ARTICLE WITHDRAWN

In the study titled "Knowledge and Attitude of Nurses about the Current COVID-19 Outbreak in Turkey" published in the 2022; 4(1) edition of your journal, a defect in the analysisof the data inadvertendly was noticed and it was concluded that the article was published incompletely. The article study is requested to be withdrawn.

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RESEARCH

Knowledge and Attitude of Nurses about the Current COVID-19 Outbreak in Turkey

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Abstract: This study aims to analyze nurses' knowledge levels and attitudes towards COVID-19 during the second peak period of the COVID-19 epidemic in Turkey and test the structural relationship between knowledge levels and attitudes with structural equation modeling. The hospital-based cross-sectional study design was employed in the study. The research population consisted of nurses working in three different private hospitals in Istanbul, with international quality and accreditation certificates. The data were collected by the researchers themselves by using face-to-face and online survey techniques. The total number of questionnaires that were evaluated and used in the analysis of the data is 390. SPSS and AMOS package programs were used in the analysis of the data. The quantitative research method was used. Descriptive statistics, independent sample t-test, ANOVA test, and structural equation modeling were applied to the data. Structural equation analysis revealed the direct effect of the nurses' COVID-19 knowledge level on attitude toward COVID-19 has an acceptable index of fit. Furthermore, the relationship between the level of knowledge toward COVID-19 and the female gender was found to be significant. In general, the level of knowledge of the nurses participating in the study about COVID-19 was found to be high, and it was observed that they had a more optimistic attitude towards preventing COVID-19 and keeping the process under control. An increase in knowledge about COVID-19 has led to an increase in the behavior of a more optimistic attitude towards prevention and control of COVID-19.

INTRODUCTION

When the history of the world is examined, it has been seen that people are struggling with a wide variety of diseases, mass deaths, and epidemic diseases are quite common in societies. The latest in this epidemic disaster is the COVID-19 disease, which was first seen in Wuhan, China. "Co" and of "Corona," "vi" of "virus," "d" of the English word "disease" and Since it was seen for the first time in 2019, it was defined as COVID-19, created from the number "19"[1]. COVID-19; is a virus with different symptoms such as fever, cough, and respiratory distress, and it causes serious consequences such as death[2]. In Turkey, the first cases identified on March 10, 2020, the number of patients recently identified 314,000 as of September, the number of our citizens who lost their life history and approached the 8,000[3]. COVID-19 infection has been a disease that has caused a crisis in both society and the health system due to its very high transmission rate and severe symptoms such as severe respiratory failure[4].

As is known, a pandemic is a term used to describe epidemics that are effective worldwide. Such epidemics attract everyone's attention in society, primarily due to their vital effects on human health and then their physiological effects. However, another underlying effect of pandemics is the traces left by people on their psychology. Although not much attention has been paid to psychological effects because bodily effects are fatal or highly destructive, psychological effects can have a much longer recovery time than bodily effects[5]. Psychological reactions seen during the pandemic process can range from extreme fear to indifference and fatalism. Some people adapt to the threat posed by the pandemic and experience less anxiety than others. In some cases, the psychological effects of the pandemic can be severe and long-lasting. Past research on the global epidemic of SARS has shown that the psychological effects of such epidemics are not always short-lived but can also lead to severe and lasting mental problems[6].

The anxiety and fear caused by the nature of the epidemic can also affect the relationships of people in their daily lives. For example, more than half of individuals suspected of having contact with someone affected by SARS and quarantined tried to stay away from people who sneezed or coughed even weeks after quarantine, 26% stayed away from crowded and closed areas, and 21% avoided all public areas[7-8]. In a study of 9009 people on social media, it was found that 67.3 percent of the participants were very or apprehensive about COVID-19, while 48.8 percent were often self-misled to avoid COVID-19[9].

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Studies have shown that knowledge, attitudes, and behaviors for a particular infectious disease affect the severity of the disease, its spread severity, and mortality rate. In the study conducted by Srichan et al. (2020) on COVID-19 in the Thai community, it was found that 73.4% of the participants had poor knowledge, 28.5% had poor attitudes, and 13.6% had high behavior[10]. In the study conducted by Reuben et al. (2020) in Nigerian society, it was found that 99.5% of the participants had a high level of knowledge. In addition, it was found that 92.7% of the participants applied social distance/self-isolation, 96.4% gave importance to personal hygiene, and 82.3% showed positive behavior by using a face mask[11]. In the study conducted by Vijai and Joyce (2020) on Indian society, it was stated that 89.9% of the respondents had a high level of knowledge about COVID-19, and newspaper and television news were seen as the highest source of information. In addition, it was determined that 87.7% of the participants used hand washing, 76.3% used antibacterial disinfectant, and 82.6% used mask-wearing measures[12].

Li et al. (2020) investigated the effects of COVID-19 on the mental health of people in their study. They found that negative emotions such as anxiety, depression, and anger and sensitivity to social risks increased, life satisfaction, positive emotions, and scores decreased[13]. Roy et al. (2020) found that in the anxiety, attitude, knowledge, and perceived mental health studies of the Indian population during the coronavirus pandemic, 12.5% of the participants had sleep difficulties, 37.8% COVID-19 infection, and 36.4%, respectively[14]. In the study conducted by Zhong et al. (2020) on healthcare professionals in China, it was determined that 89% had adequate knowledge, 90% showed correct behavior, practiced, and highly literate ones were at a more positive level[15]. In the study conducted by Khasawneh et al.[16] with medical faculty students in Jordan, it was found that many of the participants had adequate knowledge about COVID-19.

In addition, the transmission and mortality rates of COVID-19 can cause individuals to be psychologically uncomfortable. Fear caused by COVID-19 can lead to discrimination against other individuals in social life and exacerbate the effects of the disease. However, individuals' fear of COVID-19 is directly related to the rate of infection, disease, and mortality[17]. At the same time, fear and anxiety are physiologically basic emotions that involve activating the "fight or flight" response of the sympathetic nervous system and allow us to react quickly when faced with imminent threats. The most important reasons why the pandemic causes fear or anxiety both in the community and among healthcare professionals; The infection is listed as being contagious, posing an imminent threat, not being visible, and increasing its area of influence[18]. Psychological reactions at the time of the pandemic can range from extreme fear to apathy and fatalism. During the pandemic, some people adapt to the threat and experience less anxiety; in others, the psychological effects may be more severe and long-lasting. Research on the SARS epidemic has shown that psychological effects are not always short-lived but can lead to severe and persistent mental problems[6].

Understanding nurses' knowledge and attitudes help to predict the outcomes of planned behavior. The main goal of the current study was to analyze the knowledge and attitude toward COVID-19 of nurses during the novel coronavirus outbreak, to test the structural relationship between knowledge and attitude with structural equation modeling, to detect socio-demographic variables related to a satisfactory level of them and to explore awareness and health behaviors associated with the prevention of coronavirus infection. The Coronavirus Disease (COVID-19), first seen in 2019, not only showed its effect as a deadly epidemic but also affected the mental state of all community groups, including nurses. However, nurses are characterized as healthcare professionals who play a vital role in guiding COVID-19 victims. In addition, the infection control measures of nurses are significantly affected by their knowledge levels and attitudes towards COVID-19.

MATERIALS and METHODS

Research design

A hospital-based cross-sectional research design was used. The study was carried out in three different private hospitals operating in Istanbul providing secondary healthcare services. The study was designed and conducted by researchers. The study period was from March 1 to May 15, 2021. Participants were previously informed about the study. They were voluntary, and their consent was obtained.

Participants

The data were collected from three different private hospitals in Istanbul between March and May 2021. Some of 390 nurses between 20 and 59 were face-to-face surveyed, while others were online surveyed. The population consisted of 1.730 nurses from these private hospitals. Three hundred ninety nurses, who gave their consent, were informed about the objective, procedures, and confidentiality. It was ensured that the participants were in the hospital, had an internet connection, voluntarily participated in a face-to-face or online survey, and could read, understand and answer the given questions. The convenience sampling method was used to determine the research participants. Approximately equal samples were taken from each hospital.

Measurements of variables

We applied the Turkish version of a ten-item Likert-type COVID-19 knowledge level scale[19]. The measuring tool has been found to provide high reliability for the study sample (α=0.812). And then, We applied the Turkish version of eight items Likert-type attitude scale toward COVID-19[19]. The measuring tool has been found to provide high reliability for the study sample (α=0.746).

In the first stage, permission was requested from the researchers who developed the original scales for the adaptation process, and their approval was obtained. The scales were translated into Turkish separately by three experts who know both the language of the original scale and Turkish very well. In the second stage, the translations made by the authors and the translation group consisting of experts were compared. While making the comparison, each item was examined in terms of whether the translations were appropriate in terms of the intended meaning. The third stage is the provision of the previous stage. At this stage, the scales translated into Turkish were given to a group of 3-5 people who are experts in the language of the original scale and independent from the experts in the second stage, and these experts were asked to translate the scales from Turkish back to the original language. Later, the original expression of each item was compared one-to-one with the expression resulting from this translation. With the translation in the third stage, it was seen that the original scale was appropriate.

Data Analysis

SPSS and AMOS package programs were used for statistical analysis. In order to evaluate the reliability in terms of internal consistency, separate Cronbach alpha coefficients of all two subscales were calculated. First, the reliability analysis was performed on the data, and then the main variables of the research (COVID-19 knowledge level and attitude towards COVID-19) were examined in terms of means, standard deviations, reliability coefficients, frequency distribution, and variance values. Second, confirmatory factor analyses (CFA), using structural equation modeling in AMOS 24, were performed to assess different latent structure models of the relationship between COVID-19 knowledge level and attitude towards COVID-19.

Criteria for determining confirmatory factor analysis model fit and measurement invariance were based on conventional standards[20].

Ethics approval

Prior to conducting the study, we obtained informed consent from the participants. This research was carried out upon the approval of the ethics committee of Duzce University Scientific Research and Publication Ethics Committee (Date: 25.02.2021, Decision Number: 2021/062). The quantitative research methodology was used because it is suitable for the purpose and main problem of the research, and the analysis of the data set was performed by using SPSS and AMOS statistical analysis programs.

FINDINGS

Demographic findings

Three hundred and ninety (390) nurses in Istanbul participated in this survey. Table 1 shows the main characteristics of the participants in the study. It can be seen that 35.9% males and 64.1% females were the respondents for this study. Among 390 nurses, 56.7% were aged 20–29 years, 23.1% were aged 30-39 years, 16.4% were aged 40-49, 3.8% were aged 50-59 years. Participants about two-thirds (71.3%) had college education levels. Most participants were unmarried (57.4%). And the majority of participants had 0-5 years of experience (54.4%). There was a statistically significant difference in knowledge towards COVID-19 score according to sex (t-test = 3.911; $P < 0.05$). However, there was no significant relationship among the age of the participants, the educational level of the participants, the experience of the participants, and the marital status of the participants. Furthermore, there was no significant difference in attitude towards COVID-19 score according to sex, age, experience, marital status, and educational level of the participants.

Descriptive findings related to factors

Descriptive statistics, averages, standard deviations, reliability coefficients, number of participants, and variance values are given in Table 2. As a result of the confirmatory factor analysis, the overall reliability coefficient was found to be Alpha= 0.857. Because $0.80 \leq \alpha < 1.00$, the scale is highly reliable. Ensuring validity and reliability shows the existence of a structural relationship between knowledge toward COVID-19 and attitude toward COVID-19 of nurses during the novel coronavirus outbreak.

Table 2. Descriptive Statistics Related to Factors

Factors	*N*	*Mean*	*Standard deviation*	*Variance*	*Cronbach's alpha*
Knowledge toward COVID-19	390	4.2798	0.67189	0.451	0.812
Attitude toward COVID-19	390	3.8240	0.60731	0.369	0.746

The model fit measures

In this study, a total of 18 questions formed two latent variables. Out of these 18 items, 2 items were not included in the analysis since they had a poor factor load. Model fit was tested with the model goodness-of-fit indicators given in Table 3 and accepted in the literature.

In Table 3, it is seen that all latent variables of the study provide the general model goodness of fit values suggested by Munro[20], Brown[21], and Byrne[22].

Table 3. Model Fit Measures

Measure	*Estimate*	*Threshold*	*Interpretation*
CMIN/DF	2.898	Between 1 and 5	Acceptable range
CFI	0.922	≥ 0.90	Within range
GFI	0.915	≥ 0.85	Within range
SOME	0.056	≤ 0.08	Within range
RMS	0.070	≤ 0.10	Within range
RMR	0.051	≤ 0.08	Within range
TLI	0.905	≥ 0.90	Within range

Table 1. Main Characteristics of Participants (n=390)

			Knowledge toward COVID-19		*Attitude toward COVID-19*	
Variables	n	%	T test/Anova (t/F)	p	T test/ Anova (t/F)	p
Gender						
Male	140	35.9	3.911[a]	**0.000**	1.372[a]	0.171
Female	250	64.1				
Age categories						
20-29	221	56.7				
30-39	90	23.1	0.870[b]	0.457	1.082[b]	0.356
40-49	64	16.4				
50-59	15	3.8				
>59	0	0				
Experience (years)						
0-5	212	54.4				
6-10	53	13.6				
11-15	46	11.8	1.307[b]	0.253	1.567[b]	0.156
16-20	26	6.7				
21-25	28	7.2				
26-30	24	6.2				
>30	1	0.3				
Marital status						
Married	166	42.6	1.152[a]	0.250	0.967[a]	0.334
Unmarried	224	57.4				
Educational attainment						
Junior college and below	47	12.1				
College	278	71.3	0.597[b]	0.551	0.413[b]	0.662
Postgraduate	65	16.7				

a. Independent t-test b .Anova test

The results of the measurement model

It was assumed that the reasoning between the variables in the research model could be explained.

Confirmatory factor analysis was performed to test the validity of the scales used, and the structure of all scales was verified. Figure 1 shows the confirmatory factor analysis results and model fit for the variables of knowledge toward COVID-19 and attitude toward COVID-19.

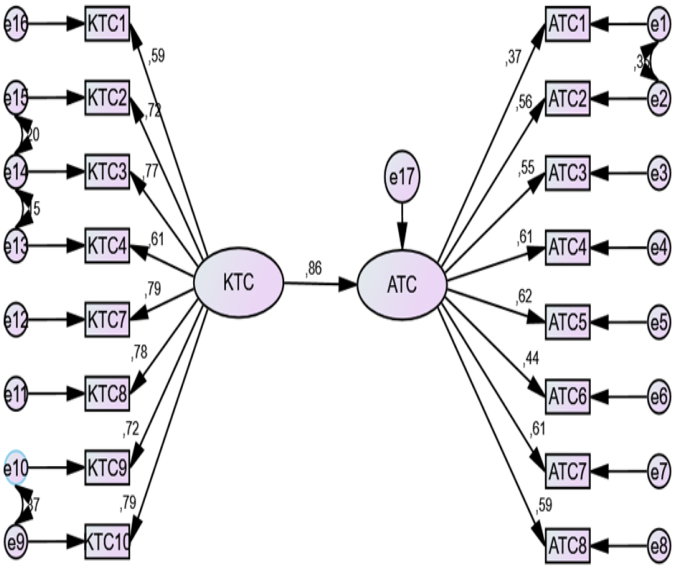

Figure 1. The Results of the Full Model

The estimates or standard loading of each item ranges from 0.49 to 0.80. According to Harrington (2009), the standard factor loading estimates should be not less than 0.30 (ideally 0.70 or higher)[23]. Table 4 shows that the Cronbach's α coefficients are above the minimum criterion (> 0.60). Finally, for average variance extracted (AVE) and construct reliability (CR), Fornell & Larcker (1981) stated that although the AVE value is below 0.50, if the CR value is above 0.70, AVE values below 0.50 can be accepted[22]. In addition, Table 4 shows that the structures applied in the research meet the reliability and validity criteria.

Table 4. The Items' Estimate and the Constructs' Cronbach's α, AVEs, and

Constructs	Items	Estimate	Cronbach's α	Average variance extracted (AVE)	Construct reliability (CR)
Knowledge toward COVID-19 (KTC)	KTC1	0.817	0.812	0.503	**0.91**
	KTC9	0.727			
	KTC8	0.784			
	KTC7	0.706			
	KTC4	0.643			
	KTC3	0.734			
	KTC2	0.579			
	KTC1	0.647			
Attitude toward COVID-19 (ATC)	ATC1	0.276	0.746	0.283	**0.75**
	ATC2	0.581			
	ATC3	0.469			
	ATC4	0.569			
	ATC5	0.637			
	ATC6	0.443			
	ATC7	0.576			
	ATC8	0.608			

Since the CR values are greater than 0.7, the factors have high construct reliability. The fit values were examined to show that the data fit the model well. Table 5 shows the results of the structural model.

Table 5. The Result of the Structural Model

Hypothesis	Correlations	Estimate	S.E.	C.R.	P	Result
Relationship between COVID-19 knowledge level and COVID-19 fear level						
H_1	KTC<--> ATC	0.351	0.074	4.770	**	H_1 supported

The obtained fit values show that the model fit is achieved. There is a positive relationship between knowledge toward COVID-19 (KTC) and attitude toward COVID-19 (ATC). The increase in knowledge toward COVID-19 causes an increase in attitude toward COVID-19, and knowledge toward COVID-19 has a direct effect on attitude toward COVID-19.

The results of the structural model

From the result, it is found that there is a positive relationship between COVID-19 knowledge level and attitude toward COVID-19, and COVID-19 knowledge level has a direct effect on attitude toward COVID-19. Thus, H_1 is statistically supported.

DISCUSSION

As the COVID-19 virus undoubtedly affects all societies, it has also affected the psychological and sociological conditions of nurses who are struggling with this epidemic disease. The spread of the COVID-19 epidemic all over the world and the increased knowledge of COVID-19 have caused a new type of fear to arise in many groups of healthcare workers. This study was conducted in the second most severe episode of the COVID-19 outbreak and on areas critically affected by the outbreak.

This study was tried to evaluate the COVID-19 knowledge level and attitude toward COVID–19 among nurses and to test the structural relationship between knowledge and attitude with structural equation modeling. In this study, the demographic features, COVID-19 knowledge level, and attitude towards COVID-19 of 390 nurses were analyzed. This is a study that examined especially frontline nurses' mental health and its associated factors during the novel coronavirus outbreak in Turkey using a medium-scale cross-sectional design. The strengths of this study include two different data collection techniques. We conducted our survey in three different private hospitals operating in Istanbul providing secondary healthcare services. Three hundred ninety nurses, who gave their consent, were informed about the objective, procedures, and confidentiality.

This study was conducted in the second most severe episode of the COVID-19 outbreak and on areas critically affected by the outbreak. In this study, the relationship between nurses' knowledge levels and attitudes towards COVID-19 was primarily investigated. In addition, it was examined whether the knowledge levels and attitudes of the nurses about COVID-19 differed according to their socio-demographic characteristics. According to the results of this study, the knowledge levels and attitudes toward COVID-19 of the nurses participating in the research were sufficient and optimistic. Knowledge levels toward COVID-19 are significantly associated with attitude toward COVID-19.

Overall, the nurses participating in the study found high levels of knowledge toward COVID-19 and were found to have a more optimistic attitude about COVID-19. An increase in knowledge about COVID-19 has led to an increase in behavior towards a more

optimistic attitude towards COVID-19. In this study, the majority of the participants had good and sufficient knowledge about the COVID-19 outbreak. This result of our research was found to be higher than the similar study conducted in Iran[24,25]and Saudi Arabia[26]. It is estimated that the reason for this may be due to the difference in the time of the study and the study population. In addition, in our study, it was determined that the knowledge level of nurses about the COVID-19 epidemic was consistent with the study conducted in Pakistan and gave similar results[27].

Our finding showed a great majority of the study participants had a favorable attitude towards the COVID–19. These findings are in line with the study conducted in China and Iran[28, 24] and Saudi Arabia[26]. The results of our current study showed that nurses in Turkey have sufficient knowledge to manage the disease and process related to COVID-19, but they need more information about the signs and symptoms of the disease.

Among the respondents, there were more females (64.1%) than males (35.9%). The responses per age group were distributed as follows: 56.7% were aged 20–29 years, 23.1% were aged 30-39 years, 16.4% were aged 40-49, 3.8% were aged 50-59 years. Two-hundred-seventy-eight respondents (71.3%) had a college education, 47 persons (12.1%) had junior college and below, and 65 respondents (16.7%) had a postgraduate degree. In similar studies on the subject, the basic characteristics of the participants differed. While most of the participants in the studies in India, China, and Egypt were women, the majority of the participants in the studies in the USA were men [5,14, 15,28,29] . Moreover, the knowledge level toward COVID-19 was significantly associated with the female gender.

Conclusion

Turkish nurses had a high level of knowledge about COVID-19 and had a positive attitude towards preventing and controlling COVID-19. Good knowledge level and positive attitudes towards COVID-19 among Turkish nurses may be an important factor that helped the country in controlling and preventing COVID-19 successfully. In addition to continuously increasing and improving the knowledge, awareness, and positive attitudes of nurses about preventing and controlling the COVID-19, it is very important to impose sanctions and strictly control those who do not comply with the measures and to control the process. The findings of our research provide valuable information to countries in terms of determining the impact of COVID-19 on nurses' mental health, as well as identifying deficiencies and negative attitudes towards preventing COVID-19 and keeping the process under control.

COVID-19 is a significant global health problem that has a great social and psychological impact on both healthcare professionals and nurses. In epidemics, different individuals and groups may experience different levels of psychological crises, but nurses, who play an important role among health workers, are more affected[31,32]. In addition, hospital-based descriptive studies to determine the mental health and psychological needs of nurses during the epidemic will greatly contribute to the pandemic management process.

In summary, the results of our research showed that nurses have a high level of knowledge about COVID-19 and show a more optimistic attitude about preventing COVID-19 and keeping the process under control. In addition, an adequate knowledge level about COVID-19 is associated with positive and serious attitudes towards preventing COVID-19, suggesting that health education programs aimed at increasing knowledge of COVID-19 help encourage a positive attitude.

Conflict of interest

The authors declare that there is no conflict of interest in the research.

Financial disclosure

The authors declared that there is no institutional or financial support.

Ethical approval

This research was carried out upon the approval of the ethics committee of Duzce University Scientific Research and Publication Ethics Committee (Date: 25.02.2021, Decision Number: 2021/062).

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