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Health Literacy among Undergraduates in Selected Faculties of Eastern University, Sri Lanka

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Abstract

A healthy life is a wealthy life. To be healthy, everyone has to understand the basic health information that is needed to make appropriate health decisions, which can aid them in avoiding illness and safeguarding their health. In this context, the necessity of health literacy which is a type of information literacy is being considered. Health literacy is the understanding and use of health information effectively to make appropriate decision making. The study aimed to evaluate the health literacy level of undergraduates of Eastern University, Sri Lanka, and the factors influencing health literacy. A cross-sectional study was carried out among undergraduates in selected faculties of Eastern University, Sri Lanka. A validated standard questionnaire called "Health Literacy Instrument for Adults (HELIA)" was adopted to collect online data from 1085 individuals. The data were analyzed using descriptive statistics and binary logistic regression. The results revealed that the mean score of overall health literacy is 65.7±13.5% which ranges between somewhat inadequate to sufficient ranks. The analysis considered the five domains of health literacy. Accordingly, a significant proportion ($p<0.05$)

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of undergraduates had adequate literacy skills for understanding health information (67.4%), and access to health information (73.7%), while the majority had a limited level of literacy for domains of reading (53.7%) and appraisal (84.1%). However, there is no significant deviation ($p>0.05$) between adequate and limited levels in the domain of decision-making/behavioural intention. The difference between the proportion of adequate (50.8%) and limited levels (49.2%) in overall literacy is not significant ($p>0.05$). The binary logistic regression proved that the health literacy of undergraduates is influenced by faculty, alcoholic habits and doctor's advice ($p<0.05$), while age, gender, family income, family members who work in the healthcare field, academic year, respondents' perceptions of their health, and smoking habits, do not influence on health literacy.

Keywords: Health Literacy, HELIA, Information Literacy, Undergraduates

Background

A healthy life is a wealthy life. To be healthy, everyone has to understand the basic health information that is needed to make appropriate health decisions, which can help them to prevent and protect their health from various situations and properly manage their health conditions. In general, the understanding of health information and its application is termed health literacy.

Health literacy is the term used to describe the ability to engage with health information and services (WHO, 2013), also health literacy is defined as it is being linked to literacy and entailing people's knowledge, motivation, and competencies to access, understand, appraise and apply health-related

facts to make decisions in day-to-day life. Health literacy is essential to improve the quality of an individual's life, prevent illness, and promote health (WHO, 2013) and it provides a harmonious relationship between healthcare professionals and patients to make decisions. Lack of health literacy leads to poor hygiene, which leads to communicable diseases, and also poor knowledge of disease condition, management, follow-up care, and home care, which cause bad prognosis for non-communicable diseases. During the pandemic of COVID 19, the awareness of the public on the correct use of health literacy skills was necessary for the success of treatment and prevention of further spreading.

There was a rapid increase in the level of health literacy, but also there is a gap in achieving a higher level of health literacy. It has been observed that even well-educated people have limited health literacy because of a lack of familiarity with medical jargon and their body physiology. Even in the developed nations, the health literacy is not beyond the satisfactory level. European health literacy survey reported that almost half of the people 47.6% surveyed in Europe, have limited health literacy, and in Spain, this percentage was higher at 58.3 (Osborne et al., 2013). In Spain and France, research was conducted among science and health sciences faculty students. The Study findings indicated that 93% of the students had insufficient health literacy (Juvinyà-Canal et al., 2020).

It is the responsibility of healthcare professionals to educate or improve the health literacy of people (Mishra, 1990). Developed countries get better health education than the developing countries. For example, in European countries, even medical officers prescribing the medications educate the clients about indications, contraindications, adverse effects, and drug compliances, and also clients are engaged to get knowledge about their health

conditions. But in South East Asian countries the medical officers prescribe the medications without educating the clients. The clients rarely know their health status and lack the desire to engage with health professionals. Local data on the knowledge of correct health literacy is essential to understand the situation in a given country and to aid in identifying strategies to be implemented.

With the view of implementing a health literacy programme in tertiary education, the present study surveyed health literacy among the undergraduates of Eastern University, Sri Lanka (EUSL). Undergraduates are considered a well-educated population, which constitutes the future generations of the country. Since health literacy is an emerging global trend, it is essential to know their knowledge of health literacy skills in Sri Lanka, so that appropriate strategies can be made to increase awareness and create responsible citizens.

General Objective

Study the health literacy among undergraduates of selected faculties in EUSL.

Specific Objective

1. To analyze the awareness of self/own health management
2. To identify the ability to engage in health information
3. To identify the factors contributing to health literacy

Literature Review

The terms information literacy and health literacy were started simultaneously in 1974. The phrase health literacy was used by S.K. Simonds in a paper titled Health Education as Social Policy in March 1974 (Simonds, 1974). The phrase information literacy was coined by Paul G. Zurkowski in a report submitted to the National Commission on Libraries and Information Science in November 1974 (Zurkowski, 1974). After the introduction of the phrase health literacy, there originated several definitions for health literacy (Cross, 1995; Ratzan et al., 2000; Sorensen, 2013). From these definitions of health literacy, the following important points can be summarized:

- Ability to access health information.
- Appropriate decision-making.
- Knowledge and understanding of individuals.
- Use of decisions in disease prevention, health promotion, and health protection.

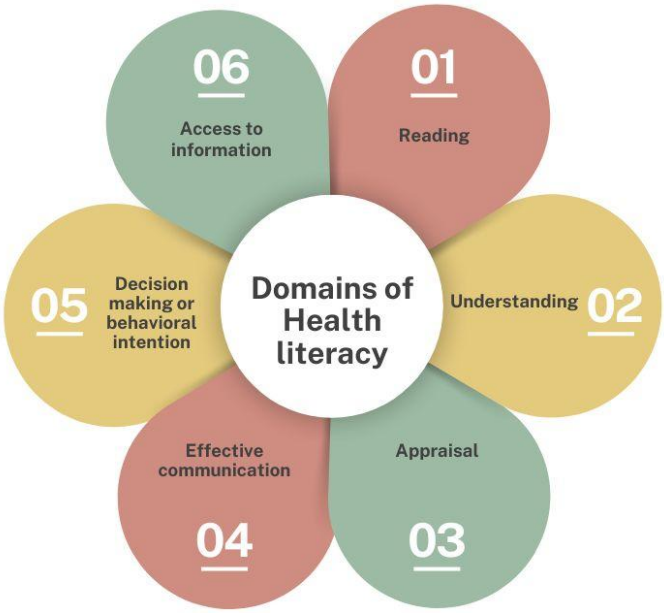
These points can be considered as domains of health literacy. However, there are several works of literature which indicate different domains. Shaukat and Naveed (Shaukat & Naveed, 2021) reported three domains of health literacy. The three domains are healthcare, disease prevention, and health promotion. Under each domain, the researchers consider the ability to assess, understand, interpret and evaluate, and decisions making. Parker (1995) developed a tool called the Test of Functional Health Literacy in Adults (TOFHLA) and this tool reports only three domains such as reading, comprehension and numeracy skills. However, Tavousi et al. (2020) reported that there are five domains such as reading, access to information, understanding, appraisal, and decision-making or Behavioral intention and using these domains, Tavousi et al. (2020) developed a tool to measure the health literacy, that is Health Literacy Instrument for Adults (HELLA). Reading includes reading educational

materials, medical records, written instructions and laboratory testing. Access to information means ability to identify information sources and access the health information related to health. Understanding means ability to understand drug labels, hospital guidelines, doctor's instructions and explanations. Appraisal is the ability to evaluate health information on internet, TV, friends & relatives and communication of trusted information to others. Decision –making or behavioral intention means experience and ability to manage situations with own understanding and awareness (Tavousi et al., 2020). These dimensions can be used as assessment tools for health literacy. These dimensions are more comprehensive compared to other tools and they can be used as assessment tools for health literacy. The domains reported by different authors can be pictorially represented in the following diagram (Fig1).

With the availability of different tools to assess health literacy levels, there are several works of literature which report the health literacy assessment among different levels of people. Few studies evaluated undergraduates' health literacy. Studies reported that health science-related students had better levels of health literacy than the students who follow other subjects (Juvinyà-Canal et al., 2020) and even among health science-related students, medical students excelled in health literacy than the paramedical students (Morris et al., 2017) since the knowledge is provided through the curriculum. In contrast, there is some literature which reports that health science-related students (both medical and paramedical) have limited knowledge of health literacy (Ozen et al., 2019; Urstad et al., 2020; Zhang et al., 2016).

Figure 1

Domains of health literacy (Developed by authors)



There are limited studies in health literacy in Sri Lanka but no studies among undergraduates in Sri Lanka. However, a study conducted among school teachers revealed that 6.4% excellent, 61.2% sufficient, 31.5% problematic, and 1% inadequate levels of health literacy, and the researchers concluded that limited health literacy was a considerable problem among school teachers (Denuwara & Gunawardena, 2017). In 2020, another study was carried out among the working-age population in Sri Lanka about a person's ability to understand and use health information through electronic sources. From the research, their conclusion was E-health Literacy Scale could measure health literacy as well as knowledge and ability to use electronic instruments (Gunasekara & Fernando, 2020).

It is very essential to be aware of factors affecting health literacy because it helps to minimize the negative impact of health issues, increase public health services & and provide positive health outcomes. There are several literatures which report the factors influencing health literacy. The socio-economic variables such as age, gender, nationality, race, social support, culture, social environment (Bodur et al., 2017; Chu-Ko et al., 2021; Mao et al., 2020; Rababah et al., 2019), education-related factors such as educational level, learning skills, communication skills, academic performance, health knowledge, exposure to video games, health education courses, year of study, a field of study (Bodur et al., 2017; Mao et al., 2020; Rababah et al., 2019) influences the health literacy. Studies also report that exercise also influences health literacy (Chu-Ko et al., 2021; Rababah et al., 2019). Smoking, alcohol consumption and history of chronic diseases also influence health literacy (Chu-Ko et al., 2021; Rababah et al., 2019).

Mao et al. (2020) report that according to their study, students who are women, urban residents, senior class students, well performance at school, have health education, highly educated parents, single child family income, have less exposure to video games, having a medical background, had a higher health literacy level. A study was conducted on Palestinian University students to assess health literacy and its associated factors. The results show a gender difference that revealed female students, whose fathers had high school education, working mothers, and living with their families had higher health literacy scores but the female students with moderate to high distress levels had lower health literacy scores. Also, male students who received medical checkups more frequently searched for more sources for health-related information, had higher self-reported health status had higher health literacy

but their distress level was not significantly associated with male students (Sarhan et al., 2021).

While various studies have addressed the factors influencing health literacy, it is important to note that these findings cannot be universally applied, as many of them are specific to particular localities or contexts. In the case of Sri Lanka, a notable gap exists in the information available regarding the health literacy of its citizens and the factors that influence it.

Methodology

A cross-sectional study was carried out among undergraduates in selected faculties of Eastern University, Sri Lanka. Participants were undergraduates of the first, second, and third year from the Faculty of Commerce & Management, Faculty of Science, Faculty of Agriculture, Faculty of Arts & Culture, Faculty of Technology, and Faculty of Health-Care Sciences. A validated standard questionnaire called "Health Literacy Instrument for Adults (HELIA)" (Tavousi et al., 2020) was used with minor modifications in wording to suit the Sri Lankan context. The tool consists of thirty-three (33) numbers of statements with a Likert scale response to measure the five domains such as reading, access to information, understanding, appraisal, and decision-making or behavioural intention. Additionally included demographic details, academic characteristics (faculty, year of study), own perception about healthiness, smoking and drinking habits, advice of the doctor and personal prescription. The sample size was 1107 at a 95% confidence interval at a precision of 2.5% (Krejcie and Morgan, 1970). The pilot study was conducted among fifteen students and internal consistency was ensured using Cronbach Alpha (>0.7). The health literacy score was

calculated using the method proposed by Tavousi et al.(2020). The score was ranked as inadequate (0-50%), somewhat inadequate (50.1-66%), sufficient (66.1-84%) and excellent (84.1-100%) and the former three ranks were considered as limited level health literacy and later two ranks were considered as an adequate level of health literacy (Pelikan et al., 2019; Tavousi et al., 2020). The data were analyzed using descriptive statistics and Binary Logistic Regression. Statistical Package of Social Sciences 26 (SPSS v. 26) were used to enter and analyze the data. Ethical clearance was obtained from the Ethics Review Committee of the Faculty of Health-Care Sciences, Eastern University, Sri Lanka (E/2022/14).

Results

The investigators received 1086 responses out of 1107 sample. Therefore, the response rate was 98%. The mean age of the respondents was 22 (the youngest age was 20 and the oldest age was 27). The summary of the demographic profile of the respondents is given in Table 1. The majority of undergraduates (96.4%) perceived that they were in good health and a majority of them did not have smoking (97.7%) and alcoholic habits (98.7%).

Table 1

Demographic profile of respondents

Factors	Levels	Frequency (n = 1085)	Percentage (%)
Gender	Male	410	37.8
	Female	675	62.2
Parent's Highest Education Level	Before ordinary level	292	26.9
	Up to ordinary level	324	29.9
	Up to advance level	269	24.8
	Diploma level	72	6.6
	Graduated	128	11.8

Family income >100 000	<25 000	488	45.0
	26 000 – 50 000	348	32.1
	51 000 – 75 000	137	12.6
	76 000 – 100 000	59	5.4
	>100 000	53	4.9
Faculty	Faculty of Commerce & Management	213	19.6
	Faculty of Agriculture	43	4.0
	Faculty of Art & Culture	430	39.6
	Faculty of Technology	37	3.4
	Faculty of Health-Care Science	135	12.4
	Faculty of Science	227	20.9
Year of Study	First Year	588	54.2
	Second Year	326	30.0
	Third Year	171	15.8

1. Awareness of self-health management

Awareness of self-health management was measured through two health literacy domains: understanding skill and decision-making/behaviour intention. The ability to comprehend health information is an essential aspect of self-health management. Individuals must possess the skills necessary to interpret medical terminology, understand treatment options, and grasp the implications of their health conditions. Decision-making/behavior intention reflects individuals' willingness and readiness to take action based on their understanding of health information. It was aimed to assess the individuals' proactive involvement in managing their health by analysing the domains such as understanding and decision making/behaviour intention.

The understanding skill has been measured by seven criteria. Those criteria include understanding the recommendations for a healthy diet, explanations about illness, the meaning of medical forms, hospital guidelines,

drug information labels, and investigation reports. The decision-making/behavioural intention domain was examined with twelve statements that pertain to the actions/decisions of individuals with health concerns both in the normal period and during illness. The average awareness scores for these two domains are presented in Table 2.

Table 2
Awareness of self-health management

Level of Literacy	Rank of Awareness	Proportions of Domains	
		Understanding (%)	**Decision-making/behavior intention (%)**
Adequate	Excellent	27.6	11.5
	Sufficient	39.8	35.9
Limited	Somewhat inadequate	20.1	29.7
	Inadequate	12.5	22.9

The difference between the proportion of adequate and limited literacy levels was compared using a binomial test. The results revealed that there is a significant difference between the proportions of adequate and limited levels of understanding (p=0.000), while there is no significance for decision-making (p=0.101). As such, the majority had adequate literacy skills for understanding health information (67.4%), while there is no significant deviation in the decision-making/behavioural intention between the proportion of adequate and limited levels.

2. Ability to engage in health information

In this section, three aspects of health literacy such as reading health information, access to health information, and appraisal, have been assessed. These three domains consist of skills or abilities to deal with the health-related information. Hence these three domains were considered as ability to engage in health information. The skill of reading health information consists of four

statements that include reading general health educational materials, written instructions from doctors, medical forms and leaflets, and instructions about laboratory tests. The skill has been assessed using four statements. The skill of access to health information consists of six statements that include finding health information from different sources, about healthy eating, mental health, a specific disease, and the harmful effects of tobacco, smoking, and alcoholism. The skill for the appraisal of health information consists of four statements that include evaluating health-related information on the Internet, broadcast on television and radio, assessing the accuracy of health-related recommendations, and communicating trusted health information to others. The findings are presented in Table 3.

Table 3

Ability to engage in health information

Level of Literacy	**Rank of Awareness**	**Proportions of Domains**		
		Reading health information (%)	**Access to health information (%)**	**Appraisal of health information (%)**
Adequate	Excellent	14.4	28.4	0.0
	Sufficient	31.9	45.3	15.9
Limited	Somewhat inadequate	19.0	14.0	34.6
	Inadequate	34.7	12.3	49.5

The binomial test revealed that there was a significant difference between the proportion of adequate and limited health literacy levels for all three domains ($p<0.05$). The majority of participants had an adequate level of literacy for the domain of access to health information (73.7%), while the

majority had a limited level of literacy for domains of reading (53.7%) and appraisal (84.1%).

3. Overall health literacy

The mean score of overall health literacy is 65.7±13.5%, which is a somewhat inadequate level. The overall health literacy levels of undergraduates can be summarized in Table 4. The binomial test revealed that there is no significant difference in the proportion of adequate and limited literacy levels (p=0.627) and it implies that both categories of students are more or less equal in proportion.

Table 4

Overall Health Literacy

Level of Literacy	Rank of Awareness	Proportions of Overall Health Literacy (%)
Adequate	Excellent	8.7
	Sufficient	42.1
Limited	Somewhat inadequate	35.9
	Inadequate	13.4

4. Factors Influencing the health literacy

The factors influencing the level of health literacy were examined through binary logistic regression. The age, gender, monthly income, family members' occupation in the health sector, faculty, academic year, respondent's perception about his/her healthiness, smoking habits, alcoholic habit, physician advice and self-management for illness were used as independent variables. Among the independent variables, faculty, alcoholic habits and

physician advice influence the health literacy of undergraduates. The results are summarized in Table 5.

Table 5

Factors Contributing to Health Literacy

Factors	Odd Ratio (OR)	Significance (P Value)
Age	0.969	0.645
Gender		
Male	1.097	0.515
Female	1	
Socio economic status		
< 25,000	1.551	0.186
26,000-50,000	1.802	0.073
51,000-75,000	1.758	0.111
76,000-100,000	1.527	0.292
>100,000	1	
Family member work in a health-related field	0.726	0.131
No	1	
Yes		
Faculty		
Faculty of Commerce & Management	0.611	0.016*
Faculty of Agriculture	0.425	0.018*
Faculty of Arts & Culture	0.802	0.244
Faculty of Technology	0.365	0.013*
Faculty of Health Care-Science	1.154	0.550
Faculty of Sciences	1	
Year of Study		
First Year	1.105	0.710
Second Year	1.149	0.535
Third Year	1	
Do you think you are healthy?		
No	0.727	0.371
Yes	1	

Do you have a smoking habit?		
No	0.351	0.140
Yes	1	
Do you have an alcoholic habit?		
No	3.348	0.044*
Yes	1	
When you seek medical attention due to illness, how will the doctor react		
Simply prescribe drugs only	0.332	0.000*
Prescribe drugs for you and clarify your illness	0.400	0.000*
Explain, provide advice about your illness, and prescribe drugs	1	
If I feel any mild illness,		
I will manage myself	0.775	0.131
Directly go to the hospital	1	

*P value <0.05: Statistically Significant

When compared with the students from the faculty of science, the students from the Faculty of Commerce and Management, Faculty of Agriculture, and Faculty of Technology are more likely to have lower Health Literacy. There was no significant difference between other faculties. The person who does not have alcoholic habits tends to be more likely (OR 3.3458) to have higher health literacy than the person who has alcoholic habits. Physician advice greatly influences health literacy. When compared to the respondents who frequently receive, physician advice on illness, its prevention, and administration of prescribed drugs, respondents who received only drug prescriptions and drug prescriptions with information about illness from the physician tend to have lower health literacy.

Discussion

Even though the mean score of overall health literacy is 65.7±13.5%, which ranges from somewhat inadequate to sufficient rank, there is no significant difference between the proportions of adequate (50.2%) and limited levels (49.8%). Since two domains such as understanding and access were at adequate levels, while two domains such as reading and appraisal were at limited levels and decision-making is equal in proportion, the overall literacy is equally distributed between adequate and limited levels. When all the domains of health literacy are at adequate levels, the condition can be considered acceptable. However, when important domains are at a weaker level, the overall health literacy at 65.7±13.5% cannot be deemed satisfactory. When considering reading about health information, the majority of them (53.7%) have limited health literacy due to poor reading habits. However, the majority have an adequate level of skill for accessing health information (73.7%) and understanding health information (67.4%). Nowadays, most undergraduates seek to acquire health information due to influence of the social media and the internet. In the context of the free flow of information, the assessment of health information is crucial to prevent unnecessary health complications arising from poor decisions. However, a significant majority of undergraduates (84.1%) exhibit a limited level of proficiency in appraising health information, and 52.6% are similarly limited in the domain of decision-making. This indicates that despite having access to health information, undergraduates lack the skills to evaluate it effectively.

Several studies reported that age influences health literacy. Chu-Ko et al. (2021) reported that health literacy changes with age, depending on the population type. Additionally, Rababah et al. (2019) discovered that age had an impact on health literacy. However, in contrast, age and health literacy did

not appear to be correlated in the present study. This may be because the study sample was undergraduates, who are more or less in the same age cohort.

Some literature indicates that gender has an impact on health literacy. The study conducted by Chu-Ko et al. (2021) reports such association. The literature reports that there is a strong association between gender and health literacy (Mao et al., 2020; Rababah et al., 2019; Sarhan et al., 2021). However, when comparing the results of the present study, which was conducted among Eastern University undergraduates, no statistically significant association between gender and health literacy could be identified. Young men and women both have greater control over their health due to the Corona pandemic, which might be a reason.

Chu-Ko et al. (2021) reported that health literacy among adults was more influenced by family income than other factors. Mao et al. (2020) study also discovered health literacy was influenced by the income of single-child families. The present study did not find any connection between socioeconomic level and health literacy.

According to a study by Mao et al. (2020), there was a strong relationship between academic performance, majors, and school type. The year of study and field of study were also found to be substantially related to health literacy by Rababah et al. (2019). Turkey nursing students participated in the study, and it was discovered that fourth-year students' had higher health literacy than first-year students (Ayaz-Alkaya & Terzi, 2019). However, the present study found a substantial correlation between faculty and health literacy. However, there was no clear correlation between health literacy and academic year.

In the present study, there was a significant association between faculty and the health literacy of undergraduates. Faculty of Science and

Faculty of Health Care Sciences students pay close attention to their health because their academic work is heavily based on science and the functioning of the human body, while other faculties such as the Faculty of Commerce & Management, Faculty of Agriculture, and Faculty of Technology, do not base their curricula on human science. Due to this, there are some knowledge gaps between them.

According to the study by Chu-Ko et al. (2021), smoking and drinking alcohol were both associated with health behaviours in the adult population. Additionally, a Jordanian study discovered a significant link between smoking and health literacy (Rababah et al., 2019). However, the present study discovered that among undergraduates at Eastern University, Sri Lanka, there was a statistically significant relationship between alcohol intake and health literacy. However, there was no connection between smoking and health literacy level. People who do not drink have a greater understanding of the effects alcohol has on their health, due to these effects, they encourage people to quit alcohol usage and pay attention to their health.

The main role in the health field is played by doctors. Most of the time, when dealing with any disease, moderate or severe, many of us think about and seek medical guidance. Sometimes, especially in the adult population, they require much more care from the doctor. Additionally, seeking medical guidance is crucial to recovering from an illness or improving a person's general health. When we go to take medications, it will not improve our health literacy if the doctor merely prescribes medication without any clarification. Patients may also believe that there is no need for clarification and that the prescription is sufficient. It is generally expected that the physician should explain to the patients about the particular health issue or how it is progressing, provide suggestions on how to stop it from happening again, such as dietary

restrictions, or how one can recover from the sickness, and provide the medication with the necessary explanation on its administration and side effects, and necessary precaution to avoid side effect. Therefore, this kind of reaction from the doctor is crucial and beneficial for increasing the patient's health and health literacy. This was proved in the present research that those who received full explanation or guidance from doctors had the highest level of health literacy than others who received only a prescription and no explanation or guidance. The doctor's response to the patient's health condition appears to have a stronger impact on the population's levels of health literacy. Better explanations from the doctor also increase patients' level of satisfaction with them.

Conclusion

The purpose of the study was to evaluate the level of health literacy among the undergraduates of Eastern University, Sri Lanka. Health literacy was analyzed based on five domains such as reading, understanding, access, appraisal and decision-making/behavioural intention. The study found the majority had adequate literacy skills for understanding health information (67.4%), and access to health information (73.7%), while the majority had a limited level of literacy for domains of reading (53.7%) and appraisal (84.1%). However, there is no significant deviation between adequate and limited levels in the domain of decision-making/behavioural intention. According to the overall health literacy, both limited (49.2%) and adequate levels (50.8%) are more or less equal in proportion. The mean score of overall health literacy is 65.7±13.5% which ranges between somewhat inadequate to sufficient ranks. However, the undergraduates are weaker at reading, appraisal, and decision-making domains of health literacy. Concerning the factors, influencing health literacy, faculty, alcoholic habits and doctor's advice influence health literacy,

while age, gender, family income, family members who work in the healthcare field, academic year, respondents' perceptions of their health, and smoking habits, do not influence on health literacy.

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