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Perceptions Regarding Personal Protective Measures against COVID-19 and Health Literacy among Undergraduate Students: A Descriptive and Cross-sectional Study

Lisans Öğrencilerinin COVID 19'a Karşı Alınan Kişisel Koruyucu Önlemlere İlişkin Algıları ve Sağlık Okuryazarlığı: Tanımlayıcı ve Kesitsel Bir Çalışma

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ÖZET

Amaç: Bu çalışma lisans öğrencilerinin COVID 19'a karşı alınan kişisel koruyucu önlemlere ilişkin algılarını ve sağlık okuryazarlığı düzeyini inceledi. **Yöntem:** Tanımlayıcı, kesitsel yapılan çalışmaya sağlık alanı dışında öğrenim gören 360 lisans öğrencisi dahil edildi. Öğrenci Bilgi Formu, Kişisel Koruyucu Önlemler Formu ve Sağlık Okur Yazarlığı Ölçeği'nden oluşan çevirim içi anket ile veriler toplandı. Veriler Ki-kare ve Mann-Whithney U testi ile analiz edildi. **Bulgular:** Kadın öğrencilerin maske, el hijyeni ve COVID 19 tanısı almaktan korkma, sağlık okur yazarlığı ölçeği puan ortalamaları erkeklerden anlamlı oranda yüksekti. Lisans öğrencilerinin %67.5'inin virüsten korunmada aşılamanın önemli olduğunu düşündüğü ve %57.2'sinin COVID 19 tanısı almaktan korktuğu saptandı. Kadın öğrencilerin kişisel koruyucu önlemlerin önemine ilişkin algıları ve sağlık okuryazarlığı düzeyi erkeklere oranla daha yüksekti. **Sonuç:** Lisans öğrencilerinin, COVID 19 hakkında sağlık okur yazarlığının arttırılması pandeminin kontrol altına alınmasında yarar sağlayacaktır.

Anahtar Kelimeler: COVID 19, kişisel koruyucu önlemler, sağlık okuryazarlığı, lisans öğrencileri

ABSTRACT

Objective: This study explored the prevailing perceptions of personal protective measures against COVID-19 and the degree of health literacy among undergraduate students. **Methods:** This descriptive, cross-sectional study included a total of 360 undergraduate students majoring in fields other than healthcare. Research data were collected through an online questionnaire consisting of Student Information Form, Personal Protective Measures Form and Health Literacy Scale. The data were analyzed with Chi-square and Mann-Whitney U tests. **Results:** The mean scores for wearing masks, hand hygiene, fear of being diagnosed with COVID-19, and health literacy scale among female students were significantly higher than those of males. We found that 67.5% of our participants thought vaccination was important in protection from the disease and 57.2% were afraid of being diagnosed with COVID-19. Female students had higher levels of health literacy and better perceptions of the importance of personal protective measures. **Conclusion:** Improving COVID-19-related health literacy among university students could offer significant benefits in controlling the pandemic.

Keywords: COVID 19, personal protective measures, health literacy, undergraduate students

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INTRODUCTION

The current COVID-19 pandemic is a serious global health threat (Li et al., 2020; Cao et al., 2020). Since it was declared as a global pandemic by the World Health Organization (WHO, 2022), the COVID-19 outbreak has exerted a profound impact on public health, social systems and governments (WHO, 2022; Mahase, 2020; Pan et al., 2020). As of 5 January 2023, the number of confirmed COVID-19 cases was over 657 million, with a death toll surpassing 6.67 million (World Health Organization, 2023). Since the onset of the pandemic, many countries have implemented various public health measures, such as mandatory quarantines, lockdowns, and compulsory mask-wearing, to prevent the spread of the coronavirus (Mitze et al., 2020; Labrague et al., 2021). In addition, various other measures were taken, including social and physical distancing, mandatory curfews, closure of all schools, and travel restrictions (Mitze et al., 2020; Labrague et al., 2021). These public health measures were implemented to "flatten the curve"; namely in an attempt to slow down or prevent further transmission of COVID-19, thereby reducing the burden on the healthcare institutions and allowing them to adequately handle the growing number of cases (Mitze et al., 2020; Labrague et al., 2021).

The best strategies to minimize the number of new COVID-19 cases involve the public's compliance with basic personal protective measures such as wearing face masks, adequate and balanced nutrition, social distancing, hand hygiene, and vaccination. Measuring such compliance among undergraduate students, who constitute one of the most active and large parts of the society, could provide us a wealth of data that will help us determine the awareness level of undergraduate students majoring in fields other than healthcare and devise additional initiatives to control the current pandemic (Hong et al., 2020). According to the statistics from the Board of Higher Education in Turkey, the total number of undergraduate students in Turkey for the year 2021-2022 is 4,676,657, and the number of universities is 207 (Higher Education Information Management System, 2022). Although the responsibility lies with each individual for collecting information and gain basic knowledge about health and disease conditions in every aspect of their lives and making the right decisions, the current global pandemic urgently requires people to become aware of and fully comply with personal protective measures (Uysal et al., 2020; Aker & Mıdık, 2020; Sons and Eckhardt, 2021). In a study conducted with undergraduate students in the City of Mangalore, 94.7% (822) of students washed their hands after visiting public places, and only 90.6% (786) of these students were aware of the appropriate steps to follow in hand-washing behavior. In the same study, it was concluded that only 20.8% (181) of students needed to become more aware of the importance of hand-washing in controlling the spread of COVID-19 (Das et al., 2021). As such studies in the relevant literature have revealed, health-promoting behaviors continue to be shaped throughout one's formative years including university education, it is therefore imperative to increase the level of knowledge on protecting and maintaining health and choosing appropriate behaviors among university students (Uysal et al., 2020; Duong et al., 2020; Sons & Eckhardt, 2021).

Health literacy is defined as a person's cognitive and social skills that determine the motivation and ability to access health-related information, understand information, and use it in ways that improve and maintain health to make judgments and make health decisions in their daily life (World Health Organization Improving Health Literacy, 2022). While malnutrition,

physical inactivity and smoking are observed in individuals with inadequate health literacy, improved health literacy has been observed to support the development of healthy behaviors, to help diminish health inequalities, and play a significant role in protecting people's mental health and improve their quality of life, especially during the pandemic (Rababah et al., 2019; Ozen et al., 2019; Uysal et al., 2020; Domanska et al., 2020; Nguyen et al., 2020). In that respect, health literacy should be considered as a social responsibility issue, an essential tool for mitigating and controlling the current pandemic (Nguyen et al., 2020). From this point of view, considering the age range and education level of undergraduate students, it is predicted that the perceptions of personal protective measures against COVID-19 are closely related to their level of health literacy.

Previous work in the literature has generally focused on the perceptions and health literacy levels among university students majoring in health-related fields, such as medicine and nursing, regarding personal protective measures against COVID-19 (Modi et al., 2020; Duong et al.,2020; Hong et al., 2021). In order to better control the number of new cases, we should also have a clear overall picture of the perceptions and attitudes toward the personal protective measures needed against COVID-19 and the level of health literacy among undergraduate students majoring in fields other than healthcare. This study, therefore, attempted to determine the perceptions and health literacy levels of undergraduate students doing courses other than health-related areas regarding personal protective measures such as wearing masks, social distancing, hand hygiene, vaccination, adequate and balanced nutrition, fear of being diagnosed with COVID-19. Additionally, unlike previous studies, the study also investigated whether there was a difference between male and female students as to the perceptions about personal protective measures as well as health literacy subdimensions.

Research Questions

In this study, answers to the following questions are sought.

- What are the perceptions of university students regarding personal protective measures against COVID 19?

- Is there a difference between female and male students' perceptions of personal protection measures and health literacy sub-dimensions?

METHODS

Participants and Sampling

Based on a descriptive, cross-sectional and online questionnaire, this study was designed according to the STROBE guidelines. G*Power statistical analysis was used to determine the sample size. When calculating the sample size, the minimum sample number to be reached for a Cohen's effect size of w = 0.5 with alpha = 0.05 and 0.95 power was determined as 222 students (Turhan, Dilcen and Dolu, 2022). A total of 360 undergraduate students aged 18 and over who were majoring in fields other than healthcare were included in the study sample. Those studying in health fields such as medicine and nursing were excluded from the study. Research data were collected between December 2020 and October 2021 through an online

questionnaire consisting of a personal information form, questions about personal protective measures, and the Health Literacy Scale. The independent variables of this study were age, gender, class, and perceptions of personal protective measures against COVID 19. Health literacy was the dependent variable of this study.

Measures

In the Student Information Form, there were questions about the age, gender, department and grade of the student, which were designed by the researchers in line with the information found in the relevant literature (Modi et al., 2020; Duong et al., 2020).

In Personal Protective Measures Form, participants were asked 6 questions about personal protective measures to be taken against COVID-19. The response options were "Agree" or "Disagree" with the statements regarding their perceptions of wearing masks, hand hygiene, social distancing, adequate and balanced nutrition, vaccination, and fear of being diagnosed with COVID-19 during the pandemic.

The Health Literacy Scale was originally developed by Toçi et al. (2013), whose psychometric suitability for the Turkish population was demonstrated in a previous study, where the Cronbach's alpha values of the scale and its subdimensions were found to range between 0.90 and 0.94 (Toçi et al., 2013; Araz & Temel Bayık, 2017). The scale consists of 25 items and four subscales. The subscales explore such domains as access to information (items 1-5), understanding information (items 6-12), appraisal/evaluation (items 13-20), application/use (items 21-25). The minimum value that can be taken from the scale is 25 and the maximum value is 125. High scores indicate high health literacy. In this study, Cronbach's alpha value of the scale was 0.97.

Data Collection Procedure

In this study, where the population size is large, all individuals that can be reached by the snowball sampling method were determined as the sample size of the research. University students were asked to fill in the data collection tools after their consent was obtained through a voluntary participation form created through an online questionnaire. Completing the online questionnaires took an average of 15 minutes.

Statistical Analysis

Descriptive analysis methods including frequency, percentage, mean, standard deviation, minimum-maximum values were used to analyze the questions about the general characteristics of the participants and the importance of personal protective measures against COVID-19. The distribution of the participants' perceptions of the importance of personal protective measures against COVID-19 by gender was analyzed by the chi-square test. The distribution of the participants' health literacy scale and subdimensions by gender was analyzed with the Mann-Whitney U test.

Ethical Considerations

Prior to initiation of any research protocols, necessary written permissions were obtained from the Clinical Research Ethics Committee of Medicine at Akdeniz University (No: 751, Date: September 23, 2020), Republic of Turkey Ministry of Health General Directorate of Public Health (No: 41306, Date: October 11, 2020), Republic of Turkey Ministry of Health General Directorate of Health Services (Form No: 2020-09-08T11_30_31, Date: September 8, 2020). A written consent was obtained from each student participating in the study, and the study was conducted in accordance with the principles of the Declaration of Helsinki.

RESULTS

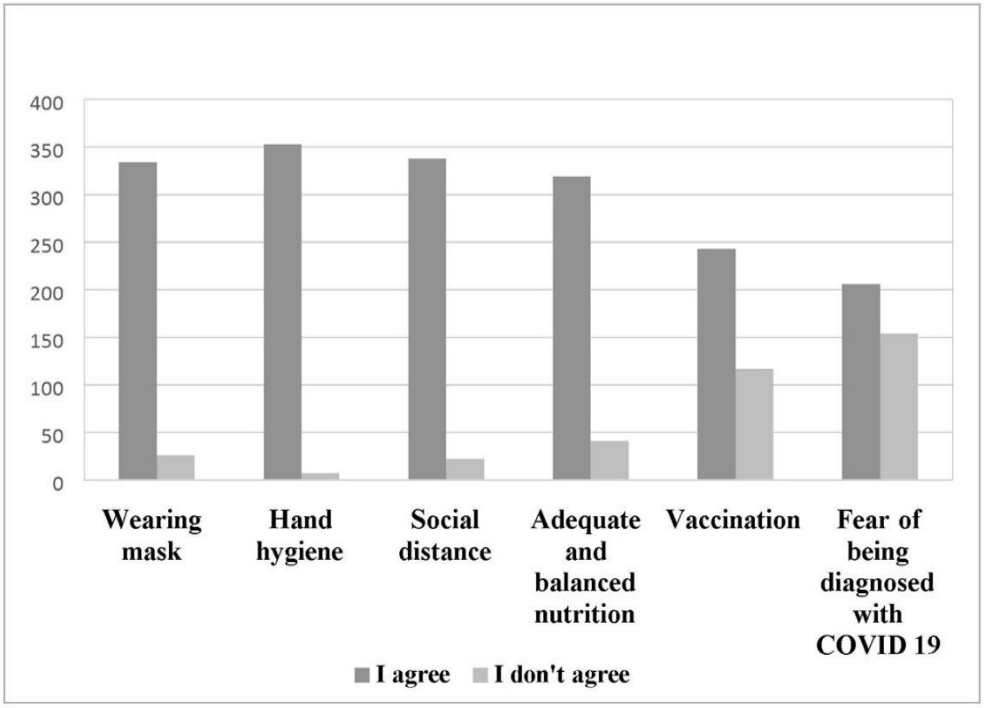
The study sample included a total of 360 students who were majoring in fields other than healthcare (such as education, science and literature, communication, sports sciences, applied units, law, architecture, communication, and engineering). The mean age of the students was 21.1±2.1. While 79.2% of the participants were female, only 20.8% were male, with 27.5% attending the 3rd grade, 24.7% 4th grade, 24.2% 1st grade, and 23.6% 2nd grade (Table 1).

Table 1. Distribution of participants (n=360)

Variable	n	%
Gender		
Female	285	79.2
Male	75	20.8
Grade		
I	87	24.2
II	85	23.6
III	99	27.5
IV	89	24.7

About 92.8% (n=334) of our participants reported that they attached importance to wearing masks during the pandemic, 98.1% (n=353) were careful about hand hygiene, 93.9% (n=338) embraced social distancing, 88.6% thought that adequate and balanced nutrition was important, 67.5% (n=243) stated that vaccination was important in protection from the virus, and 57.2% (n=206) were afraid of being diagnosed with COVID-19 (Figure 1).

Figure 1. Perceptions of personal protective measures agains COVID-19 among undergraduate students



There was a statistically significant difference between genders in terms of attaching importance to wearing a mask ($\chi 2$ =5.280, p=0.0216) caring about hand hygiene (X2=5.706, p=0.016), and fear of being diagnosed with COVID-19 ($\chi 2$ =4.312, p=0.037). Female students had a higher rate of positive perception about wearing masks and hand hygiene (p=.021, p=.016). Fear of being diagnosed with COVID-19 was higher in female students (p=.037) (Table 2). There was no difference between genders in terms of attitudes towards social distancing (X2=0.589, p=0.442), healthy nutrition ($\chi 2$= 0.354, p=0.551) and vaccination for protection from COVID-19, but female students were found to have higher rates of positive perception (X2= 3.120, p=0.077).

There was a statistically significant difference between the subdimensions of the health literacy scale in terms of understanding information (MWU= 4.313, p=0.038) and application of knowledge (MWU= 6.824, p=0.009), and general health literacy mean scores (MWU= 5.048, p=0.025) for female and male students, with female students scoring higher in general health literacy, understanding information and application. There was no difference between the mean scores for subscales access to information (MWU= 1.112, p=0.292) and appraisal (MWU= 2.947, p=0.086) according to gender (Table 3).

Table 2. Distribution of perceptions of personal protective measures against COVID-19 among undergraduate students by gender

	Gender		All		
	Female	Male			
	n (%)	n (%)	n (%)	X^2	p value
Wearing masks					
Yes	269(94.39)	65(86.67)	334(92.78)		
No	16(5.61)	10(13.33)	26(7.22)	5.280*	**.021**
Hand hygiene					
Yes	282(98.95)	71(94.67)	353(98.06)		
No	3(1.05)	4(5.33)	7(1.94)	5.706**	**.016**
Social distancing					
Yes	269(94.39)	69(92.0)	338(93.89)		
No	16(5.61)	6(8.0)	22(6.11)	0.589*	.442
Adequate & balanced nutrition					
Yes	254(89.12)	65(86.67)	319(88.61)		
No	31(10.88)	10(13.33)	41(11.39)	0.354*	.551
Vaccination					
Yes	186(65.26)	57(76.0)	243(67.50)		
No	99(34.74)	18(24.0)	117(32.50)	3.120*	.077
Fear of being diagnosed with COVID-19					
Yes	171(60.00)	35(46.67)	206(57.22)		
No	114(40.00)	40(53.33)	154(42.78)	4.312*	**.037**

*Ki kare **Fisher's exact test

Table 3. Distribution of health literacy scale and sub-dimensions by gender

	Gender							
	Female			Male				
	Mean±SD	**Q1**	**Q3**	**Mean±SD**	**Q1**	**Q3**	**MWU***	**p value**
Access to information	21.8±4.3	21.0	25.0	21.3±4.8	20.0	25.0	1.112	.292
Understanding information	29.5±6.3	27.0	34.0	28.3±6.5	27.0	33.0	4.313	**.038**
Appraisal	33.7±7.4	31.0	39.0	32.4±7.6	29.0	39.0	2.947	.086
Application	25.6±5.6	19.0	25.0	24.6±5.4	19.0	24.0	6.824	**.009**
Health literacy scale	110.7±22.6	100.0	121.0	106.7±22.5	96.0	117.0	5.048	**.025**

* Mann Whitney U test, Q1: 25%, Q3: 75%, SD: Standart Deviation

DISCUSSION

This study investigated the perceptions and health literacy on the protective measures that need to be taken against COVID-19 among undergraduate students. Accordingly, the rates of wearing masks (92.8%), social distance (93.9%) and hand hygiene (98.1%) were high during the pandemic. A study examining the knowledge, attitudes and practices against COVID-19 among undergraduate students in Japan reported that 96.4% of the students cared about wearing a mask and hand hygiene (Hatabu et al., 2020). Such high rates could be attributed to the efforts by WHO toward greater awareness of dangers associated with the pandemic, as well as to the protective strategies implemented by the health ministries of nations, widespread circulation of guidelines, and social media (Cinelli et al., 2020).

In the current study, the majority of students (88.6%) reported that adequate and balanced nutrition was important during the pandemic. A study among undergraduate students in Southern Iran reported that 83% of participants frequently/always chose to consume healthy foods, and 87.8% often/always abided by social distancing rules (Rayani et al., 2021). The results of this study appear to be in concordance with our findings. The COVID-19 outbreak motivated individuals to stay at home and avoid physical contact with other people (Muyor-Rodriguez et al., 2021).

In particular, the social isolation, loneliness, boredom, and staying away from physical and social activities brought about by the pandemic cause an increase in stress levels among people (Labrague et al., 2021). Negative mood can increase daily food intake, thus adequate and balanced nutrition is a key component in the fight against viruses, especially during pandemics (Flaudias et al.,2020).

67.5% of our participants reported that vaccination was important for protection against severe illness, while 57.2% stated that they were afraid of being diagnosed with COVID-19. A study in Spain reported that 64.3% of students were afraid of being diagnosed with COVID-19 at a moderate or high level, and vaccine hesitancy could play a role in the relatively low number of students who agreed that vaccination was important and anxious about being diagnosed with COVID-19 (Muyor- Rodriguez et al., 2021). The low vaccine approval rate in our study can be attributed to vaccine hesitancy, which is more common in developing countries than in developed countries (Solis Arce et al., 2021). Various factors are known to contribute to hesitation to take COVID-19 vaccine, which include age, gender, geographic location, ethnicity, risk perception regarding the side effects and safety of the COVID-19 vaccine, the efficacy and benefits of the vaccine, the length of the clinical trials in vaccine development, the cost and place where the vaccines were created, as well as knowledge, attitudes and beliefs about the vaccine, previous vaccination experience and respective schedule (Machingaidze & Wiysonge, 2021; Joshi et al., 2021). Furthermore, susceptibility, severity, self-risk perception and concerns and fears related to COVID-19 infection, the impact of COVID-19 on cases and deaths in the country, knowledge, attitudes and practices related to COVID-19 may be conducive to the vaccine acceptance or hesitancy (Joshi et al., 2021).

In our study, the compliance rates of mask-wearing and hand hygiene rules, along with fear of being diagnosed with COVID-19, were higher in female students. There is some research in the literature stating that female undergraduate students pay more attention to mask and hand

hygiene than do male students (Broche Perez et al., 2020; Rayani et al., 2021). For instance, a study conducted in Cuba on fear of COVID-19 reported that women were more afraid of being diagnosed with COVID-19 (Broche Perez et al., 2020). Being female has been associated with significantly greater psychological impact from the pandemic, higher anxiety, stress, insomnia, perceived stress, adjustment disorder, and depression (Wang et al., 2020). In the case of COVID-19 pandemic, the perceived threat can motivate individuals to perform behaviors that facilitate the prevention of being diagnosed with COVID-19 (Broche Perez et al., 2020; Wang et al., 2020). Recent evidence shows that fear of COVID-19 also promotes social presence in anticipation of love, acceptance, and seeking social information and encourages purchasing behavior for personal protective equipment (Addo et al., 2020). From this point of view, the greater fear of being diagnosed with COVID-19 in female students in our study might have caused them to better comply with mask-wearing and hand hygiene rules.

Additionally, female students in our study showed higher levels of health literacy, scoring higher in subscales understanding information and knowledge application. The high level of health literacy among female students may explain their higher awareness of protective measures, more sensitivity about the negative consequences of COVID-19, and higher fear of contracting this disease than those of male students. We observe contradicting findings in the relevant literature in terms of relationship between gender and health literacy, as some studies report better health literacy levels in female students whereas others report higher levels in male students (Vamos et al., 2016; Zhang et al., 2016; Rababah et al., 2019). However, there are also studies showing that there is no difference in health literacy by gender (Elsborg et al., 2017). Such contradicting findings could be attributed to the differences in education systems, sociocultural characteristics of the students, and their majors (health field/non-health field) (Vamos et al., 2016; Zhang et al., 2016; Elsborg et al., 2017; Rababah et al., 2019). Besides, there exist numerous measurement tools employed in the measurement of health literacy. Further studies utilizing the health literacy measurement tool used in our study may lay the groundwork for a more detailed discussion of such findings.

However, certain limitations restrict the generalizability of our findings to a wider population. Since it was a descriptive and cross-sectional study, it could not show a clear causal relationship between students' perceptions of personal protective measures and health literacy. Also, our study was a survey-based study, thus there may be differences between students' perceptions and practices regarding personal protective measures. More detailed evaluations can be made, especially by developing a health literacy scale related to COVID-19.

CONCLUSION

This study explored perceptions of personal protective measures against COVID-19 and the extent of health literacy among university students, which revealed that female students had much greater health literacy and better perceptions of personal protective measures than males. Two elements that stood out were the importance attached to vaccination and fear of COVID-19. As students' compliance with personal protective measures and the level of health literacy increase, it should be easier to control the COVID-19 pandemic. Designing mixed-method studies on the subject and developing a health literacy scale related to COVID-19 for

undergraduate students majoring in fields other than healthcare could help achieve much deeper insight into the subject matter.

Limitations

Using online surveys was a barrier to access university students without internet access. It limited the representation of this group.

Conflict of Interest

There is no conflict of interest.

Author Contributions

Research Idea/Concept: NO, FA
Research Design: NO, HK, FA
Supervision/Consultancy: NO, HK, FA
Data Collection and/or Processing: NO, FA
Analysis and/or Interpretation of Data: NO, HK, FA
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Article Writing: NO, HK, FA
Critical Review: NO, HK, FA
Resources and Funding: NO, HK, FA

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