communication and shared decision-making between healthcare providers and patients (Paasche-Orlow, 2008). When patients possess adequate HL skills, they can better understand medical information, express their health concerns, and actively participate in treatment decisions, leading to improved health outcomes.

- **Capacity for Self-Care and Informed Decision-Making**

This domain addresses the individual's capacity and competence to engage in self-care activities and make informed choices regarding their health (Hepburn, 2012). HL empowers individuals to understand and follow medical recommendations, manage chronic conditions, and adopt preventive health behaviours, promoting overall well-being.

The dimensions of HL can be further categorised as follows:

- **Functional Health Literacy**

This dimension refers to the basic reading, writing, numeracy, and information-processing skills needed to understand and use health-related materials and instructions. Individuals with higher functional HL are better equipped to navigate health systems, interpret prescription labels, and comprehend health education materials (Parker et al., 2003).

- **Interactive Health Literacy**

This dimension focuses on the interpersonal skills required for effective communication with healthcare providers and the ability to actively engage in healthcare decision-making. It involves understanding medical jargon, asking relevant questions, and advocating for one's health needs (Schillinger et al., 2003).

- **Critical Health Literacy**

Critical HL involves the capacity to analyse, evaluate, and critically appraise health information and sources. It enables individuals to make informed judgments about the credibility and relevance of health information, empowering them to make evidence-based health decisions (Nutbeam, 2008).

- **Communicative Health Literacy**

This dimension pertains to the skills needed to communicate health-related information effectively to others, such as family members, peers, or community members (Takhshi et al., 2013). Being able to convey health information clearly and persuasively is crucial for promoting HL within communities (Wynia & Osborn, 2010).

In conclusion, HL is a multifaceted concept that includes cognitive and affective dimensions, influencing individuals' motivation to seek health information and engage in health-promoting behaviours. The different dimensions of HL, such as functional, interactive, critical, and communicative HL, collectively contribute to the individual's ability to access, understand, and apply health-related information. Understanding these dimensions is essential for designing effective interventions and policies aimed at enhancing HL levels and promoting better health outcomes and health equity.

### ***2.5.3 The Value of Health Literacy***

HL has emerged as a significant and influential factor in shaping individual health outcomes and overall population health. It encompasses an individual's ability to access, understand, and apply health-related information and services effectively. Extensive research has

consistently shown that higher levels of HL are associated with improved health status, reduced mortality, and better healthcare utilisation (Mibei, 2016; Uysal et al., 2019).

Numerous studies have demonstrated that HL is a strong predictor of health outcomes. For instance, research by Mibei (2016) and Uysal et al. (2019) found that individuals with higher HL levels tend to have better health statuses and experience lower mortality rates. This is consistent with the findings from the World Health Organization (WHO, 2013), which highlights HL as a key determinant of health, explaining differences in health status among diverse populations.

What sets HL apart is its capacity to predict health status even more accurately than other conventional demographic factors. Parnell et al. (2019) and Quinlan et al. (2013) found that HL outperforms age, education level, and race as a predictor of health status. This emphasises the significance of addressing HL as a critical factor influencing health outcomes.

Moreover, HL plays a vital role in mediating social disparities in health. Baker (2006), Kaphingst et al., (2012), Allen-Meares et al (2020), and Silva & Santos (2021) all demonstrated that individuals with limited HL face more challenges in accessing healthcare services and experience poorer health outcomes. Addressing HL is thus crucial in reducing health disparities and promoting health self-responsibility, particularly in underserved and disadvantaged populations (Ayaz-Alkya et al., 2019; Pelikan et al., 2018; Stormacq et al., 2020).

A robust HL level empowers individuals to effectively navigate the healthcare system, communicate with healthcare providers, and make informed decisions about their health (Centers for Disease Control, 2015; HealthyPeople, 2020; Moyo & Salawu, 2017; Schulz & Nakamoto, 2013). HL also influences the individual's knowledge, attitudes, self-efficacy, and commitment, thereby shaping their perceptions, experiences, and health behaviours (Ayaz-Alkya et al., 2019; Baker, 2006; Silva & Santos, 2021). Furthermore, high levels of HL are associated with active participation in healthcare discussions, informed health decision-making, adoption of healthier behaviours, development of social capital, and potentially lower healthcare costs (Bo et al., 2014; Ishikawa & Yano, 2008; Mancuso &

Rincon, 2006; von Wagner et al., 2007; Chin et al., 2011; Kickbush et al., 2008; Nutbeam, 2000; Eichler et al., 2009).

The practical implications of HL are far-reaching. Individuals with adequate HL are more likely to engage in self-management practices, adopt healthier behaviours, effectively manage chronic diseases, and make lifestyle changes to promote overall well-being (Ayaz-Alkya et al., 2019; Baker, 2006; Guo et al., 2018; Hoët et al., 2020; Jansen van Rensburg, 2020; Kickbush et al., 2005; Lee et al., 2010; Lui et al., 2015; McCray, 2005; Sarkar et al., 2006; Suka et al., 2015; Uysal et al., 2019). It enables individuals to take responsibility for their own health and that of their families, comprehend complex health concepts, engage in self-care practices, and effectively manage their overall health (Friis et al., 2016; Janse van Rensburg, 2020; Mokwena, 2015; Nielsen-Bohlman et al., 2004; Silva & Santos, 2021).

The impact of low HL versus high HL has been extensively studied, and several research articles provide insights into this topic. Low HL is prevalent and has wide-ranging effects on various aspects of society (Mibei, 2016). It jeopardises healthcare outcomes (Cha et al., 2014; Hersh et al., 2015; Mather et al., 2018; Mullen et al., 2017; Shahid et al., 2022), population health, and health equity (IUPHE, 2018; Vozikis et al., 2014). Low HL leads to poor health outcomes, including higher mortality rates and a decline in health status (Berkman et al., 2014; Hersh et al., 2015; Nielsen-Bohlman et al., 2004; Sun et al., 2013). Poor HL has a particularly negative influence on health outcomes in vulnerable populations, which include individuals over 65 or under 18 years of age, those with limited access to healthcare, limited resources, or pre-existing health conditions (Hepburn, 2012). Low HL is generally more common in lower socioeconomic groups, ethnic minorities, older people, and those with chronic conditions or disabilities (Benjamin, 2010; Sihota & Leonard, 2004).

Low HL essentially predicts increased mortality rates, poor self-management skills, restricted health knowledge, and broader health inequalities (Barr-Walker, 2016; Berkman et al., 2011; Hersh et al., 2015; Inaç et al., 2015; Mather et al., 2018; Osborne et al., 2013; Peterson et al., 2009; Silva & Santos, 2021; Uysal et al., 2019; Serper et al., 2014; Vozikis et al., 2014). It also leads to ineffective and inefficient utilisation of health services and resources, potentially affecting patient safety and the quality of healthcare (Gazmararian et al., 2000; Hersh et al., 2015; Inaç et al., 2021; Mullen et al., 2017; Rudd et al., 2000; USDHHS, 2002).

Insufficient HL is associated with increased healthcare costs for employers and health plans, with people having low HL skills incurring four times the annual health costs compared to those with adequate skills (Blackwell, 2005; Guest et al., 2014). This is based on increased hospitalisation, use of emergency services, and higher healthcare expenses (Ayaz-Alkya et al., 2019; Barr-Walker, 2016; Dewalt et al., 2004; Hepburn, 2012; Inaç et al., 2021; Mather et al., 2018; Mullan et al., 2017; Osborne et al., 2013; Mullen et al., 2017; Nielsen-Bohlman et al., 2004; Serper et al., 2014; Uysal et al., 2019; Vozikis et al., 2014; WHO, 2013). Patients with limited HL may prefer emergency care and perceive it as a better service (Schumacher et al., 2013). Improved HL can lead to improved patient outcomes and cost savings for patients, employers, and health plans (Cohen, 2020).

In conclusion, HL plays a critical role in shaping individual health outcomes and overall population health. Adequate HL empowers individuals to make informed health decisions, engage in self-management practices, and adopt healthier behaviours. On the other hand, low HL is associated with adverse health outcomes and increased healthcare costs. Addressing HL is essential in promoting health equity, reducing disparities in health outcomes, and improving overall population health. The consequences of low HL go beyond individual health outcomes and have broader implications for public health and healthcare systems. Addressing and improving HL is crucial in reducing disparities in health outcomes, promoting health equity, and enhancing the overall quality of healthcare services. It requires multifaceted approaches, including targeted educational programs, enhanced communication strategies, and community-based interventions to empower individuals with the knowledge and skills needed to make informed health decisions and effectively manage their health. By recognising the value of HL and addressing its impact, healthcare systems can work towards achieving improved health outcomes and a more equitable distribution of health resources across diverse populations.

#### ***2.5.4 Health Behavior Theories Relevant to Health Literacy***

The value of HL extends beyond its independent influence on health outcomes. Understanding HL within the context of health behaviour theories enriches our comprehension of the cognitive, psychological, and social underpinnings that drive individuals' health-related decisions and actions. Integrating the theoretical perspectives of various health behaviour models and frameworks, such as the Health Belief Model

(Rosenstock et al., 1988), Theory of Planned Behaviour (Ajzen, 1991), Social Cognitive Theory (Bandura, 1986), Self-efficacy Theory (Bandura, 1997), Social Support Theoretical Framework (Thoits, 2011), and the Shared Decision-Making Model (Charles et al., 1997), provides a multifaceted lens through which to explore the intricate relationship between HL and the factors that shape health behaviours. These health behaviour theories offer comprehensive frameworks for comprehending the mechanisms that drive individuals to adopt health-promoting behaviours.

The Health Belief Model (Rosenstock et al., 1988) examines students' perceptions of benefits and barriers to adopting health-promoting behaviours. This model highlights the significance of perceived susceptibility to health threats, perceived severity of health issues, perceived benefits of taking action, and perceived barriers to action. By considering these elements in relation to HL, we can better understand how students' perceptions of the value of health information and their ability to understand and utilise it influence their health-related decisions (Rosenstock et al., 1988; Washburn, 2020).

The Information-Motivation-Behavioural Skills Model (Fisher & Fisher, 1992) emphasises the key components of information, motivation, and behavioural skills (Osborne & Egede, 2010; Yang et al., 2020). It posits that individuals must possess accurate health information, motivation to act on that information, and the necessary skills to engage in health-promoting behaviours (Osborn & Egede, 2010; Rongkavilit et al., 2010; Yang et al., 2020). When examining HL through this lens, we explore how students' level of understanding, motivation to seek health information, and ability to apply it contribute to their health-related actions.

Self-efficacy Theory (Bandura, 1997) explores students' beliefs in their own capabilities to organise and execute health-related actions. It delves into how students' confidence in their ability to understand and use health information influences their likelihood of engaging in health-promoting behaviours. This theory recognises that individuals with higher self-efficacy are more likely to take proactive steps towards improving their HL and making informed health decisions (Bandura, 1997; Lopez-Garrido, 2023).

The Social Support Theoretical Framework (Thoits, 2011) emphasises the role of social support in shaping health behaviours. It acknowledges that individuals' health actions are influenced by the support they receive from their social networks. When considering HL, this framework underscores the significance of interpersonal communication, advice, and assistance in navigating health information and making health-related decisions (Thoits, 2011).

Social Cognitive Theory (Bandura, 1997) considers how students appraise health information, particularly through observational learning and self-regulation. It suggests that individuals learn by observing others' experiences, successes or failures in health-related actions. This theory sheds light on how students' exposure to health-related content and models can influence their HL and behaviours (Bandura, 1997; Nickerson, 2023).

The Shared Decision-Making Model (Charles et al., 1997) emphasises the involvement of individuals in health-related decisions. It recognises that informed decisions are a joint process between individuals and healthcare providers. In the context of HL, this model underscores the importance of students' ability to comprehend health information, actively participate in discussions, and contribute to decisions about their own health (Charles et al., 1997; Elwyn et al, 2012).

By examining HL through these diverse theoretical perspectives, we gain a more comprehensive understanding of the intricate interplay between HL and health behaviours. These theories provide a structured framework for exploring students' perceptions, motivations, skills, self-efficacy, social interactions, and decision-making processes. Integrating health behaviour theories with HL research enhances our ability to design targeted interventions that empower students to make informed and healthier choices, ultimately contributing to improved health outcomes and more equitable health promotion strategies.

### ***2.5.5 Influential Factors on Health Literacy***

HL is a multidimensional concept that is shaped by a multitude of interconnected factors across personal, situational, intermediary material, psychosocial, health-related, and communication domains. These diverse factors contribute to an individual's HL level and their capacity to understand and engage effectively with health information.



### ***Personal Factors***

Personal factors, as highlighted by Parnell (2015), can significantly influence an individual's HL level and their ability to comprehend and engage effectively with health information. This section will provide a detailed exploration of how each personal factor can influence HL.

Age plays a crucial role in shaping HL (Hansen et al., 2015; HealthyPeople, 2020; Marimwe & Dowse, 2019; Mibei, 2016; Osborne, 2012; Rababah et al., 2019; Silva & Santos, 2021; Sørensen et al., 2012; Squiers et al., 2012; Uysal et al., 2019; Vozikis et al., 2014). Older individuals may have more difficulty accessing and understanding complex health information, particularly in a rapidly evolving digital health landscape (Hansen et al., 2015). Younger individuals, on the other hand, may be more familiar with digital platforms but could still face challenges in comprehending health jargon and technical terms (Mibei, 2016).

Gender can influence how individuals interact with health information and services (Lee et al., 2015; Musakwa et al., 2021; Sørensen et al., 2012; Squiers et al., 2012; Vozikis et al., 2014; Wong, 2016). Studies have suggested that men and women may have different health-seeking behaviours and communication preferences with healthcare providers (Lee et al., 2015). This can impact their ability to access and understand health-related information, leading to variations in HL levels between genders.

Cultural norms and language barriers associated with specific racial and ethnic groups can affect how individuals access and interpret health information (Aaby et al., 2017; Hansen et al., 2015; HealthyPeople, 2020; Mibei, 2016; Paasche-Orlow & Wolf, 2007; Rababah et al., 2019; Sørensen et al., 2012; Squiers et al., 2012). Tailoring health messages to align with diverse cultural beliefs and practices is essential for improving HL among these populations (Sørensen et al., 2012).

Socioeconomic status (SES) has an influence on HL (HLS-EU Consortium, 2012; Garcia-Codina et al., 2019; Svendsen, et al., 2020; Rademakers et al., 2013 Duong et al., 2017; Mavragani et al., 2023; Rababah et al., 2019; Ruegg & Abel, 2019; Silva & Santos, 2021). Individuals with lower SES may face limited access to healthcare and educational



resources, which can hinder their ability to comprehend health information (Pampel et al., 2010). Higher SES individuals, on the other hand, may have more opportunities for health education and better HL skills.

Education is a strong predictor of HL (Aaby et al., 2017; Chen & Chen, 2020; Clouston et al., 2017; Hansen et al., 2015; HealthyPeople, 2020; Hepburn, 2012; Joseph et al., 2016; Levin-Zamir et al., 2016; Marimwe & Dowse, 2019; Mibei, 2016; Paasche-Orlow et al., 2015; Pampel et al., 2010; Silva & Santos, 2021; Rababah et al., 2019; Uysal et al., 2019; Vozikis et al., 2014; Wang et al., 2014; Wong et al., 2020; Zhang et al., 2016a; Zhang et al., 2016b). Individuals with higher levels of education tend to have better reading and comprehension skills, making it easier for them to understand health-related information (Hansen et al., 2015). Nonetheless, even with high levels of education, people may still experience limitations in HL.

The type of occupation (Hepburn, 2012; Squiers et al., 2012) and employment status (Silva & Santos, 2021; Vozikis et al., 2014) of an individual can influence that individual's exposure to health-related information and resources and inherently have an impact on their HL. Those working in healthcare or health-related fields may have better HL due to their professional knowledge and exposure (Squiers et al., 2012).

Income level affects an individual's access to healthcare services and resources (Aaby et al., 2017; Chen & Chen, 2020; Hepburn, 2012; Mibei, 2016; Squiers et al., 2012; Vozikis et al., 2014; Wong et al., 2020). Higher income individuals may have better access to health information and resources, while lower income individuals may face barriers that impact their HL (Hepburn, 2012).

In summary, personal factors exert a profound influence on an individual's HL level and their capacity to effectively engage with health information. Age, gender, cultural norms, socioeconomic status, education, occupation, and income all contribute to shaping an individual's ability to comprehend and access health-related information. These factors highlight the diverse and interconnected nature of HL, emphasising the importance of recognising individual differences in designing targeted strategies to enhance health information comprehension and engagement.

### ***Situational Factors***

Situational factors encompass a wide range of elements that can influence an individual's HL (Rowlands et al., 2017). Social ties and social support can provide a supportive environment that fosters HL by facilitating access to health information and resources (Hepburn, 2012; Ruegg & Abel, 2019; Sørensen et al., 2012). Parental educational level can play a significant role in shaping a person's early exposure to health-related information and their ability to understand and apply it (Rong et al., 2017).

Co-habitation status (Aaby et al., 2017), and living circumstances (Hepburn, 2012) can impact HL by influencing an individual's access to health resources, information, and social support networks. Migration can also be a critical factor affecting HL, as individuals from different cultural backgrounds may face language barriers and encounter health information that is unfamiliar to them (Rababah et al., 2019; Vozikis et al., 2014).

Media usage is another situational factor that can influence HL (Parandeh Ashfar et al., 2022). The way health information is presented in the media can affect an individual's understanding of, and engagement with health-related messages (Catts & Lau, 2008; Marar et al., 2019; Zhang et al., 2022)

Furthermore, an individual's physical environment can have a significant impact on their HL. Access to healthcare facilities and resources, as well as the availability of health-related information in the community, can shape one's ability to access and comprehend health information (Mackenbach, 2006).

Social and environmental factors (Sørensen, 2016), such as culture (Benjamin, 2010; Hepburn, 2012; Mibei, 2016; Osborne, 2012; Sørensen et al., 2012) and language (Hepburn, 2012; Joseph et al., 2016; Marimwe & Dowse, 2019; Mibei, 2016; Osborne, 2012; Sørensen et al., 2012), also play a crucial role in shaping HL. Cultural norms and values can influence an individual's health beliefs and practices, affecting their understanding and application of health information (Benjamin, 2010; Hepburn, 2012; Mibei, 2016; Osborne, 2012; Sørensen et al., 2012). Language barriers can hinder effective communication of health information and limit an individual's ability to comprehend and engage with health-related messages (Hepburn, 2012; Joseph et al., 2016; Marimwe & Dowse, 2019; Mibei, 2016; Osborne, 2012; Sørensen et al., 2012).

Difficulty in communication can also be a significant factor influencing HL. Effective communication of health information is essential for individuals to understand and apply health-related messages (Joseph et al., 2016).

In conclusion, situational factors represent a dynamic interplay of social, environmental, and media-related elements that collectively impact an individual's HL. Social support networks, living circumstances, media usage, and physical environments all contribute to an individual's access to and comprehension of health information. Additionally, cultural norms, language barriers, and effective communication further shape an individual's HL experience. Recognising the intricate relationships between these situational factors is crucial for developing strategies that enhance health information accessibility and understanding of diverse populations.

### ***Intermediary Material Factors***

Intermediary material factors encompass various economic and resource-related elements that can significantly influence an individual's HL. Financial problems (Mackenbach, 2006), income discrepancies (Laç, 2004), and poverty (HealthyPeople, 2020; Silva & Santos, 2021) can act as barriers to accessing health-related information and services. Individuals facing financial constraints may have limited access to educational opportunities, health facilities, and health-related resources, which can hinder their ability to effectively comprehend and engage with health information.

Community resources also play a critical role in shaping HL. Communities with inadequate access to healthcare facilities, libraries, and health promotion programs may face challenges in obtaining reliable health information and resources (Mackenbach, 2006). Limited community resources can further exacerbate health disparities and hinder individuals from making informed health decisions.

Health insurance coverage is another essential intermediary material factor influencing HL. Individuals with limited or no health insurance may have difficulties accessing healthcare services and obtaining essential health information (Laç, 2004). In contrast, those with comprehensive health coverage are more likely to have regular access to healthcare professionals, health education materials, and preventive care, enhancing their

HL levels. Access to medical care is a crucial determinant of HL. Individuals with limited access to medical care may struggle to obtain accurate and timely health information (Berkman et al., 2010; Hepburn, 2012). In contrast, those with better access to medical care are more likely to receive comprehensive health information and guidance from healthcare professionals, improving their ability to understand and apply health-related messages.

To sum up, intermediary material factors play a pivotal role in shaping an individual's HL experience by influencing their access to essential resources and healthcare services. Financial constraints, inadequate community resources, and limited health insurance coverage can all act as barriers to individuals seeking and comprehending health information. Recognising the significance of these material factors is crucial for developing targeted interventions that break down economic and resource-related barriers, ensuring equitable access to health information and resources for all individuals.

### ***Psychosocial Factors***

Psychosocial factors encompass a range of psychological and social elements that can significantly influence an individual's HL. Self-esteem, mastery, and self-efficacy play a crucial role in shaping one's confidence and belief in our ability to understand and engage with health information (Matthews et al., 2010). Individuals with higher levels of self-esteem and self-efficacy are more likely to feel empowered to seek and comprehend health information, enabling them to make informed health decisions.

Physical and cognitive abilities also influence HL. Individuals with physical or cognitive limitations may face challenges in processing and understanding health-related information (Uysal et al., 2019). In contrast, those with strong cognitive abilities are better equipped to comprehend complex health concepts, contributing to higher HL levels.

Self-management capacities are essential psychosocial factors that impact HL. Individuals with effective self-management skills can navigate the healthcare system more efficiently and engage in preventive health behaviours (Goldman & Smith, 2002). On the other hand, individuals lacking self-management skills may struggle to make informed decisions about their health and manage chronic conditions effectively.

Personal capabilities and experiences also shape HL. Personal experiences, such as previous encounters with the healthcare system or health-related challenges, can influence the individual's attitudes and perceptions towards health information (Silva & Santos, 2021). Positive experiences may enhance HL, while negative experiences can create barriers to health information comprehension.

Trust is a critical psychosocial factor influencing HL. Trust in healthcare professionals and health information sources is essential for individuals to rely on and engage with health information (Mibei, 2016; Osborne, 2012). Individuals who trust their healthcare providers are more likely to seek and follow health advice, leading to improved HL and better health outcomes.

Emotions also play a significant role in shaping HL. Emotional states can impact an individual's receptiveness to health information and their ability to process and retain it (Mibei, 2016; Osborne, 2012; Mather et al., 2018). Positive emotions, such as motivation and curiosity, can enhance information processing, while negative emotions, such as fear or anxiety, may hinder comprehension and decision-making.

In conclusion, psychosocial factors wield a profound influence on an individual's HL journey by shaping their psychological and social dimensions. As highlighted by various studies, self-esteem, self-efficacy, physical and cognitive abilities, self-management capacities, personal experiences, trust, and emotional states all contribute to one's capacity to understand and engage with health information. Recognising and addressing these psychosocial factors can pave the way for tailored interventions that empower individuals to navigate health information effectively, make informed decisions, and ultimately enhance their health outcomes.

### ***Health-Related Factors***

Health-related factors encompass a variety of elements that can significantly influence an individual's HL. Attitudes and beliefs towards health and healthcare play a critical role in shaping receptiveness to health information (Abraham & Sheeran, 2005). Positive attitudes and beliefs can foster a proactive approach to seeking and engaging with health information, while negative attitudes may create barriers to information comprehension and utilisation.

Interests in health-related topics can also impact HL. Individuals with a keen interest in health are more likely to actively seek and engage with health information, leading to higher levels of HL (Conner & Norman, 2005).

The social environment also plays a significant role in shaping HL. Social support, access to healthcare resources, and the influence of peers and family members can all impact an individual's health information-seeking behaviours and comprehension (Abraham & Sheeran, 2005).

Health behaviour and risks are crucial determinants of HL. Individuals who engage in healthy behaviours and understand their health risks are more likely to seek and comprehend health information to make informed decisions about their well-being (Vozikis et al., 2014). Disease severity is yet another health-related factor that influences HL. Individuals with more severe health conditions may have a higher motivation to seek and understand health information to manage their conditions effectively (Laç, 2004).

Disabilities can pose challenges to HL. Individuals with disabilities may require accessible formats or additional support to comprehend health information effectively (HealthyPeople, 2020; Mibei, 2016; Osborne, 2012).

Prior health knowledge is a fundamental health-related factor influencing HL. Individuals with a solid foundation of health knowledge are better equipped to understand and apply new health information in their daily lives (Squiers et al., 2012).

In conclusion, health-related factors play a pivotal role in shaping an individual's HL landscape. The interplay between attitudes, beliefs, and receptiveness to health information, alongside personal interests and motivations, sets the stage for seeking and engaging with health content. The social context, encompassing support networks, healthcare access, and peer and family influences, further fosters information-seeking behaviours. Meanwhile, the nexus between health behaviours, risk awareness, and information comprehension underscores the importance of informed decision-making. The gravity of the health condition's severity and the challenges posed by incapacities in information uptake accentuate the need for accessible resources. Finally, the bedrock of prior health knowledge serves as a cornerstone, allowing individuals to navigate and assimilate new information

within their existing framework. Understanding the intricate dynamics of these health-related factors can propel individuals towards enhanced HL and empower them to take charge of their well-being.

### ***Communication Factors***

Communication factors play a pivotal role in shaping an individual's HL by influencing their ability to understand and engage with health information effectively. The language used in health messages is a critical aspect of communication. Health information presented in plain language, free of technical jargon, and easily understandable vocabulary enhances comprehension for a broader audience (Baker, 2006). On the other hand, complex and technical language may create barriers for individuals with lower HL levels.

Message complexity is another communication factor that can impact HL. Information presented in a clear and straightforward manner is more likely to be understood than dense, convoluted content (Guest et al., 2014). By simplifying health information and breaking it down into manageable parts, individuals with varying levels of HL can better engage with and apply the information to their health decisions.

The readability of health information is closely related to message complexity. It involves the consideration of factors such as sentence structure, word choice, and overall text layout (Nielsen-Bohlman et al., 2004). Readable health materials are better suited for individuals with lower HL, ensuring that critical information is accessible to a wider audience.

Text features, including font size, formatting, and graphical elements, can also influence HL. Large and legible fonts, clear headings, and appropriate use of visuals can enhance information retention and comprehension (Hepburn, 2012). Text that is visually appealing and well-organised helps individuals navigate the content more effectively.

The source or messenger delivering health information is another crucial communication factor affecting HL. The credibility and trustworthiness of the source can impact an individual's willingness to accept and act upon the information (Guest et al., 2014). Trusted sources, such as healthcare professionals or reputable organisations, are more

likely to be perceived as reliable, leading to higher engagement and adherence to health recommendations.

In summary, communication factors stand as integral pillars in shaping one's HL journey. The choice of language is paramount, with health messages presented in plain and accessible terms facilitating understanding across diverse audiences. Simplifying complex content, accompanied by clear and well-structured information, aids individuals in grasping and applying health knowledge effectively. Recognising the significance of readability, with attention to sentence structure and layout, ensures inclusivity for those with varying literacy levels. Furthermore, the strategic use of text features, such as font size and visuals, fosters engagement and understanding. Equally crucial is the role of the messenger in delivering health information – a credible and trusted source can inspire action and adherence. By attending to these communication factors, HL can be enhanced, enabling individuals to make informed choices and navigate their wellness journey with confidence.

In conclusion, the exploration of influential factors on HL reveals the intricate interplay between personal, situational, intermediary material, psychosocial, health-related, and communication domains. These domains collectively shape an individual's HL level and their capacity to effectively understand and engage with health information. Personal factors contribute significantly to an individual's HL by influencing their exposure to health information, comprehension abilities, and access to healthcare resources. Situational factors further influence an individual's ability to access and comprehend health-related messages. Intermediary material factors can act as barriers or facilitators to HL, particularly concerning financial constraints, community resources, health insurance, and access to medical care. Psychosocial factors play a pivotal role in shaping confidence, willingness, and emotional disposition to engage with health information. Health-related factors interact to influence HL. Effective communication plays an essential role in enhancing HL. Recognising the interrelated nature of these factors is essential for developing comprehensive strategies that promote HL and empower individuals to make informed health decisions.

## **2.6 Health Literacy and Emerging Adulthood**

Emerging adulthood, often defined as the developmental stage between adolescence and adulthood, typically spans from 18 to 25 years of age (Arnett, 2000). This period is characterised by significant life changes, exploration, and transitions as young individuals



venture into higher education, enter the workforce, and establish personal identities. During this period, emerging adults face unique health challenges and opportunities that warrant special attention from researchers, practitioners, and policymakers (Levine & Settersten, 2019). HL, as a crucial determinant of health-related behaviours and decisions, plays a pivotal role in shaping the well-being of this population group (Kickbusch et al., 2013).

### ***2.6.1 Understanding the Health Needs of Emerging Adults (18 to 25 years)***

The health needs of emerging adults are influenced by several factors specific to this life stage. With increased autonomy and independence, young individuals may experience a sense of invincibility and engage in risky behaviours, such as substance use, reckless driving, and unprotected sexual activity (Nelson & Barry, 2005). Mental health concerns, including anxiety, depression, and stress, are also prevalent during this phase (Kessler et al., 2005). Additionally, many emerging adults face challenges related to access to healthcare services and health insurance coverage, especially as they transition from parental health plans to individual arrangements (Collins, Patel, Kinra, & Sullivan, 2012). Understanding these health needs is essential for designing targeted health promotion and prevention strategies that resonate with emerging adults and address their unique vulnerabilities.

### ***2.6.2 Relationship between Health Literacy and the Transitional Phase to University***

Transitioning to university or higher education is a significant life event for many emerging adults. This transitional phase involves adapting to new environments, academic demands, and social networks (Arnett & Tanner, 2006). HL plays a crucial role during this transition as it influences how young individuals access, understand, and use health information and services available on campus (Rowlands et al., 2015). Students with higher HL are better equipped to navigate the complexities of university life, make informed health-related decisions, and access appropriate resources when needed (Manganello & Falisi, 2018). On the other hand, students with limited HL may face challenges in comprehending health information and effectively communicating with healthcare providers, leading to suboptimal health outcomes (Powers & Nicoleau, 2018).

### ***2.6.3 Impact of Health Literacy on Health Behaviors during Emerging Adulthood***

HL significantly impacts the health behaviours of emerging adults. Individuals with higher HL are more likely to engage in preventive health measures, such as regular health check-ups, vaccination, and healthy dietary choices (Sørensen et al., 2012). They are also more

inclined to seek timely medical care and adhere to prescribed treatments when facing health issues (Paakkari & Okan, 2020). In contrast, those with limited HL may struggle to understand health-related instructions, leading to delayed or inadequate healthcare utilisation and poorer health outcomes (Berkman et al., 2011). Furthermore, low HL can contribute to misunderstandings regarding medication dosage, treatment regimens, and disease management, thereby exacerbating health disparities among young adults (Bostock, Steptoe, & Hamer, 2012).

Interventions and policies aimed at improving HL during emerging adulthood can yield substantial benefits for individual and overall population health. Educational institutions can implement HL programs and initiatives that equip students with essential health information and communication skills (Chesser, Keene Woods, Smothers, & Rogers, 2016). Healthcare providers can adopt HL-sensitive practices, such as using plain language and teach-back techniques to enhance patient understanding (Brega et al., 2015). Public health campaigns can be tailored to resonate with the unique needs and preferences of emerging adults, fostering HL and empowering young individuals to take control of their health and well-being (Paakkari et al., 2018).

In conclusion, recognising the intersection of HL and emerging adulthood is critical for promoting positive health behaviours, addressing health needs, and improving health outcomes among young individuals. By understanding the specific health challenges and opportunities faced by emerging adults and their varying levels of HL, researchers and practitioners can develop targeted interventions and policies to support the health and well-being of this important population group.

## **2.7 Health Literacy: A South African Perspective**

HL is a fundamental factor influencing health outcomes, healthcare access, and health-related decision-making (Pleasant, 2014). In the South African context, HL has gained traction as an important area of research and intervention due to its impact on public health. This section critically examines the current state of HL in South Africa, focusing on its recognition, challenges, and implications for health promotion and equity.

### ***2.7.1 The Emergence of Health Literacy in South Africa***

In recent years, HL has become increasingly recognised as a vital component of public health in South Africa (Volmink, 2018). Researchers and policymakers have acknowledged the importance of HL in reducing health disparities and empowering individuals to take charge of their health. However, despite its significance, HL has yet to be formally acknowledged as a public policy concern, creating challenges in its integration into healthcare systems (Pleasant, 2013).

### ***2.7.2 Challenges in Assessing Health Literacy***

Assessing HL in South Africa presents unique challenges, particularly in a multicultural, multi-ethnic, and multilingual society with varying literacy levels (Marimwe & Dowse, 2019). The absence of suitable measurement tools adapted to the country's diverse population hinders accurate evaluation and understanding of HL levels. Culturally appropriate instruments are necessary to assess HL effectively and inform targeted interventions (Marimwe & Dowse, 2019).

### ***2.7.3 Language Barriers and Health Communication***

Language barriers pose significant challenges in health communication and access to healthcare services in South Africa (Marimwe & Dowse, 2019). English is the predominant language for official communications, but a substantial proportion of the population speaks other languages. This linguistic diversity affects health information comprehension and can lead to miscommunication, hindering the ability to make informed health decisions (Moyo & Salawu, 2017).

### ***2.7.4 Educational Disparities and Health Education Materials***

South Africa faces educational disparities, with a considerable portion of the population having limited or no formal education (Statistics South Africa, 2012). Many of the available materials in South African Primary Health Care (SAPHC) facilities are designed for students in the eighth grade or higher, making them difficult for patients to fully understand (Janse van Rensburg, 2020). Given the educational disparities existing in the country, health materials should ideally be written at a level that is accessible to all, such as the Grade 7 level (Krige & Reid, 2017).

### ***2.7.5 Culturally Sensitive Health Literacy Interventions***

Promoting HL in the South African context requires interventions that are culturally sensitive and tailored to the specific needs of diverse communities (Marimwe & Dowse, 2019). Collaborative efforts involving healthcare providers, policymakers, educators, and community leaders are crucial in developing effective HL initiatives that respect cultural diversity and empower individuals to make informed health decisions (Marimwe & Dowse, 2019).

In conclusion, HL is a critical factor in promoting public health and reducing health disparities in the South African context. Despite its growing recognition, formal policy acknowledgment is yet to be realised, hindering its integration into healthcare systems. Culturally sensitive interventions, collaborative efforts, and the development of appropriate measurement tools are necessary to advance HL and ultimately improve health outcomes for all South Africans.

## **2.8 Health Literacy among university student populations**

HL is an essential skill that empowers individuals to access, understand, and apply health-related information to make informed decisions and take appropriate actions for their well-being. For university students, who represent a diverse and influential demographic, developing strong HL skills is particularly important as they navigate academic and personal challenges whilst building a foundation for lifelong health and well-being. This section explores the nuances of HL among university student populations, including their perceptions, levels of HL, determining factors, and the impact on health-related behaviours and well-being.

### ***2.8.1 Perceptions and Understanding of Health Literacy Among Undergraduate Students***

Understanding how undergraduate students perceive their own HL is a crucial aspect of addressing potential misconceptions and promoting accurate self-assessment. Studies from various countries have shed light on the students' awareness and understanding of HL.

The work of Icket and Cottrell (2010) in the United States illuminates a significant incongruity between how undergraduate students perceive their HL abilities and their actual proficiency. Despite a considerable number of students believing they possess satisfactory HL skills, their performance on HL tasks reveals a different reality. This dissonance

underscores the importance of interventions that not only enhance HL skills but also foster a more accurate self-assessment of these skills.

Research by Aguirre-Hernandez et al. (2020) in Mexico uncovers a lack of consensus among college students regarding the very definition of HL. Moreover, students often possess a limited perception of their own HL skills. These findings emphasise the need for educational initiatives aimed at not only deepening students' understanding of HL but also encouraging them to assess their own HL competencies more realistically.

Nguyen et al., (2019) delve into HL perceptions among undergraduate students in Vietnam and identify a common trend of limited comprehension of HL concepts. This restricted grasp leads students to underestimate their ability to access and effectively utilise health information. These findings underscore the critical role of comprehensive HL education in broadening students' understanding beyond superficial information retrieval.

The study conducted by Manganello et al. (2017) involving college students in the United States uncovers a divergence between students' self-belief in their HL skills and their demonstrated abilities on HL tasks. This discrepancy serves as a reminder of the potential consequences of overestimating one's HL abilities. It reinforces the need for educational interventions that not only align perceptions with actual skills but also bolster those skills to meet perceived levels.

An exploration by Pleasant et al. (2016) in Australia reveals that undergraduate students predominantly associate HL with reading and comprehending health information. However, they often overlook the vital components of critically evaluating information and possessing decision-making skills. This highlights the significance of promoting a comprehensive comprehension of HL. Such an understanding equips students with the diverse skill set necessary to navigate intricate health information landscapes effectively.

The perceptions and comprehension of HL among undergraduate students represent a dynamic interplay of self-assessment, understanding, and application. This complexity underscores the importance of tailored interventions that address misconceptions, promote accurate self-assessment, and cultivate a holistic grasp of HL. By equipping students with a

well-rounded understanding of HL and its multidimensional impact, educational institutions can empower them to make well-informed decisions about their health and well-being.

### ***2.8.2 Significance of Addressing Health Literacy among University Students***

HL plays a pivotal role in empowering university students to make informed decisions about their well-being as they transition into adulthood. Universities are key settings for interventions aimed at improving HL, considering their role in shaping students' knowledge and behaviours.

Jung et al., (2020) conducted a systematic review emphasising the importance of addressing HL among university students. The review highlighted gaps in existing research and the need for comprehensive studies to enhance understanding of HL within this demographic.

Rueda-Medina et al. (2020) highlighted the significance of integrating HL education into higher education curricula, particularly among students pursuing health sciences. They stressed the importance of preparing future healthcare professionals with effective communication skills to convey health information to patients.

Stassen et al. (2020) emphasised the importance of promoting HL in vocational schools, recognising the role of education in empowering young adults to make informed health-related decisions. Similarly, Stollefson et al., (2011) highlighted the necessity of incorporating eHL education for college students, considering the prevalence of online health resources and the need for digital HL skills.

These findings collectively underscore the importance of addressing HL in university settings. By integrating HL education into curricula and promoting accurate self-assessment, educational institutions can equip students with the skills needed to make informed health decisions, both during their academic years and throughout their lives.

### ***2.8.3 Health Literacy Levels across University Students***

HL levels among university students vary significantly based on demographic factors such as geographical location and academic disciplines. Research from various regions highlights the diverse landscape of HL within this population.

Sukys et al. (2017) conducted a study that revealed insufficient HL levels among university students in Lithuania. Notably, they found that those enrolled in health-related courses exhibited comparatively higher HL levels. This suggests that students pursuing studies directly related to health might have a better grasp of health-related concepts and information. Beatty et al. (2014) also uncovered limited HL skills among undergraduate college students where even students pursuing non-health-related disciplines might lack essential HL skills, emphasising the need for comprehensive interventions across all fields of study. Bennett et al. (2018) highlighted a similar issue among Australian university students. Their findings underscored the importance of integrating HL education into academic curricula to ensure that students develop the necessary skills to navigate health information effectively.

Disparities in HL are not only observed across countries but also within specific contexts. Block et al., (2013) demonstrated that urban college students exhibited disparities in HL levels. This indicates that even within the same country, students from different backgrounds or environments might require tailored interventions to address their unique HL challenges.

Moreover, the exploration of HL goes beyond general health knowledge to specific areas such as oral health and health numeracy. Chen et al., (2021) focused on Chinese university students and found that oral HL was an area of concern. This aligns with findings from a study among Malaysian university students conducted by Chong et al., (2021), revealing low HL levels in oral health and health numeracy. These findings highlight the importance of targeting specific aspects of HL to address the diverse needs of university students.

Across different nations and cultures, inadequate HL remains a trend among university students. Eichler et al. (2017) identified this issue among Polish students, while Evans et al. (2019) highlighted it among Ghanaian undergraduate students. Cultural and contextual factors were shown to influence HL outcomes in the latter case. Additionally, Evers et al. (2019) discovered a similar trend among Dutch university students, indicating that insufficient HL skills are a concern among students from various countries.

Collectively, these studies underline the urgency of implementing targeted interventions to enhance HL levels among university students. Incorporating HL education into curricula, irrespective of the field of study, and addressing specific challenges can help bridge existing gaps. By doing so, universities can equip students with essential skills for making informed decisions about their health and overall well-being.

The determinants influencing HL levels among undergraduate students are multifaceted, reflecting a complex interplay of factors that shape their understanding of health information and decision-making abilities.

Rababah et al (2019) conducted a study to explore the relationships among the nine dimensions of HL and sociodemographic factors, including age, gender, nationality, year of study, field of study, smoking status, history of chronic diseases, use of on-campus gym, and the intention to exercise on-campus. They found that the field of study had the most prominent effect on the level of college students' HL. Moreover, the field of study emerged as a key determinant, as evidenced by Moll et al., (2019), who revealed that students in health-related majors exhibited higher HL levels. This suggests that students studying subjects directly related to health might have an advantage in understanding health-related concepts and information.

Various studies have shown that parental education, program enrolment, and academic performance are important determinants of HL levels (Elsborg et al., 2017; Štefaková et al., 2018). Students whose parents have higher levels of education tend to have better HL skills, possibly due to a supportive learning environment and exposure to health-related discussions at home. Additionally, the specific program enrolled in can influence HL, possibly due to variations in the emphasis on health-related content in different academic disciplines.

Age, socioeconomic status, and access to health information were also identified as mediating factors affecting HL levels (Mather et al., 2018; Naghibi et al., 2021). Older students might have more life experiences that contribute to better health knowledge, while socioeconomic factors can impact the availability of resources for accessing health information. Lack of access to reliable health information sources can hinder the development of HL skills.



Furthermore, the impact of health knowledge, practices, behaviours, and health status on HL has been demonstrated (Hansen et al., 2015). Ajayi et al., (2020) found that limited knowledge of chronic diseases predicted low HL among Nigerian undergraduate students. This highlights the importance of having a strong foundation of health knowledge to effectively comprehend health-related information.

Gender has also emerged as a significant determinant of HL levels. Studies have highlighted differences between male and female students (Uysal et al., 2007; Zhu et al., 2020). These differences might be influenced by societal norms, communication styles, and cultural factors that shape how individuals approach and engage with health information.

Additionally, factors such as distress, parental education, and health information sources have been shown to influence HL outcomes (Sarhan et al., 2020). Stress and mental well-being can impact students' ability to engage with complex health information. Parental education can play a role in shaping health attitudes and behaviours, and the sources of health information students rely on can impact the accuracy and depth of their health knowledge.

In conclusion, the intricate interplay of factors including field of study, parental education, program enrolment, age, socioeconomic status, access to health information, health knowledge, gender, and even psychological factors shape HL levels among undergraduate students. Tailored interventions addressing these determinants can significantly enhance HL outcomes and empower students to make informed decisions regarding their health and overall well-being.

#### ***2.8.4 Impact of Health Literacy on Health-Related Behaviors and Well-being of University Students***

HL exerts a significant influence on the health-related behaviours and overall well-being of undergraduate university students. Studies conducted across various countries have explored the relationships between HL and health-promoting behaviours, self-efficacy, quality of life, and mental health.

Lee et al. (2017) found that higher HL was associated with better engagement in health-promoting behaviours among South Korean college students. Li et al. (2020) conducted a study in China and identified a positive correlation between HL and health-related quality of life among university students.

Majumder et al. (2016) focused on HL and health-seeking behaviours among minority college students, revealing a positive association between HL and engagement in health-seeking behaviours. Similarly, Paek et al. (2021) found that lower HL was linked to poorer self-rated health, higher perceived stress, and lower engagement in health-promoting behaviours among South Korean college students.

HL also affects specific health behaviours, such as medication adherence. Baker et al. (2016) highlighted a negative correlation between HL and medication adherence among college students with chronic health conditions.

The impact of HL extends beyond physical health to mental well-being. Faisal-Cury et al. (2021) found that lower HL was associated with higher levels of depressive symptoms among undergraduate students in Brazil.

These findings collectively emphasise the pivotal role of HL in shaping health-related behaviours and well-being among undergraduate university students. Strengthening HL skills through targeted interventions can empower students to adopt healthier behaviours, enhance their quality of life, and support their overall well-being.

### ***2.8.5 Integrating Health Literacy Education across Educational Contexts***

Addressing HL within the education system is paramount to equip students with the necessary skills for navigating the complexities of health information and making well-informed decisions. Integrating HL education into higher education curricula and vocational schools can yield lasting benefits by enhancing students' abilities to manage their health effectively.

Rueda-Medina et al. (2020) stress the importance of incorporating HL education into higher education, particularly for students pursuing health sciences. This approach not only prepares future healthcare professionals but also empowers all students to effectively

communicate health information. By equipping students with the ability to decipher complex medical terminology and communicate health information clearly, higher education institutions contribute to producing well-rounded individuals capable of engaging in informed health discussions.

Recognising that promoting HL extends beyond traditional academic settings, Stassen et al., (2020) emphasise the role of vocational schools in fostering HL among young adults. These settings provide an ideal platform to impart practical health knowledge that individuals can immediately apply to their lives. By addressing HL in vocational education, students are equipped with essential skills relevant to everyday situations, enabling them to make informed decisions about their health in various contexts.

In an era dominated by digital information, Stellefson et al., (2011) underscore the significance of eHL education, ensuring that students possess the skills to critically evaluate and utilise online health resources. With the increasing reliance on digital platforms for health information, eHL is crucial in navigating the vast sea of online resources. Teaching students how to discern credible sources, understand privacy and security concerns, and interpret online health content fosters a generation that is both digitally and health literate.

Expanding upon the importance of integrating HL education, Nutbeam (2008) presents a health promotion approach that emphasises the development of critical HL. This approach goes beyond basic health knowledge to empower individuals to critically analyse health information, evaluate its relevance, and apply it to their lives effectively.

These insights, supported by Nutbeam (2008), Rueda-Medina et al., (2020), Stassen et al., (2020), and Stellefson et al., (2011), underscore the necessity of a comprehensive approach to promoting HL across different educational contexts. By integrating HL education into curricula and addressing the digital dimension, educational institutions play a pivotal role in preparing students for a lifetime of informed health decision-making. Not only do these initiatives benefit individual students, but they also contribute to the overall HL of the population, fostering a society that can make sound health choices based on accurate information.

In conclusion, the reviewed research studies highlight the significant role of HL in influencing health-related behaviours and several domains of health among university students. The findings demonstrate that higher HL levels are associated with better engagement in health-promoting behaviours, improved health-related quality of life, and increased proactive health management. Additionally, HL is found to have a positive impact on self-care practices, medication adherence, self-efficacy, and the adoption of preventive behaviours. These findings emphasise the importance of enhancing HL skills among college students to empower them to make informed decisions, adopt healthy behaviours, and improve their overall health outcomes. It is evident that promoting HL is central for supporting the well-being and academic success of college students, and interventions aimed at improving HL should be a priority in educational and healthcare settings.

## **2.9 Sørensen's Conceptual Model of Health Literacy**

Sørensen's Conceptual Model of Health Literacy (CMHL) is a pioneering theoretical framework that provides a comprehensive perspective on HL. Developed by Kristine Sørensen and colleagues, this model goes beyond viewing HL as a simple dichotomy of being either “literate” or “illiterate” about health information. Instead, it recognises HL as a multidimensional construct that encompasses a range of skills, competencies, and interactions influencing individual’ health-related decisions and behaviours (Sørensen et al., 2012; Nutbeam, 2000).

### ***2.9.1 Components of Sørensen's Conceptual Model of Health Literacy***

The CMHL comprises four main components, each representing a distinct dimension of HL:

- **Access to Health Information**

This dimension pertains to individuals' ability to locate, obtain, and retrieve health information. It recognises that HL begins with the accessibility of information, whether through various media, healthcare institutions, or online resources. In the context of the CMHL, access is the foundation upon which other dimensions are built, emphasising the importance of availability and ease of information retrieval (Sørensen et al., 2012; Nutbeam, 2008).

- **Understand and Appraise Health Information**

This dimension focuses on the individual's comprehension of health information and their ability to critically assess its relevance, accuracy, and credibility. It involves interpreting complex medical terms, evaluating the quality of sources, and discerning reliable information from misinformation. The CMHL underscores that individuals must possess the capacity to understand and critically appraise health information before using it in decision-making (Sørensen et al., 2012; Nutbeam, 2008).

- **Apply Health Information**

Applying health information involves using acquired knowledge to make informed decisions and take appropriate actions regarding one's health. This dimension highlights that HL is not merely about knowledge acquisition but about the practical utilisation of that knowledge to enhance well-being. In the CMHL, the application of health information reflects the individual's ability to integrate knowledge into their lifestyle choices and health-related behaviours (Sørensen et al., 2012; Nutbeam, 2008).

- **Engage with Healthcare Providers**

Effective communication and interaction with healthcare providers are integral to the CMHL. This dimension recognises that individuals need to express their concerns, understand medical advice, and actively participate in healthcare encounters. Engaging with healthcare providers encompasses not only asking questions but also sharing preferences and collaboratively making decisions about treatment and care (Sørensen et al., 2012; Nutbeam, 2008).

### ***2.9.2 Application to Understanding Health Literacy among undergraduate Students***

Understanding the landscape of HL among undergraduate students is a multifaceted endeavor, marked by the diverse disciplines, backgrounds, and life experiences that students bring to their academic pursuits. In this context, Sørensen's CMHL emerges as a potent framework that not only accommodates this diversity but also embraces the multidimensional nature of HL among undergraduate students.

Sørensen's CMHL offers a comprehensive framework for understanding HL among undergraduate students. It acknowledges the diversity of disciplines, the multidimensional nature of HL skills, and the dynamic interaction between academic backgrounds and health-related abilities. By applying this model, researchers can delve deep into how these students

handle health information, make informed decisions, and navigate the intricacies of their chosen fields while embracing their roles as informed individuals within their academic and health contexts.

Undergraduate students are exposed to a wide array of academic disciplines, each characterized by its unique knowledge domains, terminologies, and conceptual frameworks. In this regard, the conceptual framework of Discipline-specific Knowledge and Vocabulary, as proposed by Koehler (2013), assumes relevance within the framework of Sørensen's CMHL. This framework acknowledges that different academic disciplines possess distinct knowledge domains, terminologies, and conceptual frameworks that significantly influence students' comprehension and interpretation of health-related information within the framework of Sørensen's CMHL.

Discipline-specific Knowledge and Vocabulary, within the context of Sørensen's CMHL, refer to the underlying structure and organization of specialized knowledge and terminology within a particular academic discipline or field of study (Bransford et al., 2000). It encompasses the fundamental concepts, principles, theories, and language specific to that discipline, forming the basis for understanding and communicating within that domain. These conceptual frameworks, when viewed through the lens of Sørensen's CMHL, are pivotal in facilitating communication, critical thinking, and problem-solving within a particular field (Haggis, 2009).

For instance, the discipline of mathematics features a conceptual framework that includes mathematical principles, theories, and formulas, along with specialized language and notation used to describe mathematical concepts and operations. Within the framework of Sørensen's CMHL, this framework enables mathematicians to communicate precisely, analyze mathematical structures, and apply mathematical reasoning to various contexts.

Similarly, within the discipline of history, the conceptual framework, as understood through Sørensen's CMHL, comprises historical theories, methodologies, and interpretations, along with specific vocabulary and terminology used to analyze and explain historical events, trends, and developments (Ash & Levstik, 2013). Historians, within the context of Sørensen's CMHL, rely on this framework to analyze primary sources, construct narratives, and engage in historical debates.

The significance of Discipline-specific Knowledge and Vocabulary, when viewed within the framework of Sørensen's CMHL, lies in its ability to facilitate effective communication, critical thinking, and problem-solving within a particular field, thereby enabling scholars, researchers, and practitioners to advance their respective disciplines through rigorous inquiry and exploration.

In conclusion, when examining HL among undergraduate students within the framework of Sørensen's CMHL, it becomes essential to consider the influence of Discipline-specific Knowledge and Vocabulary. This framework, as interpreted through Sørensen's CMHL, provides the foundation for understanding and communicating within academic disciplines and guides the development of knowledge, enabling practitioners to engage in scholarly discourse. Recognizing and addressing the unique HL needs of students in different academic disciplines, within the framework of Sørensen's CMHL, are crucial steps in promoting effective health communication and empowering students to make informed health choices.

### ***2.9.3 Applying Sørensen's Conceptual Model of Health Literacy to the Health Literacy Questionnaire***

Sørensen's CMHL serves as a valuable lens through which to view and analyse the multifaceted dimensions of HL among undergraduate students. When considering the Health Literacy Questionnaire (HLQ) as a tool to assess HL, the CMHL provides a comprehensive framework that aligns with the diverse scales of the HLQ.

In the following section each scale of the HLQ is explored within the context of the CMHL:

- **Scale 1: Feeling understood and supported by healthcare providers**

This scale reflects the interactional dimension of HL highlighted in Sørensen's CMHL (Sørensen et al., 2012). It corresponds to the model's emphasis on individuals' ability to access and understand health information while effectively communicating with healthcare providers. In the context of the CMHL, this scale relates to individuals' confidence in engaging with healthcare providers, asking questions, and expressing their concerns, aligning with the notion of active participation in healthcare encounters (Osborne et al., 2013).

- **Scale 2: Having sufficient information to manage my health**

This scale aligns with Sørensen's CMHL by capturing the cognitive aspect of HL. It reflects the ability to access and comprehend health information, as well as to appraise its relevance to personal health management (Sørensen et al., 2012). The CMHL emphasises individuals' capacity to understand and apply health information to make informed decisions, which resonates with this scale's focus on having enough information to effectively manage one's health (Osborne et al., 2013).

- **Scale 3: Actively managing my health**

This scale corresponds to the interactive and critical dimension of HL described in Sørensen's CMHL (Sørensen et al., 2012). It reflects individuals' confidence and competence in actively participating in self-care and health management. The CMHL underscores the importance of applying health information to engage in effective decision-making and self-management, aligning well with this scale's emphasis on active health management (Osborne et al., 2013).

- **Scale 4: Social support for health**

The "Social support for health" scale links to Sørensen's CMHL by highlighting the interpersonal aspect of HL (Sørensen et al., 2012). It reflects the role of social networks and support systems in enhancing individuals' ability to access, understand, and apply health information. The CMHL acknowledges that social interactions can influence HL by providing opportunities for discussions and exchanges about health information, reinforcing the relevance of this scale (Osborne et al., 2013).

- **Scale 5: Appraisal of health information**

This scale closely corresponds to Sørensen's CMHL by capturing the cognitive dimension of HL (Sørensen et al., 2012). It relates to individuals' ability to critically evaluate and assess the quality and reliability of health information. Sørensen's CMHL emphasises the importance of appraising health information, as it influences individuals' capacity to make informed decisions and choices about their health, underscoring the relevance of this scale (Osborne et al., 2013).



- **Scale 6: Ability to actively engage with healthcare providers**

This scale directly aligns with Sørensen's CMHL, which emphasises the interactive and communicative aspect of HL (Sørensen et al., 2012). It reflects individuals' confidence and skills in engaging with healthcare providers, actively participating in discussions, and contributing to shared decision-making. The CMHL's emphasis on effective communication with healthcare providers resonates with this scale's focus on the ability to engage actively in healthcare interactions (Osborne et al., 2013).

- **Scale 7: Understand health information well enough to know what to do**

This scale mirrors Sørensen's CMHL by highlighting the cognitive dimension of HL (Sørensen et al., 2012). It pertains to individuals' confidence in comprehending health information and applying it to guide their health-related decisions. The CMHL underscores the importance of understanding and using health information effectively, aligning with this scale's focus on individuals' ability to interpret and apply health information (Osborne et al., 2013).

- **Scale 8: Navigating the healthcare system**

This scale corresponds to Sørensen's CMHL by capturing the navigation aspect of HL (Sørensen et al., 2012). It reflects individuals' capacity to access and use health services, as well as to navigate the complexities of the healthcare system. The CMHL acknowledges that HL includes the ability to access and navigate healthcare resources, making this scale relevant in understanding individuals' experiences within the healthcare system (Osborne et al., 2013).

- **Scale 9: Ability to find good health information**

This scale aligns with Sørensen's CMHL by highlighting the interactive and cognitive dimensions of HL (Sørensen et al., 2012). It pertains to individuals' confidence in searching for and identifying reliable and relevant health information. The CMHL underscores the importance of accessing trustworthy health information, which resonates with this scale's focus on individuals' ability to find high-quality health information (Osborne et al., 2013).

In conclusion, the integration of the CMHL not only highlights the multidimensional essence of HL but also offers a robust framework for gaining a comprehensive insight into HL among undergraduate students. Through the examination of each scale of the HLQ using the lens of the CMHL, researchers acquire profound insights into how students access, comprehend, appraise, and apply health information, while also understanding their interactions with healthcare providers and adeptness in navigating the healthcare system. This holistic comprehension forms the cornerstone for the development of precise interventions and educational schemes that cater to the diverse dimensions of HL among undergraduate students. By merging the dimensions of the CMHL with the context of HLQ scales, educators and researchers can adeptly customise interventions to bolster communication proficiencies, shared decision-making capabilities, critical appraisal skills, and overall health-oriented behaviours among students. This approach not only recognises the intricate nature of HL but also empowers students to effectively navigate the intricacies of health information, proficiently engage with healthcare providers, and astutely make informed choices concerning their well-being.

## **2.10 Conclusion**

In conclusion, this chapter offers a comprehensive discussion of HL. By navigating a comprehensive array of topics, from the multidimensional nature of health to the global and South African perspectives, this chapter illuminates the significance of HL in diverse contexts. Through an examination of its definitions, influential factors, and value, the chapter underscores the crucial role that HL plays in shaping health-related behaviours and promoting equitable health outcomes. The lens of emerging adulthood provides insights into the transitional phase to university and its implications for HL development. Moreover, the chapter highlights the nuances of HL on a global scale, particularly focusing on the challenges, interventions, and implications for health promotion. Within the South African context, the chapter summarised the specific challenges and opportunities related to HL. As the journey through the chapter culminates in an exploration of Sørensen's CMHL, it becomes evident that this model serves as a comprehensive framework for exploring HL among undergraduate students. The upcoming chapter provides a discussion of the research methodology used, unveiling the strategies employed to empirically explore HL levels among the diverse population of undergraduate students.

## CHAPTER 3: Research Methodology

### 3.1 Introduction

This chapter introduces the research methodology employed to determine and compare the HL levels among undergraduate university students. Research methodology refers to the systematic approach used to gather, analyse, and interpret data to answer research questions or test hypotheses (Creswell & Creswell, 2017). It encompasses the design, procedures, instruments, and strategies that guide the research process (Creswell & Plano Clark, 2018). This chapter outlines the research approach, design, setting, population, sample, data collection and preparation methods, data analysis techniques, validity and reliability considerations, and ethical considerations.

The choice of research methodology is pivotal to the study's success as it shapes the methods used to explore the intricacies of HL within the student population (Denzin & Lincoln, 2011). This chapter provides a detailed overview of the various aspects that underpin the empirical investigation, ensuring a structured and rigorous research process (Polit & Beck, 2017). The following sections delve into the specifics of the research methodology, offering insights into each phase of the study. By employing a robust research methodology, the study aims to explore the differences in the HL levels of undergraduate students.

### 3.2 Research Approach

Quantitative research allows for the quantification of data and the measurement of various views, interpretations, and opinions within the chosen sample in line with the research aims and objectives (Mohajan, 2020). Quantitative research allows for the investigation of social phenomena by measuring variables, which can be converted to numerical form (Gravetter & Forzano, 2017; Leedy & Ormrod, 2016; Watson, 2015). This numerical data is then analysed and interpreted using statistical techniques to produce objective results (Goertzen, 2017). A quantitative research approach was selected for this research study to compare the HL levels of undergraduate students from different faculties.

### 3.3 Research Design

The research design is the overarching method adopted by the researcher to combine the various components of the study logically and cohesively, ensuring that the research problem

is effectively addressed; it is the outline for data collection, measurement, and analysis (De Vaus, 2001).

This research study intended to explore and compare the HL levels of undergraduate students from various disciplines. This study employed a comparative research design, using a survey method for data collection. The comparative research design explores similarities and differences between social entities.

Comparative research seeks to identify and analyse similarities and differences between two groups to reach a conclusion about them (Esser & Vliegenhart, 2017; Lewis-Beck et al., 2004). The comparative research method is appropriate for this study as it allows for the examination of differences in HL levels among undergraduate students across different faculties.

***The primary research question examined in this study was:***

What are the differences in HL levels among undergraduate students enrolled in the Faculty of Humanities and the Faculty of Health Sciences?

***The primary aim of this study was:***

The primary aim of this study was to explore the differences in the HL levels of undergraduate students across various academic faculties. Specifically, the study wanted to investigate and compare the HL levels between students enrolled in the Faculty of Humanities, particularly those undertaking undergraduate psychology modules, and students enrolled in the Faculty of Health Sciences.

***To achieve the overarching aim, the study outlines the following research objectives:***

- To assess the overall HL levels of undergraduate students within the Faculty of Humanities and the Faculty of Health Sciences.
- To compare the HL levels of students within the Faculty of Humanities to those within the Faculty of Health Sciences.
- To evaluate the HL levels of undergraduate students across the nine subscales of the Health Literacy Questionnaire (HLQ) within the Faculty of Humanities and the Faculty of Health Sciences.

***The following hypotheses guided the research:***

**H<sub>0</sub>:** Undergraduate students enrolled in the Faculty of Health Sciences demonstrate similar HL levels to those in the Faculty of Humanities.

**H<sub>1</sub>:** Undergraduate students enrolled in the Faculty of Health Sciences exhibit higher HL levels compared to those in the Faculty of Humanities.

**H<sub>2</sub>:** Undergraduate students enrolled in the Faculty of Humanities demonstrate higher HL levels compared to those in the Faculty of Health Sciences.

### **3.4 Research Setting and Population**

The study was conducted at a local tertiary institution. Gravetter and Forzano (2017) and Shukla (2020) describe the research population as a large group of individuals or elements known to have similar characteristics or traits that are the focus of the scientific inquiry. The research population for this study comprised students enrolled in undergraduate degree programmes at the Faculty of Humanities (specifically from the Department of Psychology, enrolled for an undergraduate psychology module) and the Faculty of Health Sciences.

### **3.5 Research Sample**

A sample, as defined by Gravetter and Forzano (2017) and Gravetter and Wallnau (2018), is a subset of the research population participating in the study. Approximately 3000 undergraduate students from the Faculty of Humanities (specifically from the Department of Psychology) and the Faculty of Health Sciences were invited to participate in the study.

#### ***3.5.1 Sampling procedure***

Sampling is a process whereby a portion of the target population is selected to represent the total population of the research study. Non-probability sampling entails making non-random selections based on factors such as availability or ease of use, with an effort to maintain representativeness and avoid bias (Gravetter and Forzano, 2018) to enable data collection (McCombes, 2019). The sample's identity is unknown, preventing the use of a random sampling technique (Gravetter and Forzano, 2018). For the purposes of this research, purposive sampling was used. Purposive sampling solely relies on the researcher's judgement to decide where sampling must occur with a specific purpose (Maree, 2017). Participants are selected based on certain characteristics or features that will enable the researcher to collect the data needed to answer the research question. Purposive sampling is

described as a cost-effective method, although it restricts the extent to which the findings can be generalised to larger populations (Acharya et al., 2013).

***Inclusion criteria for this research study:***

- Participants had to be between the ages of 18 and 24 years old. The Organisation for Economic Co-operation and Development (OECD) (2019) regards this as the common age group for undergraduate students.
- Participants needed to be registered as undergraduate students in either the Faculty of Humanities (enrolled in any undergraduate psychology module) or the Faculty of Health Sciences.
- Proficiency in English was a prerequisite for participation.
- Participants were expected to possess computer literacy skills to successfully complete the virtual questionnaires.

***Exclusion criteria for this research study:***

- Individuals below the age of 18 were not eligible for participation.
- Undergraduate students enrolled in faculties other than the Faculty of Humanities (specifically from the Psychology Department) or the Faculty of Health Sciences were excluded.
- Individuals not enrolled at the specified local tertiary institution were excluded from the study.
- All postgraduate students were excluded from participation.

***3.5.2 Sample size***

Determining the ideal sample size for a population of 3000 students depends on several factors including the desired level of confidence, the margin of error, and the variability within the population. However, as a general guideline, a common approach is to use a 95% confidence level and a margin of error of around 5% for most studies. Using these parameters and assuming a simple random sampling method, the researcher used the following formula to calculate the ideal sample size:

$$n = \frac{Z^2 \times p \times (1 - p)}{E^2}$$

Where:

- $n$  = sample size
- $Z$  = Z-score corresponding to the desired confidence level (for a 95% confidence level,
- $Z \approx 1.96$ )
- $p$  = estimated proportion of the population with a particular characteristic (if unknown, 0.5 is often used for maximum variability).
- $E$  = margin of error (expressed as a decimal)

Using the values for a 95% confidence level ( $Z \approx 1.96$ ) and a margin of error of 0.05, and assuming maximum variability ( $p = 0.5$ ), the ideal sample size could be calculated:

$$\begin{aligned}n &= \frac{1.96^2 \times 0.5 \times (1 - 0.5)}{0.05^2} \\n &= \frac{3.8416^2 \times 0.25}{0.0025} \\n &= \frac{0.9604}{0.0025} \\n &= 384.16\end{aligned}$$

The ideal sample size for a population of 3000 undergraduate students would be approximately 385 ( $n=385$ ) undergraduate students. The researcher attempted to sample an equal number of undergraduate students from each respective faculty and a diverse student sample. However, given the voluntary nature of participation, the sample is dependent on students willingness to partake in the research. The final study sample only included 77 ( $n=77$ ) undergraduate students.

### 3.6 Data Collection

Data collection is the systematic process of gathering and measuring information on variables of interest to answer research questions, test hypotheses, and evaluate outcomes (Kabir, 2016). Data was collected using a survey method, enabling the researcher to describe the variable HL for each student group (Cresswell & Cresswell, 2018; Leedy & Ormrod, 2015).

Survey research is the “collection of information from a sample of individuals through their responses to questions” (Check & Schutt, 2012, p.160). This type of data collection offers

various means of assessment. Surveys are widely utilised in social and psychological research because they can describe and explore human behaviour (Singleton & Straits, 2009).

### ***3.6.1 Data collection procedure***

An invitation to participate in this study was shared via a specific module page(s) on the University's internal communication system. An administrative assistant shared the study invitation to several undergraduate module pages, including undergraduate psychology modules. A similar process was followed for the Faculty of Health Sciences, where the invitation was shared to module pages for undergraduate students. The module coordinator/lecturer/administrative staff were thus asked to share the study invitation to students on specific undergraduate module pages to peruse the information sheet. The researcher did not have direct access to the internal communication system. The invitation is available in APPENDIX D. Any student who complied with the inclusion criteria, noted in the invitation, and wanted to participate in the study, was requested to '*click*' on the Uniform Resource Locator (URL) or '*scan*' the Quick Response Code (QR Code) on the invitation, to access the Qualtrics webpage including to the information sheet, informed consent form and the two data collection instruments.

Qualtrics is a web-based survey application that makes conducting surveys, evaluations, and other data-collection tasks easier (Crompton, 2023). This research site can create surveys, send surveys, and analyse responses from any online location at any time (Cushman et al., 2021). Researchers can view and download reports of the results of the surveys they conducted (Barnhoorn et al., 2015). Qualtrics was suitable for this research study as it enabled the sample population to complete the questionnaires at any time, at any geographical location, and data collection was flexible because participants could stop and continue the survey in their own time (Zakharv et al., 2017). It was, therefore, not necessary for the questionnaires to be completed in one sitting. The information sheet includes important information about the research study, is available in APPENDIX E.

### ***3.6.2 Data collection instruments***

A questionnaire is a data collection instrument that consists of a series of questions and other prompts designed to elicit information from respondents (Kabir, 2016; Leedy & Ormrod, 2017). Questionnaires are the most widely used data collection method, as structured surveys can be self-administered and easily completed by participants. Questionnaires



collect data on attributes, attitudes, beliefs, behaviour, activities, and experiences (Preston, 2009). In addition to being easily administered, questionnaires offer anonymity (Leedy & Ormrod, 2017).

Conducting an online survey allows the results to be downloaded immediately into data analysis software for analysis and interpretation (Wright, 2005). In the current study, a survey method allowed the researcher to collect data easily and cost-effectively. Each participant was requested to complete the following questionnaires via Qualtrics: A demographic questionnaire and the HLQ. It took participants from 10 to 20 minutes to complete both questionnaires.

### ***Demographic questionnaire***

A demographic questionnaire enables a researcher to gather information about each participant to contextualise specific characteristics, such as faculty of registration, gender, age, year of study, etc. (Vaessen, 2021). Demographic data in this research study was collected to describe the study sample and ascertain the students' registration faculty. This information also enabled the researcher to ensure the participants complied with the inclusion criteria.

### ***Health Literacy Questionnaire (HLQ)***

The HLQ created by Osborne et al. (2013) was used in this research study to measure HL. The HLQ is a 44-item tool consisting of a collection of independent HL measures, each of which can efficiently measure a different aspect of HL. A licence agreement was signed with the Swinburne University of Technology to use the HLQ.

The HLQ assesses traditional functional HL and other components to cover the entire HL construct. The HLQ explores mechanisms underlying HL disparities and can guide intervention development (WHO, 2015). It is a multidimensional tool designed to provide data that describes the HL strengths and limitations of individuals and populations (Leslie et al., 2020). The HLQ comprises nine dimensions of HL (Osborne et al., 2013). The nine scales are:

- 1) feeling understood and supported by healthcare providers;
- 2) having sufficient information to manage my health;
- 3) actively managing my health;

- 4) social support for health;
- 5) appraisal of health information;
- 6) ability to actively engage with healthcare providers;
- 7) navigating the healthcare system;
- 8) ability to find good healthcare information; and
- 9) understanding health information well enough to know what to do.

These nine scales provide a comprehensive picture of an individual's HL across different dimensions, highlighting areas of strength and areas that may require support or improvement. By using the HLQ, researchers and practitioners can gain valuable insights into the specific aspects of HL that impact individuals' ability to navigate the healthcare system, understand health information, and actively engage in their own health and well-being.

The HLQ has been translated into 33 languages and has been extensively used to measure HL in numerous research studies across 55 countries (Aaby et al., 2017; Anwar et al., 2020; Elsworth et al., 2016; Friis et al., 2016; Hawkins et al., 2017; Leslie et al., 2020; Morris et al., 2017; Mullan et al., 2017; Mather et al., 2018; Rababah et al., 2019; Štefková et al., 2018). Research supports the reliability and validity of this measure. An Afrikaans version of the HLQ was created, but the English version has not yet been administered within a South African context. This measure is, however, regarded as a psychometrically sound instrument to assess HL given its extensive use. Section 3.8 details the psychometric properties of the questionnaire. For Scales 1 to 5 of the HLQ, a participant is asked to indicate how strongly they agree or disagree with the statements listed, using a 4-point Likert scale (1 = *Strongly disagree*; 2 = *Disagree*; 3 = *Agree*; and 4 = *Strongly agree*). For scales 6 to 9, a participant is asked to indicate the level of difficulty they experience when performing the tasks listed, using a 5-point Likert- scale (1 = *Cannot do or Always find difficult*; 2 = *Usually difficult*; 3 = *Sometimes difficult*; 4 = *Usually easy*; 5 = *Always easy*).

### **3.7 Data Preparation**

Data analysis is inspecting, cleaning, transforming, and modelling data to discover useful information to aid decision-making and propose a conclusion based on the research questions outlined (Vassakis et al., 2018).

All data was collected using Qualtrics, and the data was stored on the Qualtrics server. All metadata stored on Qualtrics will be removed from the server once the study is completed. All the data was exported in Microsoft Excel format. The informed consent sections and all personal information were separated from the data and stored in a separate folder. The data set used for analysis only included the demographic information and the responses to the HLQ.

99 Responses were recorded on the Qualtrics server. However, 22 responses were removed as some were incomplete, or the prospective participants neglected to give consent for data collection. The incomplete responses were excluded from the analysis. The final data set used to conduct descriptive and inferential statistical analysis included 77 participant responses. The statistical programme R and IBM Statistical Package for Social Sciences (SPSS) Version 29 was used for analysis in collaboration with a statistician.

### **3.8 Data Analysis**

The data was analysed using descriptive statistics to provide an overview of the study sample and information on the registration faculty. To determine whether there were differences in the HL levels of students from different faculties, inferential statistical analysis was conducted.

#### ***3.8.1 Descriptive statistics***

Descriptive statistics are used to describe, display and summarise the data purposefully to identify patterns (Gravetter & Frozano, 2017; Gravetter & Wallnau, 2018; Leedy & Ormrod, 2015; Trochim & Donnelly, 2008). In this study, the descriptive analysis allowed the researcher to describe the study sample in relation to age, gender and faculty of registration. The data was coded as follows before statistical analysis commenced. Gender: *Female* = 1; *Male* = 2 and *non-Binary* = 3. The faculty of registration was coded as follows: *Faculty of Humanities* = 1 and *Faculty of Health Sciences* = 2. The HLQ responses were coded using the HLQ scoring guide: The items for scales 1 – 5 included coding items P1Q1 to P1Q23 as follows:

- Strongly Disagree = 1
- Disagree = 2
- Agree = 3
- Strongly Agree = 4

Coding for scales 6 - 9 comprised items P2Q1 to P2Q21 and was coded as follows:

- Cannot do or Always difficult = 1
- Usually difficult = 2
- Sometimes difficult = 3
- Usually easy = 4
- Always easy = 5

Descriptive analysis was also used to provide a general overview of the HL of the participants. The researcher was able to accurately describe the different student samples and their HL levels. The findings are presented in Chapter 4 in the form of frequency tables, pie graphs, bar charts, and a crosstabs graph.

### ***3.8.2 Inferential statistics***

Inferential statistics comprises the process through which data is used from a sample to derive conclusions about the wider population from which the sample was obtained. Inferential statistics are used to derive inferences from a sample and generalise them to the entire population of interest (Gravetter & Forzano, 2017; Leedy & Ormrod, 2015; Singh, 2018; Trochim & Donnelly, 2008). This study investigated whether students enrolled in the Faculty of Health Sciences demonstrated different levels of HL compared to those enrolled in the Faculty of Humanities. The HL scores for each scale were also compared between the two student groups. To determine differences in HL among the two student groups, an independent samples *t*-test was performed. Before formal analysis was conducted, it was necessary to determine if any test assumptions were violated. Field (2009) explained that for a dependent and independent *t*-test the following assumptions are important: The data is normally distributed. For each variable, the data were tested to determine if the data were normally distributed using the Shapiro-Wilk Test. For the data normally distributed, the independent *t*-test was used. In the non-parametric version, the Mann-Whitney U test was used for the data not normally distributed. All tests were performed at a 5% level of significance.

#### ***Shapiro-Wilk Test***

This statistical test determines whether a continuous variable has a normal distribution (Shapiro & Wilk, 1965). The null hypothesis ( $H_0$ ) asserts that the variable is normally distributed, while the alternative hypothesis ( $H_1$ ) asserts that the variable is not normally distributed (Shapiro and Wilk, 1965). Therefore, if  $p \leq 0.05$ , then the null hypothesis can be

rejected (i.e., the variable is not normally distributed); and if  $p > 0.05$ , the null hypothesis cannot be rejected (i.e., the variable may be normally distributed) (Shapiro and Wilk, 1965).

### ***Levene's Test***

When data comes from a non-normal distribution, Levene's Test (Levene, 1960) ensures that variances are equal for all samples (Walker et al., 2022). According to Nordstokke and Zumbo (2010), "the null hypothesis for Levene's Test is that the variances across all samples are equal: " $H_0: \sigma_1^2 = \sigma_2^2 = \dots = \sigma_k^2$ " and the alternative hypothesis is that the variances for at least one pair are not equal: " $H_1: \sigma_1^2 \neq \sigma_2^2 \neq \dots \neq \sigma_k^2$ " (p.402).

### ***Independent t-Test***

When two independent groups of 30+ participants each must be compared based on their average score on a quantitative variable, and the variable has a normal distribution in each population, the  $t$ -test is used (Cresswell et al., 2017; Gravetter & Forzano, 2017; Gravetter & Wallnau, 2018; Leedy & Ormrod, 2015; Pallant, 2016; Trochim & Donnelly, 2008). Warner (2020) states that the null hypothesis tested by the independent  $t$ -test is that the medians of the two populations are the same: " $H_0: \mu_1 = \mu_2$ " and the alternative hypothesis may be one of the following: " $H_1: Me_1 \neq Me_2$ " OR " $H_1: \mu_1 < \mu_2$ " OR " $H_1: \mu_1 > \mu_2$ " (p.330).

### ***Mann-Whitney U Test***

This is a non-parametric test for comparing differences between two independent groups based on a single variable, i.e., continuous measure (Pallant, 2016). The Mann-Whitney U Test compares the medians of the two groups and is, therefore, the non-parametric counterpart of the  $t$ -test for independent groups, which compares the means of the two groups (Cresswell et al., 2017; Leedy & Ormrod, 2015; Gravetter & Wallnau, 2018; Pallant, 2016). When the sample size from the populations is small (<30 participants), and it cannot be assumed that the study variable is normally distributed in the populations, the Mann-Whitney U Test is used instead of the  $t$ -test (Cresswell et al., 2017). According to Lammerzhal (2019, p 1), the null hypothesis tested by the Mann-Whitney Test is that the medians of the two populations are the same: " $H_0: Me_1 = Me_2$ " and the alternative hypothesis may be one of the following: " $H_1: Me_1 \neq Me_2$ " OR " $H_1: Me_1 < Me_2$ " OR " $H_1: Me_1 > Me_2$ ".

The assumption of normality was violated in the data for scales 1 - 4 and scales 8 and 9. In this case, the non-parametric alternative was used to determine differences between the groups. The independent *t*-test was used to determine differences for scales 5 - 8. In addition, to determine whether the observed differences were significant, the effect sizes were also reported. For non-parametric tests, Vargha and Delaney's *A* was used and reported the probability that a value from one group would be greater than a value from the other group. A value of 0.50 indicates that the two groups are stochastically equal. A value of 1 indicates that the first group shows complete stochastic domination over the other group, and a value of 0 indicates complete stochastic domination by the second group (Graham, 2011). For parametric tests, Cohen's *d* serves as an effect size statistic for an independent *t*-test. The value ranges from 0 to infinity, with 0 indicating no effect when the means are equal. In certain instances, Cohen's *d* may be positive or negative depending on which mean is greater. Typically, values of 0.2 to 0.5 represent a small effect size, 0.5 to 0.8 indicate a medium effect size, and values larger than 0.8 indicate a large effect size (Cohen, 1988; Lakens, 2013).

In addition to ensuring that all test assumptions are met before conducting parametric statistical analysis, the study should also be evidence of scientific rigour. The next section details the validity and reliability of this research study.

### **3.9 Validity**

The validity of the research study “is the degree to which the study accurately answers the question it was intended to answer” (Gravetter & Forzano, 2017, p. 167). This may be assessed by examining the study's internal, external, and statistical conclusion validity, all of which will be described below. Ensuring that the measurement instruments used to provide scientifically valid results is important. The validity of a measurement instrument refers to the “degree to which the measurement process measures the variable that it was designed to measure” (Gravetter & Forzano, 2017, p. 78).

A wide range of validity testing has been carried out on the HLQ using statistical and qualitative methodologies. The multidimensional structure of the HLQ has been replicated in many languages and cultures (Osborne et al., 2013). The HLQ has been extensively used across several countries and was developed using a validity-driven approach, including in-depth

grounded consultations, psychometric analyses, and cognitive interviews (Osborne et al., 2013). Given the various translations and extensive use of the measure, the questionnaire is considered a valid measure for several domains of HL.

### ***3.9.1 Face validity***

This is how much a procedure, especially a psychological test or assessment, appears effective in terms of its stated aims. The HLQ calculates unbiased mean estimates of group differences in key demographic indicators. While measuring relatively narrow constructs, the nine dimensions are distinct, providing fine-grained data on the multidimensional area of HL (Elseworth et al., 2016).

### ***3.9.2 Content validity***

The extent to which the items on a test represent the entire domain the test seeks to measure (Leedy & Ormrod, 2017; Salkind, 2010). Concept Mapping was used to construct the items of the HLQ, which systematically captures the viewpoints of the target demographics. When the items were created, various people were consulted, including the general public, patients, healthcare practitioners, and lawmakers. Consumers' statements were used to create the items, and the items were cognitively assessed before being tested with two different demographics (calibration and replication samples). In addition, extensive engagement with practitioners supported the content validity of the HLQ items (Osborne et al., 2013).

### ***3.9.3 Construct validity***

The extent to which the measure 'behaves' in a way consistent with theoretical hypotheses and represents how well scores on the instrument are indicative of the theoretical construct (Carter, 2010; Fink, 2010; Leedy & Ormrod, 2017; Reichardt, 2005; Trochim & Donnelly, 2008). Ahmadi and Salehi (2019), and Urstad et al. (2020) determined in their studies that the HLQ is a reliable and valid scale for the investigation of HL.

### ***3.9.4 Criterion-related validity***

When the scores of a test and the criterion variables are obtained simultaneously (often referred to as concurrent validity) or when the criterion variables are measured after/before the current test (Grimm & Widaman, 2012). Criterion validity relates to how a newly developed measure compares to another popular measure of the same construct, i.e., how does the HLQ compare to other measures of HL? The nine HLQ scales capture people's

lived experiences of accessing, understanding, and engaging with health information and health services and are unique aspects of HL. There are few direct comparisons with other scales. The ninth scale - knowing enough health information to know what to do, for example, is most highly correlated with common functional scales, such as the Test of Functional Health Literacy in Adults (TOFHLA) or New Vital Sign (NVS) (Osborne et al., 2013). According to many research studies, the HLQ is predictive of a wide range of disease status, health behaviours, health-promoting behaviours, and other characteristics.

### ***3.9.5 Internal validity***

Internal validity refers to the approximation of truth in inferences about cause-and-effect or causal relationships (Trochim & Donnelly, 2008). This study was descriptive, with the main aim of determining and comparing the HL levels of several groups of undergraduate students. No variables were manipulated, and the study did not control for any extraneous variables. Several student characteristics could thus have confounded the observed relationship; however, no causal conclusions are made. The internal validity in the current study is thus not evidenced by the rigour and control associated with experimental designs. This study described HL for different student groups, and internal validity is not compromised as no cause-and-effect conclusions are made.

### ***3.9.6 External validity***

The extent to which you can generalise the findings of a study to other situations, people, settings, and measures (Trochim & Donnelly, 2008). There are three types of generalisations: population, environmental and temporal (Leedy & Ormrod, 2017). The target population was undergraduate students registered in different faculties at a local South African University. The current study used a non-probability sampling method, i.e., purposive sampling, which details that only people with specific characteristics can be included in the study. The findings may, therefore, not apply to the general population. Participation was also voluntary and dependent on students' willingness to participate.

The main aim of the research was to describe HL as it relates to a particular student group sampled from a single local tertiary institution, and the external validity may thus be compromised as it may not apply to students from other tertiary facilities. This may compromise the extent to which the findings can be related to other student populations as it mainly relates to students registered within specific degree programmes at this local organisation. The sample from each faculty may also not accurately represent the student



population from which it was sampled. The researcher attempted to obtain large enough samples from each faculty to depict an accurate representation of the student population, but the external validity of the current study may be low.

### ***3.9.7 Statistical conclusion validity***

The degree to which we reach reasonable conclusions about relationships in our data is referred to as statistical conclusion validity (Trochim & Donnelly, 2008). The validity of statistical conclusions is concerned with determining whether inferences about a relationship or covariation are reasonable, given the data collected (American Psychological Association, 2020; Shadish et al., 2002).

Statistical conclusion validation occurs when a research study's conclusions are based on adequate sampling procedures (Hufford, 2021), a thorough analysis of the collected data, which generally means that appropriate statistical methods are used for data analysis (Garcia-Perez, 2012; Hufford, 2021). This enables the researcher to logically answer the research question (Garcia-Perez, 2012) and is regarded as the measure for determining how credible or believable a conclusion is (Hufford 2012). In the current study, both descriptive and inferential statistical analysis was conducted. Where test assumptions were violated, the non-parametric version was used. Statistical conclusion validity was thus not compromised in the current study.

## **3.10 Reliability**

Reliability refers to the consistency of a measure; thus if similar results are obtained if the same measure is used with a similar study sample.

### ***Internal consistency***

Internal consistency assesses the correlation between multiple test items intended to measure the same construct (Leedy & Ormrod, 2017; Price et al., 2015). Cronbach's alpha is one method for estimating a measure's reliability. Cronbach  $\alpha$  values are interpreted as follows, values between 0.7 and 0.8 are considered acceptable, while values between 0.8 - 0.9 indicate good reliability. Values smaller than 0.7 are poor and question the scientific value of the measure (Tavokol & Dennick, 2011).

The Cronbach  $\alpha$  for each of the nine scales of the HLQ is detailed below.

- 1) Feeling understood and supported by healthcare providers – Cronbach  $\alpha = 0.81$ .
  - 2) Having sufficient information to manage my health – Cronbach  $\alpha = 0.76$ .
  - 3) Actively managing my health – Cronbach  $\alpha = 0.81$ .
  - 4) Social support for health – Cronbach  $\alpha = 0.78$ .
  - 5) Appraisal of health information – Cronbach  $\alpha = 0.80$ .
  - 6) Ability to actively engage with healthcare providers – Cronbach  $\alpha = 0.81$ .
  - 7) Navigating the healthcare system – Cronbach  $\alpha = 0.75$ .
  - 8) Ability to find good healthcare information – Cronbach  $\alpha = 0.72$ .
  - 9) Understanding health information well enough to know what to do – Cronbach  $\alpha = 0.72$
- (Urstad et al., 2020).

Based on the above-noted information, the reliability coefficients for each subscale are acceptable, and the HLQ is considered a reliable measure to assess HL. An overall Cronbach's alpha of 0.8 was awarded for the HLQ (Osborne et al., 2013).

Internal consistency reliability analysis was performed using Cronbach's alpha to determine how closely related the scales in the questionnaire were as a measure of internal consistency during this research study. The Cronbach Alpha per scale were as follows:

- 1) Feeling understood and supported by healthcare providers – Cronbach  $\alpha = 0.86$ .
- 2) Having sufficient information to manage my health – Cronbach  $\alpha = 0.78$ .
- 3) Actively managing my health – Cronbach  $\alpha = 0.87$ .
- 4) Social support for health – Cronbach  $\alpha = 0.79$ .
- 5) Appraisal of health information – Cronbach  $\alpha = 0.78$ .
- 6) Ability to actively engage with healthcare providers – Cronbach  $\alpha = 0.87$ .
- 7) Navigating the healthcare system – Cronbach  $\alpha = 0.84$ .
- 8) Ability to find good health information – Cronbach  $\alpha = 0.86$ .
- 9) Understand health information well enough to know what to do – Cronbach  $\alpha = 0.79$ .

The overall Cronbach's alpha value for this research study was: 0.95.

### **3.11 Ethical Considerations**

All research is guided by ethical principles aimed at safeguarding the well-being of participants. According to Leedy and Ormrod (2015), these ethical guidelines encompass protection against bias, obtaining informed consent, and ensuring participants' rights to privacy and honesty (Cresswell & Cresswell, 2018). Prior to commencing the research, the researcher

secured ethical approval from the Research Ethics Committees of both the Faculty of Humanities and the Faculty of Health Sciences, as well as the Survey Coordinating Committee at the University of Pretoria. Copies of the respective ethical approval letters are available in APPENDICES A, B, and C. The ethical approval number for this study: HUM014/1121.

Before data collection commenced, an information sheet detailing the study's purpose and participants' responsibilities was shared. The following ethical principles were adhered to in the current study to ensure the wellbeing of all participants:

### ***3.11.1 Voluntary participation***

Participation in this research study was done voluntarily. Individuals who agreed to participate in the study signed an informed consent document (refer to APPENDIX F). They could withdraw from the study at any stage with no negative consequences. Where participants wanted to withdraw, their data was removed.

### ***3.11.2 Confidentiality of data***

Participants remain anonymous by not providing any personally identifiable information linked to the data. Confidentiality was ensured by assigning specific number codes to each participant's response. The informed consent data, including personal information, was separated from the data set used for analysis. Privacy and confidentiality were thus maintained.

### ***3.11.3 Anticipated risk of participation***

The researcher could not identify any foreseeable risks for participation in this research study. No physical or mental harm was thus applicable during participation.

### ***3.11.4 Protection and security of data***

Electronic information will be stored for ten years. Future use of the stored data will be subject to further Research Ethics Review and approval if applicable. The identified electronic data will be stored virtually using the data management system at the University.

## **3.12 Conclusion**

In summary, this chapter presents a comprehensive and well-structured research methodology that serves as the foundation for investigating HL levels among undergraduate students. By

meticulously detailing the research approach, design, setting, population, sample, data collection methods, instruments, and data analysis techniques, this chapter establishes a robust framework for the empirical exploration ahead. The chosen quantitative research approach aligns with the study's objective of comparing HL levels across faculties, while the comparative research design is apt for examining variations within and between different academic disciplines. The utilisation of the HLQ, a rigorously developed tool with established validity and reliability, further strengthens the study's methodological underpinning. As the subsequent chapters unfold, this methodological foundation will facilitate the unravelling of the complexities surrounding the HL levels of undergraduate university students from various disciplines. The results from the present investigation are provided in the following chapter.

## CHAPTER 4: Results

### 4.1 Introduction

In this chapter, the results obtained from the study's thorough implementation are examined, providing a detailed overview of the findings derived from the investigation. This chapter offers a comprehensive breakdown of the outcomes, commencing with an investigation into the participants' demographic details to establish their characteristics. The subsequent segments concentrate on a thorough analysis of the HLQ responses using descriptive and inferential statistics. Through a comprehensive analysis of the collected data, this chapter reveals important insights into the HL levels among the diverse student population under investigation.

### 4.2 Demographic Information

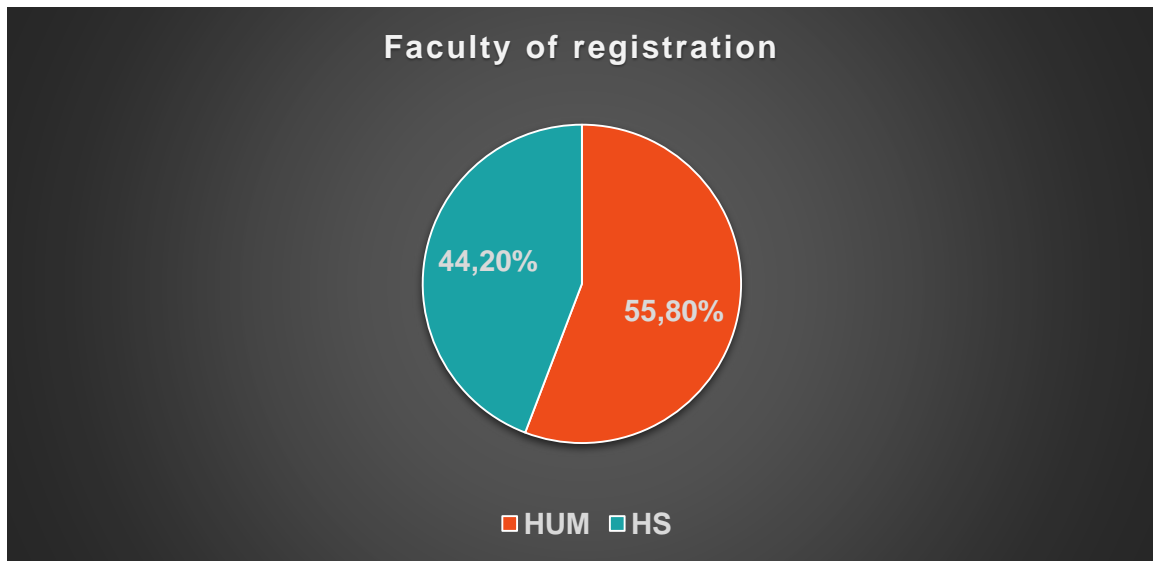
The demographic characteristics of the participants are presented in these sections. To obtain a description of the study sample, participants had to provide personal information, such as their age, gender, and information about their year of study.

Students from the Faculty of Health Sciences (HS) and the Faculty of Humanities (HUM) were invited to participate in the study. In Chapter 3 it was detailed that 99 participants initiated the survey, but only 77 signed the informed consent form and completed the demographic questionnaire and the HLQ. Incomplete surveys, i.e., missing values, were excluded from the analysis.

#### 4.2.1 Faculty

The sample comprised  $n=43$  (55.8%) students from the Faculty of Humanities and  $n=34$  (44.2%) from the Faculty of Health Sciences. A total of  $n=77$  students comprised the study sample.

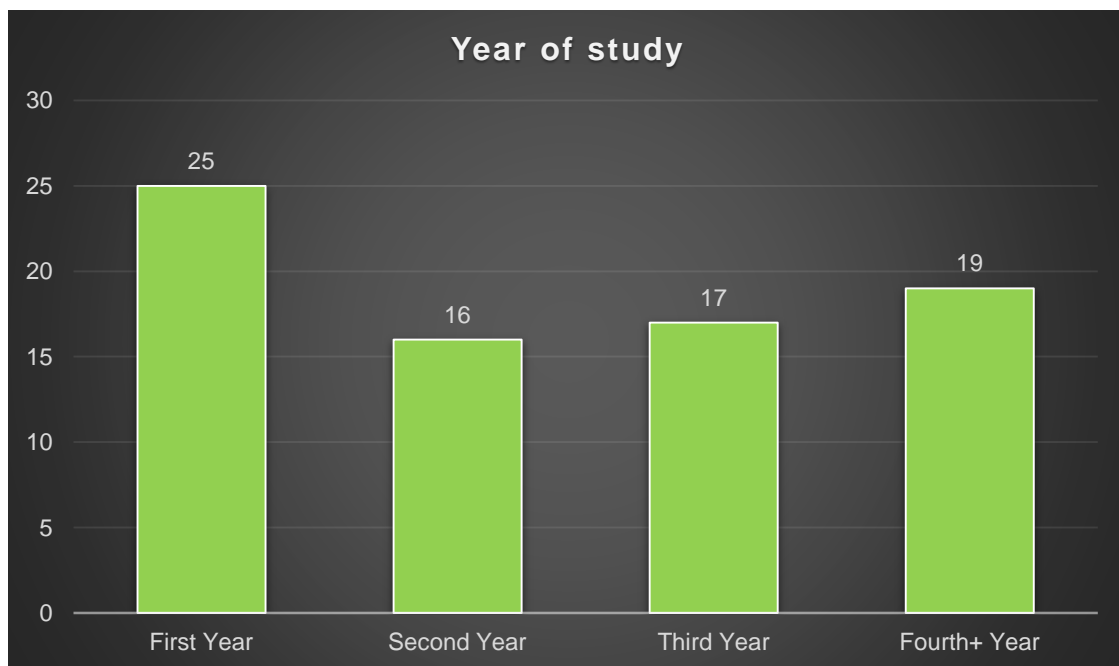
**Figure 1:** Faculty of registration



#### 4.2.2 Year of study

Students were requested to indicate their year level. The findings show that most participants,  $n=25$  (32.5%), were registered for their first year in 2022. The sample consisted of  $n=16$  (20.8%) second-year students,  $n=17$  (22.1%) third-year students, and  $n=19$  (24.7%) students in their fourth year or more.

**Figure 2:** Year of study



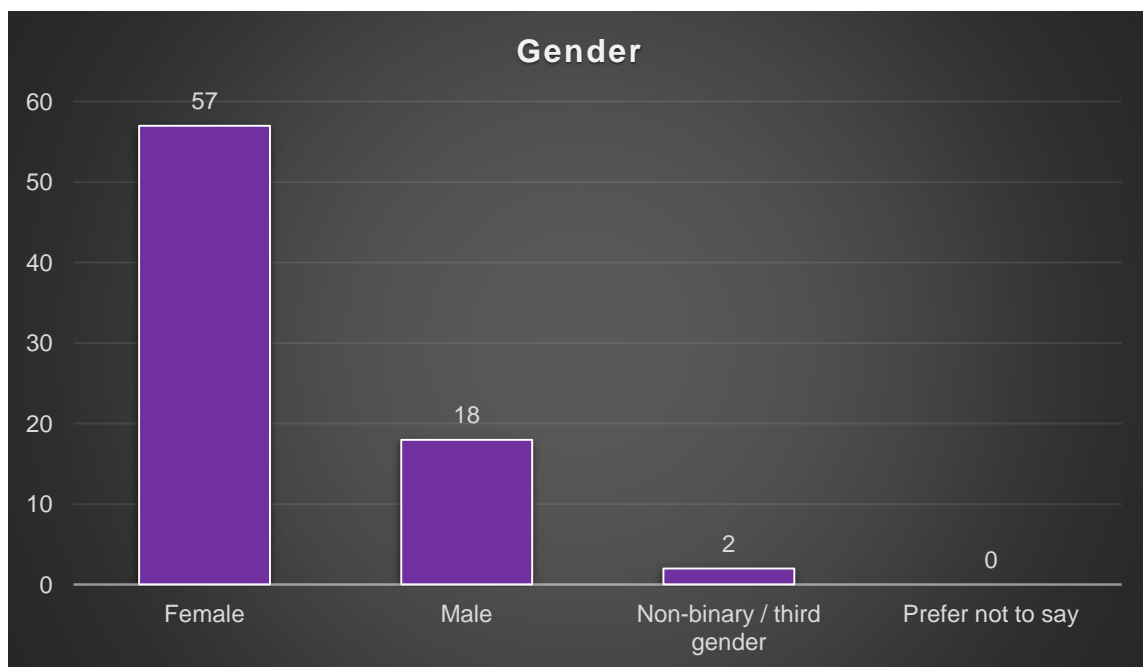
### 4.2.3 Age

Participants ranged between the ages of 18-28 years. Most participants were 19 years old, comprising (n=18) 23.4% of the sample. The average age of the sample was 20 ( $M = 20.77$ ,  $SD = 1.84$ ). The inclusion criteria detailed that participants must be between 18 and 24; however, two participants were older than 24. Due to the limited sample size, the researcher did not exclude these two participants.

### 4.2.4 Gender

A description of the sample based on gender is presented in Figure 2 below. The majority of the sample was female, comprising 74% (n=57) of the sample. Only 2.6% (n=2) of the sample indicated their gender as “non-binary.” The remaining 23.4% (n=18) were male participants.

**Figure 3:** *Description of gender*



## 4.3 Descriptive Statistics: The Health Literacy Questionnaire (HLQ)

This section offers an overview of the descriptive and frequency data captured from the HLQ for each individual scale. As detailed in section 0 of Chapter 3, the HLQ consists of nine scales, each containing different items to provide a comprehensive measure of HL. The analysis of the HLQ does not produce an overall score across the nine scales. A score for each scale (1-9) is calculated separately by averaging the item scores for each scale with equal weighting

(Osborne et al., 2013). The nine scale scores are a reflection of the different domains of HL. Section 3.7 of Chapter 3 details the data capturing and preparation information. The following section summarises the descriptive results across the student sample for Part 1 and Part 2 of the HLQ.

#### ***4.3.1 Part 1: Scales 1-5***

The scores for the five scales comprising Part 1 of the HLQ were calculated from the 23 HL questions. For each scale, an average score across all the questions was calculated to indicate an element of HL. Lower scores are equated with lower levels of a specific domain/element of HL. Refer to Table 1 below for a detailed frequency and percentage presentation of agreement of participants' responses to the 23 questions making up Part 1 of the HLQ.

**Table 1:** *Frequency and percentage of participants' responses to Part 1 of the HLQ*



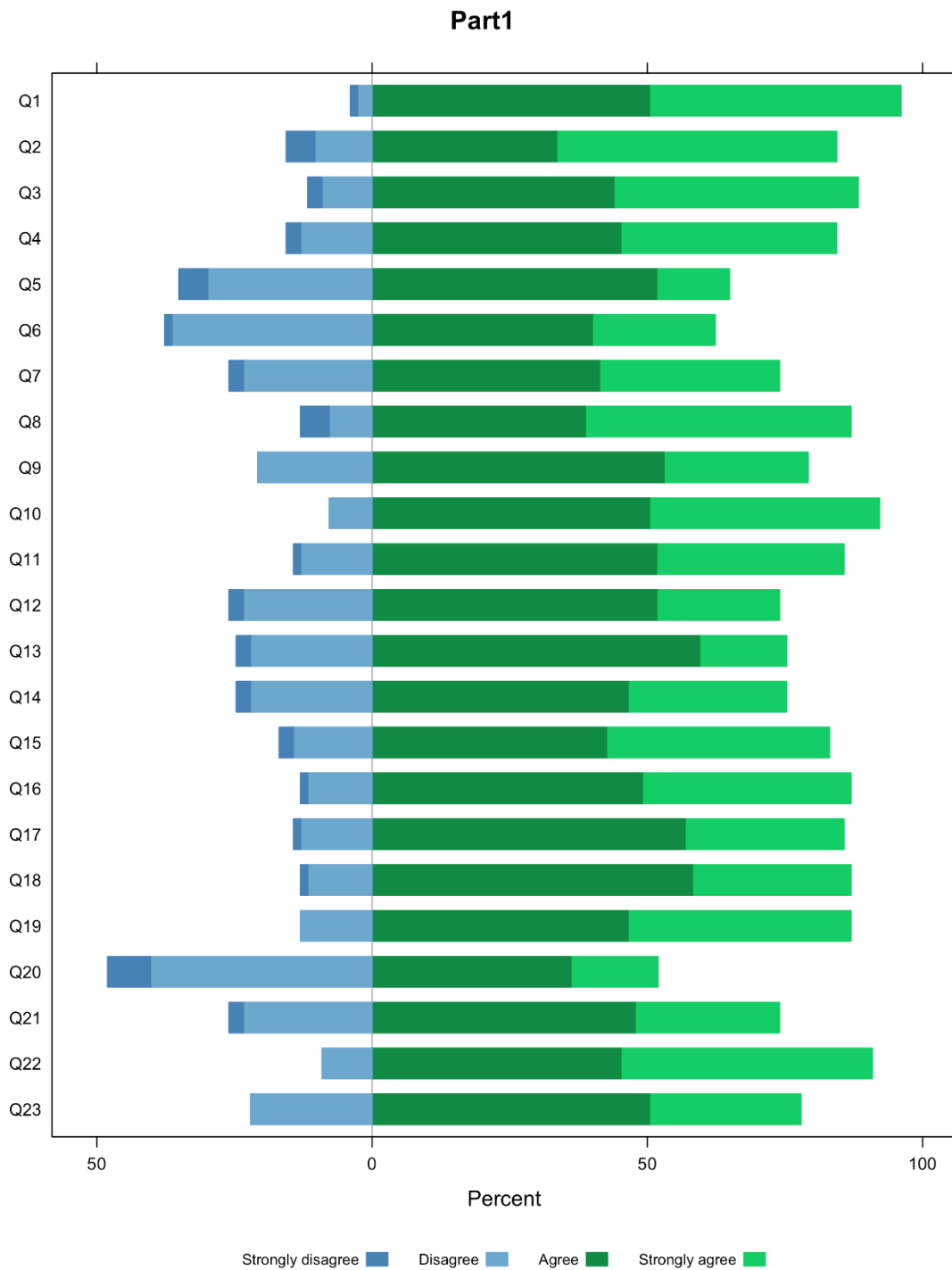
| HLQ – Part 1   | Strongly disagree | Disagree  | Agree     | Strongly agree |
|--|-------------------|-----------|-----------|----------------|
|  | n (%)             | n (%)     | n (%)     | n (%)          |
| 1. I feel I have good information about health.                                      | 1 (1.3)           | 2 (2.6)   | 39 (50.6) | 35 (45.5)      |
| 2. I have at least one healthcare provider who knows me well.                        | 4 (5.2)           | 8 (10.4)  | 26 (33.8) | 39 (50.6)      |
| 3. I can get access to several people who understand and support me.                 | 2 (2.6)           | 7 (9.1)   | 34 (44.2) | 34 (44.2)      |
| 4. I compare health information from different sources.                              | 2 (2.6)           | 10 (13)   | 35 (45.5) | 30 (38.0)      |
| 5. When I feel ill, the people around me really understand what I am going through.  | 4 (5.2)           | 23 (29.9) | 40 (51.9) | 10 (13.0)      |
| 6. I spend quite a lot of time actively managing my health.                          | 1 (1.3)           | 28 (36.4) | 31 (40.3) | 17 (22.1)      |
| 7. When I see new information about health, I check up on whether it is true or not. | 2 (2.6)           | 18 (23.4) | 32 (41.6) | 25 (32.5)      |
| 8. I have at least one healthcare provider I can discuss my health problems with.    | 4 (5.2)           | 6 (7.8)   | 30 (39.0) | 37 (48.1)      |
| 9. I make plans for what I need to do to be healthy.                                 | 0 (0.0)           | 15 (20.8) | 41 (53.2) | 20 (26.0)      |

| HLQ – Part 1   | Strongly disagree | Disagree     | Agree        | Strongly agree |
|--|-------------------|--------------|--------------|----------------|
|  | n<br>(%)          | n<br>(%)     | n<br>(%)     | n<br>(%)       |
| 10. I have enough information to help me deal with my health problems.                         | 0<br>(0.0)        | 6<br>(7.8)   | 39<br>(50.6) | 32<br>(42.6)   |
| 11. If I need help, I have plenty of people I can rely on.                                     | 1<br>(1.3)        | 10<br>(13.0) | 40<br>(51.0) | 26<br>(33.8)   |
| 12. I always compare health information from different sources and decide what is best for me. | 2<br>(2.6)        | 18<br>(23.4) | 40<br>(51.9) | 17<br>(22.1)   |
| 13. Despite other things in my life, I make time to be healthy.                                | 2<br>(2.6)        | 17<br>(22.1) | 46<br>(59.7) | 12<br>(15.6)   |
| 14. I am sure I have all the information I need to manage my health effectively.               | 2<br>(2.6)        | 17<br>(22.1) | 36<br>(46.8) | 22<br>(28.6)   |
| 15. I have at least one person who can come to medical appointments with me.                   | 2<br>(2.6)        | 11<br>(14.3) | 33<br>(42.9) | 31<br>(40.3)   |
| 16. I know how to find out if the health information I receive is right or not.                | 1<br>(1.3)        | 9<br>(11.7)  | 38<br>(49.4) | 29<br>(37.7)   |
| 17. I have the healthcare providers I need to help me work out what I need to do.              | 1<br>(1.3)        | 10<br>(13.0) | 44<br>(57.1) | 22<br>(28.6)   |
| 18. I set my own goals about health and fitness.   | 1<br>(1.3)        | 9<br>(11.7)  | 45<br>(58.4) | 22<br>(28.6)   |

| HLQ – Part 1   | Strongly disagree | Disagree     | Agree        | Strongly agree |
|--|-------------------|--------------|--------------|----------------|
|  | n<br>(%)          | n<br>(%)     | n<br>(%)     | n<br>(%)       |
| 19. I have strong support from family or friends.                                  | 0<br>(0.0)        | 10<br>(13.0) | 36<br>(46.8) | 31<br>(40.3)   |
| 20. I ask healthcare providers about the quality of the health information I find. | 6<br>(7.8)        | 31<br>(40.3) | 28<br>(36.4) | 12<br>(15.6)   |
| 21. There are things that I do regularly to make myself more healthy.              | 2<br>(2.6)        | 18<br>(23.4) | 37<br>(48.1) | 20<br>(26.0)   |
| 22. I can rely on at least one healthcare provider.                                | 0<br>(0.0)        | 7<br>(9.1)   | 35<br>(45.5) | 35<br>(45.5)   |
| 23. I have all the information I need to look after my health.                     | 0<br>(0.0)        | 17<br>(22.1) | 39<br>(50.6) | 21<br>(27.3)   |

Based on the overall levels of agreement for the 23 questions making up Part 1 of the HLQ across HS and HUM students, most students agreed or strongly agreed with the statements indicating higher levels of HL. The significance of this is detailed in the inferential statistical section.

**Figure 4: Part 1 - Health Literacy for scales 1 - 5**



#### **4.3.2 Part 2: Scales 6-9**

The scores for the four scales were calculated from the 21 HL questions comprising Part 2 of the HLQ. Similar to Part 1, an average score across all the questions was calculated. Lower scores are equated with lower levels of a specific domain/element of HL. Refer to Table 2 below for a detailed frequency and percentage presentation of agreement of participants' responses to the 21 questions in Part 2 of the HLQ.

**Table 2:** *Frequency and percentage of participants' responses to Part 2 of the HLQ*

| HLQ – Part 2  | Cannot do /      | Usually    | Sometimes    | Usually      | Always       |
|---|------------------|------------|--------------|--------------|--------------|
|   | Always difficult | Difficult  | difficult    | easy         | easy         |
|   | n                | n          | n            | n            | n            |
|   | (%)              | (%)        | (%)          | (%)          | (%)          |
| 1. Find the right health care.  | 0<br>(0.0)       | 5<br>(6.5) | 19<br>(24.7) | 38<br>(49.4) | 15<br>(19.5) |
| 2. Make sure that healthcare providers understand your problems properly. | 1<br>(1.3)       | 5<br>(6.5) | 14<br>(18.2) | 39<br>(50.6) | 18<br>(23.4) |
| 3. Find information about health problems.                                | 1<br>(1.3)       | 2<br>(2.6) | 17<br>(22.1) | 20<br>(39.0) | 27<br>(35.1) |
| 4. Feel able to discuss your health concerns with a healthcare provider.  | 0<br>(0.0)       | 5<br>(6.5) | 20<br>(26.0) | 28<br>(36.4) | 24<br>(31.2) |
| 5. Confidently fill medical forms in the correct way.                     | 0<br>(0.0)       | 1<br>(1.3) | 11<br>(14.3) | 36<br>(46.8) | 29<br>(37.7) |
| 6. Find health information from several different places.                 | 1<br>(1.3)       | 3<br>(3.9) | 19<br>(24.7) | 28<br>(36.4) | 26<br>(33.8) |
| 7. Have good discussions about your health with doctors.                  | 2<br>(2.6)       | 4<br>(5.2) | 18<br>(23.4) | 29<br>(37.7) | 24<br>(31.2) |
| 8. Get to see the healthcare providers you need to.                       | 0<br>(0.0)       | 5<br>(6.5) | 21<br>(27.3) | 34<br>(44.2) | 17<br>(22.1) |
| 9. Accurately follow instructions from healthcare providers.              | 0<br>(0.0)       | 2<br>(2.6) | 12<br>(15.6) | 35<br>(45.5) | 28<br>(36.4) |

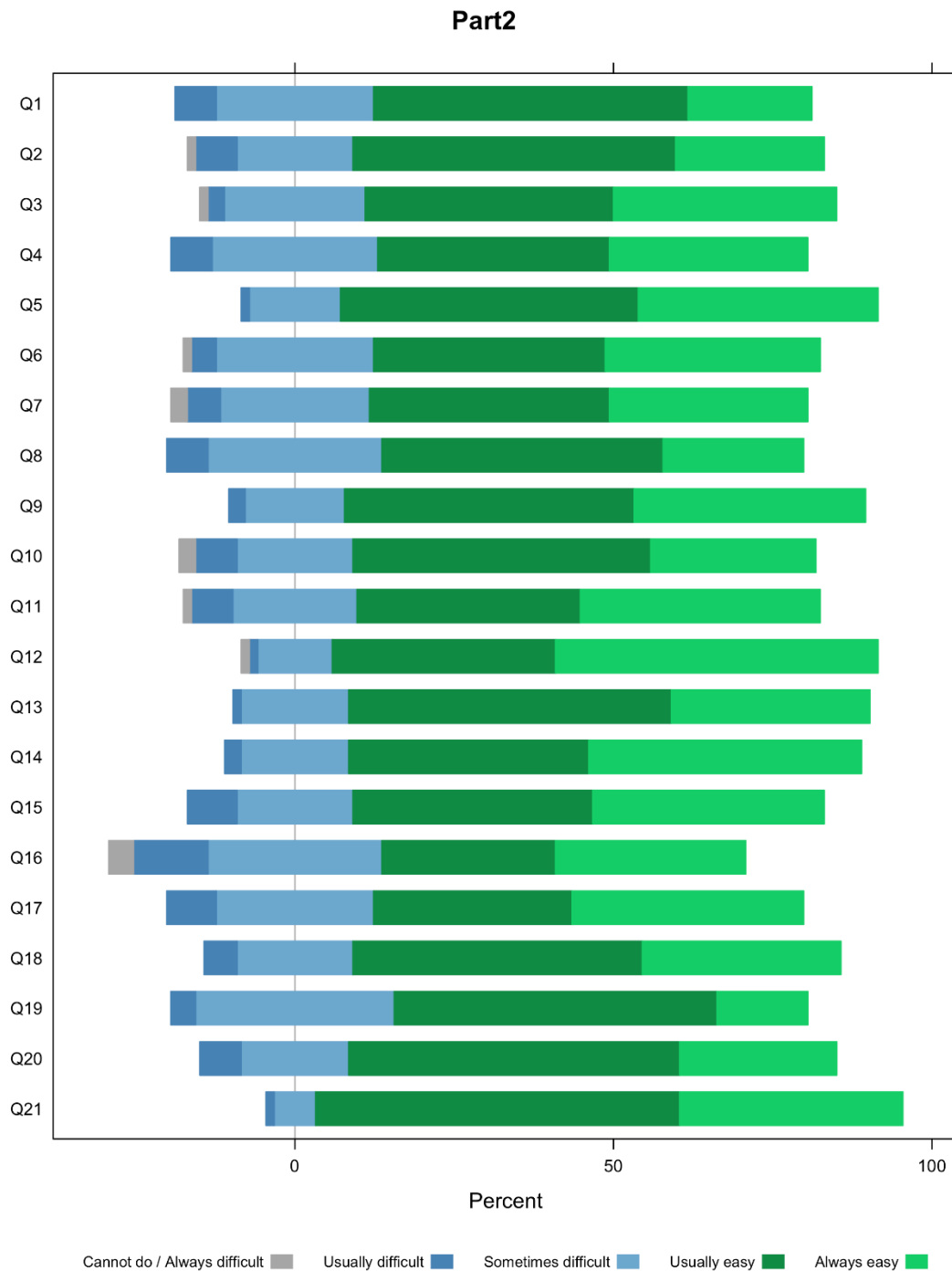
| HLQ – Part 2   | Cannot do /      | Usually     | Sometimes    | Usually      | Always       |
|--|------------------|-------------|--------------|--------------|--------------|
|  | Always difficult | Difficult   | difficult    | easy         | easy         |
|  | n                | n           | n            | n            | n            |
|  | (%)              | (%)         | (%)          | (%)          | (%)          |
| 10. Get information about health so you are up to date with the best information.  | 2<br>(2.6)       | 5<br>(6.5)  | 14<br>(18.2) | 36<br>(46.8) | 20<br>(26.0) |
| 11. Decide which healthcare provider you need to see.                              | 1<br>(1.3)       | 5<br>(6.5)  | 15<br>(19.5) | 27<br>(35.1) | 29<br>(37.7) |
| 12. Read and understand written health information.                                | 1<br>(1.3)       | 1<br>(1.3)  | 9<br>(11.7)  | 27<br>(35.1) | 39<br>(50.6) |
| 13. Make sure you find the right place to get the health care you need.            | 0<br>(0.0)       | 1<br>(1.3)  | 13<br>(16.9) | 39<br>(50.6) | 24<br>(31.2) |
| 14. Get health information in words you understand.                                | 0<br>(0.0)       | 1<br>(1.3)  | 13<br>(16.9) | 39<br>(50.6) | 24<br>(31.2) |
| 15. Discuss things with healthcare providers until you understand all you need to. | 0<br>(0.0)       | 6<br>(7.8)  | 14<br>(18.2) | 29<br>(37.7) | 28<br>(36.4) |
| 16. Find out which healthcare services you are entitled to.                        | 3<br>(3.9)       | 9<br>(11.7) | 21<br>(27.3) | 21<br>(27.3) | 23<br>(29.9) |
| 17. Read and understand all the information on medication labels.                  | 0<br>(0.0)       | 6<br>(7.8)  | 19<br>(24.7) | 24<br>(31.2) | 28<br>(36.4) |
| 18. Get health information by yourself.  | 0<br>(0.0)       | 4<br>(5.2)  | 14<br>(18.2) | 35<br>(45.5) | 24<br>(31.2) |

| HLQ – Part 2   | Cannot do /      | Usually    | Sometimes    | Usually      | Always       |
|--|------------------|------------|--------------|--------------|--------------|
|  | Always difficult | Difficult  | difficult    | easy         | easy         |
|  | n                | n          | n            | n            | n            |
|  | (%)              | (%)        | (%)          | (%)          | (%)          |
| 19. Work out what the best care is for you.                                    | 0<br>(0.0)       | 3<br>(3.9) | 24<br>(31.2) | 39<br>(50.6) | 11<br>(14.3) |
| 20. Ask healthcare providers questions to get the health information you need. | 0<br>(0.0)       | 5<br>(6.5) | 13<br>(16.9) | 40<br>(51.9) | 19<br>(24.7) |
| 21. Understand what healthcare providers are asking you to do.                 | 0<br>(0.0)       | 1<br>(1.3) | 5<br>(6.5)   | 44<br>(57.1) | 27<br>(35.1) |



The data suggests that generally, most students, irrespective of their faculty, find it easy to engage with healthcare providers, navigate the healthcare system, find health information, and understand it well. The significance of this is detailed in the inferential statistical section.

**Figure 5: Part 2 - Health Literacy for scales 6 - 9**



#### 4.4 Inferential Statistics: Health Literacy Questionnaire

This section provides an overview of the descriptive results and comparison between the HUM and HS students regarding their level of HL. To determine if there were significant differences between HUM and HS students, an independent samples *t*-test was performed, permitting that no test assumptions have been violated (refer to section 0 in Chapter 3 for a detailed discussion).

##### 4.4.1 Part 1: Scales 1 – 5

Each scale was calculated by averaging the item scores within each scale with equal weighting. Table 3 below provides an overview of the descriptive analysis comparing the scores from scales 1-5 between HS and HUM students using a 95% confidence interval.

Scale 1: Feeling understood and supported by healthcare providers consisted of four items. Scale 2: Having sufficient information to manage my health included four items. Scale 3: Actively managing my health, included five items. Scale 4: Social support for health consisted of five items. Scale 5: Appraisal of health information comprised five items.

**Table 3:** Part 1 - Descriptive results and comparison between groups

|  | Data (N = 77)             | HS (N = 34)               | HUM (N = 43)              |
|--|---------------------------|---------------------------|---------------------------|
| <b>Scale 1: Feeling understood and supported by healthcare providers</b> |                           |                           |                           |
| Missing Values   | 0                         | 0                         | 0                         |
| Min  | 1.25                      | 1.25                      | 1.5                       |
| Max  | 4                         | 4                         | 4                         |
| n; mean (sd)   | 3.27 ± 0.64               | 3.38 ± 0.62               | 3.19 ± 0.64               |
| n; median (iqr)  | 3.25 (3.00, 3.75)         | 3.62 (3.00, 3.75)         | 3.00 (2.75, 3.88)         |
| mean (CI)  | 3.27 (95% CI: 3.13, 3.42) | 3.38 (95% CI: 3.17, 3.59) | 3.19 (95% CI: 2.99, 3.38) |
| <b>Scale 2: Having sufficient information to manage my health</b>        |                           |                           |                           |
| Missing Values   | 0                         | 0                         | 0                         |
| Min  | 2.25                      | 2.25                      | 2.25                      |
| Max  | 4                         | 4                         | 4                         |
| n; mean (sd)   | 3.20 ± 0.53               | 3.32 ± 0.44               | 3.10 ± 0.58               |
| n; median (iqr)  | 3.25 (2.75, 3.50)         | 3.50 (3.00, 3.69)         | 3.00 (2.50, 3.50)         |

|   | Data (N = 77)             | HS (N = 34)               | HUM (N = 43)              |
|---|---------------------------|---------------------------|---------------------------|
| mean (CI)                                       | 3.20 (95% CI: 3.08, 3.32) | 3.32 (95% CI: 3.18, 3.47) | 3.10 (95% CI: 2.93, 3.28) |
| <b>Scale 3: Actively managing my health</b>     |                           |                           |                           |
| Missing Values                                  | 0                         | 0                         | 0                         |
| Min   | 1.4                       | 2.2                       | 1.4                       |
| Max   | 4                         | 4                         | 4                         |
| n; mean (sd)                                    | 2.98 ± 0.58               | 3.10 ± 0.52               | 2.88 ± 0.62               |
| n; median (iqr)                                 | 3.00 (2.60, 3.40)         | 3.20 (2.85, 3.55)         | 3.00 (2.60, 3.20)         |
| mean (CI)                                       | 2.98 (95% CI: 2.85, 3.11) | 3.10 (95% CI: 2.93, 3.27) | 2.88 (95% CI: 2.69, 3.06) |
| <b>Scale 4: Social support for health</b>       |                           |                           |                           |
| Missing Values                                  | 0                         | 0                         | 0                         |
| Min   | 1.2                       | 2.6                       | 1.2                       |
| Max   | 4                         | 4                         | 4                         |
| n; mean (sd)                                    | 3.14 ± 0.54               | 3.31 ± 0.43               | 3.00 ± 0.59               |
| n; median (iqr)                                 | 3.20 (2.80, 3.60)         | 3.40 (2.85, 3.60)         | 3.00 (2.60, 3.40)         |
| mean (CI)                                       | 3.14 (95% CI: 3.02, 3.26) | 3.31 (95% CI: 3.16, 3.45) | 3.00 (95% CI: 2.83, 3.18) |
| <b>Scale 5: Appraisal of health information</b> |                           |                           |                           |
| Missing Values                                  | 0                         | 0                         | 0                         |
| Min   | 1.8                       | 2.2                       | 1.8                       |
| Max   | 4                         | 4                         | 4                         |
| n; mean (sd)                                    | 3.00 ± 0.57               | 3.18 ± 0.53               | 2.86 ± 0.56               |
| n; median (iqr)                                 | 3.00 (2.60, 3.40)         | 3.20 (3.00, 3.60)         | 2.80 (2.40, 3.20)         |
| mean (CI)                                       | 3.00 (95% CI: 2.88, 3.13) | 3.18 (95% CI: 3.00, 3.36) | 2.86 (95% CI: 2.69, 3.03) |

To determine if there were significant differences in the HL scores of HUM and HS students' inferential statistical analysis was conducted. For each variable, the data was tested to determine if the data were normally distributed, using the Shapiro-Wilk Test and the equality of variances was investigated using Levene's Test. For the data normally distributed, the independent *t*-test was used, while the Mann-Whitney U Test was used for the data not normally distributed. All tests were performed at a 5% level of significance. The results of the inferential statistical analysis for each scale of Part 1 of the HLQ are as follows:

***Scale 1: Feeling understood and supported by healthcare providers***

The results of the Shapiro-Wilk Test showed that the data violated the normality assumption; therefore, the non-parametric alternative, namely the Mann-Whitney U Test, was conducted to determine whether there was a statistically significant difference between HS and HUM students in relation to feeling understood and supported by healthcare providers. Results of the Mann-Whitney U Test indicated there was no significant difference between HS ( $Md = 3.62, n = 34$ ) and HUM ( $Md = 3.00, n = 43$ ),  $U = 594.5, z = -1.422, p = .155, r = .16$ .

***Scale 2: Having sufficient information to manage my health***

The results of the Shapiro-Wilk Test showed that the data were not normally distributed, and the non-parametric alternative, namely the A Mann-Whitney U Test, was conducted to determine whether there was a difference between HS and HUM students in relation to having sufficient information to manage their health. Results of the Mann-Whitney U Test indicated there were no significant difference between HS ( $Md = 3.50, n = 34$ ) and HUM ( $Md = 3.00, n = 43$ ),  $U = 571.5, z = -1.653, p = .098, r = .19$ .

***Scale 3: Actively managing my health***

The non-parametric alternative, namely the A Mann-Whitney U Test, was conducted to determine whether there was a difference between HS and HUM students in relation to actively managing their health, as the data for Scale 3 was not normally distributed. Results of the Mann-Whitney U Test indicated there were no significant difference between HS ( $Md = 3.20, n = 34$ ) and HUM ( $Md = 3.00, n = 43$ ),  $U = 562.5, z = -1.742, p = .081, r = .02$ .

***Scale 4: Social support for health***

The Mann-Whitney U Test was conducted to determine whether there was a difference between HS and HUM students in relation to social support for health. Results of the Mann-Whitney U Test indicated there were significant differences between HS ( $Md = 3.40, n = 34$ ) and HUM ( $Md = 3.00, n = 43$ ),  $U = 523.5, z = -2.151, p = .027, r = .25$ .

***Scale 5: Appraisal of health information***

No test assumptions were violated, and an independent sample *t*-test was performed to determine if there were significant differences between HUM and HS students regarding their

appraisal of health information. The Levene's Test was conducted to test for equality of variance. The significance value was significant, and the 'Equal variances, not assumed'-value was used. The results of the independent *t*-test indicated there were statistically significant differences between HUM ( $M = 2.86$ ,  $SD = 0.56$ ) and HS ( $M = 3.18$ ,  $SD = 0.53$ ) students;  $t(72.75) = -2.57$ ,  $p = .01$ , two-tailed. The magnitude of the differences in the means (mean difference =  $-.32$ , 95% *CI*:  $-.57$  to  $-.071$ ) Eta squared:  $\eta^2 = .587$ , indicating a large effect.

#### 4.4.2 Part 2: Scales 6-9

Each scale was calculated by averaging the item scores within each scale with equal weighting. Table 4 below presents a summary of the descriptive analysis comparing the scores from Scale 6-9 between HS and HUM students using a 95% confidence interval.

Scale 6: The ability to actively engage with healthcare providers consists of five items. Scale 7: Navigating the healthcare system comprise six items. Scale 8: Ability to find good health information, includes five items. Scale 9: Understand health information well enough to know what to do, consists of five items.

**Table 4:** Part 2 - Descriptive results and comparison between groups

|  | Data (N = 77)             | HS (N = 34)               | HUM (N = 43)              |
|--|---------------------------|---------------------------|---------------------------|
| <b>Scale 6: Ability to actively engage with healthcare providers</b> |                           |                           |                           |
| Missing Values   | 0                         | 0                         | 0                         |
| Min  | 1.6                       | 2.4                       | 1.6                       |
| Max  | 5                         | 5                         | 5                         |
| n; mean (sd)   | 3.94 ± 0.74               | 4.14 ± 0.62               | 3.78 ± 0.79               |
| n; median (iqr)  | 4.00 (3.40, 4.60)         | 4.00 (3.80, 4.75)         | 3.80 (3.20, 4.40)         |
| mean (CI)  | 3.94 (95% CI: 3.77, 4.10) | 4.14 (95% CI: 3.93, 4.34) | 3.78 (95% CI: 3.54, 4.01) |
| <b>Scale 7: Navigating the healthcare system</b>                     |                           |                           |                           |
| Missing Values   | 0                         | 0                         | 0                         |
| Min  | 2                         | 3.16666666666667          | 2                         |
| Max  | 5                         | 5                         | 5                         |
| n; mean (sd)   | 3.87 ± 0.66               | 4.08 ± 0.55               | 3.70 ± 0.70               |

|                 | Data (N = 77)             | HS (N = 34)               | HUM (N = 43)              |
|-----------------|---------------------------|---------------------------|---------------------------|
| n; median (iqr) | 3.83 (3.33, 4.33)         | 4.00 (3.71, 4.50)         | 3.67 (3.33, 4.17)         |
| mean (CI)       | 3.87 (95% CI: 3.72, 4.01) | 4.08 (95% CI: 3.89, 4.26) | 3.70 (95% CI: 3.49, 3.91) |

### Scale 8: Ability to find good health information

|                 |                           |                           |                           |
|-----------------|---------------------------|---------------------------|---------------------------|
| Missing Values  | 0                         | 0                         | 0                         |
| Min             | 2.2                       | 3.2                       | 2.2                       |
| Max             | 5                         | 5                         | 5                         |
| n; mean (sd)    | 4.02 ± 0.72               | 4.38 ± 0.55               | 3.74 ± 0.71               |
| n; median (iqr) | 4.20 (3.60, 4.60)         | 4.40 (4.00, 5.00)         | 3.80 (3.20, 4.40)         |
| mean (CI)       | 4.02 (95% CI: 3.86, 4.18) | 4.38 (95% CI: 4.19, 4.56) | 3.74 (95% CI: 3.53, 3.96) |

### Scale 9: Understand health information well enough to know what to do

|                 |                           |                           |                           |
|-----------------|---------------------------|---------------------------|---------------------------|
| Missing Values  | 0                         | 0                         | 0                         |
| Min             | 2.8                       | 3.2                       | 2.8                       |
| Max             | 5                         | 5                         | 5                         |
| n; mean (sd)    | 4.18 ± 0.52               | 4.33 ± 0.46               | 4.07 ± 0.54               |
| n; median (iqr) | 4.20 (3.80, 4.60)         | 4.20 (4.00, 4.75)         | 4.00 (3.60, 4.40)         |
| mean (CI)       | 4.18 (95% CI: 4.06, 4.30) | 4.33 (95% CI: 4.17, 4.48) | 4.07 (95% CI: 3.90, 4.23) |

To determine if there were significant differences in the HL scores of HUM and HS students' inferential statistical analysis was conducted. Similar to part 1, where test assumptions were violated, the non-parametric alternative was conducted. All tests were performed at a 5% level of significance. The results of the inferential statistical analysis for each scale of Part 2 of the HLQ, are as follows:

### *Scale 6: Ability to actively engage with healthcare providers*

An independent *t*-test was conducted to determine whether there was a difference between HS and HUM in relation to their ability to actively engage with healthcare providers. The results of the independent *t*-test indicated there were statistically significant differences between HUM ( $M = 3.78$ ,  $SD = 0.79$ ) and HS ( $M = 4.13$ ,  $SD = 0.62$ ) students:  $t(75) = -2.17$ ,  $p = .03$ , two-tailed. The magnitude of the differences in the means (mean difference =  $-0.36$ , 95% CI:  $-0.69$  to  $-0.029$ ) Eta squared:  $\eta^2 = .497$ , indicating a large effect.

### ***Scale 7: Navigating the healthcare system***

An independent *t*-test was conducted to determine whether there was a difference between HS and HUM in relation to their ability to navigate the healthcare system. Equal variances can be assumed as assessed by the Levene's Test,  $F(75) = 2.10$ ,  $p = 0.151$ . The results indicated there were significant differences between HUM ( $M = 3.70$ ,  $SD = 0.70$ ) and HS ( $M = 4.08$ ,  $SD = 0.55$ ) students:  $t(75) = -2.60$ ,  $p = .01$ , two-tailed. The magnitude of the differences in the means (mean difference =  $-.38$ , 95% *CI*:  $-.67$  to  $-.089$ ). Eta squared:  $\eta^2 = .597$ , indicating a large effect.

### ***Scale 8: Ability to find good health information***

The Mann-Whitney U Test was conducted to determine whether there was a difference between HS and HUM students in relation to their ability to find good healthcare information. Results of the Mann-Whitney U Test indicated there were statistically significant differences between HS ( $Md = 4.40$ ,  $n = 34$ ) and HUM ( $Md = 3.80$ ,  $n = 43$ ) students,  $U = 359.0$ ,  $z = -3.834$ ,  $p = .000$ ,  $r = .44$ .

### ***Scale 9: Understand health information well enough to know what to do***

The Mann-Whitney U Test was conducted to determine whether there was a difference between HS and HUM students in relation to their understanding of health information well enough to know what to do. Results of the Mann-Whitney U Test indicated there were statistically significant differences between HS ( $Md = 4.20$ ,  $n = 34$ ) and HUM ( $Md = 4.00$ ,  $n = 43$ ) students,  $U = 525.00$ ,  $z = -2.129$ ,  $p = .033$ ,  $r = .24$ .

According to the findings for Part 1 of the HLQ, statistically significant differences were found between HUM and HS students in relation to having social support for health and their appraisal of health information. The findings for Part 2 of the HLQ demonstrated statistically significant differences between HUM and HS students regarding their ability to actively engage with healthcare providers, how they navigate the healthcare system, their ability to access good health information and how they understand and can implement health information shared with them.

## 4.5 Conclusion

This chapter summarises the study's findings. The first section includes a detailed account of the participants' demographical information. Most participants were from the Faculty of Humanities, in their first year of study (2022), 19 years of age and indicated their gender to be female. Details regarding the HLQ scores were also provided. Generally, the findings indicated that HS students appear to demonstrate higher levels of HL in relation to several domains of HL. The findings for Scales 4 to 9 support the hypothesis that undergraduate students enrolled in the Faculty of Health Sciences demonstrate higher levels of HL compared to those enrolled in mental health-related undergraduate programs in the Faculty of Humanities.

It is important to interpret these findings within the context of this study. Definitive conclusions are thus not made due to the study's limited sample size and the year of study was not controlled for. The following chapter, Chapter 5, will comprehensively discuss the implications and significance of these findings, placing them within the broader context of HL research.



## CHAPTER 5: Discussion

### 5.1 Introduction

This chapter explores the demographic characteristics and HL levels of undergraduate students, with a specific focus on those enrolled in two distinct disciplines: the Faculty of Humanities (HUM), i.e., undergraduate psychology students and the Faculty of Health Sciences (HS). Understanding the HL levels of undergraduate students is vital for developing targeted interventions and promoting HL within educational settings. To assess HL, the HLQ was used. This chapter begins by presenting the demographic characteristics of the sample, providing insights into the composition of the undergraduate student population. Subsequently, the chapter delves into the interpretation of the HL levels based on the findings. The discussion is structured according to the study objectives. A general overview of HL amongst the student sample is provided first, after which the comparative analysis of HL levels is outlined. The latter section intends to discern any significant variations in HL between HUM students and HS students. The findings are discussed in relation to the literature summarised in chapter 2 including the theoretical framework, the comparative model of HL. The findings are thus interpreted in the context of extant literature. This chapter aims to contribute to the understanding of HL among undergraduate students and inform future strategies to enhance HL.

### 5.2 Demographic Characteristics of the Sample

This study was comprised a sample of  $n=77$  undergraduate students from a local South African tertiary institution;  $n=43$  students from the Faculty of Humanities and  $n=34$  students from the Faculty of Health Sciences. The age of the sample ranged from 18 to 28 years, with the majority of the participants being 20 years of age. Most participants were female ( $n=57$ ).

### 5.3 The Health Literacy Questionnaire

Researchers and practitioners can assess and compare HL levels across various demographics, disciplines, and contexts by using the HLQ (Osborne et al., 2014). The HLQ's multidimensional structure enables a comprehensive understanding of HL. It considers people's perspectives, experiences, and capacities for productive interaction in the context of healthcare (Osborne et al., 2014). The HLQ has been widely used in research studies and evaluations to assess HL outcomes, identify areas of strength and improvement, and inform the development of interventions and strategies to enhance HL (Osborne et al., 2013). Its

comprehensive nature and robust psychometric properties make it a valuable tool for both research and practice in the field of HL (Osborne et al., 2014).

### ***5.3.1 Health literacy levels of undergraduate students: Part 1 (Scales 1-5)***

One of the main objectives of the study was to determine the overall HL levels of undergraduate students from various disciplines. This section provides an overview of the general HL levels for students.

#### ***Scale 1: Feeling understood and supported by healthcare providers***

This scale evaluates individuals' perspectives of being understood and supported by healthcare providers. It reflects the quality of communication and interaction between patients and healthcare professionals, known to impact engagement, satisfaction, and health outcomes (Osborne et al., 2013).

Individuals who rate high on this scale experience established relationships with healthcare providers they trust, enabling effective communication, comprehension, and support (Osborne et al., 2014). They feel heard, supported, and confident in participating in decisions about their health. Conversely, individuals with lower ratings in this domain lack regular contact with healthcare providers or face difficulties in placing trust. They encounter challenges in interacting with healthcare providers and may perceive inadequate support in understanding and making health decisions (Osborne et al., 2014).

The quality of the patient-provider relationship plays a pivotal role in healthcare outcomes, patient contentment, and adherence to treatment plans (Beach et al., 2006; Street Jr et al., 2009). Patients who feel understood and supported by their healthcare providers are more likely to have trust, actively engage in their care, and adhere to recommended treatments. Additionally, patients are more inclined to share health-related information honestly and openly. Healthcare providers need to grasp patients' emotions, viewpoints, and life experiences to provide personalised care (Kahrma et al., 2016). Effective communication, attentive listening, and involving patients in decision-making constitute fundamental elements of patient-centered care (Epstein et al., 2005; Rathert et al., 2013; Stewart et al., 2003; Street et al., 2009). Empathy and nonverbal communication skills contribute to a supportive and trustworthy environment, ultimately leading to improved patient outcomes (Derksen et al., 2013; Kim et al., 2004). Addressing unspoken concerns is

crucial for productive healthcare interactions (Griffin et al., 2004; Levinson et al., 2001). Patient-centered care is particularly vital in managing chronic illnesses, where continuous support, collaborative decision-making, and individualised care are imperative for optimal outcomes (Bodenheimer et al., 2002; Gerteis et al., 2014). By grasping patients' needs and providing patient-centered care, healthcare providers can enhance healthcare outcomes and instil a sense of empowerment in patients (Ciaglia, 2017; Osborne et al., 2014).

The findings of this study revealed that students generally obtained high scores on Scale 1, indicating high levels of HL. The average score of 3.27 suggests a moderate perception of understanding and support from healthcare providers. This signifies an opportunity for improvement in enhancing the patient-provider relationship and communication, ensuring students feel adequately understood and supported during healthcare interactions. The median score stood at 3.25, and the interquartile range (IQR) indicated variability in responses.

Numerous studies consistently underscore the importance of feeling understood and supported by healthcare providers. Patients reporting higher levels of communication, trust, and support from healthcare providers typically encounter better health outcomes, decreased hospitalisation rates, and enhanced treatment adherence (Beck et al., 2012; Street et al., 2009; Zolnierek & Dimatteo, 2009). Effective patient-provider communication correlates with heightened patient satisfaction, improved self-reported health, and enhanced patient adherence (Beach et al., 2005; Kaplan et al., 2010; Stewart et al., 2000). These findings emphasise the pivotal role of perceiving understanding and support from healthcare providers in promoting HL and overall well-being.

While limited studies focus on student populations, available evidence demonstrates a positive connection between feeling understood and supported by healthcare providers and elevated HL levels across various demographic groups (Carthery-Goulart et al., 2014; DeWalt et al., 2007). Among student populations, several studies provide backing for the positive link between feeling understood and supported by healthcare providers and higher HL levels. In a study among U.S. college students, Tinsley et al., (2017) found that those reporting such understanding and support exhibited higher HL levels and engaged in health-promoting behaviours. Similarly, among low-income immigrant undergraduate students, Veenker et al., (2020) observed that perceiving support from healthcare providers correlated

with higher HL levels, emphasising the provider's role in promoting HL among immigrant student populations.

Tinsley et al., (2021) delved deeper into this association among undergraduate students, accounting for factors like gender and health behaviours. Their results accentuated the positive relationship between feeling understood and supported by healthcare providers and higher HL levels among undergraduates. Röthlin et al., (2021) concentrated on student teachers at the University of Vienna and identified a correlation between feeling understood and supported by healthcare providers and higher HL levels, highlighting the role of positive provider-patient relationships in nurturing HL among future educators in healthcare.

Pardosi et al., (2017) conducted a comprehensive study among university students in Indonesia, reporting that perceiving support from healthcare providers corresponded to higher HL levels, better self-care practices, and improved health outcomes. Similarly, Wang et al., (2019) conducted a cross-sectional study among Chinese college students, revealing that those feeling understood and supported by healthcare providers displayed higher HL levels and were more inclined to engage in positive health behaviours.

These studies collectively affirm the notion that feeling understood and supported by healthcare providers correlates with higher HL levels among student populations. The findings highlight the importance of positive provider interactions in promoting HL and suggest that interventions focusing on improving provider-patient relationships can contribute to enhancing HL among students. Acknowledging the influence of the provider-student relationship, healthcare providers, educators, and policymakers should collaborate to create environments prioritising and facilitating HL development among students.

### ***Scale 2: Having sufficient information to manage health***

This scale evaluates individuals' ability to access and utilise health-related information to effectively manage their own well-being, a critical aspect for informed decision-making, treatment adherence, and engaging in self-care practices (Beauchamp et al., 2015).

Individuals who score high on this scale possess confidence in their knowledge and understanding of their health condition. They believe they possess all the necessary information to navigate and manage their condition effectively, enabling informed decision-

making about their health (Osborne et al., 2014). Conversely, those with lower scores encounter significant gaps in their understanding and knowledge of their health concerns. They perceive a lack of the essential information needed for proficiently living with and managing their condition, potentially leading to uncertainty and challenges in making informed choices (Osborne et al., 2014).

Adequate health information plays a pivotal role in advancing HL and yielding favourable health outcomes. Beyond individual skills, Nutbeam (2008) underscores the importance of accessible and comprehensible health information offered by the healthcare system. Sørensen et al., (2012) accentuate how health information empowers individuals to access, interpret, and employ health-related knowledge for informed decisions and health-enhancing behaviours. Berkman et al. (2011) demonstrate that low HL correlates with poorer health outcomes and limited comprehension of medical conditions and medications, stressing the necessity for effective health information comprehension. Kickbusch et al., (2013) emphasise how ample health information empowers individuals to make informed choices, adopt preventative behaviours, and navigate healthcare systems adeptly. Pleasant and Kuruvilla (2008) highlight the significance of actionable health information in nurturing HL and empowering individuals to make educated choices. In totality, these studies underscore the value of dispensing accessible, understandable, and actionable health information to foster HL and empower individuals to actively participate in their healthcare, resulting in positive health outcomes.

The current research findings reveal that both HUM and HS students demonstrated moderately high HL skills for Scale 2. With an average score of 3.20, students perceive a moderate level of possessing adequate information to effectively manage their health. While this suggests a general sense of being reasonably informed, efforts can still be directed towards ensuring comprehensive and pertinent health information accessibility for students. This can empower them in making informed decisions concerning their health. The median score stood at 3.25, suggesting a comparable perception with some variance in responses.

A compilation of studies within student populations underscores the pivotal role of possessing sufficient information for health management in enhancing HL and yielding positive health outcomes. Tinsley et al., (2017) established that U.S. college students demonstrating adequate health information presented with higher HL levels, highlighting

the significance of accessible information for college attendees. Correspondingly, Sørensen et al., (2012) revealed that university students who deemed themselves well-equipped with health information were more inclined to adopt health-enhancing behaviours. This exemplifies the affirmative impact of sufficient health information on HL and decision-making among students. Diviani et al., (2016) noted that university students with access to sufficient health information exhibited superior self-management skills and greater confidence in navigating healthcare systems. A thorough understanding of health information enhances students' capacity to proactively manage their health. Moreover, Diviani et al. (2018) discovered that students perceiving themselves as equipped with adequate health information were more predisposed to embrace preventive health behaviours. Finally, Sørensen et al. (2015) demonstrated that students who affirmed having adequate health information for self-management exhibited elevated HL levels across diverse countries. These findings highlight the significance of supplying students with comprehensive, and easily accessible health information to bolster HL, instil positive health behaviours, and empower students in the management of their well-being. Healthcare providers and educational institutions should acknowledge the importance of equipping students with the necessary resources and support for health information access and effective utilisation.

### ***Scale 3: Actively managing health***

This scale delves into individuals' involvement in health-promoting activities and their perceived capacity to autonomously manage their health. This encompasses embracing healthy behaviours, adhering to prescribed treatments, and seeking appropriate healthcare when required (Dodson et al., 2015). The practice of active self-management has demonstrated connections to enhanced health outcomes and decreased healthcare utilisation (Dodson et al., 2015).

Individuals scoring high on this scale exhibit a robust sense of personal accountability for their health. They proactively participate in their healthcare journey, taking proactive measures to manage their well-being, make informed choices, and actively engage in their healthcare interactions (Osborne et al., 2014). Conversely, those with lower scores do not perceive their health as a personal responsibility. They display minimal involvement in their healthcare, viewing it as a passive process imposed upon them, lacking active engagement in their self-care (Osborne et al., 2014).

Existing literature underscores the importance of actively managing one's health as an integral element of HL. Active health management necessitates that individuals assume responsibility for their self-care, make informed decisions, and partake in health-enhancing activities encompassing health promotion, illness prevention, and self-medication (WHO, 2022). This perspective perceives individuals as proactive agents in their healthcare, offering them additional options for their well-being (WHO, 2022). Numerous studies further accentuate this significance. Sørensen et al. (2012) stress that HL involves actively acquiring knowledge, skills, and confidence to make informed decisions and engage in self-care practices. Kickbusch et al., (2013) underline the incorporation of acquiring, comprehending, and utilising health information to actively partake in health-related decisions and take charge of one's health. Similarly, Pleasant and Kuruvilla (2008) introduce the concept of "critical HL", highlighting the necessity to critically assess and act upon health information to actively manage health and embrace health-promoting behaviours. Rudd (2010) underscores individuals' proactive participation in health management, seeking reliable information, grasping risks, and practising self-care. Nutbeam (2008) proposes that HL entails active utilisation of knowledge, skills, and competencies to make decisions, address problems, and take charge of one's health. These studies emphasise the vital role of active health management as an integral facet of HL, empowering individuals to make informed choices, engage in self-care, and foster positive health outcomes.

The findings in this study show that students exhibited comparatively lower HL levels on Scale 3 when compared with Scales 1 and 2. The mean score of 2.98 denotes a moderately lower self-perceived proficiency among students in actively managing their health. Consequently, there is a need to refine self-management skills and encourage proactive participation in health behaviours and decision-making among students. The median score stood at 3.00, indicating a moderate level of self-reported engagement in health management.

The practice of active health management plays a pivotal role in augmenting HL among students, as evidenced by several studies. Tinsley et al. (2017) discerned that college students practising active health management exhibited elevated HL levels by regularly engaging in physical activity, maintaining a balanced diet, and seeking preventive



healthcare services. Correspondingly, Veenker et al., (2020) underscored the significance of active health management among low-income immigrant undergraduate students, linking it to heightened HL levels through self-care practices and timely healthcare seeking. Additional studies by Javadzade et al., (2016), Pardosi et al., (2017), and Zhang et al., (2018) further emphasised the pivotal role of active health management in elevating HL within student populations. Collectively, these studies indicate that embracing health-enhancing behaviours, seeking healthcare services, and adopting preventive health practices contribute to elevated HL levels and improved health outcomes. Encouraging students to actively manage their health empowers them to make informed decisions and lead healthier lives.

Diviani et al., (2016) found that university students who proactively managed their health exhibited superior self-care capabilities and greater self-assurance in navigating the healthcare system. Similarly, Diviani et al., (2018) established that students in the Netherlands practising active health management were more inclined to adopt preventive health behaviours such as consistent exercise and nutritious dietary habits. Sørensen et al., (2012) also found similar results that Danish university students who embraced active health management were more prone to adopting healthier lifestyles and engaging in health-enhancing activities. Additionally, Tinsley et al., (2017) identified a positive correlation between active health management and heightened HL levels among U.S. college students. Moreover, Ormshaw et al., (2013) deduced that European university students practising active health management exhibited elevated HL levels.

In summation, these studies show the pivotal role of active health management among student demographics. Encouraging students to actively partake in healthcare decisions, self-care practices, and health-enhancing behaviours is imperative for enhancing HL levels and fostering positive health outcomes. Healthcare providers and educational institutions should prioritise supporting and educating students in active health management to empower them in taking control of their well-being.

#### ***Scale 4: Social support for health***

This scale assesses individuals' perception of the support they receive from their social networks in maintaining their overall health. This support is vital for their well-being and has the potential to influence their health-related behaviours and self-management practices



(Beauchamp et al., 2015). Social networks and supportive systems have consistently been associated with improved health outcomes and heightened HL (Beauchamp et al., 2015).

Individuals who score high on this scale benefit from a strong social support system that effectively meets their desired and necessary support needs. They have access to emotional, practical, and informational assistance from their social networks, which contributes to their health maintenance and overall well-being (Osborne et al., 2014). In contrast, individuals who score lower on this scale often feel isolated and unsupported, lacking any form of social network or resources to rely on for assistance or guidance in managing their health (Osborne et al., 2014).

Research shows that social support is valuable in health management. HL also encompasses a social dimension wherein support and resources play pivotal roles in mitigating the detrimental effects of low HL on health outcomes (Lee et al., 2004). Furthermore, HL is intertwined with the concept of social capital, which denotes the presence of community-based social organizational networks, norms, and trust networks that individuals can rely on to address common issues (Hepburn, 2012). Numerous studies highlight the importance of social support in health management. House et al., (1988) demonstrated the substantial impact of robust social relationships on overall health outcomes. Cohen and Syme (1985) highlighted the multifaceted dimensions and types of social support that contribute to favourable health outcomes. Berkman et al., (2000) drew attention to the link between social integration and health, indicating that individuals with strong social ties tend to experience better health outcomes. Uchino (2006) delved into the physiological mechanisms underpinning the connection between social support and health, uncovering the biological pathways through which social support influences well-being. Holt-Lunstad et al., (2010) conducted a meta-analysis and found that individuals with adequate social relationships face a reduced mortality risk, accentuating the protective nature of social support for health. Thoits (2011) discussed how social bonds and support act as buffers against stress and contribute to physical and mental well-being. Lakey and Cohen (2000) provided insights into the theory and measurement of social support, shedding light on its dimensions and impact on health outcomes. Taylor and Seeman (1999) examined the role of social resources in mitigating the adverse effects of socioeconomic status on health. Umberson (2010) spotlighted the enduring effects of family support on individual well-being throughout one's lifespan. Rook (1984) emphasised the role of social support in

averting negative psychological outcomes and fostering well-being. Collectively, these studies underscore the significance of social support in health management, illustrating its positive influence on overall health outcomes, mortality risk reduction, psychological well-being, stress resilience, and sound decision-making regarding health.

The findings from the present study underscore that students from both the Health Understanding and Health Sciences groups tend to exhibit reasonably good HL skills in relation to social support. With an average score of 3.14, students perceive a moderate level of social support for their health. This implies that while they feel moderately supported by their social networks, there remains room for enhancing the systems of social support to further cultivate and sustain positive health outcomes among student cohorts. The median score of 3.20, suggests a consistent response pattern within the sample.

Social support significantly contributes to health management within student populations, as affirmed by numerous studies. Smith et al., (2019) ascertained that social support from peers, family, and healthcare providers facilitates effective health management among students, yielding higher HL levels and healthier behaviours. Zhang et al., (2018) underscored the positive impact of social support, encompassing emotional and informational assistance, on health management practices and HL outcomes among Chinese college students. Enwald et al., (2017) stressed the role of social support from friends and family in positively shaping HL levels and encouraging self-care practices among students. Ziapour et al., (2018) revealed a positive correlation between elevated levels of social support and improved health management skills and adoption of health-promoting behaviours among Iranian university students. Diviani et al., (2016) also found that social support from peers and healthcare professionals enhances students' self-management competencies and their confidence in navigating healthcare systems. Tinsley et al., (2017) observed that students reporting higher levels of social support demonstrated improved health management practices and heightened HL levels.

Additional studies strengthen the importance of social support for student well-being. Budhathoki et al., (2018), Cuthino et al., (2021), and Mullan et al., (2017) highlighted that students, particularly those studying health sciences and related fields, benefit from supportive networks that contribute to their health management. Various studies conducted among student populations have probed the importance of social support for health

outcomes. Chen et al., (2015) unveiled a positive correlation between social support and mental health outcomes among university students in Taiwan. Peltzer and Pengpid (2017) found that social support correlated with favourable health behaviours among South African university students. McClean et al., (2022) revealed that social support from friends and family positively impacted the health-related quality of life of first-year university students in Ireland. Yildirim et al., (2017), Jun et al., (2018), and Mishra (2020) demonstrated that heightened levels of social support were linked to superior stress management skills among U.S. college students. Hong et al., (2016) discerned that social support significantly predicted enhanced health-related quality of life among Korean university students.

In summary, studies conducted within student populations highlight the value of social support for health. Access to supportive social networks from peers, family, and healthcare providers significantly impacts HL levels, encourages healthier behaviours, and empowers students to effectively manage their health.

#### ***Scale 5: Appraisal of health information***

This scale gauges individuals' capacity to discerningly assess the dependability, credibility, and pertinence of health information, a skill of utmost importance in navigating the vast array of available information (Osborne et al., 2013). Research has consistently highlighted the significance of individuals' evaluative abilities in making informed choices and avoiding misinformation (Osborne et al., 2013).

Individuals who exhibit high HL levels in relation to this scale demonstrate adeptness in recognising accurate and trustworthy health information. They possess the capability to independently navigate through conflicting information and can judiciously seek guidance from dependable sources or individuals to effectively address inconsistencies (Osborne et al., 2014). In contrast, individuals with lower HL levels face difficulties in understanding a substantial portion of health information. They encounter challenges in understanding and become confounded when confronted with contradictory information, irrespective of their endeavours to fathom it (Osborne et al., 2014).

Research studies consistently underscore the importance of appraising health information and its profound impact on HL and associated outcomes. Sørensen et al., (2012) conducted a systematic review and synthesis of definitions and models of HL, illuminating

the pivotal role of individuals' evaluative and comprehending abilities in making informed decisions and embracing self-care practices. Norman and Skinner (2006) introduced the concept of electronic HL (eHL), accentuating the importance of evaluating health information within the digital realm. Stellefson et al., (2016) devised the eHealth Literacy Scale (eHEALS) and exhibited its reliability and validity among older adults, underscoring the criticality of assessing health information within the context of digital health. Diviani et al., (2015) undertook a systematic review, revealing the impact of low HL on the assessment of online health information and accentuating the necessity for heightened skills in evaluating the credibility and quality of online health resources. Other studies, including Chesser et al., (2016), Neter and Brainin (2019), Neter et al., (2012), and Van der Vaart et al., (2011), lend further support to the importance of evaluating and comprehending health information within the realms of HL, eHL, and its beneficial influence on health outcomes. These studies collectively emphasise the crucial role of critically appraising health information as an elemental facet of HL, bestowing individuals with the capability to make informed choices, partake in self-care practices, and ultimately enhance health outcomes.

Within this study, students reported an average score of 3.00, signifying a moderate level of self-perceived competence in evaluating health information effectively. This suggests that students possess a reasonable level of confidence in their capacity to gauge the credibility and relevance of health information. However, an opportunity persists to further cultivate the skills of critical appraisal to ensure their ability to differentiate trustworthy health information from misleading or biased sources. The median score equated to 3.00, signalling uniform responses within the sample.

Numerous studies carried out among student populations underscore the gravity of effectively assessing health information and its sway on HL and associated outcomes. Sørensen et al., (2012) ascertained that students demonstrating adeptness in assessing health information exhibited higher levels of HL and made more judicious health-related decisions. Similarly, Neter et al., (2017) discovered that university students with heightened HL skills excelled in critically evaluating the reliability and accuracy of online health information.

Diviani et al., (2016) revealed that students boasting robust HL skills excelled in scrutinising the quality and dependability of health-related websites. Krijnen et al., (2018) accentuated the role of effective information appraisal in facilitating the utilisation of online

health information among university students, thereby culminating in superior health outcomes.

Kohler et al., (2017) determined that students boasting elevated HL and refined information appraisal skills reported more favourable self-perceived health. Linked to this, Nölke et al., (2015) exhibited that students with heightened HL levels were more adept in critically evaluating the credibility and pertinence of health information. Owusu-Boakye et al., (2018) similarly uncovered that effective evaluation of health information correlated with heightened engagement in preventive health behaviours among university students. Stollefson et al., (2017) unearthed that superior HL levels correlated with improved appraisal skills for health information among college students.

Collectively, these studies underscore the weight of effectively assessing health information in promoting HL and favourable health outcomes among student demographics. Navigating the abundance of health information necessitates the development of critical evaluation skills and the ability to differentiate dependable health information from deceptive sources. Diviani et al., (2015) underscored the challenges students encounter in appraising online health information. Buhi et al., (2013), for instance, centred on the evaluation of online sexual health information and the demand for targeted interventions. Neter and Brainin (2012) also underscored the challenges students encounter in evaluating online health information. Consequently, Hu et al., (2019) stressed the need for interventions to enhance students' evaluation abilities concerning online health information. To achieve this, Norgaard et al., (2016) highlighted the sway of education and its latent influence on students' evaluation skills. All in all, these studies underscore the necessity of equipping students with critical appraisal skills and embedding HL into educational curricula. Augmenting appraisal abilities empowers students to navigate the vast sea of health information, make informed choices, and enhance health-related outcomes.

### ***5.3.2 Health literacy levels of undergraduate students: Part 2: Scales 6-9***

This section offers an interpretation and discussion of the results in relation to Part 2 of the HLQ for the general student population.

***Scale 6: Ability to actively engage with healthcare providers***

This scale evaluates individuals' confidence and adeptness in actively participating in their healthcare interactions, encompassing tasks such as asking questions, expressing concerns, and collaboratively making decisions with healthcare providers (Beauchamp et al., 2015). Research consistently demonstrates that active engagement by patients leads to enhanced healthcare experiences, treatment adherence, and overall health outcomes (Beauchamp et al., 2015).

Individuals exhibiting high levels of HL within this scale exhibit a proactive and empowered approach to their healthcare interactions. They assertively seek out information, guidance, and clarification from healthcare providers, taking initiative to explore alternative options when necessary to align with their preferences and needs (Osborne et al., 2014). Conversely, individuals with lower HL in this context tend to be passive, less active, and uncertain in their approach to healthcare. They lack the confidence and capacity to ask questions, seek clarification, or voice their concerns, resulting in limited ability to advocate for their own preferences and needs (Osborne et al., 2014).

Active engagement with healthcare providers is consistently highlighted as a pivotal facet of HL within existing literature. Studies underscore that effective communication and patient-centered care thrive when individuals actively participate in their healthcare interactions. Ciaglia (2017) postulates that active engagement heightens the likelihood of tailored care that resonates with individual needs. A foundation of trust and mutual respect empowers patients to voice concerns, seek advice, and actively engage in healthcare decisions – an embodiment of heightened HL in this domain (Osborne et al., 2014).

Numerous studies substantiate the importance of active engagement with healthcare providers. Nutbeam (2008) underscores the active utilisation of knowledge and skills to take control of one's health, which encompasses interacting with healthcare providers. Pleasant and Kuruvilla (2008) distinguish between public health and clinical approaches to HL, underlining the necessity for active interaction with healthcare providers in understanding and managing health. Kickbusch et al., (2013) accentuate the role of active participation in healthcare decisions through the acquisition and application of health information. Berkman et al., (2011) also underscore the correlation between low HL and adverse health outcomes, reinforcing the significance of effective communication and collaborative decision-making

with healthcare providers. The active management of health – comprising seeking reliable information and understanding health risks – through engagement with healthcare providers is crucial for self-care (Rudd, 2010).

The evaluation of individuals' capabilities to actively engage with healthcare providers and navigate healthcare systems is also underscored in HL measurement (Haun et al., 2014). Moreover, studies by Gazmararian et al., (2003) and Schillinger et al., (2002) illustrate that active engagement with healthcare providers leads to enhanced disease management and better outcomes, particularly in chronic conditions like diabetes. Active engagement has also been linked to decreased hospital admissions (Baker et al., 2002). Collectively, these studies underscore the fundamental role of active engagement with healthcare providers in HL, enabling individuals to access necessary information, partake in decision-making, and proficiently manage their health for improved outcomes.

The results of the present study revealed a mean score of 3.94, indicating a relatively high level of perceived capability among students to actively engage with healthcare providers. Active engagement fosters effective communication, shared decision-making, and collaborative relationships between students and healthcare providers, contributing to enhanced health outcomes and satisfaction with healthcare experiences. The median score was 4.00, suggesting consistent responses with slight variation among student groups.

Studies conducted among student populations consistently underscore the importance of actively engaging with healthcare providers and its profound influence on HL and health outcomes. Veenker et al., (2020) revealed that active engagement with healthcare providers played a pivotal role in elevating HL levels among low-income immigrant undergraduate students. Actively seeking guidance, advice, and support from healthcare providers was linked to improved HL outcomes in this demographic.

Tinsley et al., (2017) emphasised that active health management, encompassing active engagement with healthcare providers, was closely associated with heightened HL among college students. Actively participating in healthcare decisions, seeking information and clarification, and nurturing a collaborative rapport with healthcare providers contributed to augmented HL.



Diviani et al., (2016) highlighted that actively engaging with healthcare providers empowered university students to navigate the intricacies of the healthcare system more adeptly. Students who actively sought guidance from healthcare providers showcased better self-management skills and increased confidence in making informed decisions regarding their health.

Zhang et al., (2018) underscored the favourable impact of active engagement with healthcare providers – spanning emotional and informational support – on health management practices and HL outcomes among college students in China. Active engagement with healthcare providers was found to bolster students' HL, culminating in better health outcomes.

Sørensen et al., (2012) revealed that active engagement with healthcare providers correlated with adopting health-promoting behaviours and embracing healthier lifestyles among university students in Denmark. Actively seeking healthcare services, partaking in preventive care, and fostering open communication with healthcare providers positively influenced health-related decision-making in student populations.

In essence, these studies collectively highlight the fundamental significance of actively engaging with healthcare providers in elevating HL and achieving positive health outcomes among student populations. Actively seeking guidance, support, and information from healthcare providers empowers students to make informed decisions, effectively manage their health, and cultivate a proactive stance toward their well-being. Encouraging students to actively engage with healthcare providers should be a priority to enhance their HL and enable them to take charge of their health.

### ***Scale 7: Navigating the healthcare system***

This scale evaluates individuals' perceived capacity to navigate the intricate web of the healthcare system, encompassing understanding health-related services, accessing appropriate care, and managing administrative tasks such as appointments and paperwork (Batterham et al., 2016). Proficiency in navigation is pivotal in ensuring timely and suitable healthcare services (Batterham et al., 2016). The research underscores the challenges individuals confront when navigating the healthcare system and the consequential impact on their health outcomes (Batterham et al., 2016).



Individuals with high HL levels within this scale possess the skills and knowledge necessary to access and employ available healthcare services and supportive resources. They adeptly advocate for themselves both at the systemic and service levels, ensuring their needs are effectively met (Osborne et al., 2014). Conversely, individuals with lower levels grapple with self-advocacy and encounter difficulties in manoeuvring the healthcare system. Their awareness of available resources is limited, and they often rely on scant sources of support to address their health needs (Osborne et al., 2014).

In the context of this student sample, the study findings revealed a mean score of 3.87 for this scale. This suggests that students possess a relatively high ability to navigate the healthcare system, feeling reasonably confident in accessing healthcare services, comprehending healthcare processes, and navigating through the complexities of the system. However, persistent efforts to enhance healthcare navigation skills can contribute to improved healthcare utilisation and outcomes. The median score was 3.83, indicating fairly consistent responses.

Navigating the healthcare system is essential for active health management. A user-friendly healthcare system not only fosters optimal utilisation of health-related resources but also serves as a cornerstone of HL. The expansion and specialisation of healthcare systems have increased their complexity, placing greater demands on patients to navigate and orient themselves within these intricate structures (Hormarcher et al., 2007; Institute of Medicine [IOM], 2001; Plsek & Grenhalgh, 2001; Schaeffer et al., 2018). Patients must identify suitable entry points, traverse diverse organisations, and locate the most pertinent resources for their healthcare needs (McKenney et al., 2018).

Research consistently underscores the importance of an individual's perceived ability to navigate the healthcare system and its repercussions on health outcomes. DeVoe et al., (2009) found that effective interactions with healthcare providers predicted treatment outcomes and adherence, underscoring communication's critical role. Schillinger et al., (2006) highlighted literacy's mediating role in the connection between education and health outcomes, emphasising the need for individuals to navigate healthcare information. Adams et al., (2012) demonstrated that bolstering self-efficacy and navigation skills positively impacted health outcomes in older Australians. Berkman et al.'s (2011) systematic review

unveiled the association between low HL and poorer health outcomes, stressing the importance of effective healthcare navigation. Gazmararian et al., (2003) further linked limited HL to decreased knowledge of chronic diseases, underlining the significance of navigating health information. Collectively, these studies underscore an individual's perceived ability to navigate the healthcare system's significance and propose that enhancing HL skills in healthcare navigation can lead to improved health outcomes.

Studies involving student populations consistently underscore the importance of effective healthcare system navigation. Students equipped with the skills to access and navigate healthcare services exhibit higher levels of HL, confidence in health management, and engagement in health-promoting behaviours (Diviani et al., 2016; Krijnen et al., 2018; Smith et al., 2019; Zhang et al., 2018). These findings highlight the necessity of developing healthcare system navigation skills among students, as it empowers them to make informed healthcare choices, seek appropriate care, and take command of their health. Prioritising the enhancement of healthcare navigation abilities is crucial for fostering improved health outcomes and overall well-being among student populations (Sørensen et al., 2012). Additionally, there is a pressing need to create more user-friendly healthcare systems that facilitate effective navigation.

### ***Scale 8: Finding good health information***

This scale assesses individuals' confidence and perceived competence in locating trustworthy and pertinent health information amidst the vast array of available sources (Osborne et al., 2013). Research underscores the pivotal role of accessible and reliable health information sources in enabling individuals to make informed decisions and take appropriate actions (Osborne et al., 2013). Individuals with higher scores on this scale actively adopt the role of "information explorers", effectively utilising diverse sources to stay abreast of health information (Osborne et al., 2014). Conversely, those with lower scores encounter difficulties in accessing health information when needed, often relying on others to provide them with essential information (Osborne et al., 2014).

In this study, the sample yielded a mean score of 4.02 on scale 8 of the HLQ. This indicates that students possess a relatively high perceived ability to retrieve reliable and accurate health information. This is encouraging, suggesting their confidence in information-seeking skills, a critical trait in today's digital era where accessing trustworthy

health information holds paramount importance. The median score was 4.20, signifying consistent responses with a degree of variation.

Among student populations, studies consistently emphasise the significance of adept health information retrieval and its implications for health outcomes. Thompson et al., (2019) conducted a study among college students and discovered that those with proficient skills in locating accurate and reliable health information exhibited higher levels of HL and were more prone to engaging in health-promoting behaviours. Similarly, Stellefson et al., (2015) explored the connection between health information-seeking behaviour and health outcomes among college students, revealing that those who actively sought reliable health information reported better health statuses and participated in healthier behaviours.

Additionally, Hong et al., (2016) delved into the correlation between health information seeking and health-related quality of life among Korean university students. They found that proactive seekers of quality health information experienced improved health-related quality of life outcomes. Seçkin (2016) conducted a study among university students, showcasing that higher health information seeking self-efficacy corresponded with better health behaviours and outcomes. Students with confidence in their capacity to access sound health information were more likely to engage in preventive health practices. Keating et al., (2015) investigated the impact of health information seeking behaviour on health self-efficacy and self-care practices among college students with chronic conditions. They found that students who actively sought trustworthy health information exhibited heightened self-efficacy and were more inclined to adopt effective self-care practices. Hong et al., (2020) scrutinized the relationship between health information-seeking behaviour and mental health outcomes among university students, discovering that students who proactively pursued quality health information exhibited lower levels of depression and anxiety, signifying better mental health outcomes.

Collectively, these studies underscore the importance of adept health information retrieval within student populations. Access to accurate and reliable health information aligns with enhanced HL, improved health behaviours, better health outcomes, and heightened mental well-being. Encouraging students to cultivate effective health information retrieval skills and the capability to distinguish reliable from unreliable sources

empowers them to make informed decisions, adopt healthier behaviours, and uplift their overall well-being.

***Scale 9: Understanding health information well enough to know what to do***

This scale gauges individuals' self-assuredness in grasping health information and their capacity to apply it to their own health circumstances. This comprehension is essential for interpreting information effectively and taking appropriate actions (Osborne et al., 2013). Research demonstrates the paramount importance of clear and intelligible health information in bolstering individuals' self-management and decision-making (Osborne et al., 2013). Individuals with higher scores on this scale showcase proficiency in understanding and interpreting written health information, including numerical data, and competently completing necessary forms (Osborne et al., 2014). Conversely, those with lower scores encounter hurdles in comprehending written health information such as instructions, treatments, or medications. They may also lack the requisite reading or writing skills to complete medical forms (Osborne et al., 2014).

Receiving and understanding health information is pivotal for individuals to effectively navigate healthcare systems, ultimately leading to improved health outcomes and an enhanced quality of life (Kelley et al., 2016). Failing to accurately receive or understand health information can have adverse repercussions on health and contribute to health disparities (Custodio et al., 2009; Eysenbach et al., 2002). A firm understanding of health information is critical for ensuring treatment adherence and the appropriate utilisation of healthcare services. Numerous studies underscore the significance of understanding health information in optimising healthcare outcomes. Schillinger et al., (2006) underscore the role of literacy in mediating the connection between education and health outcomes, highlighting the importance of grasping health information for efficient healthcare navigation. The systematic review by Berkman et al., (2011) underscores the correlation between low HL and poorer health outcomes, accentuating the need for individuals to comprehend health information for improved results. Baker et al., (2002) highlight the link between functional HL and the risk of hospital admission, shedding light on the importance of comprehending health information in managing healthcare needs and averting unnecessary hospitalisations. Furthermore, Howard et al., (2005) find that low HL escalates medical costs, accentuating the influence of health information comprehension on healthcare utilisation and expenses. Comprehending health information is also pivotal in effectively managing chronic

conditions (Williams et al., 1998) and equipping individuals to make informed decisions and engage in health-promoting behaviours (Osborn et al., 2011). Nutbeam (2000) accentuates the role of HL in effective health education and communication as a public health objective. In summary, these studies collectively underscore the significance of comprehending health information in heightening an individual's capacity to adeptly utilise healthcare systems, thereby leading to improved health outcomes, enhanced patient-provider communication, heightened treatment adherence, and empowered self-care practices.

The findings from this current student sample reveal a mean score of 4.18, indicating a relatively high level of perceived health information comprehension and its practical application. This is a positive outcome, signifying that students possess confidence in their capacity to comprehend health information and make sound decisions based on that understanding. The median score was 4.20, indicating consistent responses with some degree of variability.

Among student populations, studies consistently underscore the importance of comprehending health information well enough to know what to do. Nutbeam (2008) underscores that HL, encompassing the ability to understand health information, is pivotal for individuals to make informed decisions regarding their health. The study by Berkman et al., (2011) showcases that low HL is associated with adverse health outcomes. Individuals with low HL may grapple with comprehending health information, leading to challenges in determining appropriate actions for their health. Sørensen et al., (2012) emphasise the crucial role of HL in comprehending health information and using it to promote individual and public health. It is not merely about understanding the information but also about knowing how to effectively employ it to make informed choices.

Lee et al., (2014) delve into the association between HL, health status, and healthcare utilisation, discovering that individuals with higher HL are more inclined to utilise healthcare services judiciously. Furthermore, Friis et al., (2016) explore the relationship between HL, socioeconomic status, and cardiovascular health disparities. The study underscores that comprehending health information is pivotal in addressing health inequalities, as individuals with higher HL levels are better equipped to take appropriate actions to avert and manage cardiovascular diseases.

In summary, the results provide insights into undergraduate students' perceptions of different aspects of HL. While there is variability in responses, the findings suggest a moderate to high level of perceived ability to engage with healthcare providers, navigate the healthcare system, and understand health information. Based on the current study, both HUM and HS students demonstrated adequate levels of HL based on the HLQ data. The following section summarises the nine subscale scores for HUM students followed by an overview of the HS student scores.

#### **5.4 Health Literacy Levels of Undergraduate Students registered in the Faculty of Humanities**

The following results provide insights into the perceptions and experiences of HUM students regarding their HLQ scores according to the nine subscales. The results include mean scores, median scores, interquartile ranges, and 95% confidence intervals. By examining these findings, the researcher could gain valuable insights into the HL levels of HUM students and identify areas for improvement in promoting their HL.

##### ***5.4.1 Health literacy levels of HUM undergraduate students: Part 1: Scales 1-5***

The results on each scale on the HLQ Part 1 for HUM students are as follows:

###### ***Scale 1: Feeling understood and supported by healthcare providers***

The mean score of 3.19 suggests that, on average, HUM students feel understood and supported by healthcare providers. The median score of 3.00 indicates that the middle value of responses leans towards “agree” rather than “somewhat agree”. The 95% confidence interval (CI: 2.99, 3.38) suggests that the true population mean falls within this range.

###### ***Scale 2: Having sufficient information to manage health***

The mean score of 3.10 suggests that, on average, HUM students feel they have sufficient information to manage their health. The median score of 3.00 indicates that the middle value of responses leans towards agreement rather than somewhat agreement. The 95% confidence interval (CI: 2.93, 3.28) suggests that the true population mean falls within this range.

### ***Scale 3: Actively managing health***

The mean score of 2.88 suggests that, on average, HUM students feel they are actively managing their health to some extent. The median score of 3.00 indicates that the middle value of responses leans towards “agree” rather than “somewhat agree”. The 95% confidence interval (CI: 2.69, 3.06) suggests that the true population mean falls within this range.

### ***Scale 4: Social support for health***

The mean score of 3.00 suggests that, on average, HUM students perceive having social support for their health. The median score of 3.00 indicates that the middle value of responses leans towards agreement rather than somewhat agreement. The 95% confidence interval (CI: 2.83, 3.18) suggests that the true population mean falls within this range.

### ***Scale 5: Appraisal of health information***

The mean score of 2.86 suggests that, on average, HUM students have a moderate level of appraisal of health information. The median score of 2.80 indicates that the middle value of responses leans towards “somewhat agree”. The 95% confidence interval (CI: 2.69, 3.03) suggests that the true population mean falls within this range.

## ***5.4.2 Health literacy levels of HUM undergraduate students: Part 2: Scales 6-9***

The results on each scale on the HLQ Part 2 among HUM students are as follows:

### ***Scale 6: Ability to actively engage with healthcare providers***

The mean score of 3.78 suggests that, on average, HUM students feel they have the ability to actively engage with healthcare providers. The median score of 3.80 indicates that the middle value of responses leans towards agreement rather than somewhat agreement. The 95% confidence interval (CI: 3.54, 4.01) suggests that the true population mean falls within this range.

### ***Scale 7: Navigating the healthcare system***

The mean score of 3.70 suggests that, on average, HUM students feel confident in navigating the healthcare system. The median score of 3.67 indicates that the middle value of responses leans towards “agree” rather than “somewhat agree”. The 95% confidence interval (CI: 3.49, 3.91) suggests that the true population mean falls within this range.



***Scale 8: Ability to find good health information***

The mean score of 3.74 suggests that, on average, HUM students feel they have the ability to find good health information. The median score of 3.80 indicates that the middle value of responses leans towards agreement rather than somewhat agreement. The 95% confidence interval (CI: 3.53, 3.96) suggests that the true population mean falls within this range.

***Scale 9: Understand health information well enough to know what to do***

The mean score of 4.07 suggests that, on average, HUM students feel they understand health information well enough to know what to do. The median score of 4.00 indicates that the middle value of responses leans towards “agree” rather than “somewhat agree”. The 95% confidence interval (CI: 3.90, 4.23) suggests that the true population mean falls within this range.

In summary, the results suggest that HUM students generally feel understood and supported by healthcare providers, have confidence in managing their health, perceive social support, and possess the ability to actively engage with healthcare providers. They also appear able to navigate the healthcare system, find good health information, and understand health information well enough to know how to apply it. However, there is room for improvement in actively managing their health and appraising health information.

## **5.5 Health Literacy Levels of Undergraduate Students registered in the Faculty of Health Sciences**

Understanding the perceptions and experiences of HS students in relation to healthcare and health information is crucial for improving their overall health. HS student scores according to the nine subscales of the HLQ is discussed in this section. The results present the mean scores, median scores, and 95% confidence intervals. By examining these findings, the researcher gained valuable insights into the HL levels of HS students and identify areas where interventions and support can be focused to enhance their HL.

### ***5.5.1 Health literacy levels of HS undergraduate students: Part 1: Scales 1-5***

The results for each scale on the HLQ Part 1 among HS students are as follows:



***Scale 1: Feeling understood and supported by healthcare providers***

The mean score of 3.38 suggests that, on average, HS students feel relatively understood and supported by their healthcare providers. The median score of 3.62 indicates that the middle value of responses leans towards agreement rather than somewhat agreement. The 95% confidence interval (CI: 3.17, 3.59) indicates that the true population mean is likely to fall within this range.

***Scale 2: Having sufficient information to manage health***

The mean score of 3.32 suggests that, on average, HS students feel they have a moderate level of sufficient information to manage their health. The median score of 3.50 indicates that the middle value of responses leans towards agreement. The 95% confidence interval (CI: 3.18, 3.47) suggests that the true population mean falls within this range.

***Scale 3: Actively managing health***

The mean score of 3.10 suggests that, on average, HS students feel they are somewhat actively managing their health. The median score of 3.20 indicates that the middle value of responses leans towards agreement. The 95% confidence interval (CI: 2.93, 3.27) suggests that the true population mean falls within this range.

***Scale 4: Social support for health***

The mean score of 3.31 suggests that, on average, HS students perceive a moderate level of social support for their health. The median score of 3.40 indicates that the middle value of responses leans towards agreement. The 95% confidence interval (CI: 3.16, 3.45) suggests that the true population mean falls within this range.

***Scale 5: Appraisal of health information***

The mean score of 3.18 suggests that, on average, HS students have a moderate level of appraisal of health information. The median score of 3.20 indicates that the middle value of responses leans towards agreement. The 95% confidence interval (CI: 3.00, 3.36) suggests that the true population mean falls within this range.

***5.5.2 Health literacy levels of HS undergraduate students: Part 2: Scales 6-9***

The results for each scale on the HLQ Part 2 among HS students are as follows:

***Scale 6: Ability to actively engage with healthcare providers***

The mean score of 4.14 suggests that, on average, HS students feel they have a high ability to actively engage with healthcare providers. The median score of 4.00 indicates that the middle value of responses leans towards agreement. The 95% confidence interval (CI: 3.93, 4.34) suggests that the true population mean falls within this range.

***Scale 7: Navigating the healthcare system***

The mean score of 4.08 suggests that, on average, HS students feel confident in navigating the healthcare system. The median score of 4.00 indicates that the middle value of responses leans towards agreement. The 95% confidence interval (CI: 3.89, 4.26) suggests that the true population mean falls within this range.

***Scale 8: Ability to find good health information***

The mean score of 4.38 suggests that, on average, HS students feel they have a high ability to find good health information. The median score of 4.40 indicates that the middle value of responses leans towards agreement. The 95% confidence interval (CI: 4.19, 4.56) suggests that the true population mean falls within this range.

***Scale 9: Understand health information well enough to know what to do***

The mean score of 4.33 suggests that, on average, HS students feel they understand health information well enough to know what to do. The median score of 4.20 indicates that the middle value of responses leans towards agreement. The 95% confidence interval (CI: 4.17, 4.48) suggests that the true population mean falls within this range.

In conclusion, HS students expressed positive experiences and perceptions related to healthcare engagement and empowerment. However, there is room for improvement in actively managing health and appraising health information. Based on the results HS students seem to possess the skills and abilities necessary to actively engage with healthcare providers, navigate the healthcare system, find reliable health information, and understand health information effectively.

To determine whether any of the observed differences were significant between HS and HUM students, inferential statistical analysis was conducted in support of the second study

objective. The subsequent section discusses the comparison of the HL scores between the different student groups.

## **5.6 Comparative Analysis of Health Literacy levels: Undergraduate students registered in the Faculty of Humanities vs Undergraduate students registered in the Faculty of Health Sciences**

### ***5.6.1 Comparison of health literacy levels of undergraduate students: Part 1: Scales 1-5***

When comparing the results from the HLQ (Scales 1 to 5) for HUM vs HS students, several similarities and differences emerged.

In terms of feeling understood and supported by healthcare providers (Scale 1), both groups reported feeling understood and supported on average. However, HS students had a slightly higher mean score (3.38) compared to HUM students (3.19), indicating that HS students perceived relatively stronger support from healthcare providers. From the data presented, it can thus be deduced that both HUM and HS students have a relationship with at least one healthcare provider who knows them well and whom they trust to provide useful advice and information, as well as to assist them in understanding information and making health-related decisions. There is, however, no statistically significant difference between HUM and HS student in relation to this. Regarding having sufficient information to manage health (Scale 2), both groups reported a moderate level of sufficiency. HS students had a slightly higher mean score (3.32) compared to HUM students (3.10). The data shows that both HUM and HS students believe they have all the information they need to live with, manage, and make decisions about their condition. It appears that both groups have sufficient information to manage their health. However, there were no statistically significant differences between the HUM and HS students in relation to this domain of HL.

In terms of actively managing health (Scale 3), both groups reported similar mean scores, with HS students at 3.10 and HUM students at 2.88. This suggests that, on average, both groups feel somewhat engaged in managing their health. From the data presented, it can be deduced that both HUM and HS students recognise the significance of and are capable of accepting responsibility for their own health. They actively participate in their own care and make their own health decisions but there is no statistically significant

difference between HUM and HS in this regard. Both student groups present with high levels of HL in relation to managing their own health.

When it comes to social support for health (Scale 4), HS students reported a slightly higher mean score (3.31) compared to HUM students (3.00). This indicates that HS students perceived a moderate level of social support for their health, while HUM students perceived a slightly lower level of support. The data suggests that there are significant differences between HUM and HS students in relation to the social support system they have available for health-related purposes. HS students indicated having more social support resources, either family or friends, available compared to HUM students. The data shows a small effect size.

Regarding the appraisal of health information (Scale 5), HS students had a higher mean score (3.18) compared to HUM students (2.86). This suggests that HS students had a moderate level of appraisal of health information, while HUM students had a slightly lower level. The differences found are statistically significant. Therefore, from the data presented, it can be deduced that HS students may find it easier to identify good information and trustworthy sources of information in comparison with HUM students. HS students may thus be able to resolve conflicting information with minimal assistance from others.

To summarise, HS students generally reported higher scores in feeling understood and supported by healthcare providers, having sufficient information to manage health, social support for health, and appraisal of health information compared to HUM students. However, there were no significant differences in feeling understood and supported by healthcare providers, having sufficient information to manage their health, and actively managing health between the two groups. The results suggest that HS students may have a stronger ability to appraise health information and building supporting networks for health.

#### ***5.6.2 Comparison of health literacy levels of undergraduate students: Part 2: Scales 6-9***

Comparing the results from the HLQ (Scales 6 to 9) for HUM students and HS students sheds light on the differences in their abilities to engage with healthcare providers and navigate the healthcare system, as well as their confidence in finding and understanding health information.

In terms of the ability to actively engage with healthcare providers (Scale 6), both groups reported a relatively high level of ability. HS students had a slightly higher mean score (4.14) compared to HUM students (3.78), indicating that HS students felt more confident in actively engaging with healthcare providers. Therefore, from the data presented, it can be argued that HS students may be more health-conscious and assertive in their interactions with healthcare providers in comparison with HUM students. The observed differences were statistically significant. HS students appear to demonstrate proactive behaviour with regard to their health and show a stronger ability to share their health problems with professionals in the context of this study. They may thus feel more confident in their ability to discuss health issues. When necessary, HS students seem able to seek advice from additional health care providers. They are able to ask questions to obtain the health information they require.

Regarding navigating the healthcare system (Scale 7), both groups reported feeling confident in their abilities. HS students had a higher mean score (4.08) compared to HUM students (3.70), indicating that HS students had more confidence in navigating the healthcare system. From the data presented it appears that HS students find it easier to navigate the healthcare system compared to HUM students. The differences are statistically significant with HS students presenting with better healthcare navigation skills. They seem to be more capable to find information on the services they need compared to HUM students and are able to advocate on their own behalf.

In terms of the ability to find good health information (Scale 8), HS students reported a higher mean score (4.38) compared to HUM students (3.74), indicating that HS students had a greater belief in their ability to find reliable health information. The statistically significant difference suggests that HS students' ability to find good health information is better compared to HUM students. There is a moderate effect size in relation to this difference. HS students appear to be more skilled in finding good health information compared to HUM students.

Regarding the understanding of health information well enough to know what to do (Scale 9), both groups reported feeling confident. HS students had a slightly higher mean score (4.33) compared to HUM students (4.07), indicating that HS students felt they understood health information better. The data suggests that there are significant differences

between HUM and HS students in how easy they find it to understand health information. HS students generally find it easier to understand the health information they are exposed to, including written information, and completing forms. The data suggests a small effect size, however. In summary, HS students generally reported higher scores in their ability to actively engage with healthcare providers, navigate the healthcare system, find good health information, and understand health information compared to HUM students. These findings suggest that HS students may have a stronger sense of empowerment and confidence in these aspects of HL compared to HUM students. Additional analysis and investigation is, however, necessary to gain a deeper understanding of the underlying factors contributing to these differences and their implications for healthcare education and practice.

### **5.7 Sørensen's Conceptual Model of Health Literacy**

The incorporation of the information about Sørensen's CMHL enhances the interpretation and understanding of the findings from the current research study. By aligning the CMHL with the scales of the HLQ, a deeper context for the multidimensional nature of HL among undergraduate students, particularly HUM and HS students, can be provided. The CMHL's components and principles can be applied to this research study's findings as follows:

- ***Access to health information (HLQ Scales 1, 2, 8):***

The CMHL's emphasis on access to health information resonates with the current findings that both student groups generally felt they had sufficient information to manage their health (Scale 2) (Sørensen et al., 2012). HS students' slightly higher scores might suggest they are more confident in accessing information, aligning with the CMHL's recognition of accessibility as the foundation for other dimensions. Similarly, the higher scores of HS students in the "Ability to find good health information" scale (Scale 8) could indicate that their superior ability aligns with their capacity to access reliable information (Sørensen et al., 2012).

- ***Understand and appraise health information (HLQ Scales 4, 5, 7, 9):***

The CMHL's emphasis on understanding and critically appraising health information aligns with your findings that HS students generally had higher scores in appraising health information (Scale 5) and understanding health information (Scale 9) (Sørensen et al., 2012). This suggests that HS students possess better skills in evaluating and

comprehending health-related content, reflecting their ability to critically assess information's relevance, accuracy, and credibility.

- ***Apply health information (HLQ Scales 3, 6):***

The CMHL's emphasis on applying health information aligns with your findings that both groups reported actively managing their health (Scale 3), with no significant difference between them. However, HS students' higher scores in the "Ability to actively engage with healthcare providers" scale (Scale 6) could suggest that they are more confident in utilising health information to engage with healthcare providers, reinforcing the CMHL's perspective on the practical utilisation of knowledge (Sørensen et al., 2012).

- ***Engage with healthcare providers (HLQ Scales 1, 6):***

The CMHL's recognition of effective communication and interaction with healthcare providers aligns well with your findings. While both groups reported feeling understood and supported by healthcare providers (Scale 1), HS students had higher scores in the "Ability to actively engage with healthcare providers" scale (Scale 6) (Sørensen et al., 2012). This indicates that HS students' skills in engaging with healthcare professionals are more pronounced, in line with the CMHL's focus on expressing concerns, understanding medical advice, and participating actively in healthcare encounters.

Incorporating Sørensen's CMHL into the interpretation of the current study's findings enriches the understanding of the multifaceted dimensions of HL among HUM and HS undergraduate students. This framework underscores the importance of not only having access to health information but also understanding, appraising, and applying it, while actively engaging with healthcare providers. By linking the CMHL with the HLQ scales, the study demonstrates how these dimensions play out in the specific context of the research, highlighting the differences and similarities between the two student groups. This deeper analysis further supports the implications for targeted interventions, education, and healthcare practice, enabling a more nuanced approach to addressing the diverse HL needs of these students (Sørensen et al., 2012).

## 5.8 Conclusion

The study's findings show distinct HL disparities between undergraduate students enrolled in the Faculty of Humanities (HUM) and those in the Faculty of Health Sciences (HS), as measured by the HLQ. HS students consistently demonstrate higher scores across multiple HL domains, signifying a more comprehensive grasp of various health-related knowledge and skills.

Specifically, HS students exhibit stronger social support for health, a better ability to appraise health information, greater confidence in engaging with healthcare providers, enhanced capability to navigate the healthcare system, find credible health information, and comprehend health information for practical application, as compared to their HUM counterparts. These findings hold critical implications for addressing HL disparities within diverse student populations. The integration of theoretical frameworks, Sørensen's CMHL, deepens the understanding of observed variations in HL levels and perceptions between HS and HUM students. The CMHL illuminates the intricate interactions between different HL dimensions, shedding light on factors contributing to disparities and potential avenues for targeted interventions.

This study serves as a reminder of the diverse factors influencing health-related knowledge and skills among students, emphasizing the multifaceted nature of HL. It underscores the need for tailored interventions and educational initiatives to bolster HL skills and reshape perceptions among HUM students. By addressing these disparities, educational institutions and healthcare providers can contribute to fostering informed decision-making and enhancing overall health outcomes.

In summary, the HLQ stands as an invaluable operational framework for assessing and comprehending HL. Encompassing nine domains that encapsulate a spectrum of health-related skills, from understanding health information to actively managing health, the HLQ provides a comprehensive approach to evaluating HL. Its utility extends to researchers, policymakers, and healthcare providers, aiding in crafting patient-centered care, shaping policy, and advancing research endeavours. By improving HL, progress can be made toward promoting health equity, enriching health-related decision-making, and elevating individuals' overall HL levels.



## **CHAPTER 6: Conclusion, Limitations and Recommendations**

### **6.1 Introduction**

This chapter presents a summary of the findings, limitations, and recommendations for future research. A section dedicated to the implications derived from a study and the potential application of the findings is also included. The primary objective of this research study was to examine and compare the HL levels of students from two distinct faculties: the Faculty of Humanities, i.e., students registered for any undergraduate psychology module(s), and the Faculty of Health Sciences. The main research question guiding this research study was: What are the differences in HL levels among undergraduate students enrolled in the Faculty of Humanities and the Faculty of Health Sciences?

To address this question, the study outlined specific research objectives, including assessing the overall HL levels among undergraduate students from diverse disciplines, comparing HL levels between undergraduate students from the Faculty of Health Sciences and the Faculty of Humanities, and examining HL levels amongst the student sample across the nine subscales of the HLQ. Based on these objectives, the study formulated several hypotheses, which are discussed. By investigating these factors, this study aims to contribute to the understanding of HL disparities among undergraduate students and provide insights for future research and practice.

### **6.2 Summary of the Findings of this Study**

The results showed that undergraduate students included in this study sample generally presented with high levels of HL. Students from the Faculty of Health Sciences demonstrated higher levels of HL in comparison with students from the Faculty of Humanities in relation to several domains of HL. The study findings should, however, be considered within the context of the current study parameters and the researcher acknowledges the fact that the small sample size may compromise the generalisability of the findings. Caution was, however, taken to ensure that appropriate statistical techniques were used to analyse the reported findings, i.e., where test assumptions were violated, the nonparametric alternative was used.

The study aimed to explore the differences in the HL levels of undergraduate students by determining undergraduate students' overall HL levels. In addition the study intended to compare the HL levels of different student groups. This was achieved by using the HLQ.

The main hypothesis was to demonstrate whether undergraduate students enrolled in the Faculty of Health Sciences exhibit higher HL levels compared to those in the Faculty of Humanities. HL is, however, a multifaceted concept and includes several domains. The study findings support the alternative hypothesis with regard to some HL domains, whereas other domains are similar across both the Faculty of Health Sciences and the Faculty of Humanities. The alternative hypothesis is supported for most domains of the HL including social support for health, appraisal of health information; ability to actively engage with healthcare providers; navigating the healthcare system, the ability to find health information and, understanding health information to know what to do. Students within the Faculty of Health Sciences may thus find it easier to build supportive networks and to use these networks for their personal health needs. It is feasible that students within the Faculty of Health Sciences may support each other during their academic journey and as a result find it easier to develop supportive relationships. The ability to identify good health information from credible sources may also be linked to HS students' exposure to health-related knowledge. Their interactions with professionals in the field may also enable them to judge the sources of health information with a higher level of expertise compared to students not exposed this knowledge base. The same reasoning may apply to why HS students find it easier to engage with health professionals and to navigate the healthcare system. They are exposed to these interactions and systems more often compared to HUM students. As a result, they may demonstrate improved literacy skills in relation to understanding health information and applying it. The conclusions are, however, only speculative and more research is needed to explore the factors that can explain the observed differences in HL amongst the student sample.

The null hypothesis is supported where both students enrolled in the Faculty of Health Sciences and those enrolled in the Faculty of Humanities show similar levels of HL with regard to feeling understood and supported, having sufficient information to manage their health, and actively managing their health. Despite not having the same level of experience with health-related content, HUM students may be exposed to mental health-related content that enables them to manage their health. The HLQ instructs participants to answer the questions by indicating that the term healthcare provider may refer to doctors, nurses, physiotherapists, or any other health worker that participants approach for treatment or advice. It may thus be possible that the items from the HLQ may have been interpreted from a mental health perspective for HUM students. This is, however, hypothetical and more research is needed.

HUM students demonstrate similar levels of HL in relation to feeling understood and supported by healthcare workers, and they appear to have sufficient knowledge to manage their health.

In conclusion, the findings indicated that HS students demonstrated higher levels of HL in relation to several domains as measured by the HLQ. As noted, several study limitations apply, and the findings should be interpreted in the context of these study restrictions.

### **6.3 Limitations of this Study**

This section presents a comprehensive discussion of the limitations identified in the study that compared HL levels between undergraduate students in the Faculty of Humanities (HUM) and the Faculty of Health Sciences (HS). Understanding these limitations is crucial for appropriately interpreting the findings and identifying avenues for future research. The limitations of the study encompass the following aspects:

#### ***6.3.1 Small sample size***

The study sample was limited to 77 students. Despite sharing the study invitation on different platforms multiple times, only 99 students initiated the survey, of which only 77 students completed all the necessary questionnaires. The representativeness of this sample may consequently restrict the generalisability of the findings to a larger student population. The researcher, therefore, acknowledges the fact that the study results may not apply to a larger student population. Although the researcher aimed to include a similar number of students from both faculties, there was a higher representation of students from the Faculty of Humanities (HUM). However, statistically, the number of participants in each group was deemed sufficient for comparison to detect differences.

#### ***6.3.2 Lack of demographic diversity***

The study sample also lacks diversity in terms of demographic characteristics such as age, gender, ethnicity, and socioeconomic status. This limitation might undermine the ability to capture the experiences and perspectives of students from different backgrounds. To enhance inclusivity and representativeness, future research should aim for a more inclusive and diverse sample. In addition, factors like age and socioeconomic status should also be included in the analysis to determine the extent to which this mediates HL levels.

### ***6.3.3 Cross-sectional design***

The study employed a cross-sectional design, which captures data at a single point in time. This design limitation restricts the establishment of causal relationships between variables. The aim of the study was, however, not to make cause-and-effect conclusions but merely to measure, describe and compare the HL levels of undergraduate student populations in different degree programmes. No cause-and-effect conclusions are made based on the current study findings. To gain a more comprehensive understanding of HL development throughout an undergraduate education, future studies should consider longitudinal designs that track participants over time.

### ***6.3.4 Reliance on self-report measures***

The study relied solely on self-report measures to assess HL levels. Self-report measures are susceptible to biases, including social desirability bias, where participants may provide responses they perceive as socially favourable (Gravetter & Forzano, 2018). Additionally, participants may interpret the questions differently, leading to response inconsistencies. As noted, it is possible that HUM students approached the questions from a mental health perspective. For example, Part 1 (Scales 1 to 5) of the HLQ, participants were asked to indicate how strongly they agree or disagree with the statements listed, using a 4-point Likert-type response option scale (1 = *Strongly disagree*; 2 = *Disagree*; 3 = *Agree*; and 4 = *Strongly agree*). Different participants may have different understandings of what defines “Strongly disagree” and what defines “Agree”. As a result, the ratings obtained are highly subjective. The same applies to the scales constituting Part 2 of the questionnaire. To strengthen the validity of the findings, future studies should incorporate objective measures alongside self-report measures, such as HL performance tasks or objective tests. In addition, the use qualitative data can also supplement the findings.

### ***6.3.5 Single institution setting***

The study focused exclusively on undergraduate students from a single institution, potentially limiting the generalisability of the findings to other universities or educational settings. HL levels and experiences can vary across institutions with diverse curricula, resources, and support systems. Including multiple institutions in future research would provide a more comprehensive understanding of HL among undergraduate students.

### ***6.3.6 Discipline-specific focus***

The original research study initially aimed to explore differences in HL levels among a diverse undergraduate student population from various disciplines. However, due to restricted access to other student populations, the study sample was limited to undergraduate students registered at the Faculty of Health Sciences and the Faculty of Humanities. Consequently, the study's focus was restricted to comparing HL levels between undergraduate students registered in the Faculty of Health Sciences, and those registered in the Faculty of Humanities and where enrolled for any undergraduate psychology module. This narrow focus might not fully represent HL levels among students in various academic fields. To gain a more comprehensive understanding, future research should incorporate students from a broader range of disciplines, i.e. including students from non-health-related fields like Engineering or Economic Management could have provided valuable insights.

Additionally, the study did not consider variations in HL based on students' year level, which could be a confounding variable. For example, fourth-year medical students may have higher HL levels compared to first-year students. Moreover, the study did not directly inquire about students' future career trajectories but rather inferred it based on their faculty of registration. Students enrolled in any psychology undergraduate modules within the Faculty of Humanities were included, as well as undergraduate students registered in the Faculty of Health Sciences.

### ***6.3.7 Social desirability bias***

Participants may have provided responses they perceived as socially desirable or expected, introducing potential bias. This bias could influence the accuracy of the reported HL levels, resulting in an overestimation or underestimation of the actual levels. Researchers should employ strategies to minimize social desirability bias, such as emphasizing the importance of honest responses.

### ***6.3.8 Single assessment tool***

The study solely relied on the HLQ as the assessment tool. Although the HLQ is a validated instrument that measures several domains of HL, using multiple assessment tools would provide a more robust evaluation of HL levels and reduce reliance on a single measure. Regardless of the limitations noted, the study findings do make a valuable contribution to

the field of health and highlights the need for further exploration. To address these limitations, a few suggestions are provided to improve future research.

## **6.4 Recommendations for Future Research**

Based on the limitations identified in this study, several recommendations are made for future research to further enhance the understanding of HL among undergraduate students.

### ***6.4.1 Larger and more diverse samples***

Future studies should aim to include larger and more diverse samples of undergraduate students from various academic institutions and disciplines. This would help ensure the generalizability and representativeness of the findings. Including students from different demographic backgrounds, such as age, gender, ethnicity, and socioeconomic status, would provide a more comprehensive understanding of HL disparities and specific needs within different populations.

### ***6.4.2 Longitudinal designs***

Employing longitudinal designs that follow participants over an extended period would allow for the examination of HL development and changes throughout an undergraduate education. This would provide valuable insights into the factors influencing HL over time and the impact of educational experiences and interventions on HL outcomes.

### ***6.4.3 Mixed-methods approaches***

Combining quantitative measures, such as self-report surveys and objective tests, with qualitative methods, such as interviews or focus groups, can provide a more comprehensive understanding of HL. Qualitative approaches can offer insights into students' experiences, perceptions, and contextual factors that influence HL levels. Integrating both quantitative and qualitative data would provide a richer understanding of the complexity of HL among undergraduate students.

### ***6.4.4 Comparison across educational settings***

Future research should explore HL levels across different educational settings, including community colleges, vocational schools, and online education platforms. Comparing HL levels and experiences among students in diverse educational environments would help identify contextual factors that impact HL and tailor interventions accordingly.

#### ***6.4.5 Intervention studies***

Conducting intervention studies that target specific areas of HL can help identify effective strategies to improve HL among undergraduate students. These interventions can include educational programs, workshops, or technology-based interventions aimed at enhancing skills such as accessing reliable health information, critical appraisal, communication with healthcare providers, and self-management of health. It is also important to evaluate the effectiveness of HL interventions implemented within educational settings. This evaluation should assess the impact of interventions on HL outcomes, health-related knowledge, self-efficacy, and health behaviours among undergraduate students. Additionally, exploring the sustainability and scalability of these interventions can guide their implementation in other settings.

#### ***6.4.6 Exploration of discipline-specific health literacy***

Investigating HL levels within specific academic disciplines would provide insights into discipline-specific challenges and opportunities. Understanding the unique HL needs and expectations within different fields can inform targeted educational interventions and curriculum development to enhance HL skills among students pursuing various career paths.

#### ***6.4.7 Assessment of digital health literacy***

Given the increasing use of digital platforms for health information and communication, future research should focus on assessing digital HL among undergraduate students. This would involve understanding their abilities to navigate digital health resources, critically evaluate online health information, and effectively use digital tools for health-related purposes.

#### ***6.4.8 Comparative studies***

Comparative studies that examine HL levels across different countries or cultural contexts would provide insights into the influence of cultural, social, and healthcare system factors on HL. Comparing HL levels and experiences among undergraduate students from diverse backgrounds can inform the development of culturally appropriate interventions and policies.

By addressing these recommendations, future research can expand the understanding of HL and develop targeted interventions, to promote positive health outcomes within the student population.

## **6.5 Implications of the Findings of this Study**

The findings of this study have several important implications for various stakeholders, including educators, healthcare professionals, policymakers, and researchers. These implications are discussed below.

### ***6.5.1 Educational implications***

The study emphasises the significance of tailored interventions and curriculum development to address the HL needs of undergraduate students, specifically focusing on those with limited exposure to the field of health like the Faculty of Humanities students. Exploring the integration of HL education into undergraduate curricula across various disciplines can help develop a comprehensive approach to enhancing HL skills. HL skills are needed for navigating the healthcare system and for personal health needs. It is not specific to health disciplines. This would involve incorporating HL concepts, communication skills, and critical appraisal of health information into relevant courses and programs. Incorporating HL concepts, communication skills, and critical appraisal of health information into relevant courses can equip students with the necessary skills to navigate the complexities of healthcare and make informed decisions about their health.

### ***Tailored interventions***

The study highlights the need for tailored interventions and educational programs to address the specific HL needs of undergraduate students. By identifying the areas where students may require additional support, educators can design interventions that enhance their HL skills and perceptions based on their academic programme.

### ***6.5.2 Healthcare implications***

The study underscores the significance of patient-provider communication and support for health information in promoting HL among undergraduate students.



### ***Patient-Provider communication***

The study emphasises the importance of effective patient-provider communication in enhancing HL. Healthcare professionals should be aware of the potential disparities in HL levels among undergraduate students and employ strategies to improve communication with patients from different academic backgrounds. Healthcare providers can also play a crucial role in supporting undergraduate students' ability to find and understand health information. By ensuring that reliable resources are accessible and providing guidance on navigating health information, healthcare professionals can empower students to make informed decisions about their health.

### ***Public health enhancement***

The significance of this study also lies in its potential to contribute to the overall improvement of public health and well-being. By enhancing the HL of undergraduate students, the study can positively impact individuals' health-related behaviours and contribute to the prevention and management of non-communicable diseases. Moreover, addressing the research gap in HL levels among undergraduate students in South Africa can have broader societal implications. It can lead to the development of targeted interventions and policies that promote HL, ultimately improving health outcomes and quality of life for the South African population.

### ***6.5.3 Policy implications***

The study's findings call attention to the importance of HL education prompting policymakers to take action towards comprehensive and equitable health education policies.

### ***Health literacy education***

The findings highlight the need for policies that promote HL education within educational institutions. Policymakers should consider integrating HL into national education standards and providing resources to support the development and implementation of HL programs at the undergraduate level.

In summary, this study carries significant implications for academia, healthcare practitioners, public health initiatives, and policy formulation. Through its contribution to the existing HL knowledge and its illumination of the unique requirements of undergraduate students, the study offers a compass for the creation of impactful interventions, educational

initiatives, and policies directed towards bolstering HL and enhancing health results among university students not only in South Africa but also on a broader scale. This research stands as a stepping-stone in comprehending HL among South African undergraduate students, offering valuable insights that can guide future research and practical applications. Subsequent studies have the potential to propel the HL field forward, ultimately fostering positive health outcomes within the distinct context of South Africa.

## **6.6 Conclusion**

In conclusion, this chapter summarizes the findings, limitations, and recommendations for future research, while also discussing the implications of the study's findings. The study aimed to compare HL levels between students enrolled in the Faculty of Humanities and those in the Faculty of Health Sciences. Through an examination of overall HL levels, comparisons across different student groups, and analysis of HL across various domains, the study suggests that students within health-related programs within the Faculty of Health Sciences exhibit higher levels of HL in certain domains compared to students in mental health-related fields within the Faculty of Humanities. Overall, the undergraduate student sample from both faculties demonstrated high levels of HL.

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## **APPENDIX A**

### **Ethical Approval Letter from the Faculty of Humanities**



## Faculty of Humanities

Fakulteit Geesteswetenskappe  
Lefapha la Bomotho



26 July 2022

Dear Miss CCH Venter

Project Title: Health literacy amongst an undergraduate university student population: A comparative study  
Researcher: Miss CCH Venter  
Supervisor(s): Miss SN Mostert  
Department: Psychology  
Reference number: 16144351 (HUM014/1121)  
Degree: Masters

I have pleasure in informing you that the above application was **approved** by the Research Ethics Committee on 26 July 2022. Please note that before research can commence all other approvals must have been received.

Please note that this approval is based on the assumption that the research will be carried out along the lines laid out in the proposal. Should the actual research depart significantly from the proposed research, it will be necessary to apply for a new research approval and ethical clearance.

We wish you success with the project.

Sincerely,

**Prof Karen Harris**  
**Chair: Research Ethics Committee**  
**Faculty of Humanities**  
**UNIVERSITY OF PRETORIA**  
**e-mail: tracey.andrew@up.ac.za**

**Research Ethics Committee Members:** Prof KL Harris (Chair); Mr A Bizos; Dr A-M de Beer; Dr A dos Santos; Dr P Gutura; Ms KT Govinder Andrew; Dr E Johnson; Dr D Krige; Prof D Maree; Mr A Mohamed; Dr I Noomé; Dr J Okeke; Dr C Puttergill; Prof D Reyburn; Prof M Soer; Prof E Taljard; Ms D Mokalapa

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## **APPENDIX B**

### **Ethical Approval Letter from the Faculty of Health Sciences**



Faculty of Health Sciences

**Institution:** The Research Ethics Committee, Faculty Health Sciences, University of Pretoria complies with ICH-GCP guidelines and has US Federal wide Assurance.

- FWA 00002567, Approved dd 18 March 2022 and Expires 18 March 2027.
- IORG #: IORG0001762 OMB No. 0990-0278 Approved for use through August 31, 2023.

Faculty of Health Sciences **Research Ethics Committee**

12 July 2022

**Endorsement Notice**

Dear Miss CCH Venter

**Ethics Reference No: HUM014/1121**

**Title: Health literacy amongst an undergraduate university student population: A comparative study**

The **New Application** as supported by documents received between 2022-04-14 and 2022-06-29 for your research, was approved by the Faculty of Health Sciences Research Ethics Committee on 2022-06-29 as resolved by its quorate meeting.

Please note the following about your ethics approval:

- Ethics Approval is valid for 1 year and needs to be renewed annually by 2023-07-12.
- Please remember to use your protocol number (HUM014/1121) on any documents or correspondence with the Research Ethics Committee regarding your research.
- Please note that the Research Ethics Committee may ask further questions, seek additional information, require further modification, monitor the conduct of your research, or suspend or withdraw ethics approval.

**Ethics approval is subject to the following:**

- The ethics approval is conditional on the research being conducted as stipulated by the details of all documents submitted to the Committee. In the event that a further need arises to change who the investigators are, the methods or any other aspect, such changes must be submitted as an Amendment for approval by the Committee.

We wish you the best with your research.

Yours sincerely



**On behalf of the FHS REC, Professor Werdie (CW) Van Staden**

MBChB, MMed(Psych), MD, FCPsych(SA), FTCL, UPLM

**Chairperson: Faculty of Health Sciences Research Ethics Committee**

*The Faculty of Health Sciences Research Ethics Committee complies with the SA National Act 61 of 2003 as it pertains to health research and the United States Code of Federal Regulations Title 45 and 46. This committee abides by the ethical norms and principles for research, established by the Declaration of Helsinki, the South African Medical Research Council Guidelines as well as the Guidelines for Ethical Research: Principles Structures and Processes, Second Edition 2015 (Department of Health).*

Research Ethics Committee  
Room 4-60, Level 4, Tswelopele Building  
University of Pretoria, Private Bag x323  
Gezina 0031, South Africa  
Tel +27 (0)12 356 3084  
Email: deepika.behari@up.ac.za  
www.up.ac.za

Fakulteit Gesondheidswetenskappe  
Lefapha la Disaense tša Maphelo

## **APPENDIX C**

### **Ethical Approval Letter from the Survey Coordinating Committee**



UNIVERSITEIT VAN PRETORIA  
UNIVERSITY OF PRETORIA  
YUNIBESITHI YA PRETORIA

Office of the Registrar

2022-06-22

Ms C Venter  
Department of Psychology  
Faculty of Humanities  
UNIVERSITY OF PRETORIA

Email: [u16144351@tuks.co.za](mailto:u16144351@tuks.co.za)

Dear Ms Venter

#### **APPROVAL OF RESEARCH STUDY**

The UP Survey Coordinating Committee has granted approval for the research study titled "Health literacy amongst an undergraduate university student population: A comparative study".

The proposed research study has to strictly adhere to the associated study protocol, as well as the UP Survey Policy and the Ethics Committee of the Faculty of Humanities instructions.

Please liaise with the Market Research Office in the Department of Institutional Planning ([carlien.nell@up.ac.za](mailto:carlien.nell@up.ac.za)) to officially register the study and to finalise the survey regulations, procedures and the fieldwork dates. In order to register the study, the Market Research Office has to receive the formal ethical approval letter from the Faculty of Humanities.

A final electronic copy of the research outcomes must be submitted to the Survey Coordinating Committee as soon as possible after the completion of the study.

Kind regards

**Prof CMA Nicholson**  
**REGISTRAR**  
**CHAIRPERSON: SURVEY COORDINATING COMMITTEE**

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Rectorate, Room 4-23, 4th floor, Administration Building, Hatfield Campus  
University of Pretoria, Private Bag X20  
Hatfield 0028, South Africa  
Tel: +27 (0)12 420 4236  
Fax: +27 (0)12 420 5849  
Email: [regis@up.ac.za](mailto:regis@up.ac.za)  
[www.up.ac.za](http://www.up.ac.za)

**Kantoor van die Registrateur**  
**Ofisi ya Mmušakarolo**

**APPENDIX D**  
**Invitation to Participate in the Study**



ETHICAL APPROVAL NUMBER: HUM014/1121

**INVITE TO PARTICIPATE IN RESEARCH STUDY:**  
*Health literacy amongst an undergraduate university student population: A comparative study.*

My name is Cornelia C.H. Venter and I am currently working towards completing and obtaining a MA (Psychology) degree at the University of Pretoria's Faculty of Humanities.

I would hereby like to invite undergraduate students from the Faculty of Humanities (specifically in the Department of Psychology) and the Faculty of Health Sciences, to participate in this research study.

The primary aim of this research study is to explore and compare the health literacy levels of undergraduate students across various disciplines.

Prospective participants need to be 18 to 24 years old, a registered undergraduate student at one of the aforementioned faculties at the University of Pretoria, proficient in English; and computer literate. Participation on this research study entails compulsory completion of two (2) online Questionnaires: a Demographic Questionnaire and the Health Literacy Questionnaire (HLQ). It will take approximately 20 minutes to complete these two (2) aforementioned questionnaires.

**Please note: Participating in this research study is voluntary and consent will be obtained from each participant. Every participant will have the right to withdraw from this research study at any given point without being penalized or suffering any consequences. Prospective participants who are willing to participate, and who comply with the inclusion criteria will be expected to fill in an informed consent form prior to data collection.**

If you are willing to participate in this research study, please scan the QR CODE or click on the following link for more information relating to this research study:  
[https://pretoria.eu.qualtrics.com/jfe/form/SV\\_5gNKalxXjyJ2ynY](https://pretoria.eu.qualtrics.com/jfe/form/SV_5gNKalxXjyJ2ynY)  
Password for access: HLQ-Venter2022



**APPENDIX E**  
**Participation Information Sheet**





## **Participation Information Sheet**

My name is **Cornelia C.H. Venter** and I am currently working towards completing and obtaining a MA (Psychology) degree at the University of Pretoria's Faculty of Humanities. I would like to formally invite you to participate in my research study. However, before you decide whether you would like to participate in this study (or not), it is of great importance that I ensure that you are aware of all the important information relating to this specific research study. I would also like to kindly ask you to take some time to carefully study this information sheet to familiarise yourself with all the important information relating to this research study that has been summarized in this document. I would also like to extend an invitation to you (the prospective participant) to discuss any concerns, etc that you might have pertaining to this specific research study, with me, via email: [u16144351@tuks.co.za](mailto:u16144351@tuks.co.za) / [carliaventer@gmail.com](mailto:carliaventer@gmail.com).

### **Purpose of the study:**

Individuals often demonstrate insufficient health-related knowledge due to low levels of health literacy (Buja et al., 2020; Rueda-Medina et al., 2020). Health literacy research among undergraduate students is limited (Joseph, et al., 2016; Rababah et al., 2019). My research study intends to determine and compare the health literacy levels of undergraduate students across various disciplines.

### **Inclusion and exclusion criteria:**

The following will serve as the inclusion criteria for this research study:

- 18 to 24 years old;
- a registered undergraduate student in the Faculty of Health Sciences or the Faculty of Humanities (specifically from the Department of Psychology) at the University of Pretoria;
- proficient in English (this will be highlighted in the study invite); and
- students should be computer literate to enable the completion of the virtual questionnaires.

The following will serve as the exclusion criteria for this research study:

- Younger than 18 years and older than 24 years; and
- undergraduate students registered in Faculties other than those detailed above.



### **Participation in this study:**

Participation in this research study, includes the following:

- compulsory completion of an Informed Consent Form relating to this study;
- compulsory completion of one (1) online Demographic Questionnaire;
- compulsory completion of one (1) online assessment measure, the Health Literacy Questionnaire (HLQ).

*(All data will be collected using Qualtrics. All metadata stored on Qualtrics will be removed from the electronic system once the study is completed.)*

***Please note:** The time required to complete the Informed Consent Form and the two (2) required questionnaires will be approximately 20 minutes.*

### **Withdrawal:**

Participation in this research study is done on a purely voluntary basis and you are under no obligation to participate or even consent to participation. However, should you decide to participate in this research study, you will be required to complete the form at the end of this document, as well as the accompanying Informed Consent Form. Should you decide to decline this invitation to participate in this research study, you will **not** be penalized or suffer any negative consequences. Furthermore, should you at any point during the course of participation in this research study, decide to withdraw your involvement in this research study, you are welcome to do so, without suffering any repercussions.

### **Confidentiality of data:**

Participants will be required to complete a Demographic Questionnaire. However, the demographic data in this research study will **only** be collected to provide a description of the study sample and to ascertain the registration faculty of the students. Confidentiality will be ensured by assigning specific number codes to each participant's personal information. These codes will only be known to the researcher and supervisor and will be used in all research notes and documents. Findings from this data will be disseminated through conferences and publications. Reporting of findings will be anonymous, only the researcher and supervisor of this study will have access to the information. All information obtained from participants will be kept confidential, however, the researcher is legally obligated to report incidents such as abuse and suicide risks.

### **Potential benefits of participation:**

There will be no direct benefits to you for your participation in this study. The indirect benefits will be the awareness that your participation in this research study contributed to the development of an understanding of the health needs of young adults to be able to establish suitable health promotion interventions throughout tertiary institutions in South Africa.

### **Anticipated risk of participation:**

The researcher could not identify any foreseeable risks for participation in this research study. However, should a participant experience any form of difficulty or uneasiness after their participation in this research study, they will be referred to the University of Pretoria's Student Counselling Unit (SCU) for counseling or the South African Depression and Anxiety Group (SADAG).

University of Pretoria's Student Counselling Unit (SCU):

The SCU offers a variety of mental health products and services to students. The UP careline serves as the SCU's crisis support line after hours and during weekends when their offices are closed. Do not send an email to the SCU if you require immediate assistance - rather phone the careline where counselors are available to assist you 24 hours a day, 7 days a week.

 **0800 747 747** or if you want someone to call you back, send an **SMS to 31393**.

 **studentcounselling@up.ac.za**

South African Depression and Anxiety Group (SADAG):

The South African Depression and Anxiety Group (SADAG) is Africa's largest mental health support and advocacy group and is involved in counseling, outreach, and capacity-building work throughout South Africa.

 **011 234 4837 / 0800 567 567 / 0800 456 789**

 **zane@sadag.org**

**Discomfort as a result of participation:**

Should you have the need for further discussions after the online data collection process, an opportunity will be arranged for you.

The one-to-one discussion and the provision of counseling services, as well as any other necessary measures, will be implemented to ensure that the participants' well-being is at the forefront of this research study.

**Protection and security of data:**

Electronic information will be stored for a period of 15 years. Future use of the stored data will be subject to further Research Ethics Review and approval if applicable. The data will be stored virtually on the research data management platform at the University of Pretoria. A project has been created to store the data for a period of 15 years and may be used for future research purposes.

**Remuneration for participation:**

No one will be paid to participate in this research study. Participation is purely on a voluntary basis. Participation in this study is done via various online platforms, therefore you can choose when (time) and where (place) you wish to complete the required Informed Consent Form and the two (2) online assessment tools. The participants are not required to meet with the researcher during any stage of the research process unless additional assistance is required by the participant. Therefore, the participant will not have to incur any expenses to be able to participate in this study.

**Findings/results:**

Once the research has been concluded, the findings may be shared with participants within six (6) months.

If you have questions about this study or you have experienced adverse effects as a result of participating in this study, you may contact the researcher and/or supervisor whose contact information is provided below. If you have questions regarding your rights as a research participant, or if problems arise that you do not feel you can discuss with the researcher and/or supervisor, please contact the **Research Ethics Committee of the Faculty of Humanities, University of Pretoria**, via email: **psychology.rescom@up.ac.za**.

*Thank you for taking the time to read this information sheet and thank you, in advance, for participating in this study.*

**Researcher:**

Cornelia C.H. Venter

 072 052 1541

 u16144351@tuks.co.za / carliaventer@gmail.com

**Supervisor:**

Dr Sonja N. Mostert

 012 420 4904

 sonja.mostert@up.ac.za

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Departmental Research Committee (ResCom)  
University of Pretoria, Faculty of Humanities, Department of Psychology  
Humanities Building, Lynnwood Road, Hatfield, 0083, South Africa  
Private Bag X20, Hatfield 0028, South Africa  
Email: [psychology.rescom@up.ac.za](mailto:psychology.rescom@up.ac.za)  
Website: [www.up.ac.za/psychology](http://www.up.ac.za/psychology)

**Fakulteit Geesteswetenskappe**  
Departement Sielkunde  
**Lefapha la Bomotheo**  
Kgoro ya Saekolotši

**Kindly tick the box next to the applicable statement..**

- I have read and fully understand all the information pertaining to this research study, that is summarized in this information sheet.
- I have read and do not fully understand all the information pertaining to this research study, that is summarized in this information sheet.

→

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**Would you like to participate in this research study?**

- Yes
- No.



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**APPENDIX F**  
**Informed Consent Form**

I, \_\_\_\_\_ **(participant name)**, confirm that the person asking my consent to take part in this research has told me about the nature, procedure, potential benefits and anticipated inconvenience of participation.

**Please complete the following table:**

|   |
|---|
| I understand that my participation is voluntary and that I am free to withdraw at any time, without giving any reason, and without any consequences or penalties. |
|---|

Agree

Disagree

Not Applicable

→

Powered by Qualtrics 

I, \_\_\_\_\_ **(participant name)**, confirm that the person asking my consent to take part in this research has told me about the nature, procedure, potential benefits and anticipated inconvenience of participation.

**Please complete the following table:**

|   |  |   |
|---|--|---|
| < | I understand that information collected during the study will not be linked to my identity and I give permission to the researchers of this study to access the information. | > |
|---|--|---|

Agree

Disagree

Not Applicable

→

Powered by Qualtrics 

I, \_\_\_\_\_ (**participant name**), confirm that the person asking my consent to take part in this research has told me about the nature, procedure, potential benefits and anticipated inconvenience of participation.

**Please complete the following table:**

|   |  |   |
|---|--|---|
| < | I understand that this study has been reviewed by, and received ethics clearance from Research Ethics Committee Faculty of Humanities of the University of Pretoria. | > |
|---|--|---|

Agree

Disagree

Not Applicable

→

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I, \_\_\_\_\_ **(participant name)**, confirm that the person asking my consent to take part in this research has told me about the nature, procedure, potential benefits and anticipated inconvenience of participation.

**Please complete the following table:**

|   |  |   |
|---|--|---|
| < | I understand who will have access to personal information and how the information will be stored with a clear understanding that I will not be linked to the information in any way. | > |
|---|--|---|

Agree

Disagree

Not Applicable

→

Powered by Qualtrics 

I, \_\_\_\_\_ **(participant name)**, confirm that the person asking my consent to take part in this research has told me about the nature, procedure, potential benefits and anticipated inconvenience of participation.

**Please complete the following table:**

|   |   |   |
|---|---|---|
| < | I understand how this study will be written up and published. | > |
|---|---|---|

Agree

Disagree

Not Applicable

→

Powered by Qualtrics 

I, \_\_\_\_\_ **(participant name)**, confirm that the person asking my consent to take part in this research has told me about the nature, procedure, potential benefits and anticipated inconvenience of participation.

**Please complete the following table:**

|   |  |   |
|---|--|---|
| < | I understand how to raise a concern or make a complaint. | > |
|---|--|---|

Agree

Disagree

Not Applicable

→

Powered by Qualtrics 

I, \_\_\_\_\_ **(participant name)**, confirm that the person asking my consent to take part in this research has told me about the nature, procedure, potential benefits and anticipated inconvenience of participation.

**Please complete the following table:**

|   |   |   |
|---|---|---|
| < | I have sufficient opportunity to ask questions and I agree to take part in the above study. | > |
|---|---|---|

Agree

Disagree

Not Applicable

→

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Please enter your name and surname:

Please enter today's date:

Please sign here:

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SIGN HERE

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