Health Literacy and Preventive Behaviors of Undergraduate University Students During the COVID-19 Pandemic

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Abstract

The situation of the coronavirus (COVID-19) pandemic is full of unpredictability, uncertainty about the severity of the disease, and incorrect information. Therefore, health literacy preparation is the key to preventing COVID-19 and having the correct health behaviors. The objectives of this study were 1) to study health literacy on COVID-19 and prevention behaviors of COVID-19 among undergraduate students at Mahasarakham University, and 2) to compare health literacy on COVID-19 and prevention behaviors of COVID-19 among undergraduate students at Mahasarakham University, classified by genders, academic years, grade point averages (GPAs), and faculty groups. The participants were 417 undergraduate students at Mahasarakham University chosen by stratified random sampling and simple random sampling. The research instruments were as follows: the questionnaire on health literacy on COVID-19 and the questionnaire on COVID-19 prevention's behavior. The data were analyzed using percentage (%), mean (M), standard deviation (S.D.), independent sample t-test, one-way ANOVA. The findings revealed that 1) undergraduate students were well versed in health literacy for the COVID-19 infection and their prevention behaviors of COVID-19 infection were at a good level (M = 90.06, S.D. = 9.54; M = 86.87, S.D. = 11.50) and 2) female undergraduate students had statistically higher mean scores on COVID-19 health literacy scores and COVID-19 prevention's behaviors than males. Students from the health sciences faculty group had statistically significantly higher average health literacy scores on COVID-19 infection than those from the technology sciences faculty group.

Keywords: COVID-19, health literacy, preventive behaviors, university students

1. Introduction

1.1 Background

According to the situation of the COVID-19 outbreak, reported on November 12, 2021, there has been an increasing number of infections and deaths globally. There have been a total of 251,788,329 cases, with over 5,077,907 deaths (World Health Organization [WHO], 2021). Droplet transmission, coughing, droplet transmission, and touching objects contaminated with secretions can all spread the disease from person to person, followed by contact transmission (Chantrabenchakul, 2020), leading to more stringent disease control measures. The Center for the Administration of the Situation Due to the Outbreak of the Communicable Disease Coronavirus 2019 [COVID-19] was established on March 25, 2020, to serve as the primary policy-making and informational resource for the COVID-19 outbreak. Afterward, on March 26, 2020, the Emergency Decree on Public Administration in Emergency Situations went into effect across the country, with strict control measures such as limiting the time people can leave the house, asking for people's cooperation in increasing social distance, wearing masks (or cloth masks), arranging places to detain people in risk groups, working from home campaigns, and others to rout the disease.

Health literacy is a lifestyle concept that refers to people's ability to access, understand, evaluate, and apply

health information to consider and make daily decisions about health care, health promotion, and disease prevention to maintain a high quality of life throughout their lives (Cheysuwan, 2017). According to Taylor, Fraser, Bradley, Draper, Metcalfe and Roderick (2017), health literacy is a personal quality that enables people to be knowledgeable, motivated, and capable of accessing, understanding, evaluating, and using health information. Access to health information and services, cognition, communication skills, decision-making skills, self-management, and media literacy are all components of health literacy (Division of Health Education, Department of Health Service Support, 2017). According to the 12th National Health Development Plan (2017–2021), there are plans and methods for reforming health literacy and communication. It reflects the progress and success of all departments' work in health literacy by examining changes in people from various groups, including modifying personal health behaviors that are difficult to happen, and perspectives on health literacy abroad. For example, Europe has assessed health literacy as an influential tool in preventing non-communicable diseases (NCDs) (Sørensen, Van den Broucke, Fullam, Doyle, Pelikan, Slonska, & Brand, 2012). Hence, when the COVID-19 outbreak occurred, it was determined that health literacy was preparedness and was the key to preventing such a disease. Low health literacy has been linked to poor health outcomes such as low self-efficacy, increased mortality, poor health, and decreased quality of life (QOL) (Zheng, Jin, Shi, Duan, Wang, Yu, & Li, 2018). Sørensen, Pelikan, Röthlin, Ganahl, Slonska, Doyle and Falcon (2015) also found that a person's ability to respond to complex health literacy relates to precise health decisions. The universities strive to develop health literacy for this group of students within the specific context of the health literacy necessary to enable individuals to make the right decisions in their daily life situations. Health literacy entails more than just being able to read and follow health manuals, it is a clear indicator of empowerment when it comes to providing access to and the ability to use health information. Besides, it is related to literacy and affects people's knowledge, motivation, and ability to access, understand, evaluate, and apply health information to consider and make daily decisions about health care (Sørensen et al., 2012). As a result, this research aimed to investigate health literacy and use the results to create a manual to promote health literacy and provide students with health literacy knowledge. They also included basic instructions on how to develop learning activities and create environments to promote health literacy and healthy habits. The development of health literacy is related to health outcomes, for example, overall health status reduces health costs, increases knowledge of health, the length of stay in the hospital, and the frequency of using health services. As a result, if the majority of the country's population has a low level of health literacy, the overall situation will suffer. In other words, people are unable to look after their health. As a result, undergraduate students are an important target group for communicating COVID-19 infection information to family members and neighbors. Furthermore, if students can exhibit the proper health behaviors, it is an excellent example of disseminating useful information to the community to comprehend the new way of life in the prevention of COVID-19 infection.

1.2 Purpose of the Study

The purposes of this research are to 1) investigate health literacy about COVID-19 disease and prevention behaviors of COVID-19 infection among undergraduate students at Mahasarakham University, and 2) compare health knowledge about COVID-19 infection and prevention behavior of COVID-19 infection among undergraduate students at Mahasarakham University classified by genders, GPAs, and faculty groups (humanities and social sciences, technology sciences, and health sciences).

1.3 A conceptual Framework

Health literacy and health behaviors are the knowledge and ability of people to access, understand, evaluate, and apply health information to consider and make daily decisions about health care, health promotion, and disease prevention to have a good quality of life throughout the lifespan (Cheysuwan, 2017). Gender is also an indicator as a social determinant of health (Chirawatkul, 2020), whereas the characteristics and experiences of individuals have both direct and indirect influences on the practice of health-promoting behaviors, and the ability to receive information as well as process baseline data will lead to appropriate health decisions (Parker & Ratzan, 2010; Purakom & Kaewmahingsa, 2013). As a result, as shown in Figure 1. the researcher used it to develop a conceptual framework for this study.
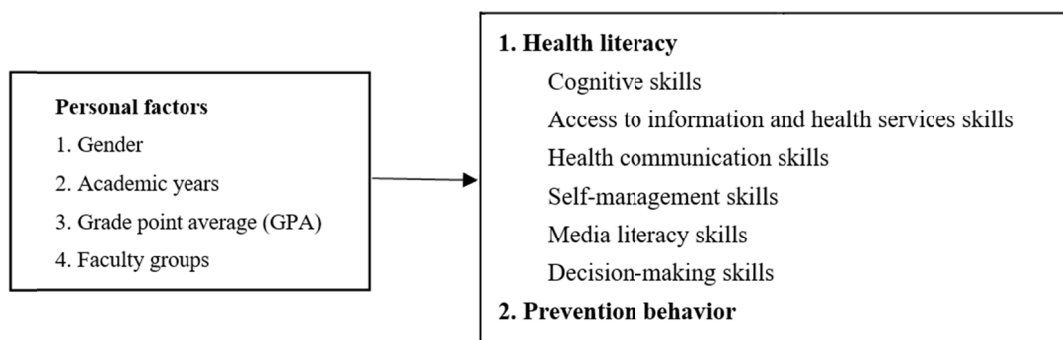
Figure 1. A conceptual framework

2. Method

This quantitative research aims to study health literacy in all six components and the prevention behaviors of COVID-19 infection among undergraduate students at Mahasarakham University.

2.1 Participant

The samples used in the research were 417 undergraduate students at Mahasarakham University in the academic year 2021, using Yamane's sample size method (Yamane, 1967), with a confidence level of 95% and an allowable percentage of error of 5%. Stratified random sampling was used, and all samples were classified into three groups, namely humanities and social sciences, technology sciences, and health sciences faculty groups. In addition, to provide complete and comprehensive information according to the characteristics of the faculty groups, the samples were taken for simple random sampling by drawing lots. Thus, all sub-samples had equal chances of being selected. As a result, four faculties from the humanities and social sciences, three faculties from technology sciences group, and two faculties from the health sciences faculty groups were chosen.

2.2 Variables

The independent variables were personal factors consisting of genders, academic years, grade point average (GPA), and faculty groups. The dependent variables referred to (1) health literacy on COVID-19 disease, including six areas of interest: cognitive skills, access to information and health services skills, self-management skills, health communication skills, media literacy skills, decision-making skills, and (2) COVID-19 prevention behavior of Mahasarakham University students.

2.3 Research Instrument

The instruments used in this research were 1) the questionnaire of students' health literacy towards COVID-19, consisting of 45 items, and 2) the questionnaire of students' prevention behavior towards COVID-19, which consisted of 20 items. Both questionnaires were developed from three different sources, as follows: (1) TOFHLA scale (Parker, Baker, Williams, & Nurss, 1995). (2) The Rapid Estimate of Adult Literacy in Medicine (REALM), developed for the diagnosis and identification of patients with low levels of health literacy (Murphy, Davis, Long, Jackson, & Decker, 1993). And (3) The Functional Communication and Critical Health Literacy Scales (FCCHL), which assesses the level of fundamental health literacy in patient communication and judgment. It was used to measure the level of health literacy of diabetics according to the Nutbeam concept (Ishikawa, Takeuchi, & Yano, 2008). After adjusting the content of the questionnaire to match the undergraduate students, the questionnaire for students' health literacy towards COVID-19 was developed and divided into six areas: cognitive skills, access to information and health services skills, health communication skills, self-management skills, media literacy skills, and decision-making skills. The questionnaire was designed in a true-false test for cognitive skills, while the rest was a five-level rating scale. Furthermore, a five-level rating scale was used to characterize the questionnaire of students' COVID-19 prevention behaviors. Further, experts were asked to validate the quality of content validity and the index of item objective congruence (IOC) by selecting an assessment with a value of 0.60–1.00. Afterward, the questionnaire was tested with 50 undergraduate students to determine validity by analyzing item discrimination using item-total correlation and Cronbach's alpha coefficient. Based on the results of students' health literacy towards COVID-19, the discrimination of cognitive skills ranged between 0.21 and 0.71, and the reliability was 0.87. In addition, discrimination in access to information and health services, health communication skills, self-management skills, and media literacy skills ranged from 0.40–0.76 with a 0.91 reliability. For decision-making skills, the discriminant power ranged from

0.44 to 0.90, and the reliability was 0.95. In addition, the discrimination of the questionnaire of students' prevention behaviors towards COVID-19 was between 0.28–0.71, and the reliability was 0.91.

2.4 Data Collection

The researchers communicated with the sample group via the cooperation request form to collect and analyze the data. When collecting data, the researchers introduced themselves, clarified the research objectives, and requested cooperation and protection of the sample groups' rights. The researchers distributed the questionnaire between July and September 2021, after the sample agreed to cooperate. The researchers used stratified random sampling to control for selection bias introduced by the sampling procedure. Additionally, the researchers used random sampling to ensure the equal distribution of samples across academic years and genders by dividing the quota of academic years and gender equality and collecting responses, verifying the accuracy of the information, and obtaining complete data for further analysis.

2.5 Data Analysis

This study used descriptive statistics such as percentage (%), mean (M), and standard deviation (S.D.), as well as the independent sample t-test and one-way ANOVA to compare groups by gender, academic year, faculty group, and GPAs.

2.6 Ethical Considerations

This research study was approved by the Human Research Ethics Committee of Mahasarakham University (No. 168-095/2021), issued on May 20, 2021. All information was kept confidential.

3. Results

The research results were divided into four parts as follows:

3.1 Demographic Data Regarding the Participants

Most of the respondents in this research were females (58.3%), and most were second-year students (26.1%). The majority were students from the Humanities and Social Sciences faculty group (62.1%). In addition, most of them were students with a GPA of 3.01–3.50 (38.1%).

3.2 Analysis of the Average Score on the Level of COVID-19 Health Literacy and Prevention Behaviors of COVID-19 of Undergraduate Students at Mahasarakham University

Table 1. Analysis of the average score on the level of health literacy and prevention behaviors on COVID-19 of undergraduate university students

Personal Factor	Level of Health Literacy			Prevention Behaviors		
	M	S.D.	Meaning	M	S.D.	Meaning
1. Genders						
Male	87.87	9.92	Good	85.05	11.99	Good
Female	91.62	8.95	Good	88.18	10.98	Good
2. Academic Years						
Year 1	90.30	8.55	Good	87.24	10.41	Good
Year 2	90.29	10.36	Good	86.21	12.59	Good
Year 3	90.13	9.41	Good	86.38	12.11	Good
Year 4	89.46	9.84	Good	87.74	10.75	Good
3. Faculty groups						
Humanities and Social Sciences	90.16	9.30	Good	86.42	11.45	Good
Technology sciences	88.64	10.18	Good	86.39	12.42	Good
Health Sciences	93.11	8.59	Good	90.77	8.43	Good
4. Grade Point Averages (GPAs)						
Lower than 2.00	85.50	5.45	Fair	93.25	9.22	Very good
2.01–2.50	87.29	11.17	Good	86.65	14.28	Good
2.51–3.00	89.13	9.87	Good	86.88	12.64	Good
3.01–3.50	91.30	9.08	Good	86.90	9.91	Good
3.51–4.00	90.76	8.73	Good	86.65	11.16	Good
Total	90.06	9.55	Good	86.87	11.50	Good

Note. N = Number of samples; M = Mean; S.D. = Standard Deviation

According to the results of Table 1, female students had the highest average score at a good level of health literacy on COVID-19 (M = 91.62). First-year students achieved the average score (M = 90.30). The health sciences faculty group had the highest average score (M = 93.11), and students with GPAs ranging from 3.01−3.50 had the highest average of health literacy (M = 91.30). Furthermore, for prevention behaviors on COVID-19, female students had the highest average score at a good level (M = 88.18). Students in their fourth year had the highest average score (M = 87.74), followed by students from the health science faculty group (M = 90.77). Students with GPAs less than 2.00 had the highest average score (M = 93.25).

3.3 Comparison of Health Literacy Scores and Preventive Behaviors on COVID-19 of Undergraduate Students at Mahasarakham University Classified by Genders, Academic Years, GPAs, and Faculty Groups

Table 2. Comparison of scores on health literacy on COVID-19 of undergraduate university students classified by genders, academic years, GPAs, and faculty groups

Personal Factor		M	S.D.	t	Sig*	
Gender	Male	87.87	9.92	-4.029	.000**	Females are significantly higher than males.
	Female	91.62	8.95			
Source of Variation		**SS**	*df*	**MS**	**F**	**Sig***	**Pairwise Comparison**
Academic	Between Groups	47.70	3	15.90	.174	.914	There is no significant difference.
Year	Within Groups	37788.92	413	91.50			
	Total	37836.62	416				
Faculty	Between Groups	642.74	2	321.37	3.577	.029*	The health sciences faculty group was
	Within Groups	37193.88	414	89.84			significantly higher than the technology
	Total	37836.62	416				sciences faculty group.
GPAs	Between Groups	839.47	4	209.87	2.337	.055	There is a significant difference.
	Within Groups	36997.15	412	89.80			
	Total	37836.62	416				

Note. ** $P < 0.01$, * $P < 0.05$. M = Mean; S.D. = Standard Deviation; t = The independent sample t-test; Sig = significant; SS = Sum of Square; *df* = degrees of freedom; MS = Mean of Square; F = One-way ANOVA.

Table 2 revealed that female undergraduate university students had a statistically significantly higher mean COVID-19 health literacy score than males at .01. Students belonging to different faculty groups had mean scores on health literacy scores on COVID-19 that were statistically different at the .05 level. When comparing the pairs, the health sciences faculty group

Table 3. Comparison of scores on health literacy on COVID-19 of undergraduate university students classified by genders, academic years, GPAs, and faculty groups

Personal Factor		M	S.D.	t	Sig*	
Genders	Male	85.05	11.99	-2.767	.006**	Females are significantly higher than males.
	Female	88.18	10.98			
Source of Variation		**SS**	*df*	**MS**	**F**	**Sig***	**Pairwise Comparison**
Academic	Between	161.69	3	53.90	.406	.749	There is no significant difference.
Years	Groups						
	Within	54860.58	413	132.83			
	Groups						
	Total	55022.26	416				
Faculties	Between	748.17	2	374.09	2.854	.059	There is no significant difference.
	Groups						
	Within	54274.09	414	131.10			
	Groups						
	Total	55022.26	416				
GPAs	Between	169.62	4	42.40	.319	.866	There is no significant difference.
	Groups						
	Within	54852.65	412	133.14			
	Groups						
	Total	55022.26	416				

Note. ** $P < 0.01$.

Table 3 revealed that female undergraduate university students had a statistically significantly higher mean COVID-19 prevention behaviors than males at the .01 level.

4. Discussion

The researchers discussed the results according to the research objectives as follows:

4.1 Undergraduate Students' Health Literacy and Preventive Behaviors on COVID-19

This study revealed that undergraduate university students had a good understanding of the COVID-19 infection and its health implications. It demonstrated that the students had a sufficient level of health literacy and the ability to take effective COVID-19 prevention measures. Additionally, health literacy also refers to the ability and skill to access information, knowledge, and understanding for analysis, evaluation, and self-management, as well as the ability to advise on personal, family, and community health issues for good health. It promotes good health and well-being. People can achieve sustainable and healthy behaviors by enabling them to make better-informed decisions about appropriate health practices (Santos, Sá, Couto, & Hespanhol, 2017). Based on the fact that both the public and private sectors disseminate information about the virus prevention situation. In addition, the students, the samples of this study, have learned through various subjects, especially in the quality of life and the environment, in the General Education program, which includes courses about health literacy related to health promotion and health care. As a result, the students had a good average score for health literacy on the COVID-19 infection. It is consistent with research findings that the subjects have a good or a sufficient level of health literacy on COVID-19 (Silva & Santos, 2021; Luevanich, Naklong, Surachetkomson, Ngansakul, Wong-utai, Khoka, & Muranic, 2021).

The finding showed that the level of COVID-19 prevention behaviors of undergraduate university students was good. Furthermore, they exhibited correct behaviors in preventing COVID-19 infection, and the students' behaviors were aimed at keeping them from becoming ill with COVID-19. According to Thianthavorn and Chitiang (2021), there is a link between health literacy and disease prevention behaviors. If people in the community lack the proper knowledge, including complete information, it will affect their awareness of taking care of themselves and their families to avoid infection. It will hasten the spread of the pandemic because respiratory infections are easily transmitted if not prevented, causing people great anxiety and panic (Glomjai, Kaewjiboon, & Chachvarat, 2020). Following the findings of Waehayi's (2020) study, which discovered that adolescents in Yala Province had a high level of COVID-19 prevention behaviors, however, it contradicted the findings of Weerakhachon, Kwanpichit, Nawsuwan, and Singweratham (2020), who discovered that the COVID-19 prevention behavior of medical personnel in medical centers in the southern border provinces was at the highest level. Because they were medical and public health personnel involved in people's health care, there was a fear of contracting COVID-19, as well as a fear of violence. Furthermore, the agency's recognition reflected COVID-19 prevention behavior at the highest level. Besides, it contradicted the findings of Thinthavorn and Chitiang (2021), who found that COVID-19 prevention behavior among university-age students was moderate. As a result, it is possible to conclude that COVID-19 health literacy is the key to effective medical prevention. COVID-19 health literacy assists university students and other groups of the population in better controlling the prevention and spread of the disease, which results in better health behaviors.

4.2 Comparison of Average Scores on COVID-19 Health Literacy and Preventive Behaviors Against COVID-19 Infection of Students at Mahasarakham University Classified by Genders, Academic Years, GPAs, and Faculty Groups

The findings revealed a statistically significant difference in COVID-19 health literacy and COVID-19 infection prevention behaviors among undergraduate university students of different genders, with females having a statistically significantly higher mean score for health literacy than males at the .01 level. Gender is a social determinant of health. It encompasses the nature of gender in terms of health, illness, disease, prevention, and treatment, such as men's alcohol and substance abuse, being more violent than women, committing more suicides, but receiving useless mental health services (Chirawatkul, 2020). It is in line with a recent study from China's Center for Disease Control and Prevention (CDC); which found that while men and women have similar COVID-19 infection rates, their mortality rates differ significantly. Males died 2.8 %, while females died 1.7 %, indicating that men and women in some cultures had different healthcare behaviors. It's also one of the reasons why men are more likely than women to become ill and die from COVID-19 (https://www.bbc.com/thai/international-51688656). Female Chinese students had a better understanding of disease and prevention than male students, according to Gao's (2020) research. Consistent with Gao's (2020) study, female students in China had a greater understanding of disease and prevention than male students, similar to what Silva and Santos (2021) claimed in their study that females were associated with better knowledge and

attitudes.

The study showed that when comparing the average score of health literacy for COVID-19 disease with different faculty groups, it revealed that undergraduate students at Mahasarakham University, in particular, faculty groups had significantly different mean scores of COVID-19 health literacy at a .05 level. The health sciences faculty group had higher mean scores in health literacy than the humanities and social science and technology sciences faculty groups, with statistical significance. That is because the health sciences faculty group consists of the Faculty of Nursing, Faculty of Pharmacy, Faculty of Public Health, Faculty of Medicine, and Faculty of Veterinary Medicine, is a group of faculties related to public health and medicine. They must graduate to become public health personnel to take care of people's health in the future and must be able to provide health care to the people. Along with the health sciences faculty group, there are teaching and learning programs that focus on health promotion in both curriculum and general education courses, including elective courses, resulting in a link to quality integration between basic skills, health literacy, and health promotion behavior that results in being ready to study or do other activities. This is in line with a study by Purakom and Kaewmahingsa (2013), which found that students in faculties with health-related activities had different health-promoting behaviors than those in faculties without activities. Students from various faculties study-specific health-related subjects that reflect a variety of health concerns. Similarly, the findings of this study supported Gao's (2020) finding that medical students in China had a better understanding of COVID-19 than non-medical students. It influenced attitudes and practices regarding COVID-19 prevention and control. Similarly, according to Silva and Santos (2021), students studying in the health field had better knowledge and attitudes.

5. Conclusion

This study showed that though undergraduate students at Mahasarakham University had health literacy for the COVID-19 infection and their preventive behaviors against the infection were at a good level, male undergraduate students were less knowledgeable about health than females. Further, students from the humanities and social sciences and the technology sciences faculty groups had less health literacy than the health sciences faculty group. Thus, the university should create a manual or a program to develop health literacy on the COVID-19 to prevent disease, treat, and promote the health of students, their families, and society, with an emphasis on male students and undergraduate students in the humanities, social sciences, and technology sciences faculty groups. Health literacy for COVID-19 will improve students' behaviors in preventing infection and their ability to control COVID-19 spread. Additionally, students can use their health literacy to advise family, friends, and the community on how to stay healthy.

Acknowledgments

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