Survey health literacy in Mashhad University of Medical Sciences regarding COVID-19 protocols

ABSTRACT

Background and Objective: Adequate health literacy and compliance with COVID-9 health and safety protocols are among the main ways to break the SARS-CoV-2 transmission chain. This study aimed to investigate the level and relationship between awareness, attitude and behavior of students, staff and faculty in Mashhad University of medical sciences, regarding compliance with COVID-9 health and safety protocols in 2021.

Materials and Methods: This analytical cross-sectional descriptive study was conducted at Mashhad University of medical sciences, Mashhad, Iran in October 2021. The study sample included 411 students, staff and faculty selected through available sampling. The data were collected using a previous standard questionnaire and analyzed through the partial least squares (PLS) approach for structural equation modeling (SEM) using Smart PLS software (version 3.0). We employed descriptive and inferential statistics for our data analysis.

Results: Respondents 'awareness, attitude and behavior towards COVID-19 health protocols yielded significant positive correlations (P<0.001). Furthermore, the mean score percentage of awareness, attitude and behavior were 85%, 65% and 84% of the total score, respectively. Additionally, respondents' mean scores for behavior and attitude differ significantly across age, gender, job and marital status.

Conclusion: The level of awareness of the participants in Mashhad University of Medical Sciences about the COVID-19 health safety protocols was good. A significant relationship was observed between awareness, attitude and behaviors related to compliance with COVID-19 protocols. It seems that these people can be good representatives in the community to increase people's awareness, considering the participants' observance of the protocols.

Paper Type: Research Article

Keywords: COVID-19; university; health literacy; awareness; protocol, Adherence, staff.

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Introduction

The SARS-CoV-2, a member of coronaviruses caused a pandemic in the last quarter of 2019, termed coronavirus disease of 2019 (COVID-19); a highly infectious disease that brings the world to humanitarian, social and economic cises (1, 2).Currently, all of the countries have reported prevalence and mortality due to covid19(3-5).

On the other hand, during competencies such as COVID-19, public awareness is essential for the management of emotions, behaviors, and awareness infection transmission ways, symptoms, prevention, and self-care protocols, which are essentials for response to pandemic situations (6, 7). Accordingly, dealing with complex health information requires adequate health literacy (HL), that entails people's knowledge and competences to obtain, process, and understand health information and services to make appropriate health decisions(8) Importantly, nations should invest in the health literacy of citizens that could help people related pandemic risk of infection spreading and understand the reasons behind the social responsibility and disease prevention (9-14)

In this context, several studies have examined the knowledge and behavior of individuals about preventive protocols in COVID-19 in different communities (15-19). A systematic review of pandemic-related health literacy such as MERS, COVID-19, and SARS by Seng et al. (2020) indicated the sub-optimal level of health literacy ranging from 4.3% to 57.9% among health workers (8). A recent study by Nguyen, et al. reported that people with low health literacy appeared to have higher depression caused by the COVID-19 pandemic (20).In another research, Ahorsu and colleagues found an association between higher health literacy and the lower fear of COVID-19 (8). The study of Sajadi, et al. examined the levels of health literacy among students and factors influencing it at Isfahan University in Iran. The results revealed 46% of students had adequate health literacy(21). Fauzi and coworkers explored COVID-19 literacy among biological students in Indonesia and found that most of the students had poor health literacy related to COVID-19 (22). Further, Taghrir, et al. showed that most medical students had sufficient knowledge about COVID-19 and showed acceptable behavior (23). Also, Scientists reported a high knowledge of the COVID-19 pandemic in the U.S (24).

As noted in the studies above, attention to health awareness and literacy among young people and students about COVID-19 has been emphasized (14)(19, 25)(26).thus staff, faculty and students of medical institutions provide the backbone of health literacy(27-30). few studies have been conducted, especially in Iran, and most of the studies are from the pre-COVID-19 period(31-36). So far, especially in Iran, no comprehensive study has been conducted to examine the level of knowledge, attitude and behavior of all three main groups of stakeholders in the University of Medical Sciences, namely students, faculty and staff.

considering the important role of this segment of society in informing, preventing and controlling the spread of COVID-19 virus, in this study we investigated the awareness, attitude and behavior of students, staff and faculty of Mashhad University of Medical Sciences regarding related health protocols towards COVID-19 in 2021.

Materials & Methods

This descriptive-analytical study was conducted at Mashhad University of medical sciences, Iran. The study population consisted of students, staff and faculty who are studying or working at Mashhad University of Medical Sciences in 2021. Mashhad University of Medical Sciences has 7 schools, 14 hospitals and 5 health centers. The sample size was

determined using Cochran formula with an error of 0.05, 95% accuracy and p = 0.50%, and taking into account the 5% probability of sample loss equal to 384 people that in this study 411 people were selected. Cochran formula is given below.

$$n = \frac{\frac{z^2 pq}{d^2}}{1 + \frac{1}{N}\left[\frac{z^2 pq}{d^2} - 1\right]}$$

Sampling was performed by available sampling method among students, faculty and staff of the hospital and University offices. Inclusion criteria included a willingness to enter the study, having an employment or studying relationship in one of the schools, hospitals, or health centers of Mashhad University of Medical Sciences. Incomplete completion of the questionnaires was considered as an exclusion criterion. The research instrument was a researcher-made questionnaire resulting from the instructions of the Ministry of Health, Treatment and Medical Education and the opinion of related specialists (infectious diseases and health education and health promotion specialists) that was used recently in Nasirzadeh, et al. study (16). Cronbach›s alpha coefficient for different parts of the questionnaire was above 75%. CVR ratio and CVI index validity of tools were above 78%. The questionnaire consisted of four parts: 1. Demographic profile (5 questions), 2. Awareness questions (20), 3. Attitude-based questions (6) and 4. Behavior questions (13)

The questions related to awareness and attitude were in the form of choosing the desired options. If a person had chosen all the options of the questions, he would have obtained a full score in the field of awareness and attitude, which was equal to 40 scores in awareness and 18 scores in attitude. Behavior questions were related to the degree of adherence to health protocols in practice, which ranged from very high (5 points) to very low (1 point) for questions,

and a maximum of 65 and a minimum of 13 overall scores(16).

The questionnaires were compiled electronically following ethical standards, then supplied to the respondents through social networks and e-mails. Everyone was asked to answer the questionnaire with complete honesty and they were assured that all the information requested in the questionnaire would be used confidentially. At the beginning of the questionnaire, after the necessary explanations, the consent of the study participant was obtained. Any ambiguities of participants regarding the questionnaire were addressed in detail.

All the data were entered into SPSS software version 21 for analysis and validation. The qualitative variables were presented in the form of frequencies and percentages. Information was expressed in the form of tables. The proposed relationships in the conceptual model were evaluated through the partial least squares (PLS) approach for structural equation modeling (SEM). The PLS-SEM method simultaneously minimizes the bias and error variance (37). Moreover, the factor weighting scheme for inner weighting and statistical inferences were based on the bootstrap procedure. Besides the questions on, gender, age, job status, education, workplace, underlying disease, and marital status were included in the structural model as control variables to control the effects of extraneous variables. The PLS-SEM analysis was conducted using the Smart PLS (version 3.0). The p-value of less than 0.05 was considered statistically significant.

Results

In total, 411 participants, of which we have 100 students, 274 staff, and 37 faculty completed the questionnaire. The majority of the participants were female (65.2%), and 65.9% of them were married. Most participants (57%) had a bachelor's degree (table1).

Table 1: Demographic characteristics of the study participants and their relationship with their awareness, attitude and behavior regarding the observance of COVID-19 protocols

Characteristics		N (%)	Awareness-Mean (SD)	Attitude-Mean (SD)	Behaviors-Mean (SD) Awareness	Asymp. Sig.		
						Attitude	Behaviors	
Age	<25	92(22.4)	33(6.8)	13(4.2)	53(8.3)	0.183	0.005	0.005
	26-35	90(21.9)	35(5.6)	11(4.2)	55(7.0)			
	36-45	175(42.6)	35(6.19)	11(3.8)	56(7.0)			
	>45	54(13.1)	34(5.6)	12(3.3)	54(8.2)			
Gender	Female	268(65.2)	35(5.8)	12(3.8)	56(6.6)	0.771	.064	.000
	Male	143(34.8)	34(6.8)	12(4.2)	53(8.7)			
Marital status	Married	271(65.9)	34(6.3)	11(3.9)	55(7.7)	0.092	0.006	0.773
	Single	140(34.1)	35(5.9)	13(4.0)	55(7.4)			
Workplace	Hospital clinical staff	105(25.5)	35(5.7)	11(3.6)	56(7.9)	0.118	0.003	0.019
	Hospital Non-clinical staff	83(20.2)	34(6.6)	10(4.0)	55(7.7)			
	School	41(10.0)	34(5.9)	12(4.2)	55(6.2)			
	University official Staff	36(8.8)	36(4.9)	12(3.0)	56(7.4)			
	Health centers	46(11.2)	36(6.1)	12(4.3)	57(6.8)			
	Student	100(34.3)	33(6.5)	13(4.1)	53(7.9)			
Job status	Student	100(24.3)	33(6.5)	13(4.1)	53(7.9)	0.119	0.006	0.002
	Employee	274(66.7)	35(5.6)	11(3.8)	56(7.4)			
	Academic staff	37(9.0)	32(8.2)	11(4.3)	55(6.9)			
Education	Associate Degree& lower	37(9.0)	34(6.9)	12(4.0)	56(7.1)	0.925	0.265	0.537
	Bachelor	229(55.7)	34(6.1)	12(4.0)	54(8.0)			
	Master	89(21.7)	35(5.8)	11(3.7)	55(7.2)			
	Doctoral & higher	56(13.6)	34(6.3)	12(4.1)	56(6.7)			

As shown in Table 1, there is a positive relationship between the participant's age, their attitude (p ≤ 0.005) and behavior (p ≤ 0.005) towards observance of COVID-19 health protocols. We reported a statistically significant relationship between behavior of students, faculty and staff towards observance of COVID-19 health protocols with their gender (p ≤ 0.001), work place (p ≤ 0.05) and job status (p ≤ 0.05). However, there is no significant association between respondents' behavior with their marital status (p > 0.05) or education level (p > 0.05). We found statistically significant relation between participants' attitude with their marital status (p ≤ 0.05), work place

(p ≤ 0.05) and job status (p ≤ 0.05). Although no significant relationship reported between respondents' attitude with their gender (p > 0.05) and educational level (p > 0.05). Of note, we did not find a significant association between awareness of the participants and all the demographic characteristics examined (p > 0.05).

The respondent's awareness, attitude and behavior were positive with more than 90% of participants believing "the need to use a mask and cover the mouth and nose" and "observe social distance" and in total over 83% of the participants, were aware of all the protocols for prevention and transmission routes of COVID-19 listed in the questionnaire. The participants are oblivious on some preventive measures that include "Using disposable gloves", "disinfecting surfaces with 70% alcohol", "throwing out used masks" (Between 67% and 76%).

About 80% of participants knew about the protocols for "dealing with a person with COVID-19" when they or their close relatives are infected. About the symptoms of COVID-19, most participants (about 98%) considered a fever, cough, shortness of breath and body aches to be the main symptoms of COVID-19. More than 90% of the participants used masks, observed social distance, avoided losing others, and have agreed with these protocols. Among the participants, 78.59% agreed with hand disinfection and 64.48% agreed with surface disinfection protocols. Among the study participants, about 72.99% considered themselves exposed to the disease and 75.18% considered it serious and dangerous. 46.23% of people said that this disease is more severe than other respiratory diseases. 22.14% believed that the chances of recovery from this disease are low. 71.05% believed they would be treated if infected.

Of the participants, 36.50% believed that others might be exposed to COVID-19 due to

their non-compliance with the protocols, while 65.45% believed that non-compliance with the protocols by others might cause their illness. In addition, 80.05% of people believed that staying at home and observing quarantine is effective in preventing the spread of the disease. The average score of individuals' behaviors in following the protocols to prevent the transmission of COVID-19 was 54.92 out of 65 scores.

Also, protocols related to using face masks, avoiding rubbing of hands-on face, observing social distance and covering the face when sneezing were more commonly asked in this survey. Prompt physician consultation when symptoms of colds are perceived, continuous disinfection of personal belongings and not using public transportation were less observed than other safety protocols. The findings also showed that the highest level of awareness was seen among 26 to 35 years' age group, women, married participants, health center staff and university staff, which of course was not statistically significant. However, the most positive attitude towards protocols was seen among respondents under 25 years of age, men, single and students. There was a significant relationship between age and marital status and being a student with an attitude score (P ≤ 0.005).

In Table 2, the average scores obtained in the three areas of awareness, attitude and behavior by the participants are given. As presented, the mean score of participants' awareness is 34.32 out of 40 points, attitude is 11.76 out of 18 and behavior is 54.92 out of 65. Thus, the mean scores obtained in measuring awareness, attitude and behavior are 85%, 65% and 84% of the total scores, respectively. As demonstrated, the points earned in awareness and behavior were greater than the points obtained for attitude.

As shown in Table 3, there is a statistically significant relationship between the score earned in awareness, attitude and behavior (P

Table 2: Average score obtained in the areas of knowledge, attitude and practice

	Mean	Standard Deviation	Maximum	Minimum	Percentile 25	Percentile 75	Variance
Awareness	34.32	6.18	40.00	5.00	31.00	39.00	38.22
Attitude	11.76	4.01	18.00	1.00	9.00	15.00	16.12
behavior	54.92	7.64	65.00	21.00	51.00	60.00	58.30

Table3: Relationship between awareness, attitude and behavior with respondents' demographic variables

Effect	Path coefficient	Standard Deviation (STDEV)	T Statistics (|O/ STDEV|)	P Values
Age -> Attitude	0.004	0.05	0.085	0.932
Age -> Awareness	0.144	0.07	2.063	0.04
Age -> Behaviors	0.092	0.069	1.337	0.182
Attitude -> Behaviors	0.044	0.073	0.602	0.548
Awareness -> Attitude	0.621	0.041	15.085	0.001
Awareness -> Behaviors	0.267	0.072	3.708	0.001
Education -> Attitude	-0.031	0.041	0.762	0.446
Education -> Awareness	-0.006	0.066	0.086	0.931
Education -> Behaviors	-0.003	0.059	0.059	0.953
Gender -> Attitude	0.083	0.039	2.111	0.035
Gender -> Awareness	-0.049	0.053	0.928	0.354
Gender -> Behaviors	-0.216	0.052	4.155	0.001
Job status -> Attitude	-0.068	0.053	1.296	0.195
Job status -> Awareness	0.022	0.095	0.232	0.816
Job status -> Behaviors	0.085	0.074	1.159	0.247
Marital status -> Attitude	0.019	0.05	0.39	0.697
Marital status -> Awareness	0.136	0.056	2.431	0.015
Marital status -> Behaviors	0.035	0.057	0.624	0.533
Underlying disease -> Attitude	0.05	0.041	1.213	0.226
Underlying disease -> Awareness	0.005	0.044	0.123	0.902
Underlying disease -> Behaviors	-0.114	0.047	2.402	0.017
Workplace -> Attitude	-0.136	0.047	2.901	0.004
Workplace -> Awareness	-0.025	0.057	0.43	0.667
Workplace -> Behaviors	0.007	0.055	0.134	0.894

≤ 0.001). Individuals' gender and behaviors also had a significant relationship (P ≤ 0.001). Here we reported that the observance of protocols was documented more among women. There was also a significant relationship between the workplace and individuals' attitudes towards COVID-19 prevention protocols (P ≤ 0.004). Students and staff at health centers were more committed to COVID-19 prevention protocols than hospital staff and university professors.
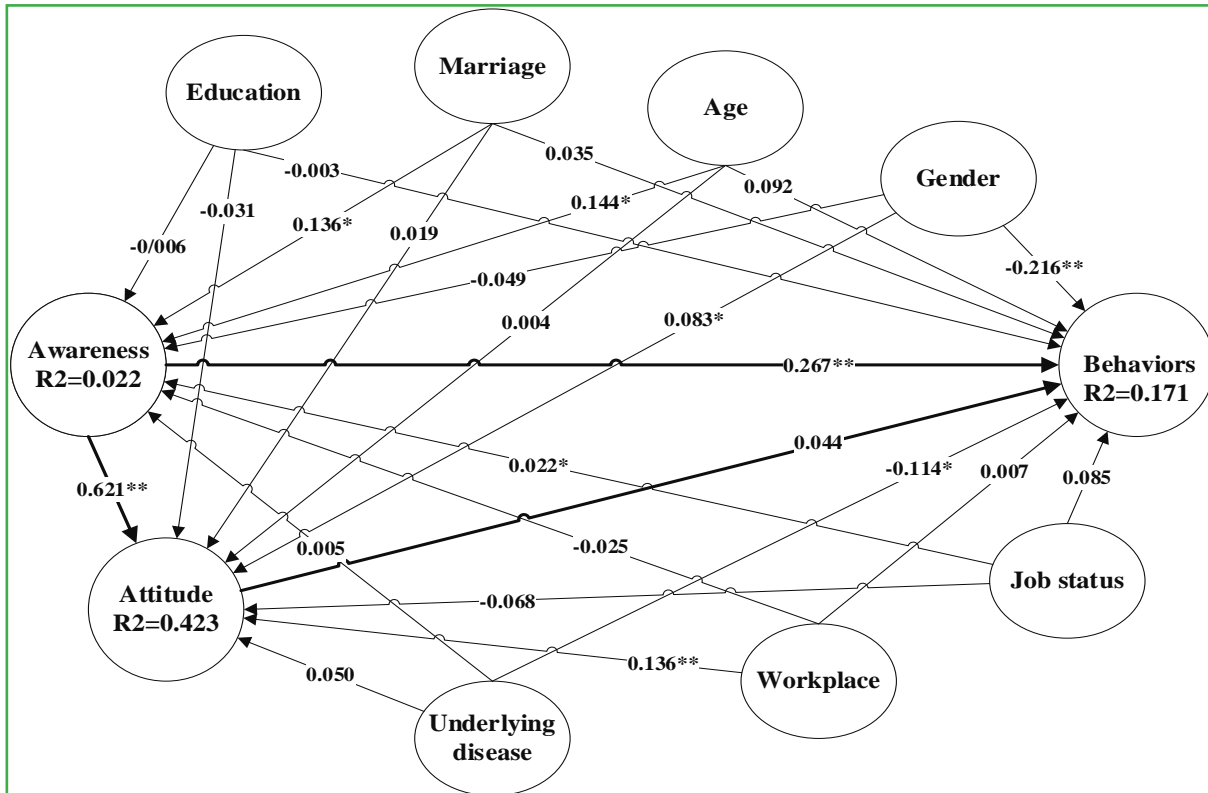

Fig 1: Path coefficients between awareness, attitude, behavior, and other individual variables

As shown in Figure 1, the evaluation of path coefficients indicates that an increase in measure in awareness will increase the behavior by 0.267 standard deviations if all other variables are kept constant. It can also be said that the indicators of the above model can explain 17% of behavioral changes regarding the observance of protocols. In addition, having an underlying disease had a significant negative effect on compliance with COVID-19 health protocols. Age and gender have a significant positive effect on people's attitudes about health protocols.

Discussion

In this study, knowledge, attitudes and behaviors related to COVID-19 prevention protocols among students, faculty and staff of Mashhad University of Medical Sciences were examined. The findings of this study show that more than 76% of the respondents were aware of the nature and methods of transmission and protection against Covid-19. More than 64% of people have right attitude about the importance of following protocols in preventing virus transmission. These results were consistent with the results of previous studies.(38, 39). This study also showed that there is a significant direct relationship between people's awareness of prevention protocols and their attitudes and behaviors concerning COVID-19 (P value≤0.001).

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In addition, the findings of the present study indicate a significant relationship between awareness of COVID-19 protocols and participants age that is similar to the findings of Erfani et al. (40) and Yıldırım and Güler (41) that younger people had a higher level of literacy. In our survey women performed better than men and took more of the preventive behaviors of COVID-19, a result that has been observed in other studies (16, 42). The above finding might be because of the women's position in families. Students in this survey demonstrated a commendable level of literacy, other surveys documented similar results (32, 33, 43, 44)

As noted, young adults display likely tendencies in taking risks (40). Our survey involves more postgraduate students, in which case there is a likely tendency to report more positive attitudes, higher knowledge and positive behavioral scores, since conventionally; previous studies utilized more of undergraduate students. Therefore, considering the role of higher education on an individual's knowledge, attitude and behavior can explain our findings with higher scores.

Nasirzadeh et al in their study in Qom showed that the people of Qom have a high level of knowledge, perception and preventive behaviors towards COVID-19 (16). The results of our present survey parallel outcomes of earlier studies conducted by Nasirzadeh et al (16). In our study, we employed a three-dimensional questionnaire to report on participants' knowledge, attitude and behavior and their interrelationship. We used respondents among faculty, staff and students and use multiple methods to analyze our results to describe and examine the varying aspects of health literacy and preventive behavior of individuals towards COVID-19.

This study also showed that there is a significant direct relationship between participant's awareness of COVID-19 prevention protocols and their attitudes and behaviors (P value≤0.001), which is consistent with Li and Liu (45) as well as An et al. studies (46). Awareness among the participants shows a linear relationship with one's qualification, the higher the educational status the higher the awareness, previous studies reported similar findings (47-49).

The scores of safety preventive behaviors for the prevention of COVID-19 in this study was significant and averaged more than 88%. This high percentage was probably the result of high publicity for COVID-19 by the media to sensitize the populace. Among the preventive behaviors, regular hand washing, avoiding rubbing hands, and covering the mouth and nose during coughing and sneezing were the most common as reported in a previous study (16).

As explained above our current study was undertaken in Mashhad province among staff, faculty and students of Mashhad University of medical sciences as such this can be one among the main limitations of our survey since we cannot generalize the finding of our research on to the other areas of the country. Hence, we strongly suggest for future studies conduct a more encompassing study that will cut across all medical schools in the country to research the awareness, attitude and behaviors of students, staff, and faculty towards safety and preventive practices regarding COVID-19. Of note, there is a likely tendency to find a difference between individuals' expression on the questionnaire and the reality.

Conclusion: Altogether, the students, staff, and faculty of Mashhad University of medical sciences possess positive (good) awareness and behaviors and to a lesser extent attitude towards safety and preventive protocols against the COVID-19 pandemic. Higher educational qualification, female gender, and age were found to be associated with positive scores

for attitude and behavior of the participants towards COVID-19 health protocols. The level of individuals' positive perception can be improved using better educational instruments and efficient methods to convert infodemics.

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