Supportive Care in Cancer (2021) 29:1999–2006
https://doi.org/10.1007/s00520-020-05700-w

ORIGINAL ARTICLE

Assessment of Turkish oncology nurses' knowledge regarding COVID-19 during the current outbreak in Turkey

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Received: 8 June 2020 / Accepted: 19 August 2020 / Published online: 22 August 2020

Abstract

Purpose To assess Turkish oncology nurses' knowledge regarding novel coronavirus (COVID-19) during the current outbreak in Turkey.

Methods This descriptive study was carried out with the 185 oncology nurses between April and May 2020 in Turkey. Research data were collected through online survey using "Nurse Information Form" and "Nurse Information Scale for COVID-19." Multilinear regression analysis was used in determining the factors affecting oncology nurses' information regarding COVID-19.

Results According to the data delivered from 185 oncology nurses, 57.7% of the participants had an undergraduate degree, 74.1% were working in adult oncology units, and 52.4% of them were working as clinical nurses, 48.1% of the nurses received education for COVID-19 (51.9% did not receive) and 70.3% followed and read the COVID-19 Guidelines published by the Ministry of Health (29.7% did not follow guidelines). Using multiple regression analysis, a model based on the relationship between the variables was created. In the model, the descriptive characteristics of the oncology nurses and their experiences of COVID-19 were found to explain 29.1% of their knowledge level for COVID-19. Nurses' education level, the presence of a relative diagnosed with COVID-19, and following the COVID-19 guidelines were found to statistically significantly affect the knowledge levels of COVID-19.

Conclusion These findings suggest that hospital management and the Ministry of Health should provide more information for the oncology nurses to better control of cancer patients from the infectious disease.

Keywords Oncology nursing · Cancer · COVID-19 · Coronavirus · Knowledge

Introduction

With the unidentified pneumonia cases reported to the World Health Organization in Wuhan, China, in December 2019, the novel severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) was discovered [1]. From this date on, the infection identified as COVID-19 by the Chinese government has swiftly spread to other countries through Europe or China travels and contact with infected individuals and it has become a pandemic [2, 3]. According to the May 20, 2020, report of the World Health Organization, the number of COVID-19 cases has reached 4,761,559 and the number of deaths has reached 317,529, worldwide [4]. In Turkey, as of May 20, 2020, 151,615 COVID-19 cases and 4199 deaths have been reported [5].

Coronaviruses can cause simple syndromes like in common cold, as well as severe signs of infection like in the severe acute respiratory syndrome (SARS) [4, 6]. The clinical symptoms of COVID-19 cases are as follows: 83-98% of patients have fever, 76-82% have dry cough, and 11-44% of them suffer from fatigue and muscle pain [2]. The other symptoms include abdominal pain, headache, sore throat, and diarrhea. It is reported that deaths occur in individuals with chronic diseases, respiratory-related diseases, immunosuppressive diseases, and who are 50 years of age or older [7]. Similarly, it

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has been reported that the deaths in Italy occur in individuals with chronic diseases [8].

Within the scope of chronic diseases, cancer is a worldwide increasing health problem [9]. According to the world cancer statistics, cancer is the first cause of death, and in Turkey, it is the second-most frequently reported cause of death following cardiovascular diseases. Therefore, the probability of COVID-19 contraction and mortality is high in patients with cancer [10]. It has been reported that 20.32% of COVID-19 death cases in Italy are cancer patients [8]. According to the report of the Turkish Ministry of Health on April 3, 2020, 64.2% of the cases who died due to COVID-19 had at least one chronic disease, and about 20% of them were cancer cases. Further research found that people with cancer had a 3.5 times higher risk of serious COVID-19 infection than other patient populations [11]. The latest COVID-19 studies' results revealed a fatality risk of 5.6% for those affected by cancer [12]. These findings show that cancer patients who continue their treatment in the hospital have a high risk of becoming infected with COVID-19.

Healthcare systems and government response to COVID-19 are rapidly evolving worldwide [13]. It is estimated that half of the 43.5 million health workers in the world are nurses [14]. As a result, nurses are at the forefront of this pandemic and are taking a proactive strategy with multidisciplinary teams to take part in pandemic planning within their healthcare organizations [13]. However, due to the inadequacy of health professionals all over the world, the risks of exposure and infection to COVID-19 have increased in addition to the increasing workload of healthcare workers during this crisis period [3]. In a study conducted in China, it was reported that 29% of the healthcare workers were infected through hospital-induced transmission [15]. According to Turkey's Health Ministry report dated April 29, 7428 of healthcare workers have been infected. Considering that half of these healthcare professionals are nurses, they face a potential risk of infection as well as a significant risk of transmitting the infection to patients. Therefore, the roles and functions of nurses have become particularly important to prevent transmission of the COVID-19 and enable early detection of infection signs [16].

Chen et al. specified the roles of nurses in five domains for the COVID-19 pandemic [16]. The first domain is health education, prevention, and support for people, especially high-risk groups. The second field is the detection and prevention of nosocomial infections. The third domain is the planning and safety precaution application in nursing care. The fourth domain is the protection of people with immune deficiencies or underlying diseases, such as chronic obstructive pulmonary disease and cancer. The last domain is providing care to patients with COVID-19. Nurses should have sufficient knowledge about COVID-19 to carry out their roles and responsibilities in these five domains [13, 17]. Additionally, it is important to apply the latest knowledge, including the COVID-19 test, self-isolation, social distance, quarantine, treatment, and the use of personal protective equipment for protecting oncology patients from the COVID-19 [3, 13, 18]. Therefore, this study is aimed to assess Turkish oncology nurses' knowledge regarding COVID-19 during the current outbreak in Turkey.

Methods

Study design and sample

This descriptive and methodological study was carried out with the oncology nurses in Turkey between the dates of April 2020 and June 2020. The sample size of the study was determined based on the study by Nemati et al. [19]. By using the mean of the nurses' COVID-19 knowledge scores and considering α error = 5%, power $(1-\beta) = 95\%$, the effect size of 1.44, it was calculated via the G*Power 3.1.9.4 program that this study should include 163 nurses [20].

The inclusion criteria were as follows: working as an oncology nurse, speaking Turkish, and volunteering to participate in the study.

Data collection tools

Research data were collected via "Nurse Information Form" and "Nurse Information Scale for COVID-19."

Nurse Information Form

The form was developed by the researchers based on the relevant literature (Davidson & Szanton, 2020; Jackson et al., 2020; Nemati et al., 2020). The form consists of the questions that are related to oncology nurses' sociodemographic characteristics and their knowledge and experiences regarding COVID-19. The form consists of a total of 13 questions including 7 questions related to the nurses' sociodemographic characteristics (age, gender, marital status, working unit, education level, working years, working position) and 6 questions about nurses' COVID-19 knowledge and experiences (status of receiving education on COVID-19, the status of caring for a patient with suspected COVID-19, the status of caring for a patient diagnosed with COVID-19, presence of a relative diagnosed with COVID-19, the status of diagnosis with COVID-19, the status of following COVID-19 guidelines).

Nurse Information Scale for COVID-19

The scale was prepared by the researchers based on the "COVID-19 (SARS-CoV-2) Infection) Guidelines"

updated by the Republic of Turkey Ministry of Health Directorate General of Public Health Coronavirus Scientific Committee on April 14, 2020 [6]. The scale consists of 30 items and 9 sub-dimensions. Sub-dimensions include general information about COVID-19, sample intake, characteristics of possible/definite cases, infection control and isolation, termination of isolation, contact tracing, COVID-19 adult patient management and treatment, COVID-19 child patient management and treatment, and evaluation of healthcare workers with contacts. Each sub-dimension has items that are scored with a three-point Likert-type scale and scored as (1) "no," 2 "undecided," and (3) "yes." The minimum score that can be obtained from the scale is 30, and the maximum score is 90. Higher scores on the scale indicate higher oncology nurses' knowledge about COVID-19. The scale includes no reversed items.

The form prepared by the researchers was created as a result of an intense literature review on the study's aim, the consultation with the experts [6, 21]. Opinions of eight experts were received about the scales (three academic members from the Department of Pediatric Nursing, two academic members from the Department of Oncology Nursing, and three academic members from the Department of Internal Diseases Nursing). The scale form was given to the specialists and they were asked to grade all items between 1 and 4 point for determining the convenience of items (1—requires a great change, 4—very convenient) [22]. The scores of eight experts were evaluated by scope validity analysis (S-CVI) and S-CVI was found to be 0.99, thus indicating the agreement among the experts [22, 23]. According to the experts' opinions, the form was revised and the last version was prepared. The scale was applied to the pilot group of 10 people, and after the understandability of the items was sufficient, it was applied to the study group. The Cronbach's alpha value for the Turkish population was 0.879, the Kaiser-Meyer-Olkin value was 0.823, and the Barlett Test was 2209.882. The total explained variance of the scale was 68.85%.

Data collection period

The written permission was obtained from the Turkish Oncology Nursing Society for data collection. The researcher informed the member nurses about the aim and the scope of the study via e-mail and invited them to participate in the study. The "Nurse Information Form" and "Nurse Information Scale for COVID-19" were sent as an online link and completed by the volunteer oncology nurses. The scales take approximately 10-15 min. The data forms were completed by 185 oncology nurses. Therefore, this study was conducted with 185 oncology nurses.

Data analysis

The data was analyzed via IBM SPSS Statistics for Windows (Version 23.0. Armonk, NY: IBM Corp.). In the evaluation of oncology nurses' characteristics, their knowledge and experiences about COVID-19, numbers, percentage distribution, the mean and standard deviation were used. Shapiro-Wilk was used for determining compliance of the parameters with the normal distribution. The chi-square test, Spearman correlation analysis, Mann-Whitney U test, Kruskal-Wallis test, and regression analysis were used for analyzing the relationship between the oncology nurses' characteristics and the score averages. Multilinear regression analysis was used in determining the factors affecting oncology nurses' information regarding COVID-19. It was determined which independent variable to be included in the model (determining whether there is multicollinearity) through tolerance, VIF, and condition index values. A VIF value < 10, a tolerance value < 0.2, and a condition index value < 15, which are independent variables, were included in the regression analysis. The results were evaluated with a 95% confidence interval and $p < 0.05$ value was accepted as a significance level.

Ethical statement

This was a quality assurance project that involved humans. Full ethical approval was granted by the Trakya University Ethical Committee of the Faculty of Medicine by the Helsinki Declaration, Good Clinical Practice Guide (08/16). The reference number is TÜTF-BAEK 2020/76, and the date of approval is 22/05/2020. Also, the written permission was taken from the Republic Ministry of Health, General Directorate of Health Services, Scientific Research Platform, and Turkish Oncology Nurses Society.

Results

Using Shapiro-Wilk's test, we found that the nurses were not different from each other in terms of sociodemographic variables and experiences for COVID-19, and the participants were homogeneous ($p > 0.05$). The mean age of the nurses participating in the study was 34.74 ± 7.71 years and the mean of the working years was 12.53 ± 8.5. Table 1 presents the oncology nurses' descriptive characteristics and their experiences of COVID-19.

Table 2 presents the mean scores of the oncology nurses participating in the study from the Nurse Knowledge Scale for COVID-19.

COVID-19 NIS, Nurse Information Scale for COVID-19; *SD*, standard deviation

While a high level of statistically significant difference was found between the mean scores of oncology nurses for

Table 1 The oncology nurses' descriptive characteristics and their experiences of COVID-19

Gender	*n*	%
Female	166	89.7
Male	19	10.3
Marital status		
Married	117	63.2
Single	68	36.8
Working unit		
Adults unit	137	74.1
Pediatric unit	48	25.9
Age		
20-29	50	27.0
30-39	91	49.2
40 and above	44	23.8
Education level		
High school diploma	14	7.6
Undergraduate degree	107	57.7
Master's degree	42	22.7
Doctoral degree	22	11.9
Working years		
0-5 years	36	19.5
5-10 years	41	22.2
10-15 years	43	23.2
15 years and above	65	35.1
Working position		
Academician nurse	24	13.0
Clinical nurse	97	52.4
Nurse managers	43	23.2
Outpatient treatment units	21	11.4
Receiving education on COVID-19		
Yes	89	48.1
No	96	51.9
Caring for a patient with suspected COVID-19		
Yes	75	40.5
No	110	59.5
Caring for a patient diagnosed with COVID-19		
Yes	35	18.9
No	150	81.1
Presence of a relative diagnosed with COVID-19		
Yes	19	10.3
No	166	89.7
COVID-19 diagnosis in nurses		
Yes	5	2.7
No	180	97.3
Following COVID-19 guidelines		
Yes	130	70.3
No	55	29.7

knowledge of COVID-19 in terms of their education level and position at work ($p < 0.05$), no significant difference was determined in terms of age, gender, marital status, working years, and the unit they worked in ($p > 0.05$, Table 3). The Bonferroni-corrected Mann-Whitney *U* test was used to determine which measurement led to the difference in the education level of the nurses and their position at work. Since there were six pairs of comparisons in the analysis, the accepted significance level ($p = 0.05$) had to be divided into six to determine the new significance level. Accordingly, the new significance level was calculated as $0.05/6 = 0.0083$. As a result of the test, regarding the education level of nurses, a statistically significant difference was determined between nurses with a high school diploma and those with master's degree ($p < 0.001$) or doctoral degree ($p = 0.003$), and between nurses with an undergraduate degree and those with master's degree ($p < 0.001$). In addition, regarding the position at work, a statistically significant difference was determined between the nurse working in the field of oncology as an academician and the clinical nurse ($p = 0.002$).

There was a statistically significant difference between the mean scores of oncology nurses for their knowledge levels for COVID-19 in terms of receiving education on COVID-19, the presence of a relative diagnosed with COVID-19, and the following COVID-19 guidelines ($p < 0.05$, Table 3).

As a result of the analysis, the variables that affected the level of knowledge about COVID-19 in a statistically significant manner (level of educational, position at work, receiving education about COVID-19, presence of a relative diagnosed with COVID-19, and following COVID-19 guidelines) were included in the regression model (Table 3). According to the relationship between variables showing up in multiple regression analysis, the effect of the descriptive characteristics of the oncology nurses and their experiences of COVID-19 on their knowledge levels for COVID-19 was identified as a model. According to the model, the increase in the education level of oncology nurses, the presence of a relative diagnosed with COVID-19, and following the guidelines published by the Ministry of Health were observed to increase the knowledge levels for COVID-19. In the model, the descriptive characteristics of the oncology nurses and their experiences of COVID-19 were found to explain 29.1% of their knowledge level for COVID-19. The education level of oncology nurses, the presence of a relative diagnosed with COVID-19, and following the COVID-19 guidelines were determined to increase their knowledge levels of COVID-19 by 0.154 ($\beta = 0.154$), 0.195 ($\beta = 0.195$), and 0.400 ($\beta = 0.400$) times, respectively. In addition, all the factors except the position at work ($\beta = 0.044$, $p > 0.05$) and the status of receiving education about COVID-19 ($\beta = 0.041$, $p > 0.05$) were found to statistically significantly affect the knowledge levels of COVID-19 ($p < 0.05$, Table 3).

Table 2 Mean scores of the oncology nurses for the knowledge level for COVID-19 ($n = 185$)

	Minimum	Maximum	Mean	SD
COVID-19-NIS total	51	90	79.38	7.96
COVID-19-NIS general information sub-dimension	12	18	17.09	1.13
COVID-19-NIS sample intake sub-dimension	3	9	8.02	1.34
COVID-19-NIS characteristics of possible/definite cases sub-dimension	3	9	8.34	1.07
COVID-19-NIS infection control and isolation sub-dimension	3	9	8.25	1.20
COVID-19-NIS termination of isolation sub dimension	2	6	5.39	0.93
COVID-19-NIS contact tracing sub-dimension	3	9	7.97	1.30
COVID-19-NIS adult patient management and treatment sub-dimension	4	12	10.03	1.76
COVID-19-NIS child patient management and treatment sub-dimension	3	9	7.55	1.42
COVID-19-NIS evaluation of health workers with contact sub dimension	3	9	6.69	1.87

Discussion

The pandemic caused by SARS-CoV-2 (COVID-19) is rapidly affecting the delivery of care for patients around the world. Also, the COVID-19 pandemic has generated significant challenges for healthcare professionals in all areas, particularly cancer centers [24]. Oncology nurses are at the forefront in cancer care, and they play an integral role in supporting these patients during the pandemic. To prevent transmit and detect early signs of the infection among oncology patients, nurses should have knowledge regarding COVID-19. Therefore, it was aimed to assess Turkish oncology nurses' knowledge regarding COVID-19 during the current outbreak in Turkey. The findings of this study showed that more of the oncology nurses had good knowledge about COVID-19.

Control of nosocomial infection is a primary concern for the management of hospitalized cancer patients [25]. During the pandemic, health professionals especially nurses should be informed about COVID-19 to protect cancer patients from this infection [25]. In this present study, 48.1% of the oncology nurses received training for COVID-19. According to this result, only nearly half of the nurses received training regarding COVID-19 and this rate is insufficient for the control and prevention of the infection. In previous studies, it was emphasized that oncology nurses play an important role in the management and prevention of the spread of COVID-19 and patient's education [13, 16]. Chen et al. stated that nurses must receive training about prevention and management of COVID-19 including the proper use of personal protective equipment, the detection of early symptoms and signs of infection, proper personal hygiene practices, and corresponding environmental measures [16]. Therefore, to reduce the risk of infection among both oncology nurses and patients, policies and training should be implemented.

In this study, 70.3% of the oncology nurses followed the COVID-19 guidelines published by the Ministry of Health. This finding was similar to the literature. In a study conducted in China, 89.7% of healthcare professionals followed correct practices regarding COVID-19 [26]. In a study in Iran, 55.29% of the nurses followed the information of the World Health Organization and the Ministry of Health [19]. Nurses are at the forefront in prevention oncology patients from COVID-19, on the other hand, a lack of resources and information to ensure that all know and understand what is required to keep patients safe [17]. It is important that nurses periodically check and follow the guidelines of hospitals, professional institutions, and government recommendations [13]. The information about COVID-19 disease is likely to change frequently; therefore, oncology nurses should follow the evidence-based information and up-to-date resources in their respective countries.

The results of this study showed that nurses' education level, the presence of a relative diagnosed with COVID-19, and following the COVID-19 guidelines affected their knowledge level for COVID-19 at a rate of 29.1%. Within this regard, it can be thought that the outbreak and high-speed transmission of COVID-19 in the world could improve the nurse's attention and knowledge about this pandemic disease. Also, nurses whose relative was diagnosed with COVID-19 might be searching for information and follow the guidelines regarding the infection to support their relatives. In parallel with our study results, Zhang et al. (2020) stated that an educational degree affected healthcare workers' knowledge, the workers with postgraduate degree had more information about COVID-19 [26]. In a study in Saudi Arabia, the education level of nurses affected their knowledge about COVID-19 [27].

Table 3 The effect of the oncology nurses' characteristics and experiences of COVID-19 on their knowledge levels for COVID-19

Characteristics of oncology nurses	Mean	SD	*U*	*Z*	*p*
Gender			1527.500	− 0.224	0.822
Female	79.37	0.61			
Male	79.42	2.00			
Marital status			3844.000	− 0.382	0.702
Married	79.11	0.76			
Single	79.85	0.89			
Working unit			3269.500	− 0.058	0.954
Adults unit	79.18	0.71			
Pediatric unit	79.95	0.97			
			X^2_{KW}	**df**	***p***
Age			2.364	2	0.307
20-29	78.62	1.04			
30-39	79.72	0.93			
40 and above	79.54	0.95			
Working years			1.686	3.	0.640
0-5 years	78.22	1.39			
5-10 years	79.73	1.20			
10-15 years	79.83	1.42			
15 years and above	79.50	0.86			
Oncology nurses' experiences of COVID-19			***U***	***Z***	***p***
Caring for a patient with suspected COVID-19					
Yes	81.18	0.67	3461.500	− 1.589	0.063
No	78.15	0.85			
Caring for a patient diagnosed with COVID-19					
Yes	81.42	1.09	2122.000	− 1.767	0.077
No	78.90	0.67			
COVID-19 diagnosis in nurses					
Yes	81.60	1.96	407.000	− 0.365	0.715
No	79.32	0.59			
Variables included in regression	$R = 0.539$	$R^2 = 0.291$	$F = 14.667$	$p = 0.000$	**DW = 2.128**
Education level			X^2_{KW}	**df**	***p***
High school diploma	71.71	2.64	20.110	3	**0.000**
Undergraduate degree	78.44	0.78			
Master's degree	83.19	0.75			
Doctoral degree	81.54	1.38			
	$\beta = 2.573$	**SE = 1.284**	**Beta* = 0.154**	$t = 2.004$	$p = 0.047$
Working position					
Academician nurse	83.12	1.19		3	**0.003**
Clinical nurse	77.43	0.87	13.697		
Nurse managers	81.16	1.14			
Outpatient treatment units	80.47	1.05			
	$\beta = 1.040$	**SE = 1.848**	**Beta* = 0.044**	$t = 0.563$	$p = 0.574$
Receiving education about COVID-19			***U***	***Z***	***p***
Yes	81.52	0.68			
No	77.39	0.88	3065.500	− 3.323	**0.001**
	$\beta = 0.660$	**SE = 1.162**	**Beta* = 0.041**	$t = 0.568$	$p = 0.871$
Presence of a relative diagnosed with COVID-19					
Yes	84.73	0.87	847.500	− 3.306	**0.001**
No	78.77	0.62			
	$\beta = 5.101$	**SE = 1.680**	**Beta* = 0.195**	$t = 3.036$	$p = 0.003$
Following COVID-19 guidelines*					
Yes	81.73	0.49	1841.000	− 5.220	**0.000**
No	73.83	1.31			
	$\beta = 6.960$	**SE = 1.164**	**Beta* = 0.400**	$t = 5.978$	$p = 0.000$

U, Mann-Whitney test; *Z*, Kruskal-Wallis test; X^2 *KW*, Kruskal-Wallis chi-square; *df*, degree of freedom; *SD*, standart deviation. β, unstandardized coefficients β; *SE*, coefficients standardized error; *DW*, Durbin-Watson

*Standardized beta coefficients

Limitations

The strengths of the study are the fact that this study is related to a special group such as oncology nurses, the current subject COVID-19 pandemic, and the unknown points about oncology nurses, the relationship between nurses' characteristics and COVID-19 knowledge level. Despite the strengths of this study, it is limited by the use of the convenience sample,

which may affect the generalizability of the study. The second limitation of this research is the participants completed the survey using an online research tool. Due to the COVID-19 pandemic, it is recommended that the online study is carried out face-to-face following the control of the pandemic, and different points are added to reveal unknown points. Also, it is recommended to plan studies in which online education programs that will increase the knowledge level of nurses regarding COVID-19 will be implemented and their effectiveness will be revealed.

Conclusion

This study results showed that more of the oncology nurses had good knowledge about COVID-19, but nurses who had doctorate, who followed the COVID-19 guidelines, and had a relative diagnosed with COVID-19 had more knowledge than other nurses.

The significance of the role and contribution of nurses is more important than ever before in this pandemic. They are also the cornerstone of health services, particularly on the frontline providing healthcare or in leadership and education, through implementing and developing new policies on standards of care. COVID-19 poses significant challenges to quality care of the oncology patients. Therefore, the nursing administration and hospital management should have an organized training program for preventing hospital infection in this unprecedented outbreak. Additionally, the Ministry of Health, nursing administration, and hospital management should support oncology nurses with a comprehensive training curriculum comprising of a more structured approach to provide sufficient professional awareness of COVID-19. Besides, oncology nurses should follow evidence-based practices and guidelines and these recommendations should be integrated in the patient's care.

Acknowledgments We would like to thank the nurses who participated in the study. Also, we would like to thank the Turkish Oncology Nursing Association for its valuable contributions.

Author contribution Conceptualization: Remziye Semerci, Aslı Akdeniz Kudubeş, and Ferhan Çetin Eşref. Methodology: Remziye Semerci. Formal analysis and investigation: Aslı Akdeniz Kudubeş. Writing—original draft preparation: Remziye Semerci and Aslı Akdeniz Kudubeş. Writing—review and editing: Remziye Semerci and Aslı Akdeniz Kudubeş. Supervision: Aslı Akdeniz Kudubeş.

Compliance with ethical standards

Conflict of interest The authors declare that they have no conflict of interest.

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