Original Paper

Determining Covid-19 Vaccine Literacy Levels of Nursing Students

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ABSTRACT: This study aimed to determine nursing students' levels of COVID-19 vaccine literacy and the affecting variables. This descriptive research was carried out on 391 students receiving education at Bursa Uludağ University Nursing Department between January and March 2022. Research data were collected using a "Student Introduction Form" and the "COVID-19 Vaccine Literacy Scale". The mean total score of the nursing students included in the study on the COVID-19 Vaccine Literacy Scale was 2.80±0.44. The mean scores of the students on the subscales were 2.41±0.58 for functional skills, 2.99±0.55 for interactive/critical skills. There was a significant difference between the students' grades, place of residence, and income status and their mean total COVID-19 Vaccine Literacy Scale score and mean interactive/critical skills subscale score ($p<0.05$). On the other hand, the variables of gender, COVID-19 positivity, and COVID-19 positivity in family member(s) were not associated with COVID-19 Vaccine Literacy ($p>0.05$). In this study, it was determined that the COVID-19 vaccine literacy levels of nursing students were moderate and that some of the variables affected vaccine literacy.

KEYWORDS: *COVID-19, vaccine, vaccine literacy, nursing student.*

Introduction

The COVID-19 pandemic has had great impacts at individual, national and international levels [1]. Due to the exceedingly high infection rate and relatively high death rate, individuals inherently worry about and are afraid of COVID-19 [2].

Although the exact treatment of the COVID-19 infection, which causes people to have intense fear, is not known yet, vaccination applications that protect our body against this infection have started and been continuing in many countries [3].

With the initiation of vaccine applications for the COVID-19 pandemic, the anti-vaccination movement has started simultaneously. According to WHO and UNICEF, anti-vaccination is defined as a delay in accepting the vaccine or rejection despite the fact that the vaccine has been developed and may be related to one or more vaccines [3,4].

According to the Turkish Report research carried out in twelve provinces across Turkey in April 2021, 20% of the participants had been vaccinated, 53% had been considering getting vaccinated, and 25% had not been considering getting the COVID-19 vaccine. It was stated that the most common view among those who had not planned to be vaccinated are distrust of the current vaccines and disbelief in the effectiveness of the vaccines [5].

In a research conducted by Salmon et al [6] in the USA, 45% of participants stated that they had concerns about the content of vaccines.

The concept of vaccine literacy, on the other hand, has come to the fore with vaccine applications in recent years. In the literature, literacy is indicated as one's ability to read, write and use numbers, obtain information, express ideas and thoughts, make decisions, and solve problems [7].

Vaccine literacy, which is one of the types of literacy, is indicated as one's capacity to obtain, and understand basic health information and services in order to do suitable health decisions about vaccines [8].

Vaccine literacy is also defined not only as having knowledge about vaccines but also as developing a system with less complexity to explain and present vaccines as an indispensable part of a functional health system [9].

As of 2021, the advantages and disadvantages of vaccines are one of the most discussed issues in the world and some inconsistent information has emerged about the issue. This information on social media can cause individuals to make wrong decisions about whether to get vaccinated and have hesitations about vaccination [7].

It is important to identify perceptions, beliefs, and attitudes towards the COVID-19 vaccine, as well as the level of acceptance of the COVID-19 vaccine in order to identify strategies to support vaccination [10].

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Some studies suggested that cognitive biases should be considered in any plan and intervention to increase vaccine confidence and acceptability, especially for COVID-19 vaccines [11-13].

This brings the concept of vaccine literacy to the agenda. Correa-Rodríguez et al [10] found that the vaccine literacy of the patients was moderate and some variables of the participants were the determining factors of vaccine literacy. In a similar study conducted by Biasio et al [9] on the Italian adult general population, the vaccine literacy level was found to be above the average. A study conducted in Turkey reported that the vaccine literacy of the participants was at a moderate level [7].

It is of great importance to increase the awareness of society on preventing diseases and gain literacy information regarding vaccines or vaccination. In the literature, the number of studies conducted on COVID-19 vaccine literacy is quite limited. In particular, no study had been conducted one-on-one with nursing students. On the other hand, nurses are undoubtedly the health professionals who work at the forefront in the fight against COVID-19 and give care to complicated COVID-19 cases that require hospitalization the most [14,15].

In this respect, it is necessary to examine the vaccination literacy levels of nursing students, who are the nurse candidates of the future, and the factors affecting these levels. The findings of this study are thought to contribute to the literature and will be important in terms of providing the opportunity to make interventions when necessary. In this direction, this study aimed to determine the COVID-19 vaccine literacy levels of nursing students and the affecting variables.

Material and Methods

The population of this descriptive study consisted of students receiving education at Bursa Uludağ University Nursing Department between January and March 2022. The sample of the study consisted of 391 nursing students who were reached during the study period and voluntarily participated in the research. Simple random sampling was used in the selection of the students to be included in the sample.

Data Collection

A "Student Introduction Form" and the "COVID-19 Vaccine Literacy Scale" were used as data collection tools in the research.

Student Introduction Form

This form includes questions about the students' age, grade, gender, place of residence, income status, COVID-19 positivity, and vaccination status.

COVID-19 Vaccine Literacy Scale

The scale was developed by Ishikawa et al [16] to evaluate health literacy for chronic diseases; its validity and reliability was established by Biasio et al [9] to assess vaccine literacy in the adult Italian population. Finally, the same scale was adapted as the COVID-19 vaccine literacy scale by Biasio et al [9].

The Turkish validity and reliability study was carried out by Durmuş et al [7].

The scale consists of 12 questions and 2 subscales investigating the literacy of "Functional Skills" and "Interactive/Critical Skills". The items are ranked on a Likert-type scale from 1 to 4 (often-never) and are reverse scored for the two subscales. A score on the scale and its subscales close to 4 indicates high vaccine literacy skills. The Cronbach alpha value of the scale was 0.868 [7].

The Cronbach alpha value in this study was calculated as 0.80.

Ethical Aspect of Research

In order to carry out the research, necessary legal permissions were taken (via e-mail) from the authors who established the Turkish validity and reliability of the scales and from the ethics committee of the university where the study was conducted (Decision no: 2021-11).

The purpose of the research was explained to the students in writing and participation in the research was on a voluntary basis. Surveys were sent to the students online and the completed forms sent by the students were evaluated.

Data Analysis

The data were evaluated with the SPSS 23.0 package program. Number, percentage, and mean were calculated for the analysis of the data. Student t-test and ANOVA were used to analyze the data. Statistical significance was taken as 0.05.

Results

The mean age of the nursing students participating in the study was 20.23±1.93 years; the majority were female (82.69%; n=324) first-grade students (43.5%; n=170). Of the students, 48.8% (n=191) had been living with their

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families; 73.7% (n=288) had an income equal to their expenses; families of 38.9% (n=152) of the students had been living in the metropolitan city. 96.4% (n=377) of the students were vaccinated to be protected against the COVID-19 pandemic. Of the students, 74.9% (n=293) stated that they had not been tested COVID-19 positive so far, but 55.5% (n=217) stated that one of their family members had been tested COVID-19 positive (Table 1).

Table 1. Distribution of students' descriptive information.

Variables	Number (n)	Percentage (%)
Mean Age: 20.23±1.93 years		
Gender		
Female	324	82.9
Mal	67	17.1
Grade		
First grade	170	43.5
Second grade	93	23.8
Third grade	52	13.3
Fourth grade	76	19.4
Place of Residence		
With family	191	48.8
With friends	15	3.8
Dormitory	162	41.4
With relatives	23	5.9
Income Status		
Income<Expenses	73	18.7
Income=Expenses	288	73.7
Income>Expenses	30	7.7
COVID-19 Vaccination	377	96.4
Yes	14	3.6
No		
COVID-19 Positivity		
Yes	86	22.0
No	293	74.9
Not known	12	3.1
COVID-19 Positivity in Family Members		
Yes	217	55.5
No	168	43.0
Not known	6	1.5

The mean total score of the students on the COVID-19 Vaccine Literacy Scale was 2.80±0.44.

The mean scores of the students on the subscales were 2.41±0.58 for Functional Skills and 2.99±0.55 for Interactive/Critical Skills (Table 2).

Table 2. Students' mean scores on the Covid-19 vaccine literacy scale and its subscales.

Scale and Subscales	Mean±SD	Min.-Max. Score
Functional Skills	2.41±0.58	1-4
Interactive/ Critical Skills	2.99±0.55	1-4
Total Scale Score	**2.80±0.44**	**1-4**

Note: SD: Standard deviation.

Table 3 shows the findings regarding the mean scores of the nursing students participating in the study on the COVID-19 Vaccine Literacy Scale according to some variables.

According to the statistical analysis, there was a significant difference between the students' variables of place of residence, grade and income status and the mean total COVID-19 Vaccine Literacy Scale score and the mean Interactive/Critical skills subscale score ($p<0.05$, Table 3).

A significant difference was determined between the students' COVID-19 vaccination status and the Functional Skills subscale.

On the other hand, the variables of gender, COVID-19 positivity, and COVID-19 positivity in the family member(s) were not associated with COVID-19 Vaccine Literacy ($p>0.05$, Table 3).

Table 3. Distribution of students' mean scores on the Covid-19 vaccine literacy scale and its subscales according to some independent variables.

Variables	Functional Skills	Interactive/Critical Skills	Total Scale Score
Gender			
Female	2.40±0.56	3.02±0.54	2.81±0.43
Male	2.49±0.63	2.82±0.54	2.71±0.48
Statistical analysis	t: -1.189 p: 0.235	t: 2.635 p: 0.009	t: 1.672 p: 0.095
Grade			
First grade	2.36±0.58	2.86±0.55	2.70±0.42
Second grade	2.32±0.49	2.99±0.54	2.77±0.41
Third grade	2.60±0.58	3.12±0.58	2.94±0.49
Fourth grade	2.52±0.64	3.17±0.49	2.96±0.42
Statistical analysis	F: 3.893 p: 0.09	F: 6.920 p: 0.000	F: 8.660 p: 0.000
Place of Residence			
With family	2.44±0.60	3.04±0.54	2.84±0.44
With friends	2.41±0.63	3.12±0.60	2.88±0.53
Dormitory	2.38±0.23	2.87±0.56	2.71±0.42
With relatives	2.53±0.64	3.32±0.36	3.05±0.32
Statistical analysis	F: 0.500 p: 0.683	F: 5.199 p: 0.002	F: 4.833 p: 0.003
Income Status			
Income < Expenses	2.43±0.58	2.85±0.58	2.33±0.61
Income = Expenses	2.33±0.61	2.92±0.49	2.77±0.37
Income > Expenses	2.47±0.48	3.03±0.55	2.83±0.43
Statistical analysis	F: 0.925 p: 0.397	F: 3.246 p: 0.040	F: 3.439 p: 0.033
COVID-19 Vaccination	2.43±0.58	2.99±0.55	2.80±0.44
Yes	2.08±0.50	2.85±0.55	2.61±0.60
No			
Statistical analysis	t: 2.174 p: 0.030	t: 0.912 p: 0.362	t: 1.705 p: 0.089
COVID-19 Positivity			
Yes	2.34±0.62	3.00±0.60	2.78±0.49
No	2.44±0.56	2.97±0.54	2.80±0.43
Not known	2.37±0.59	3.16±0.56	2.90±0.42
Statistical analysis	F: 0.889 p: 0.412	F: 0.672 p: 0.511	F: 0.360 p: 0.698
COVID-19 Positivity in Family Members			
Yes	2.44±0.58	2.99±0.58	2.81±0.47
No	2.39±0.57	2.99±0.53	2.79±0.41
Not known	2.20±0.55	2.64±0.46	2.50±0.32
Statistical analysis	F: 0.685 p: 0.505	F: 1.162 p: 0.314	F: 1.432 p: 0.240

t: Independent Samples t Test; F: One Way ANOVA.

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Discussion

In this study, which was conducted to determine the COVID-19 vaccine literacy levels of nursing students and the affecting variables, the mean total point of the students on the COVID-19 Vaccine Literacy Scale was found to be 2.80±0.44.

Based on these results, it can be said that the COVID-19 vaccine literacy levels of nursing students were moderate.

In studies in the literature, it was reported that the COVID-19 vaccine literacy of the participants was mostly at moderate levels [7,10].

Unlike these results, in a similar study conducted by Biasio et al [9] on the general Italian adult population, the vaccine literacy levels of participants were reported to be slightly above the average (2.92±0.70).

This difference between the studies was thought to be due to the differences between the samples included in the studies and the countries where the studies were conducted.

In the literature, "functional vaccine literacy" is based on basic reading and writing skills to be able to carry out daily activities and individuals who are literate at this level are able to read materials about health education and vaccines [17].

As a result of this study, the mean Functional Skills subscale score of the students who were vaccinated against COVID-19 was determined to be significantly higher than that of the students who were not vaccinated. This was an expected result.

After all, individuals who want to be vaccinated are likely to read information about the vaccine and want to be informed about the issue.

Durmuş et al [7] determined that the vaccination literacy levels of the participants who had knowledge about the COVID-19 vaccine were found to be higher. On the other hand, Biasio et al [9] reported a positive correlation between the vaccination literacy levels of individuals and their positive attitudes towards vaccination.

These results seem to indirectly support our study finding.

In the study, it was found that the mean total COVID-19 Vaccine Literacy Scale score and the mean Interactive/Critical Skills subscale score of the students who had been studying in the fourth grade, had been living with relatives, and had a high income were significantly higher compared to the other students. Interactive/Critical vaccine literacy focuses more on cognitive efforts such as decision-making and problem-solving.

When evaluated separately, "interactive health literacy" is explained as having social and cognitive skills, benefiting from different health activities, obtaining information and inferring meaning, and using the information they have in changing health conditions whereas "critical health literacy" is defined as one's ability to analyze information critically together with social skills and as more advanced cognitive skills that allow one to learn and use this knowledge to gain more control over life events [17,18].

Biasio et al [9] considered these two dimensions as a single dimension in their study. Likewise, in this study, these two concepts were evaluated as a single dimension.

The reason why the COVID-19 vaccine literacy levels of the students receiving education in the fourth grade were higher than the lower grades can be explained by the fact that the students had more clinical experience and, in this sense, their cognitive skills for the COVID-19 pandemic were better.

As a matter of fact, in a study conducted by Alshdefat et al [19] to examine the knowledge, attitudes, and practices of nursing students in Oman about the COVID-19 pandemic, it was found that final-grade students had higher knowledge, attitudes, and applications about the COVID-19 pandemic compared to lower grades. Similar results were found in a study conducted with nursing students receiving education at a university in Egypt [20].

On the other hand, the COVID-19 vaccine literacy levels of the students living with their relatives were higher compared to the other students.

The fact that the relatives' possibility of being exposed to the virus during the pandemic process was thought to be related to the students' desire to have more information about the vaccine and their critical use of this information.

It was also thought that this situation might be related to the fear of pandemics as well as their relatives' possibility of exposure to the virus. Likewise, in a study conducted by Yilmaz and Uzelli Yilmaz [21] with nursing students, it was reported that the fear of pandemics of the students living with their relatives was higher compared to the students living with their friends.

Correa-Rodríguez et al [10] examined COVID-19 vaccine literacy among patients with systemic autoimmune diseases and found that interactive/critical vaccine literacy level was high

in patients with high socioeconomic status. Golboni et al [22] carried out community-based research in Iran and stated that the high monthly income increases the probability of health literacy. Similar results were obtained in some studies [23-25].

In our study, it was seen that the COVID-19 vaccine literacy level of the students with higher income was higher than that of other students. This result of the study is consistent with the above-mentioned study results.

Some studies in the literature reported that the gender variable affects COVID-19 vaccine literacy [9,10,26,27].

In this study, it was seen that although the COVID-19 vaccine literacy of female students was higher than that of male students, the difference was not significant. This difference in studies was thought to be due to the sociodemographic variables of the study samples. Moreover, it was assumed that the fact that the majority of the students participating in our study were female also affected this result. On the other hand, in a study conducted by Durmuş et al [7] with individuals from different generations in Turkey, it was stated that the COVID-19 vaccine literacy levels were not affected by the gender of the participants. The result of this study is in line with our study findings.

As a result of this study, it was found that the COVID-19 positivity in students or their family member(s) was not associated with COVID-19 vaccine literacy.

Durmuş et al [7] stated that there was no statistically significant difference in COVID-19 vaccine literacy, functional skills, and interactive/critical skills, according to the participants' COVID-19 positivity.

Our study result is consistent with this study result.

On the other hand, as a result of the study, it was expected that the exposure of nursing students or their family members to COVID-19 would significantly increase their vaccination literacy levels regarding the disease.

However, it was striking that the vaccination literacy levels of the students who had been or had not been exposed to the disease were very close to each other.

Such study result suggested that students' vaccine literacy had continued before they were exposed to the disease during the COVID-19 pandemic process.

Conclusions

In conclusion, it was determined that the COVID-19 vaccine literacy levels of nursing students were moderate.

Moreover, it was observed that the vaccine literacy levels of the students who were vaccinated against COVID-19, who had been receiving education in the fourth grade, who had been living with relatives, and who had higher income were higher.

On the other hand, it was determined that the variables of gender and COVID-19 positivity in family member(s) were not associated with COVID-19 vaccine literacy.

In line with these results, ensuring that students are properly informed about COVID-19 vaccines to improve their COVID-19 vaccine literacy skills and planning education programs on the subject can reduce incorrect information about COVID-19 vaccines.

Furthermore, it is recommended to conduct similar studies with a larger sample by considering different variables that were not evaluated in this study.

Limitations of the Research

The limitations of the study are that it was carried out in a single center and that the answers to the survey questions were based on students' expressions.

Conflict of interests

None to declare.

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