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RESEARCH ARTICLE

The Knowledge and Behavior of Preservice Schoolteachers Regarding Respiratory Infections and Coronavirus Disease 2019 Measures, Vaccination Confidence, and Impacting Factors

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Abstract

The aim of this study to determine the knowledge and behavior of preservice schoolteachers regarding respiratory infections and COVID-19 measures, as well as their vaccination confidence and impacting factors. For this purpose, a descriptive study was conducted with 306 college students in their senior year at 11 universities. The Kruskal–Wallis χ^2 , Mann–Whitney U test, and regression were employed. Among the participants, 41.5% correctly identified the areas that were missed in handwashing, while 12.7% stated that vaccinations were the most effective way of protecting the community from infections. The participants' mean score was 56.03 ± 12.78 on the Vaccination Confidence Scale. The vaccination confidence of the preservice teachers who would be advising students' parents to have their child vaccinated was 8.15 units greater ($\beta = 8.150$; $p < .001$). The vaccination confidence score of those who did not want to get the coronavirus vaccine was 7.943 units greater ($\beta = 7.943$). In conclusion, the knowledge of the participants about preventing infectious respiratory diseases is unsatisfactory. Vaccination confidence is low.

Keywords: Behavior, Coronavirus disease 2019, factors vaccination confidence, knowledge, preservice teacher, prevention, respiratory infections

Introduction

Among the range of infectious diseases, those transmitted through the respiratory tract are widely prevalent among schoolchildren and are a primary cause of school absences (Aronson & Shope, 2016; Tabak, 2019). Infectious respiratory diseases (IRD) are spread by droplets generated when an infected person sneezes, coughs, or speaks. The transmission of droplets generally occurs when an individual is in contact with an infected person and is at a distance of less than approximately 3 m. Contagious diseases that are spread through the respiratory tract are common colds, influenza, meningitis, mumps, rubella, and whooping cough. Some diseases are transmitted by means of small aerosol droplets that remain suspended in the air measles, smallpox, and tuberculosis. Coronavirus disease 2019 (COVID-19) is a respiratory disease that led to a pandemic in 2020 (Aronson & Shope, 2016; Musher, 2003). The World Health Organization (WHO) recommends the use of masks, social distancing and practicing hygiene to prevent, control and contain the spread of COVID-19 (Cheng et al., 2020; Ciotti et al., 2020)

Schools play a part in a child's development by providing a source of practice and experience, as well as awareness (Johnson & Deshpande, 2000). At the same time, while schools are positive learning environments where hygienic habits are taught, they are also the ideal setting for the spread of diseases because of the close contact children of different ages have with each other (Mikolajczyk et al., 2008). The appropriate containment measures taken in schools will keep the transmission of

contagious respiratory infections to a minimum, both inside the school environment and in the outside community (Aronson & Shope, 2016). This is a situation that requires classroom teachers especially, as well as school nurses and school health specialists to have a basic knowledge of general infections so that contagious diseases are prevented from spreading and kept under control (Lineberry & Ickes, 2015; Wong et al., 2010). Recognizing the signs and symptoms of diseases and knowing how infections can spread may facilitate prevention and control efforts (Murray et al., 2019).

Classroom teachers act as exemplary models for the community and student outcomes (Cheng & Wong, 2015; Tondeur et al., 2019). They are key persons who play important roles in protecting and improving the health of the community, and in this context, it is of great importance that their views and behaviors regarding this aspect of their work are understood (Cheng & Wong, 2015; Onurkan Aliusta & Özer, 2017). Recognizing the fact that the efforts of these individuals shape new generations and the community at large, it is highly valuable to determine the extent of teachers' knowledge about IRD measures, to understand their behavior in this context, and to define the range of their vaccination confidence and the factors affecting this confidence. Based on the results of this study, it is believed that this research will contribute to the field literature by bringing to light what must be done to plan for adjustments to be made in the curriculum of teachers' education and public health specialists' education, as well as in terms of creating initiatives pertaining to school nurses and public health specialists.

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Aim of the Research

To determine the knowledge and behaviors of preservice schoolteachers regarding infectious respiratory diseases and COVID-19 measures, their vaccination confidence, and impacting factors.

The subproblems of the present study to be answered are as follows:

Research Questions:

1. What is the extent of their knowledge about the prevention and control of infectious respiratory diseases?
2. What is the degree of their vaccination confidence?
3. What are the factors that affect their vaccination confidence?

Classroom teachers play a crucial role in protecting and improving the health of the community. These research questions aim to clarify the issue. Respiratory tract infections, one of the most common childhood infections, are frequently encountered by teachers. For this reason, it is very important to learn and reveal their knowledge about control and prevention. The more precise information teachers possess about RTIs, the better equipped they will be to address this issue. The findings obtained within the scope of this research question will shed light on future interventional research and programs to be developed by teachers/health professionals. In addition, knowledge of vaccine safety and ethical factors will make it easier to find answers to the questions of parents who experience vaccine refusal or vaccine hesitation, which has recently become an increasingly common and current problem.

Methods

Quantitative research method was used in the study. Quantitative research is a research method that tries to understand and explain an event or situation, which is dominated by a view that sees the facts independent of the researcher and accepts that the reality outside itself can be objectively measured and analyzed. This study is a descriptive approach (Büyüköztürk et al., 2020).

Universe and Sample

The universe of the study consisted of all the departments of teacher education in Türkiye ($N=70$). Cluster sampling method was used in this study. Cluster sampling is a statistical sampling method that involves taking samples from larger and diverse subgroups of a population. This method divides the population into smaller, more manageable, and more representative subgroups and then randomly selects samples from these subgroups. Cluster sampling is particularly useful in large and diverse populations because sampling the entire population directly can be costly and time-consuming. This method reduces the practical difficulties of sampling while ensuring representation of the population and generalizability of statistical results (Büyüköztürk et al., 2020). Turkey is divided into seven geographical regions. In this study, each geographical region is considered as a cluster. Stratification was performed to create a sample of two universities from each region. The goal was to reach all college students studying in their senior year at each university ($N=550$). However, only a total of 306 students from the 11 universities from which official permission was obtained could be reached.

Place and Time of the Study

The study was conducted over the period March 2020–March 2021. The regions and provinces where the research is planned to be conducted are as follows: Ordu and Trabzon provinces in the Black Sea region, Antalya and Burdur provinces in the Mediterranean region, Muğla and Uşak provinces in the Aegean region, two universities in İstanbul in the Marmara region, Eskişehir and Konya provinces in the Central Anatolia region, Erzurum and Bayburt provinces in Eastern

Anatolia, and Gaziantep and Şanlıurfa provinces in the Southeastern region. Students studying in faculties of education in these regions are the places where this study was carried out. However, due to the pandemic and the low interest in the online data collection technique, only students from 11 universities could be reached.

Data Collection Method

Following research permission from the Marmara University Noninterventional Clinical Trials Ethics Committee, the authors collected the study data online. Questionnaires were sent to the schools via students' Whatsapp groups. They reached the senior class representatives and asked them to share the data collection forms with their classmates. The data collection instruments were drawn up using Google Forms and sent to all students who matched the study inclusion criteria. Participants were informed about the research and confidentiality principles, and voluntary consent forms of participants were obtained before the collection of research data.

Data Collection Instruments

Individual Descriptive Questionnaire

This form consisted of nine questions on the preservice teachers' sociodemographic characteristics and 11 questions on aspects of their lives during the COVID-19 pandemic.

Knowledge Questionnaire on Preventing Infectious Respiratory Diseases

This form was designed to determine the preservice teachers' level of knowledge about infectious respiratory diseases and their prevention and consisted of five multiple-choice questions.

Vaccination Confidence Scale

This scale was developed by Gilkey (Gilkey et al., 2014) and adapted to Turkish by Özdemir and Kadioğlu. Comprising a total of eight items, the scale's items are scored on the basis of 0 (I definitely disagree) to 10 (I definitely agree). The scale comprises three factors: benefits of the vaccine, risks of the vaccine, and confidence in health-care providers. Cronbach's α coefficient for the overall scale is 0.70 (Özdemir & Kadioğlu, 2020).

Ethical Considerations

Permission was obtained for the conduct of the study from the Uşak University Noninterventional Clinical Trials Ethics Committee (Approval no: 27.02.2020/30, Date: 27.02.2020). The participants were informed about the study, and an informed voluntary consent form was sent to each individual.

Data Analysis

Means, percentages, frequencies, the Kruskal–Wallis χ^2 , Mann–Whitney U -tests, and multiple linear regression analysis were used in the data analysis. Descriptive statistics, including number and percentage, were used to describe teachers' sociodemographic characteristics. Data analysis were conducted based on significance levels of histogram graphics and Kolmogorov–Smirnov test results. Kolmogorov–Smirnov test results for the scale ($p=.00$) also showed non-normal distribution. Therefore, the Kruskal–Wallis χ^2 and Mann–Whitney U -tests were used for the analysis of the research data (Büyüköztürk et al., 2020). Finally, regression analysis was used to determine the impact of the Predictive Value of the Vaccination Confidence Scale in terms of selected independent variables. The independent variables were recoded using the dummy variable method, and a multiple linear regression analysis was performed for the Vaccination Confidence Scale. The research data were analyzed using the Statistical Package for Social Sciences version 27.0 software (IBM Corp.; Armonk, NY, USA). A significance level of $p < .05$ was accepted for all results.

Results

Some of the descriptive characteristics of the participants were as follows: mean age, 22.38 ± 2.93 ; 78.1% were women, 73.5% lived in a large family, 6.5% had a chronic disease, and 87.6% had completed their childhood inoculations.

Of the preservice teachers, 60.6% correctly responded that the most effective measures to take for protection against contagious and infectious respiratory diseases were to “frequently air out the environment”; 84% cited this precaution as the simplest way of protecting against contagious diseases in closed environments. Another 47.4% correctly stated that respiratory infections were the most common group of diseases to be seen in the school environment. Only 41.5% correctly identified the most commonly missed areas in handwashing. Only 12.7% said that the most effective method of protecting the population from infection was vaccination (Table 1).

Of the participants, 28.1% said they had close relatives who had contracted coronavirus, and 29.7% said they had been treated for coronavirus. Another 51.8% were not sure about the accuracy of the information they had received on this subject.

In the context of behaviors related to COVID-19 prevention and protection: 16% did not want to receive the coronavirus vaccine when their turn came; 26.1% said that the frequency of their handwashing before COVID-19 did not match the standards defined after the pandemic; another 41.5% said that the duration of their handwashing was not sufficient before COVID-19; 64.1% stated that they did not engage in shaking hands or hugging since COVID-19 started; 19.6% said they

had not gotten accustomed to wearing a mask, and 43.8% said that they followed the social distancing rule but others did not (Table 2).

In this study, the preservice teachers' score on the VCS was 56.03 ± 12.78 , which was below the possible median score of 61. The participants received a score of 29.71 ± 8.09 from the “Benefits of the vaccine” subscale. The median for this subscale was 32. In other words, the participating preservice teachers' “Benefits of the vaccine” score was below the median. In the perception of risk subscale, the higher the score, the lower the perception of risk, and the maximum possible score was 20. The participants registered a median of 15.0 in this subscale. Their mean score on this subscale, which indicated their hesitation about the risks the vaccine presented, was 11.86 ± 4.42 . The scores of the participating preservice teachers on the risks subscale were lower than their median score. The participants scored a mean of 14.47 ± 4.14 in the “Confidence in health workers” subscale. This score was lower than the possible median that could be received from the scale (\bar{x} :16.0) (Table 3).

In the analyses of the vaccination confidence scale in terms of all of the demographic variables, there was only a significant difference between the total score for “benefits of the vaccine” and the gender variable ($p = .04$). Women had more confidence in the benefits of vaccines compared to men. Among the participants, 37.3% had not heard of the concept of being vaccine-hesitant; 15% did not know that some diseases were not prevalent thanks to vaccines, and 38.9% did not have confidence in doctors or health workers on the subject of vaccines.

Upon analyzing the overall and subscale scores of preservice teachers regarding their knowledge and behaviors using the Vaccination

Table 1.
Knowledge about Preventing and Controlling Contagious and Infectious Diseases

Knowledge Questions and Percentages of Correct Answers	<i>n</i>	%
Answering the question, “What is an effective measure to take to protect against infectious respiratory diseases?” correctly		
Mask	84	27.8
Handwashing	12	4.0
Isolation methods	13	4.3
Eye and face shields	10	3.3
All of the above	183	60.6
Answering the question, “Which area of the hand is most commonly missed if the right handwashing technique is not used or if the hands are not sufficiently washed?” correctly		
Fingertips + Thumbs + Between the fingers	127	41.5
Fingertips + Inside of the palm + Wrists	22	7.2
Top of the hand + Between the fingers + Outer sides of the hands	93	30.4
Fingertips + Thumbs + Outer sides of the hands	42	13.7
Top of the hand + Thumbs + Wrists	22	7.2
Correctly answering the question, “What is, in your opinion the most effective way of protecting the school population from infections like the flu, tuberculosis, or Coronavirus?”		
Giving children education on hygiene	96	31.4
Isolating sick individuals	161	52.6
Vaccinating healthy people	39	12.7
Inoculating those who have been in contact with sick people with standard gamma-globulin	8	2.6
Being breastfed as a child	2	0.7
Correctly answering the question, “Which of the statements below can be said about infectious respiratory diseases?”		
They are more commonly seen in adults	18	5.9
They are the most commonly seen group of illnesses in the school setting.	145	47.4
Transmission is usually through saliva, blood and contact.	76	24.8
They can be seen as frequently every season.	67	21.9
Correctly answering the question, “Which of the following is the simplest measure to take to prevent the spread of infectious respiratory diseases in closed environments?”		
Frequently airing out the environment	257	84.0
Checking up on eating habits	26	8.5
Keeping mosquitoes in check	8	2.6
Increasing body resistance without vaccinating	15	4.9

Table 2.
Behaviors of the Preservice Teachers Regarding COVID-19 Prevention and Control

Behaviors Related to COVID-19 Prevention and Control	<i>n</i>	%
Will you get vaccinated once your turn comes up to receive the Coronavirus vaccine?		
Yes	257	84.0
No	49	16.0
Did the frequency of your handwashing before COVID-19 match the standards defined during the pandemic?		
No, it did not	80	26.1
Yes, it did	226	73.9
Was the duration of your handwashing sufficient before COVID-19?		
Yes	179	58.5
No	127	41.5
For how long do you wash your hands now?		
Less than 20 seconds	44	14.4
More than 20 seconds	208	68.0
I've never paid attention to this	54	17.6
Have you been shaking hands or hugging since the start of COVID-19?		
Yes	34	11.1
No	196	64.1
I've developed new ways of greeting people	76	24.8
Have you gotten used to wearing a mask?		
Yes	246	80.4
No	60	19.6
Do you follow the social distancing rule?		
Yes	146	47.7
No	26	8.5
I do but others don't	134	43.8

Confidence Scale, distinct correlations emerged. Participants expressing discomfort at the thought of a student in their class not receiving the vaccine displayed the highest scores on the vaccination confidence scale (58.42 ± 11.54). Conversely, respondents acknowledging the influence of religious factors on their vaccination-related behavior (\bar{x} : 47.92 ± 13.19), and those supporting vaccine-hesitant parents (\bar{x} : 37.77 ± 13.65) exhibited comparatively lower scores. Participants not inclined to advise students' (\bar{x} : 40.10 ± 11.59), perceiving serious side effects from vaccines (\bar{x} : 49.15 ± 12.92), rejecting vaccination as a child's right (\bar{x} : 53.76 ± 12.71), favoring integrative medicine over vaccines (47.35 ± 11.88), and expressing reluctance to receive the coronavirus vaccine (44.43 ± 11.47) displayed lower scores on the vaccination confidence scale. Notably, statistically significant differences were observed across all these independent variables concerning the subscales of the Vaccination Confidence Scale, vaccine benefits ($p=.00$), vaccine risks ($p=.00$), and the cumulative score ($p=.00$) (Table 4).

The results of the regression analysis showed that the F value representing the level of significance indicated that the established model was statistically significant ($F=19.880$, $p<.001$). The beta coefficient

for the independent variables, the t value, and the level of significance showed that the independent variables had a statistically significant effect on vaccination confidence ($t=7.28$, $p<.00$). The model used 10 independent variables, which explained 41% of the model (Adjusted $R^2=0.409$). The vaccination confidence of the preservice educators who would be advising students' parents to have their child vaccinated was 8.15 points greater ($\beta=8.150$; $t=3.460$; $p<.001$). The vaccination confidence score of those who did not want to have the coronavirus vaccine was 7.943 units greater ($\beta=7.943$). Reviewed in order, it was seen that the variables of knowing that some diseases were not prevalent thanks to vaccines, not believing that integrative medicine was more effective than being vaccinated, not trusting doctors or health workers, being uncomfortable when a student did not get vaccinated, not believing that vaccines had serious side effects were significant predictors of attitudes towards vaccination confidence (Table 5).

Discussion

There were five questions asked in the study about the level of knowledge preservice classroom teachers had about contagious infectious respiratory diseases. The fact that most of the participants (84%) answered that the simplest way of preventing IRD was "to air out the environment frequently," and that 60.6% could state the measures for protecting against IRD can be regarded as a positive outcome. On the other hand, the fact that only 12.7% knew that the most effective way of protecting the community against infections was vaccination, only 41.5% knew the areas missed when handwashing, and 47.4% knew that IRD comprised the most common disease group seen in school communities is thought-provoking. In other words, the number of participants correctly responding to the last three questions was less than half of all of the participants. Under these circumstances, it is believed that the knowledge of the preservice schoolteachers about preventing and controlling infectious respiratory diseases was unsatisfactory. It was found in other studies conducted with a similar sample group that preservice teachers' knowledge about common contagious diseases was not very much higher than average (Eraslan, 2011; Buse Eraslan & Matyar, 2010). It was reported in a study with teachers that 62.5% knew that vaccination was an effective way of preventing influenza and that the level of knowledge of teachers about influenza was high (Ganczak et al., 2020). It can be seen that compared to the findings of Ganczak et al.'s (2020) and Eraslan & Matyar's (2010), the knowledge level of this study's participants about infectious respiratory diseases was lower. Another study revealed that after schools reopened after the pandemic, almost all teachers believed that they should abide by the rules of hygiene. The teachers stated that they could protect themselves and work by changing their masks frequently, disinfecting their hands, and practicing the rules of hygiene with regard to their personal belongings (Baysal & Gürbüz, 2020). The results of studies show that although teachers and preservice teachers show raised awareness about the prevention and control of infectious diseases, their level of knowledge in this context is still insufficient. Additionally, research has demonstrated that the health literacy of teachers and preservice teachers about disease awareness and control is low (Cheng & Wong, 2015; Deniz et al., 2020; Lamanauskas & Armoniene, 2012). In a study conducted for the purpose of determining the level of health literacy of elementary school teachers in Turkey, it was reported that only 26.2% of teachers have adequate health literacy (HL) (Yılmazel & Çetinkaya, 2016). According to Archila et al. (2021), a lack of literature exists about COVID-19 literacy among university students. In a Lithuanian study, the authors reported that teachers had insufficient concrete knowledge about how to adopt healthy lifestyle habits, how to live a healthy life, and about disease control (Lamanauskas & Armoniene, 2012). On the other hand, a study by Hill and Hollis (2012) indicated that teachers allotted an hour every day to their elementary school students' health

Table 3.
Attitudes of Preservice Schoolteachers about the Vaccination Confidence Scale (N=306)

Variables	Mean	SD	Min	Max	Median of the Original Scale
Vaccination confidence scale	56.03	12.78	21.00	80.00	61.0
Benefits of the vaccine	29.71	8.09	0.00	40.00	32.0
Risks of the vaccine	11.86	4.42	0.00	20.00	15.0
Confidence in health workers	14.47	4.14	2.00	20.00	16.0

Table 4.

Distribution of Scores of Preservice Teachers on the Vaccination Confidence Scale Related to Knowledge and Behaviors

		VCS	Benefits	Risks	Confidence in Health Workers
Knowledge and Behaviors Related to Vaccines		Mean \pm SD	Mean \pm SD	Mean \pm SD	Mean \pm SD
Do religious people/groups affect your decision to display a certain behavior toward vaccination?	Yes (16.0%)	47.92 \pm 13.19	25.06 \pm 9.41	10.24 \pm 4.48	12.61 \pm 4.86
	No (84.0%)	57.58 \pm 12.13	30.59 \pm 7.51	12.17 \pm 4.35	14.82 \pm 3.90
	Statistics Z; p	-4.975; .00	-4.08; .00	-2.97; .00	-3.04; .00
Would you be uncomfortable if a student in your class did not get a vaccine?	Yes (77.8%)	58.42 \pm 11.54	31.38 \pm 7.02	12.04 \pm 4.48	15.00 \pm 3.93
	No (22.2%)	47.68 \pm 13.46	23.85 \pm 8.89	11.22 \pm 4.16	12.60 \pm 4.37
	Statistics Z; p	-5.68; .00	-6.408; .00	-1.40; .00	-4.16; .00
How would you act if an vaccine-hesitant parent consulted you?	I would absolutely advise that the child be vaccinated (69.0%)	58.97 \pm 11.44	31.50 \pm 6.92	12.34 \pm 4.51	15.13 \pm 3.87
	I wouldn't voice an opinion because it's none of my business (26.8%)	51.37 \pm 12.25	27.07 \pm 7.99	10.68 \pm 3.88	13.61 \pm 3.92
	I would support the parent's decision not to vaccinate-this is their right (4.2%)	37.77 \pm 13.65	17.23 \pm 11.09	11.46 \pm 4.99	9.08 \pm 5.09
	Statistics Kw χ^2 ; p	39.76; .00	35.73; .00	8.99; .01	22.50; .00
Knowledge that some diseases are not prevalent thanks to vaccines	Yes (85.0%)	57.92 \pm 11.89	30.85 \pm 7.54	12.19 \pm 4.43	14.87 \pm 3.97
	No (15.0%)	45.39 \pm 12.53	23.24 \pm 8.11	9.98 \pm 3.93	12.17 \pm 4.40
	Statistics Z; p	-5.96; .00	-5.82; .00	-3.42; .00	-3.87; .00
When you graduate, will you advise your students' parents to have their child vaccinated?	Yes (90.5%)	57.70 \pm 11.73	30.72 \pm 7.25	12.10 \pm 4.38	14.88 \pm 3.94
	No (9.5%)	40.10 \pm 11.59	20.03 \pm 9.40	9.55 \pm 4.17	10.52 \pm 4.07
	Statistics Z; p	-6.51; .00	-5.83; .00	-3.31; .00	-5.19; .00
Do you believe that vaccines has serious side effects?	Yes (25.8%)	49.15 \pm 12.92	26.51 \pm 9.72	9.84 \pm 4.11	12.81 \pm 4.03
	No (74.2%)	58.43 \pm 11.86	30.82 \pm 7.13	12.56 \pm 4.32	15.04 \pm 4.03
	Statistics Z; p	-5.02; .00	-3.30; .00	-4.48; .00	-4.31; .00
Is it a child's right to be vaccinated?	Yes, it is a child's right (57.5%)	59.11 \pm 12.27	31.70 \pm 7.60	11.27 \pm 4.31	14.26 \pm 4.13
	No (42.5.0%)	53.76 \pm 12.71	28.23 \pm 8.15	12.65 \pm 4.46	14.75 \pm 4.16
	Statistics Z; p	-4.10; .00	-4.19; .00	-2.81; .00	-1.25; .20
Integrative or alternative medicine is more effective and produces less side effects than vaccines	Yes (17.1%)	47.35 \pm 11.88	24.71 \pm 8.42	9.94 \pm 4.07	12.71 \pm 4.56
	No (82.9%)	58.15 \pm 11.94	30.94 \pm 7.54	12.35 \pm 4.33	14.87 \pm 3.98
	Statistics Z; p	-5.56; .00	-5.05; .00	-3.39; .00	-3.26; .00
Do you want to get your coronavirus vaccine when your turn comes up?	Yes (84.0%)	58.25 \pm 11.80	31.05 \pm 7.54	12.19 \pm 4.43	15.00 \pm 3.92
	No (16.0%)	44.43 \pm 11.47	22.65 \pm 7.25	10.12 \pm 3.97	11.65 \pm 4.18
	Statistics Z; p	-6.86; .00	-6.73; .00	-3.20; .00	-4.87; .00

χ^2 , Kruskal-Wallis; Z, Mann-Whitney U; VCS, Vaccination Confidence Scale; Benefit, Benefits of the vaccine; Risks, adverse effects of the vaccine; Confidence, confidence in Health Workers

Table 5.

Multiple Regression Analysis of the Predictive Value of the Vaccination Confidence Scale in Terms of Selected Independent Variables

	R	R ²	F	p	
	0.640	0.409	19.880	.000	Durbin Watson
Model	B	Standard Error	β	t	p
Fixed	20.784	2.852		7.287	.000
Gender	2.111	1.370	0.071	1.541	.124
Being uncomfortable if a student does not get vaccinated	4.033	1.507	0.132	2.675	.008
Knowledge that some diseases are not prevalent thanks to vaccines	5.949	1.806	0.161	3.295	.001
Advising a parent to have their child vaccinated	8.150	2.355	0.175	3.460	.001
Wanting to get the Covid-19 vaccine	7.943	1.682	0.229	4.723	.000
Not trusting doctors and health workers	3.450	1.207	0.136	2.858	.005
Not believing that vaccines has serious side effects	3.571	1.381	0.123	2.586	.010
Not believing that children have a right to be vaccinated	1.682	1.206	0.067	1.394	.164
Not trusting integrative medicine	4.972	1.600	0.151	3.107	.002

*p < .05

**p < .001

problems. The low levels of health literacy (Archila et al., 2021) and scientific literacy (Reiss, 2020) reported in studies included in the Turkish and international literature can be associated with the low level of knowledge about infectious respiratory diseases. At the same time, with regard to the COVID-19 vaccine, it was found that 16% of study participants were not willing to take the vaccine. The reasons behind this hesitation may also stem from insufficient knowledge. In

another study, it was seen that 55% of the teachers responded correctly to the following item stating that the coronavirus "is a disease like the common cold that is transmitted by coughing and sneezing" (İmamoğlu & İmamoğlu, 2020). It is observed in this review of the behaviors related to COVID-19 protection and prevention that 26.1% of the participants said that handwashing frequency before the pandemic did not conform to the standards advised during the pandemic

and 41.5% said that handwashing durations also were not sufficient before the pandemic. In another study, it was found in an evaluation of preservice classroom teachers' health behaviors that these individuals did not show an adequate degree of interest in hand and skin hygiene, foot hygiene, mouth and teeth hygiene, and actually neglected these matters (Eraslan, 2011). When preservice classroom teachers have insufficient knowledge about protecting against and preventing respiratory infections, this may lead to an increase in transmission of the infection. Schools constitute one of the most opportune environments for the spread of contagious diseases. The risk increases the more teachers are in constant contact with their pupils. Most students learn how to wash their hands from their parents or at school. A study that supports this premise indicated that students are indeed more likely to learn how to wash their hands from their teachers (Bilgin et al., 2016). It is for this reason that it is important to raise the level of knowledge teachers have about the prevention and control of contagious and infectious diseases. This and their adoption of the right handwashing habits are of vital importance in keeping infectious diseases under control.

Vaccination is one of the most effective methods of preventing and controlling contagious and infectious diseases (Chang, 2014). Among the participants, 16% did not wish to be vaccinated when their turn came. A recent global report on COVID-19 vaccine acceptance illustrated that nearly 30% of the investigated participants would refuse or hesitate to take a COVID-19 vaccine when it is available (Sallam, 2021). Similarly, it was reported in a study in Italy when employees were asked to state their intention about whether or not they would take a potential COVID-19 vaccine, 51.6% of the teachers said "yes" or "probably yes" (La Vecchia et al., 2020). Tam et al. (2020) reported 15.1% as hesitant, 60.6% as acceptance group, and 24.3% as refusal group among college students in South Carolina. In this study, 84% of the preservice classroom teachers were thinking about taking the vaccine. In contrast, results were stated by Barelo et al. (2020) as they found the Italian university students' intention to get the COVID-19 vaccine as 86.1%, and on the other side, 13.9% of them reported no intention (Barelo et al., 2020). When compared with the international literature, it is seen that this study's participants looked more positively on vaccination. A look at the Vaccination Confidence scores of the preservice teachers, however (mean: 56.03), showed that the mean was below the possible median score on the scale. Confidence denotes trust in vaccination safety, effectiveness, and competence of health-care systems (Saied et al., 2021). The fact that the preservice teachers had a low level of belief in the benefits of the vaccine and a high degree of belief in its adverse effects is a worrisome finding. Also, confidence in the vaccine was lower among those preservice teachers in this study who believed that vaccines produce serious side effects. In a study conducted with teachers in Poland, the authors reported that one-fourth of the participants had received the influenza vaccine. The main reasons some were averse to taking this vaccine were a lack of confidence in its effectiveness (56.9%) and anxiety over side effects (30.6%). It was found in another European study that individuals had many worries about safety and this in general confirmed the idea that people thought that the risks of vaccination outweighed its benefits (Karafillakis & Larson, 2017). Erduran (2021) stated that low belief in vaccines will negatively affect public health and lead to public health disaster. Still another study revealed that the most common reason school employees agreed to be vaccinated was to protect themselves and their families (87%). The belief that the vaccine was unnecessary (32%) or ineffective (21%) was found to be the most common reason for not being vaccinated (de Perio et al., 2014). In general, it can be seen from both the Turkish and the international literature that teachers and preservice teachers have a lack of confidence in vaccines. The harmful effect of teachers entertaining such beliefs is a threat to themselves and to the community since vaccination is a

method that protects not only the individual vaccinated but also the entire community. The negative beliefs of teachers can have an impact on their pupils and their pupils' parents. It is because of this that it is important that teachers are provided with training geared to raise their awareness of this issue.

In the investigation, 16% of preservice teachers showed influence from religious leaders/groups, while 17% favored alternative medicine over vaccination. The mean score (14.47) in the "Confidence in health workers" subscale was notably low among participants. Similarly, in a study involving family practitioners, a group with potential community influence akin to teachers, 66.7% exhibited anti-vaccination sentiments, contributing negatively to increased cases. A majority of these doctors (65.8%) cited religious reasons for rejecting vaccinations (Aras, 2019). The limited impact of religious leaders/groups on this study's participants regarding vaccinations was a positive outcome, yet some preservice teachers remained influenced by alternative medicine and religious groups. Given teachers' influential role in communities, their perspectives hold significant importance.

Unfortunately, 40% of the preservice teachers in this study perceived vaccination as not a child's right, while 4.2% believed vaccine hesitancy was a parental prerogative; 26.8% displayed disinterest in this domain. Conversely, when asked how they would handle vaccine-hesitant parents, a majority indicated they would recommend vaccinating the child. A study on anti-vaccination perspectives among family practitioners yielded similar results, with 88.3% willing to persuade anti-vaxers by highlighting vaccine benefits. In contrast, only 10% in the study by Aras et al. held the view that vaccination was not a child's right (Aras, 2019). Furthermore, another study reported 16.7% of medical students asserting that refusal to be vaccinated was an individual's right (Günay et al., 2020). However, in the case of epidemic infections, the decision to be vaccinated transcends individual choice, becoming a public health imperative. Vaccination holds crucial significance in preventing epidemics, acquiring immunity, and averting disease-induced disabilities (Sallam, 2021).

Conclusion and Recommendations

With regard to preservice classroom teachers:

- It was concluded that their knowledge regarding preventing infectious respiratory diseases is unsatisfactory.
- It was found their confidence in vaccines is low.
- It was seen that their belief in the benefit of vaccines is low.
- It was seen that their belief in the adverse effects of vaccines is high.
- Their confidence in health workers with regard to vaccines is low.

An examination of their behaviors regarding the prevention and control of the spread of COVID-19 showed that a little more than half of the participants abided by the rules covering handwashing durations, shaking hands, and hugging, and avoiding close contact during the pandemic. However, only a little less than half of the participants said that maintaining social distance was important. It is also unfortunate that very few of the participants had become accustomed to wearing a mask.

Even today, religious leaders/groups have an influence on people's thoughts about vaccines. Those affected by these groups have a lower level of confidence.

Vaccination confidence was low among the preservice teachers who supported anti-vaccination views, did not advise vaccines, believed in the serious side effects of vaccines, believed being vaccinated was not a child's right, thought integrative or alternative medicine was more effective, and also those who were not thinking of taking the coronavirus vaccine.

The most significant predictors affecting vaccination confidence attitudes are recommending vaccination, wanting to receive the COVID-19 vaccine, knowing that some diseases have been eradicated as a result of vaccinations, not trusting integrative medicine as an alternative to vaccination, being uneasy about a student's not receiving the vaccine, and the belief that vaccines do not have serious side effects.

Availability of Data and Materials: The data that support the findings of this study are available on request from the corresponding author.

Ethics Committee Approval: Ethics committee approval was received for this study from the Ethics Committee of the Uşak University (Approval no: 27.02.2020/30, Date: 27.02.2020).

Informed Consent: Written informed consent was obtained from participants who participated in this study.

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