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Rozeen Shaukat

Office of Research Innovation and Commercialization, University of Management and Technology, Lahore,
rozeen.shaukat@umt.edu.pk

Muhammad Asif Naveed

Department of Information Management, University of Sargodha, Sargodha., asif.naveed@uos.edu.pk

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Health Literacy of University Students in Covid-19 Pandemic and Infodemic: A Pakistani Perspective

by

Rozeen Shaukat*

Muhammad Asif Naveed†

*ORIC, University of Management and Technology, Lahore.

†Department of Information Management, University of Sargodha, Sargodha.

Corresponding email: rozeen.shaukat@umt.edu.pk

Abstract

This research investigated the levels of health literacy among Pakistani university students in the Covid-19 pandemic and infodemic. The university students were surveyed using an online questionnaire at two public sector universities and one private sector university in Punjab-Pakistan. The administration of the data collection instrument was completed with permission from concerned authorities. A total of 374 responses received which were imported to SPSS and analyzed by applying descriptive as well as inferential statistics. The results revealed that the health literacy of university students in the Covid-19 pandemic and infodemic was not at an optimal level as these participants expressed difficulty for half of the items of the health literacy scale. A large majority of these students had health literacy from low to moderate levels. Besides, the students' age, sex, study program, and Covid-19 testing did not appear to predict their health literacy. However, the geographical background of these students predicted their health literacy indicating that urban had students had higher literacy as compared to rural students. The results of this study indicated the need for health education and promotion among the general public in Pakistan especially university students as they serve as a change agent for people around them. The program for health literacy related to Covid-19 would be a great step to respond proactively to the pandemic and infodemic situation. Hoping, these results would be helpful for not only policymakers, healthcare providers, health information professionals especially engaged in health promotion but also for library staff to play their role in the health emergency related to Covid-19. This study would be a worthy contribution to the existing research on health literacy as a limited amount of research appeared from developing countries like Pakistan.

Keywords: Covid-19 pandemic, Infodemic, Health literacy, Public health, Students, Pakistan.

Background

The rapid spread of coronavirus (Covid-19) infection called for peoples' ability for acquiring and utilizing credible health information to proactively respond in the pandemic situation (Nguyen, et al., 2020a; Nguyen, et al., 2020b Paakkari, & Okan, 2020; Zarocostas, 2020). The individuals' preparedness is also essential with systems preparedness in response to infectious diseases as it enables people in making an informed decisions and adopting preventive behaviors (Paakkari, & Okan, 2020; Zarocostas, 2020). Health literacy is and has been critical not only in controlling infectious diseases but also in avoiding the devastating effects of pandemic situations like Covid-19 (Abel & Mcqueen, 2020; Parikh, et al., 2020). It also builds the capacity of the individual to actively respond to the abundance of conspirative information that spreads faster than the infectious disease (DeLuca, 2020; (Naeem, Bhatti & Khan, 2020; Zarocostas, 2020). The review of existing research revealed that people with limited health literacy are more vulnerable to Covid-19 infection (Fauzi, et al., 2020; Sørensen, 2020), likely to have higher fear and depressions

(Nguyen, et al., 2020a; Nguyen, et al., 2020b), less likely to adopt preventive behaviors (McCaffery et al., 2020; Okan, et al., 2020; Riad, et al., 2020; Riiser, et al., 2020; Watkins, J. (2020), greater endorsements toward conspiracy belief related to Covid-19 (Chen, et al., 2020; Song & Karako, 2020). The development of health literacy is realized more in days of the Covid-19 pandemic and infodemic than ever (Abel & McQueen, 2020; Sentell, et al., 2020; Paakkari & Okan, 2020).

Health literacy enhances people's knowledge, adapts their existing lifestyles, reduces carelessness, prevents over-reactions, and adopts preventive behaviors (Abdel-Latif, 2020; Abdullah & Zakar, 2019; Able & McQueen, 2020; Greenhalgh, 2015; Maverick Insider, 2020; Moro, et al., 2010; Naveed & Shaukat, 2020a; Nguyen, et al. 2020a; Watson, 2011). Thus, adequate health literacy is essential to deal with the prevailing scenario of Covid-19 as it not only enables individuals to utilize credible health information but also prepares them for the adoption of preventive behaviors. A perusal of published literature on health literacy related to Covid-19 exhibited several studies that were conducted focusing samples from medical and non-medical populations using an online questionnaire in Asia and North America. (e.g. Fauzi, et al.; 2020; Nguyen, et al., 2020a; Nguyen, et al., 2020b; Parikh, et al., 2020). The results of these studies reported that both general and medical populations had health literacy at a sub-optimal level which was quite worrisome. The study of Seng et al. (2020) emphasized that "understanding the levels and determinants of pandemic related health literacy across different populations is essential for healthcare policymakers to formulate optimal strategies for effective communication of critical medical information in the COVID-19 crisis and future pandemics" (p. 5).

Understanding the levels of health literacy among the general public is essential for developing useful for making strategic decisions to respond to the Covid-19 pandemic. An extensive search for published literature indicated the dearth of research on health literacy in Pakistan. Only a few studies appeared to have been conducted in Pakistan addressing the health literacy related to the Covid-19 pandemic. The study of Naveed, Shaukat, and Anwar (2020) developed and validated a scale for the measurement of Covid-19 literacy. In another, Naveed and Shaukat (2020b) assessed the levels of awareness of university students related to the Covid-19 pandemic. No other study seemed to have been conducted using the general public in Pakistan. Considering the national demographics, health literacy among youth will be of utmost importance as they comprise the population bulge. This study, therefore, attempted to measure the levels of health literacy among university students from three universities in Pakistan. This research addressed precisely the following research objectives.

Research objectives

1. To measure the levels of information literacy among university students.
2. To determine the nature of the association of university students' health literacy with their personal and academic variables.

Research Design

This study surveyed university students using an online questionnaire to measure their health literacy in the Covid-19 pandemic. The students were recruited from three universities (two public and one private) such as the University of the Punjab, Lahore, University of Management and Technology, Lahore, and the University of Sargodha, Sargodha. University of the Punjab is the

oldest, largest, and research-intensive university of Pakistan whereas the University of Sargodha is an emerging and fast-growing university in Punjab. While the University of Management and Technology is the W4-Category university from Lahore.

The questionnaire comprised of statements related to health literacy that was adopted from the short-form health literacy questionnaire (HLS-SF12) developed by Duong, et al., (2019) along with certain personal and academic variables such as age, sex, study program, geographical background, and Covid-19 testing. HLS-SF12 was a unidimensional scale comprising of 12 statements designed for the general public. It is a reliable and valid measure of health literacy for evaluation of people's ability for accessing, understanding, appraising, and applying health information on healthcare, disease prevention, and health promotion. Besides, it was not only in agreement with the original and comprehensive 47-item European Health Literacy Questionnaire (HLS-EU-Q47) developed by Sørensen *et al.* (2013) but also validated with Asian countries such as Indonesia, Malaysia, Kazakhstan, Myanmar, Taiwan, and Vietnam (Duong, et al., 2017; Duong, et al., 2019). It is a comprehensive measure expanding its ability by adding virtual media and social support lacking in other instruments (Liu, *et al.*, 2018). The shortness of HLS-SF12 allows the researcher to combine it with other instruments to investigate its relationship with other constructs. Each item of the instrument was measured on a 4-point Likert scale (e.g. '1= very difficult', '2= difficult', '3= easy', and '4= very easy'). The composite variable for health literacy was created by computing the mean scores of all the items representing overall health literacy for each student. The greater mean scores indicated better health literacy among university students.

All the students enrolled in different social science programs at the above-mentioned three universities were considered as the study population. The selection of the students from social science disciplines was purposively made considering the convenience of data collection in the time of lockdown situation. The questionnaire was administered online for data collection with the permission of concerned authorities as it was possible due to online classes. The participation of students in the survey was voluntary. The researchers received a total of 374 responses were screened for completeness and were imported into SPSS for data analysis. The mean and standard deviation were calculated for each statement of health literacy. The composite variable for health literacy was used to determine the levels of health literacy of university students. Pearson correlation and an independent sample t-test were performed for relationship testing. The measure of internal consistency such as Cronbach alpha was used to check the reliability of HLS-SF12 based on the data set of this study. The high value of Cronbach alpha (CA= .833) indicated the higher reliability of HLS-SF12.

Results

Profile of the survey sample

Out of 374 survey participants, 183 (48.9%) students belonged to the University of the Punjab, Lahore whereas 138 (36.9%) were from the University of Sargodha, Sargodha. Only 51(13.6) respondents participated in the survey from the University of Management and Technology, Lahore. There were 148 (39.6%) males and 226 (60.4%) females. A large majority of these students (n=306, 81.8. %) were enrolled in undergraduate program (16 years), followed by those students (n=68, 18.2%) enrolled in postgraduate programs (MS/MPhil/PhD). The age of these students ranged from 19 to 51 years along with a majority having age up to 30 years. More than half of the survey respondents (n= 203, 54.27%) had a geographical background as urban whereas

171 (45.72%) participants belonged to rural areas. As far as Covid-19 infection is concerned, a large majority (n=351, 93.8%) of the sample did not infect with Covid-19. Only 23 (6.14%) students infected with Covid-19.

RO1: Health literacy of survey respondents

The survey participants were asked to rate their level of easiness or difficulty with each statement of health literacy on a four-point Likert scale such as 'Very difficult=1', 'Difficult=2', 'Easy=3', and 'Very easy=4'. The mean and standard deviation of participants' responses for each statement was presented and ranked in Table 1. The figures revealed that the survey participants were able to understand health information in the media, call an ambulance in an emergency, judge an everyday health behavior, identify activities good for mental health, self-protection and self-treatment as they expressed their level of easiness with these statements with mean score 2.87 and above. However, these participants expressed their difficulty for understanding the reasons for health screening, medicine leaflets, judging the best treatment options available, joining a sports class, managing stress/depression, and making decision making the vaccination they need as the mean score for these statements were ranged from 2.33 to 2.74. It was worth noting here that the health literacy of the survey participants was not up to the mark and optimum level as these participants expressed their difficulty with half of the items of a short form of health literacy scale.

Table 1
Health literacy of university students (N=374)

Rank	Statements (<i>How easy would you say it is to:</i>)	Mean	Std. Dev.
1	Understand information in the media (such as the internet, newspaper, magazines) on how to get healthier?	3.24	.945
2	Call an ambulance in an emergency?	3.14	.984
3	Judge which everyday behavior (such as drinking and eating habits, exercise etc.) is related to your health?	3.14	.946
4	Find out about activities (such as meditation, exercise, walking, Pilates etc.) that are good for your mental well-being?	3.04	1.003
5	Decide how you can protect yourself from illness based on advice from family and friends?	2.98	1.024
6	Find information on treatments of illnesses that concern you?	2.87	.992
7	Understand why you need health screenings (such as breast exam, blood sugar test, blood pressure)?	2.74	.996
8	Understand the leaflets that come with your medicine?	2.65	.970
9	Judge the advantages and disadvantages of different treatment options?	2.62	1.021
10	Join a sports club or exercise class if you want to?	2.61	1.069
11	Find information on how to manage mental health problems like stress or depression?	2.57	1.083
12	Judge which vaccinations you may need?	2.33	1.032

Scale: 'Very difficult=1', 'Difficult=2', 'Easy=3', and 'Very easy=4'

Levels of health literacy

The survey participants' levels of health literacy were determined as 'Low', 'Moderate', and 'High' based on grouping using Bloom cut off point. The score of 12 statements of the overall scale in literacy level was summed as the health literacy score of each student. If the summed score of respondents was ≥ 80 , they were characterized as 'high' in the health literacy level. The respondents having a summed score between 60 to 79 were considered as 'moderate', in the health literacy level. The 'low' health literacy level was assigned to those respondents having their sum scores less than 60. Table 2 presented the distribution of respondents based on the three levels of health literacy for the overall scale. This table indicated that a majority of the survey respondents (n=224, 60%) had a low level of health literacy which was followed by those having moderate levels of health literacy (n=81, 21.66). There were only 69(18.45%) respondents who had high levels of health literacy. It was worth noting that more than two-thirds of the survey sample had their health literacy at a sub-optimal level (low to moderate) which was quite alarming and worrisome in the Covid-19 pandemic and infodemic.

Table 2

Participants' levels for health literacy (N=374)

Levels	Frequency	Percentage
Low	224	59.90
Moderate	81	21.66
High	69	18.45
Total	374	100.0

RO2: Relationship of health literacy with personal and academic variables

The composite mean score for the overall scale by computing the mean scores of all the 12 statement was calculated to determine the nature of the association of university students with their personal and academic variables. Afterward, an inferential statistic such as Pearson correlation and independent-sample *t*-test were applied. Table 3 outlined the details of the results. The results of Pearson correlation revealed no statistically significant relationship of health literacy with the age of the university students ($r = .023$, $P = .664 > .05$). These figures also indicated no statistically significant mean differences in the index of health literacy based on sex (male and female), study program (undergraduate and postgraduate), and Covid-19 testing (Yes and No) as *p*-values were greater than the alpha value ($P > .05$). However, there was a statistically significant mean difference in health literacy scores among students based on their geographical background (urban and rural) as the *p*-value was less than the alpha value ($P < .05$). It meant that the students having an urban background had higher health literacy than those having a rural geographical background as the mean scores of urban students were greater than the mean score of rural students. These results indicated that the rural population needed to be focused on health promotion and education to respond proactively to control the Covid-19 pandemic.

Table 3
Relationship of Covid-19 Literacy with socio-academic variable

Variables	Statistics	Value	Sig.
Age	Pearson correlation	.023	.664
Sex	Independent sample <i>t</i> -test	-.808	.419
Program of study	Independent sample <i>t</i> -test	.557	.319
Geographical background	Independent sample <i>t</i> -test	1.891	.031*
Covid-19 testing	Independent sample <i>t</i> -test	.456	.649

*P < .05

Discussion and conclusions

This study assessed the health literacy of university students in times of Covid-19 Pandemic and infodemic at universities of Pakistan using an online survey questionnaire. The results showed that a large majority of the survey participants had health literacy at the sub-optimal level as more than two-thirds of university students had low to moderate literacy levels toward health. There were only 69 respondents (18.45%) who had a high level of health literacy related to the Covid-19 pandemic. These findings were quite surprising World Health Organization, the Pakistani government and mass-media proactively communicated health-related public service messages. If the educated population does not have optimal health literacy, what will the level of illiterate and rural populations? This finding has a serious implication for public health in Pakistan. The reasons for low health literacy might be due to the inappropriate use of channels and formats for health communication. Understanding of health information behavior of the general public would be interesting in planning health related information delivery compatible with community needs that ultimately resulting in their satisfaction. This finding appeared to agree with that of Fauzi et al., (2020) who discovered that the biology teacher candidates also exhibited Covid-19 literacy at low to moderate levels. These results were also consistent with the findings of Naveed and Shaukat (2020b) reporting that the university students had limited health-related knowledge of the Covid-19 pandemic.

A closer look at the analysis also showed no statistically significant mean differences in the index of health literacy based on age, sex, the program of study, and Covid-19 testing. However, the results indicated that the geographical background of university students appeared to predict their health literacy as urban students had higher levels of health literacy as compared to those who belonged to rural settings. These results were also consistent with that of Naveed and Shaukat (2020b) who also reported similar results. This finding also had implications for health information delivery related to the Covid-19 pandemic as the rural student should be targeted more in health promotion and communication. The reason might be due to the lack of access to communication channels or limited access to the internet in rural areas of Pakistan. The government, university, and library administration should respond proactively for planning a need-based mechanism to enhance health literacy among university students as they might act as an agent of information delivery for people around them. The university teacher should also engage students with assignments related to the Covid-19 pandemic and infodemic and its devastating effect on socio-economic development. The limited health literacy of the general public might put

public health at severe risk in the Covid-19 pandemic. Thus, health literacy should be a frontline tool to proactively respond to Covid-19 pandemic and infodemic as many studies reported that the people with reasonable health literacy likely to adopt health-protective behaviors (Naveed & Shaukat, 2020a; Riad, et al., 2020), helps people to reduce carelessness, prevent over-reactions (Able & McQueen, 2020), and prepare communities for a collective societal response (Naveed & Shaukat, 2020a; Paakkari & Okan, 2020; Zarocostas, 2020). It is hoped that these results would serve as a guide to policymakers to make informed and evidence-based decisions about Covid-19. In limitations, the results of this research should carefully be generalized as the data were collected from only three universities in Pakistan. Therefore, this study did claim to be the voice whole of university students in Pakistan.

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