

Health literacy among an undergraduate student population: a comparative study

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Abstract

The transition from adolescence to young adulthood is a critical period in the development of an individual's long-term health behaviour. Health literacy is a critical factor in promoting and maintaining health-enhancing behaviours and preventing non-communicable diseases. Undergraduate students often have limited health literacy, regardless of their educational experience. This quantitative study compared the health literacy of a sample of undergraduate students enrolled in degree programmes in the Faculty of Health Sciences with a similar sample from the Faculty of Humanities at a South African university. The Health Literacy Questionnaire was used to measure health literacy across nine subscales. The sample included 77 participants ($n = 77$). An independent sample's t-test and Mann-Whitney U test were employed to compare the health literacy of students from the two faculties. The study found that students enrolled in the Faculty of Health Sciences generally demonstrated higher health literacy levels across several subscales compared to those from the Faculty of Humanities. This research contributes to understanding the disparities in health literacy among undergraduate students across distinct academic disciplines, underscoring the importance of implementing interventions to enhance health-related knowledge within specific academic domains.

Keywords: Health, health behaviour, health literacy, undergraduate students

Introduction

The transition to tertiary education represents a pivotal period for undergraduate (UG) students, during which they undergo significant personal growth and gain increasing independence in physical, social, emotional, and financial aspects of their lives (Bernardo et al., 2017). This phase often coincides with heightened psychological stress and the adoption of unhealthy behaviours such as poor dietary choices, physical inactivity, inadequate sleep, excessive alcohol consumption, smoking, and substance abuse, which can contribute to the development of non-communicable diseases (NCDs) such as obesity, cardiovascular diseases, and diabetes (World Health Organization [WHO], 2021).

Students' tendency to engage in unhealthy habits is often linked to their limited knowledge about health and how these behaviours could compromise their future health (Janse van Rensburg, 2020). Despite their diverse educational experiences, UG students commonly exhibit insufficient health literacy (HL), including an inadequate ability to access, process, and comprehend health information (Osborne et al., 2022). Limited HL thus undermines an individual's ability to understand and engage with health-related information, hampering the adoption of healthy behaviours (Buja et al., 2020; Rababah et al., 2019; Rueda-Medina et al., 2020).

The core components of HL involve recognising the importance of health, taking an active interest in health matters, assuming personal responsibility for health, and being well-informed about healthcare

systems (Štefková et al., 2018). Students often display deficiencies in several HL domains including understanding food labels and making healthy dietary choices (Lupi et al., 2015; Sørensen et al., 2015). Low HL is pervasive across various levels of society but is particularly pronounced among student populations (Rueda-Medina et al., 2020). Education on topics that support healthy living practices, including nutrition, stress management, and disease prevention, is essential during students' UG years, a period of their lives that constitutes a 'teachable moment' for instilling health-promoting behaviours (WHO, 2022).

Individuals with higher education levels generally exhibit higher HL levels. Disparities among students enrolled in different academic disciplines, however, remains an underexplored topic, particularly in the South African context. Most HL research has been focused on international student populations (Juvinyà-Canal et al., 2020; Paiva et al., 2017), or focused on specific conditions such as COVID-19 (Patil et al., 2021), and typically focused on only one specific student population such as nursing students (Daniels & Mibei, 2019), or on a general student population (Rababah et al., 2019).

To combat the burden of NCDs, it is necessary to improve the HL of the general population. World Health Organisation Director-General Dr Tedros Adhanom Ghebreyesus has highlighted that HL forms part of the Sustainable Development Goals (WHO, 2022). HL is, however, neglected in research and more investigation is needed – particularly among student populations that comprise a vulnerable group (Rababah et al., 2019). This study addresses this gap by examining variations in HL among UG students across diverse academic disciplines, comparing those enrolled in health-related programmes with those enrolled in other programmes. By assessing HL and identifying potential disparities, this research aims to inform targeted interventions to enhance HL and promote healthier lifestyles among students (Rababah et al., 2019). Improving HL can ultimately empower individuals to take charge of their health, thereby reducing healthcare costs (WHO, 2022). This study explored HL in relation to the nine subscales of the HL questionnaire (HLQ) and compared HL across two faculties at a South African university. Researchers hypothesised that students in health-related disciplines would exhibit higher HL levels compared to other students.

The primary aim of this study was to explore the differences in the HL levels of UG students across two academic faculties: the Faculty of Humanities (HUM) – particularly, students enrolled for psychology modules – and Faculty of Health Sciences (HS). The study was informed by the research question: What are the differences in HL levels among UG students enrolled in the HUM and the HS? The study assessed the HL levels of UG students using the HLQ and compared HL for each of the nine subscales between the two student groups.

Health and HL

Health encompasses several dimensions influenced by biological, psychological, social, and environmental factors, facilitating access to services, information, and resources for managing health (Felman, 2023). Financial, educational, and cultural beliefs and experiences impact subjective health (Nutbeam & Lloyd, 2021), which is an individual's own assessment of their health and ability to function optimally (Araújo et al., 2018). Subjective health constitutes a significant feature of HL (Nutbeam & Lloyd, 2021). HL involves the ability to navigate healthcare systems and to access, understand, and apply health information (Nutbeam, 2000). It includes the cognitive and social skills that shape our understanding of health and the motivation to maintain it (Urstad et al., 2020).

HL is commonly conceptualised as having three domains: the ability to access and utilise healthcare services, patient-provider interactions, and the capacity for self-care and informed decision-making (Nutbeam, 2008). Accessing healthcare requires navigating the healthcare system and understanding

healthcare information (Nutbeam, 2008), interacting with healthcare providers, and forming collaborative partnerships (Paasche-Orlow & Wolf, 2007). Capacity for self-care involves engaging in self-care activities and making informed health decisions (Hepburn, 2012). High HL empowers individuals to manage their health actively, while low HL undermines this ability (Shahid et al., 2022). Research shows that low HL may account for insufficient health-related knowledge among students (Buja et al., 2020; Rueda-Medina et al., 2020).

HL among university students

Students assume responsibility for their health needs (Patil et al., 2021) and often overlook critical HL components, such as the ability to evaluate credible sources of information and decision-making skills (Pleasant et al., 2011). Discrepancies exist between students' perceived and actual HL abilities, highlighting the challenges students experience in evaluating health information (Ickes & Cottrell, 2010). Various factors shape UG students' HL, including their field of study, age, socioeconomic status, access to health information (Rababah et al., 2019), gender (Sukys et al., 2017), and psychological factors (Bhusal et al., 2021; Kühn et al., 2022). Students' field of study impacts their HL: students enrolled for health-related programmes have been found to have higher levels of HL than students in other disciplines (Bhusal et al., 2021; Kühn et al., 2022; Rababah et al., 2019; Sukys et al., 2017). In a study by Sukys et al. (2017), it was reported that students enrolled in health-related courses had higher HL levels. Similarly, Kühn et al. (2022) found limited HL skills among UG students pursuing non-health-related disciplines, emphasising the need for comprehensive interventions across all fields of study. Bennett et al. (2023) reported a similar issue among Australian students, underscoring the importance of integrating HL education into academic curricula to enable students to develop the necessary skills to navigate health information effectively.

Theoretical framework

The conceptual model of HL (CMHL) by Sørensen et al. (2012) is an innovative theoretical framework that offers a detailed conceptualisation of HL. The model moves beyond viewing HL as a dichotomy, where individuals are either 'literate' or 'illiterate' about health information. Instead, it understands HL as a multidimensional construct that includes a range of skills, competencies, and interactions that influence an individual's health-related decisions and behaviours (Nutbeam, 2000; Sørensen et al., 2012). The model comprises several components, each representing a distinct dimension of HL; these include access to health information, appraisal of health information, application of health information, and engagement with healthcare providers. The CMHL by Sørensen et al. (2012) provides a solid foundation for understanding HL among UG students, as it acknowledges the diversity of disciplines that students relate to, the multidimensional nature of HL, and the dynamic interaction between educational backgrounds and health-related behaviours and skills.

Methodology

A quantitative research approach, using a comparative research design, was used to explore HL among a sample of students.

Recruitment and sample selection

The target population comprised UG students from two faculties at a South African university. Purposive sampling was applied, using the criteria that participants had to be 18 to 29 years of age, registered as UG student at HS (enrolled in a health-related module) or HUM (enrolled in a psychology module), proficient in English, and having adequate digital literacy to complete the virtual questionnaires. The invitation to participate in the study included a uniform resource locator (URL) to

the informed consent document and questionnaires. The invitation was posted on the UG module pages using the university's internal communication system. A total of 99 participants responded to the invitation; due to incomplete responses, the final sample comprised 77 students.

Data collection instruments and procedure

Students were requested to complete two questionnaires. The demographic questionnaire gathered data, such as participant's age, gender, the university faculty at which they were registered, the degree programme for which they were enrolled, and their current year of study. The HLQ by Osborne et al. (2013) was also used extensively to assess HL and has been found to be a reliable and validated tool (Leslie et al., 2020; Rababah et al., 2019; Štefková et al., 2018). The HLQ uses nine subscales, each measuring a specific aspect of HL, with a total of 44 items. Scales 1–5 ask participants to respond to a series of statements using a 4-point Likert-type scale (1 = *strongly disagree*; 2 = *disagree*; 3 = *agree*; and 4 = *strongly agree*). Scales 6–9 asks participants to indicate their level of difficulty executing certain actions using a 5-point Likert-type scale (1 = *cannot do* or always find difficult; 2 = usually difficult; 3 = sometimes difficult; 4 = usually easy; 5 = always easy). Cronbach alpha values for the nine dimensions of the HLQ are indicated in Table 1. The Cronbach alpha values for the data in this study indicated that the test is reliable for the South African context with an overall Cronbach $\alpha = .95$ (44 items). The questionnaires were uploaded via the online platform Qualtrics.

Table 1. Cronbach alpha values derived from the Health Literacy Questionnaire (HLQ) by Osborne et al. (2013) and this study sample.

HLQ scale	HLQ scale descriptors	HLQ Cronbach α (Urstad et al., 2020)	This study sample Cronbach α
Scale 1	Feeling understood and supported by healthcare providers – 4 items	.81	.86
Scale 2	Having sufficient information to manage my health – 4 items	.76	.78
Scale 3	Actively managing my health – 5 items	.81	.87
Scale 4	Social support for health – 5 items	.78	.79
Scale 5	Appraisal of health information – 5 items	.80	.78
Scale 6	Ability to actively engage with healthcare providers – 5 items	.81	.87
Scale 7	Navigating the healthcare system – 6 items	.75	.84
Scale 8	Ability to find good healthcare information – 5 items	.72	.86
Scale 9	Understanding health information well enough to know what to do – 5 items	.72	.67

Data analysis

Descriptive and inferential statistical analyses were conducted using R and IBM Statistical Package for Social Sciences (SPSS) version 29. Descriptive statistics provided an overview of demographic characteristics. Inferential statistics included independent samples *t*-tests, or Mann–Whitney U test (non-parametric alternative), to examine differences in HL among students from the two different faculties.

Ethical considerations

Ethical approval was received from the Faculty of Humanities Research Ethics Committee at the University of Pretoria before the study commenced (HUM014/1121). Participants signed informed consent forms and were reminded that participation was voluntary. The ethical guidelines provided by the faculty ethics committee were followed. Privacy and confidentiality were maintained; no

personally identifiable information was collected during the study. Participants did not receive an incentive for participation.

Results

The sample comprised 43 (55.8%) students from the HUM and 34 (44.2%) students from the HS. The average age of the sample was 20 ($M = 20.77, SD = 1.84$); 19 was the most frequent age reported, comprising ($n = 18$) 23.4% of the sample. The first year of study was the most frequent year reported (see Figure 1). Majority of the participants identified as female (see Figure 2).

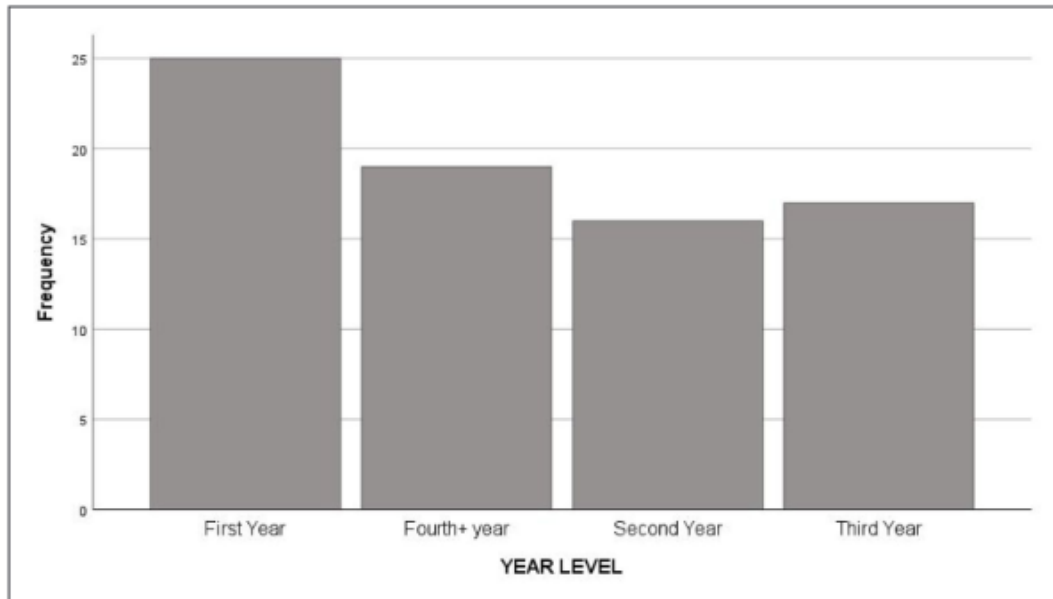


Figure 1. Participants' year of study.

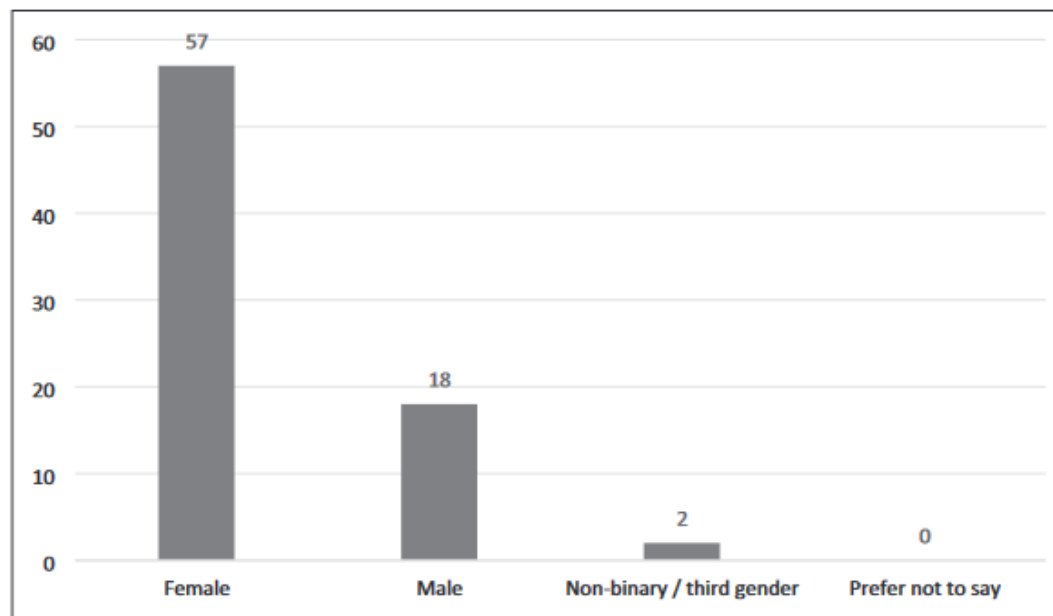


Figure 2. Participants' gender.

Health Literacy Questionnaire

This section provides an overview of the descriptive results from Part 1 (Scales 1–5) and Part 2 (Scales 6–9) of the HLQ across the student sample. In line with the scoring guide by Osborne et al. (2013), each scale was scored separately by averaging the items with equal weighting.

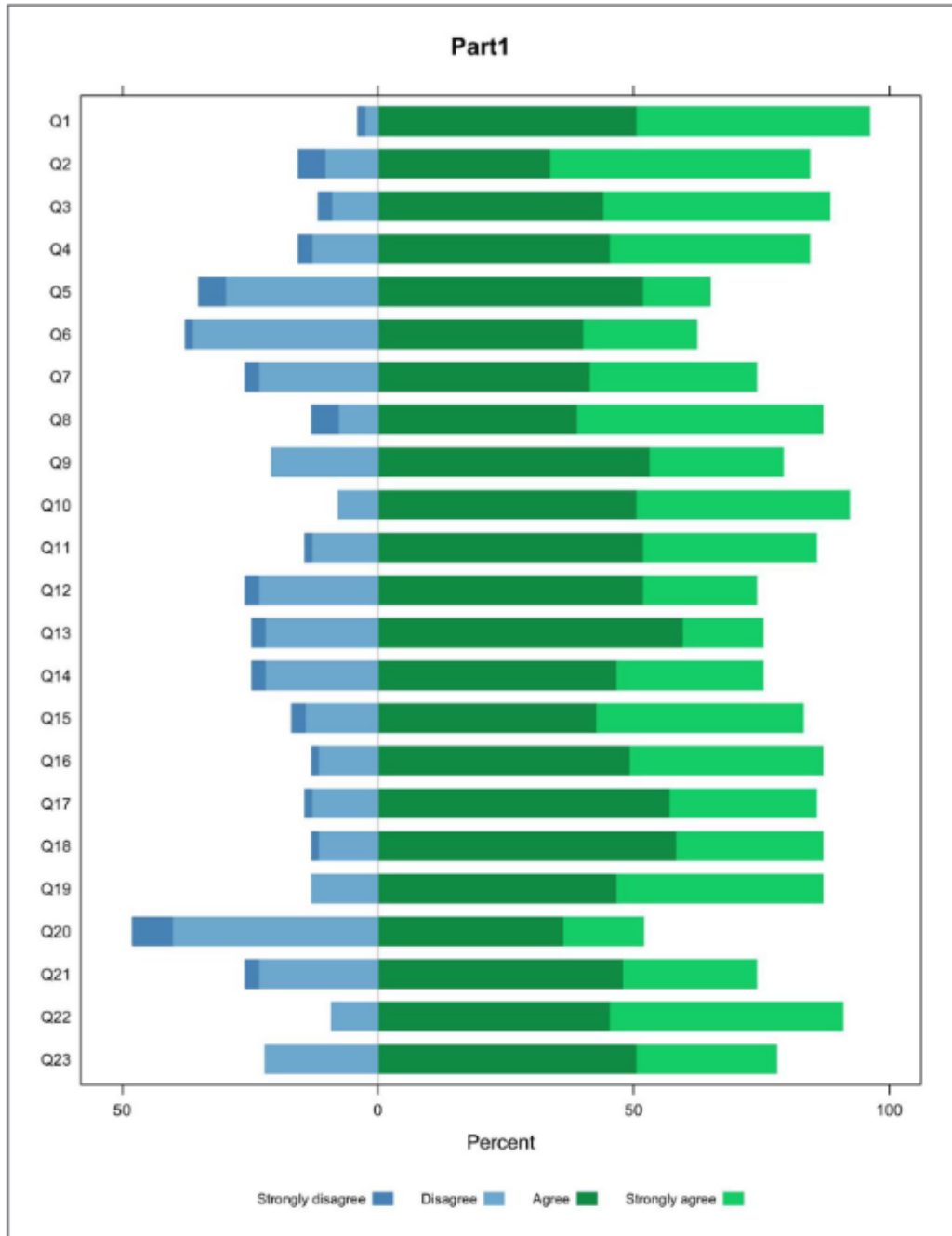


Figure 3. Participants’ responses to Part I of the Health Literacy Questionnaire.

Part 1: Scales 1–5

Scores for Part 1 were derived from 23 HL questions, with lower scores indicating lower levels of specific HL domains. The majority of participants from both faculties indicated that they *agreed* or

strongly agreed with the statements, reflecting higher HL levels. Figure 3 presents an overview of participants' responses.

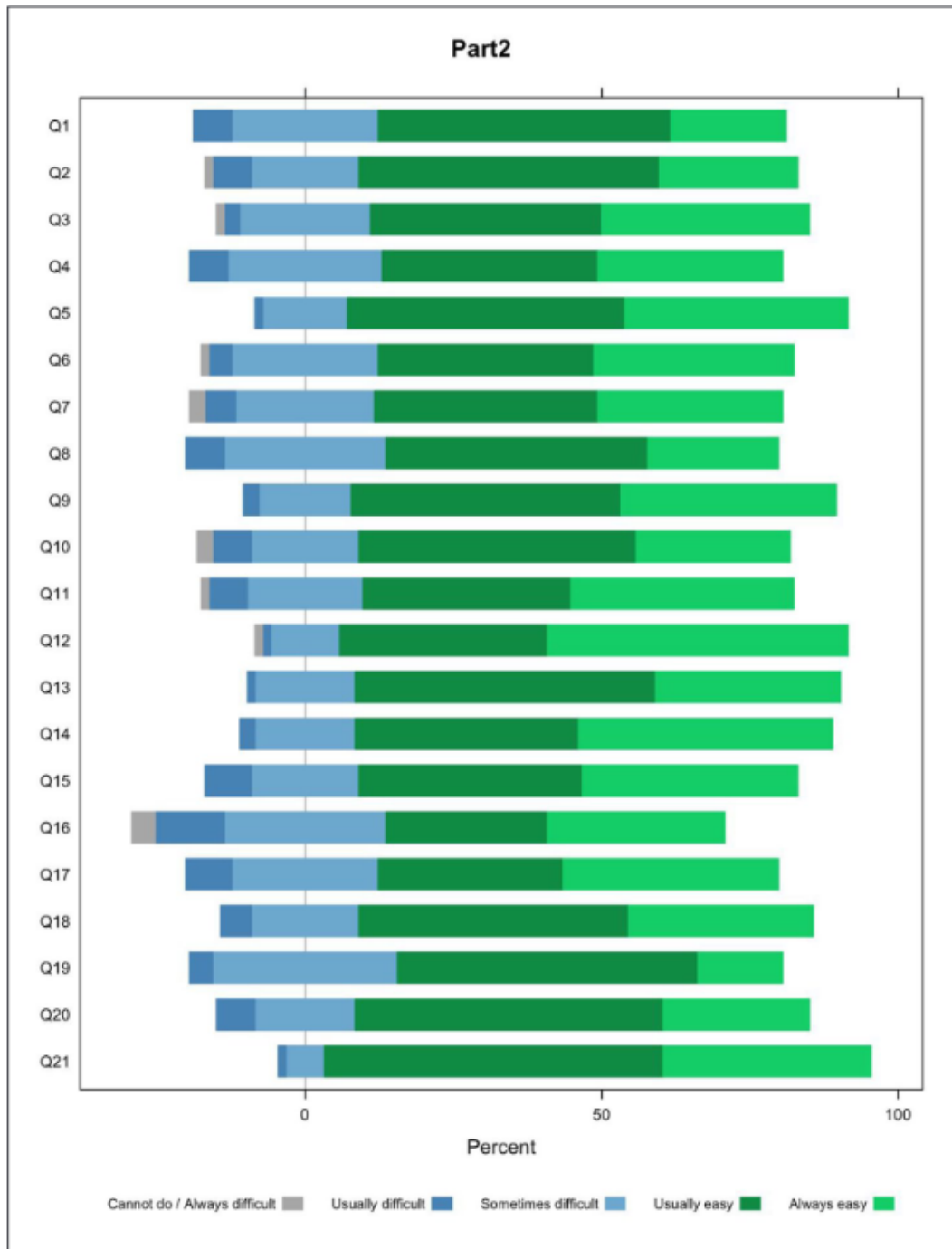


Figure 4. Participants' responses to Part 2 of the Health Literacy Questionnaire.

Part 2: Scales 6–9

Scores for Part 2 (Scales 6–9) were calculated from 21 HL questions. Lower scores imply lower levels of specific HL domains. Overall, the data suggested that most participants from both faculties found it easy to engage with healthcare providers, navigate the healthcare system, find health information,

and understand the information well. Figure 4 displays the overall level of difficulty reported by participants from both faculties.

Comparative analysis of HL levels

The main objective of the study was to determine whether there were differences in the HL levels of UG students from the HUM and the HS. This section compares the scores of the participants from the HUM and the HS.

Part 1: Scales 1–5. The differences between the scores of participants from the two faculties were insignificant for Scales 1–3, but significant for Scales 4 and 5 as described below.

Scale 1: feeling understood and supported by healthcare providers. Both groups reported feeling understood and supported. HS students scored slightly higher (3.38) than HUM students (3.19), but the difference was statistically insignificant: HS ($Md = 3.62, n = 34$); 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. Both groups reported moderate levels of agreement. HS students scored slightly higher (3.32) than HUM students (3.10); again, the difference was statistically insignificant: HS ($Md = 3.50, n = 34$); HUM ($Md = 3.00, n = 43$), $U = 571.5, z = -1.653, p = .098, r = .19$.

Scale 3: actively managing my health. Both groups reported similar scores, indicating a shared sense of responsibility for their health. No statistically significant difference was observed: HS ($Md = 3.20, n = 34$); HUM ($Md = 3.00, n = 43$), $U = 562.5, z = -1.742, p = .081, r = .02$.

Scale 4: social support for health. HS students scored slightly higher (3.31) than HUM students (3.00), suggesting better perceived support among HS students. This difference was statistically significant: HS ($Md = 3.40, n = 34$); HUM ($Md = 3.00, n = 43$), $U = 523.5, z = -2.151, p = .027, r = .25$, with a small effect size.

Scale 5: appraisal of health information. HS students scored higher (3.18) than HUM students (2.86), indicating better ability to identify reliable health information. This difference was statistically significant, suggesting HS students may navigate conflicting information more independently. HUM ($M = 2.86, SD = 0.56$); 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 = -0.32 , 95% confidence interval (CI) = $[-0.57$ to $-0.071]$) and $\eta^2 = .587$ indicated a large effect.

In summary, the HS students generally reported higher HL scores compared to the HUM students, with two domains demonstrating statistically significant differences.

Part 2: Scales 6–9. Significant differences were found between the scores of the HUM and HS students for Scales 6–9 as described below.

Scale 6: ability to actively engage with healthcare providers. HS students displayed a higher mean score (4.14) than HUM students (3.78). The results showed 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 $-0.029]$) and $\eta^2 = .497$ indicated a large effect.

Scale 7: navigating the healthcare system. HS students reported a higher mean score (4.08) compared to HUM students (3.70). The difference was statistically significant with 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 = -0.38 , 95% CI = $[-0.67$ to $-0.089]$) and $\eta^2 = .597$ indicated a large effect.

Scale 8: ability to find good health information. HS students reported a higher mean score (4.38) compared to HUM students (3.74). This significant difference suggests HS students were more skilled in this aspect of HL: 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. HS students had a slightly higher mean score (4.33) compared to HUM students (4.07). HS students generally reported finding it easier to understand health information, including written materials and forms. The difference was statistically significant: HS ($Md = 4.20$, $n = 34$) and HUM ($Md = 4.00$, $n = 43$) students, $U = 525.00$, $z = -2.129$, $p = .033$, $r = .24$.

Discussion

Health management requires adequate HL spanning various domains, such as how to seek medical care, appraise health information, communicate with professionals, and implement medical advice. Feeling understood by healthcare providers builds patients' trust and facilitates their engagement (Beck et al., 2002; Osborne et al., 2013). Similarly, knowing how to access and use health information is crucial for individuals to be able to make competent decisions about their health and manage any health-related conditions (Beauchamp et al., 2015; Osborne et al., 2014). Individuals' active involvement in health-promoting activities and perceived accountability are integral to their HL, with research supporting its positive impact on health outcomes (Dodson et al., 2015; Osborne et al., 2014). Social support, health information appraisal, active engagement with healthcare providers, proficiency in navigating healthcare systems, and finding reliable health information are also essential components of HL.

The transition to tertiary education, where UGs develop a sense of independence and become responsible for their health (Bernardo et al., 2017), represents a vulnerable time during which they may engage in unhealthy behaviours that can increase the likelihood of NCDs in later life (WHO, 2021). The tendency of students to engage in unhealthy habits is often related to their inability to access and use health information (Janse van Rensburg, 2020). Diverse educational experiences may influence UG students' ability to navigate the healthcare system and to apply health-related content. Proficiency in finding health information and navigating the healthcare system ensures timely access to suitable healthcare services (Batterham et al., 2016). Diviani et al. (2016) found 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. (2015) discovered that students who perceived themselves as equipped with adequate health information were more likely to practice preventive health behaviours.

When examining HL among UG students, it is essential to consider the influence of discipline-specific knowledge and vocabulary. Hole (2017) explains that each discipline has its own specific knowledge domain, terminology, and conceptual framework that impact students' understanding of course material. As students are exposed to various terms and concepts, they begin to learn the language relevant to the discipline. This allows students to master the course content unique to the discipline. As the definition of HL has evolved, it has become apparent that a multidisciplinary approach to conceptualising and improving HL is needed (Massey et al., 2017). The CMHL framework of Sørensen et al. (2012) provides the foundation for understanding and communicating regarding HL within

academic disciplines and guides the development of health-related knowledge. The integrated model proposed by Sørensen and colleagues '[draws] from the multiple definitions, conceptual dimensions, and disciplines of health literacy scholarship' (Massey et al., 2017, p. 183). The model outlines four types of competencies (accessing, understanding, appraising, and applying health information) that are applied across multiple domains (health care, disease prevention, and health promotion). Recognising and addressing the unique HL needs of students in different academic disciplines is a first step towards promoting effective health communication and empowering students to make informed health decisions.

In this study, students scored high on the scale related to finding health information, which demonstrates their capability to find and access applicable health services. Stellefson et al. (2011) found a link 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. The ability to find health information is linked to using and navigating the healthcare system. In this study, students from the HS obtained higher scores on the health navigation ability scale compared to students from the HUM, demonstrating the potential value of discipline-specific knowledge in the development of HL. In a previous study, Storey et al. (2020) reported that students registered for health-related courses presented higher HL levels compared to students enrolled in Arts courses.

Complex healthcare systems demand that individuals identify suitable services and resources to meet their needs (Vogt et al., 2018). Embedding critical appraisal skills in curricula may permit students to navigate health information effectively and judge the credibility of health information sources. The ability of an individual to evaluate the reliability and relevance of health information impacts their subsequent decision-making (Osborne et al., 2013). The transitional phase of UG studies also includes financial limitations, which may force students to use alternative means to manage their health. They may have to use their own skills to find health information and to apply this to their health outcomes. High scorers in the HL domain of finding reliable information can discern access to accurate information and guidance from dependable sources, while lower scorers indicate a lack of understanding and an inability to compare and interpret health information (Osborne et al., 2014). Students in this study generally displayed moderate to high levels of HL in the domain of understanding health information, demonstrating their ability to complete medical tasks, follow instructions, and understand medication labels. Students in the HS tended to score higher than students in the HUM, highlighting the role of education in HL.

According to Hong et al. (2021), students who actively seek trustworthy health information show improved mental health outcomes. Understanding health information is essential for navigating healthcare systems (Taylor & Stanton, 2021), as this enhances confidence in communication and application of medical advice, ultimately improving health outcomes (Berkman et al., 2011; Nutbeam, 2008). Moreover, understanding health information is essential for patient collaboration (Berkman et al., 2011; Custodio et al., 2009). Low HL predicts poor health management, contributing to higher medical costs (Baker et al., 2002; Howard et al., 2005). This study found a high perceived ability among students to actively engage with healthcare providers, with HS students demonstrating an enhanced ability to seek out medical advice. Dodson et al. (2015) highlight the importance of active engagement with healthcare providers to increase HL and improve health behaviours. Active self-management and the ability to seek health information are linked to enhanced health outcomes and decreased healthcare utilisation. In this study, HS students achieved higher HL scores than HUM students in relation to understanding health information, highlighting the potential mediating role of education.

Managing health requires individuals' active involvement in health-promoting activities and their perceived capacity for autonomous health management, encompassing healthy behaviours, treatment adherence, and seeking health care when needed (Dodson et al., 2015). Individuals with a strong foundation of HL have been found to exhibit a robust sense of personal accountability, actively participating in their health-care journey, making informed choices, and engaging in health-care interactions (Osborne et al., 2014). Lower HL has been found to be associated with a lack of perceived personal responsibility and minimal involvement in self-care. Taylor and Stanton (2021) describe the health locus of control as the degree to which people take responsibility for their health, as self-responsibility predicts better health outcomes compared to attributing this responsibility to external factors. Active health management is integral to HL, guiding selfcare practices, informed decision-making, and health-enhancing activities (WHO, 2021; 2024). In this study, both student groups had moderately lower self-perceived proficiency in actively managing their health. Research supports the positive impact of active health management on HL levels and health outcomes among students (Diviani et al., 2016; Sørensen et al., 2012; Veenker & Paans, 2016).

Limitations and recommendations

The study included a small sample, limiting the generalisability of the findings. The sample lacked diversity in terms of the age and gender of participants. The ethnicity and socioeconomic status of participants was not documented, potentially limiting the representation of varied perspectives on HL. Future research would benefit from a more inclusive sample and analysis of the mediating effects of demographic factors on HL. Reliance on self-reporting instruments for data collection introduces possible biases such as social desirability, potentially affecting the validity of findings. The study was limited to exploring HL among students at a single institution. The findings may thus not be generalisable to other tertiary education environments. Despite these limitations, the study contributes valuable insights into HL among UG students and underscores the need for further exploration of this topic. It is recommended that future research include a larger, more diverse sample, compare students' HL levels across years of study, and include participants from several degree programmes and disciplines. The inclusion of several higher education institutions could also yield valuable results.

Conclusion

This study compared the HL of students enrolled at two different faculties at a higher education institution, with the hypothesis that students from the HS would exhibit higher levels of HL than students from the HUM. The results across most HL domains supported this; these included social support, appraisal of health information, active engagement with healthcare providers, navigating the healthcare system, finding health information, and understanding health information. The study contributes valuable insights into HL disparities among UG students and emphasises the multifaceted nature of HL. The observed differences between the HL of students underscore the importance of tailored interventions and education initiatives to build students' HL. The inclusion of an online health and wellbeing module for first-year students across the university should be considered. While the study contributes to the understanding of HL among students, the findings should be interpreted within the parameters of the study's limitations.

Implications of the findings

The study emphasises the value of integrating HL education into UG curricula across various disciplines to enhance students' HL. As Kühn et al. (2022) argue, HL initiatives should target all students, and tertiary institutions should utilise their resources to present HL workshops drawing from several

disciplines, such as medicine, psychology, and sociology. To maximise efficiency, HL interventions should be informed by the specific needs of each unique student population.

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