

Nurses' compliance with standard precautions during COVID-19 pandemic

Esin Kavuran¹, Gazi Baran Camci²

¹Department of Nursing, Faculty of Nursing, Ataturk University, Erzurum, Turkey

²Department of Nursing, Faculty of Health Sciences, Kahramanmaraş Istiklal University, Kahramanmaraş, Turkey

Received: 2023-02-17.

Accepted: 2023-05-02



This work is licensed under a
Creative Commons Attribution 4.0
International License

J Clin Med Kaz 2023; 20(3):69-74

Corresponding author:

Esin KAVURAN.

E-mail: esinkavuran@hotmail.com;

ORCID: 0000-0003-3791-102X.

Abstract

Aim: Nurses are healthcare professionals who work at the forefront of healthcare delivery during the Covid-19 pandemic. Pandemic conditions have brought many difficulties for nurses. On the one hand, nurses working 24 hours a day, seven days a week to meet the severe health care needs of patients infected with Covid-19, on the other hand, are struggling against the risk of virus transmission. This study was conducted in a descriptive manner to determine the nurses' compliance with standard precautions during the Covid-19 pandemic process.

Material and methods: This study was carried out at Dr. Ersin Arslan Training and Research Hospital between September and December 2021. The population of the study consisted of nurses working in the hospital during the pandemic process, and 219 nurses who agreed to participate in the study without any sampling method formed the sample of the study. The study data were collected by the researcher by face-to-face interview technique with the "Socio-demographic Information Form" and "Scale of Adaptation to Standard Precautions" created by the researchers.

Results: 57.5% of the nurses participating in the study were women and 63.9% were single. The age of the participants in the study is between 18-65 and 31.5% of them are between 26-35 years old. 23.7% of the nurses participating in the study work in the intensive care unit, and 32.9% of them work between 26-30 years. The mean score of the Nurses' Compliance with Standard Precautions Scale was 14.48±2.80.

Conclusion: As a result of the study, the compliance score of nurses to standard precautions in the Covid-19 pandemic was found above the average. In addition, it has been determined that the characteristics of nurses such as age, gender, professional experience are factors that affect their compliance with standard precautions.

Key words: Covid-19, nurse, standard precautions

Introduction

Nurses are the health professionals who are at the forefront of health service delivery during the Covid-19 pandemic [1]. Nurses working at the bedside 24 hours a day, seven days a week to meet the severe health care needs of patients infected with Covid-19 are struggling against the risk of virus transmission [2,3]. The International Council of Nursing (ICN) has reported that there are over 90 thousand Covid-19 infected healthcare professionals worldwide [1]. The most basic precautions to be taken against Covid-19 are personal

hygiene, isolation and social distancing. In the literature, the precautions to be taken at the social level against Covid-19 are limited to these three topics, and it has been reported that the precautions to be taken for nurses, who provide care to Covid-19 infected patients in hospitals and are one of the high-risk occupational groups, should be examined in more detail [4,5]. In a meta-analysis study in which 119.219 patients infected with Covid-19 were analyzed; 10% of the patients were reported to be healthcare professionals [6]. The percent of healthcare professionals in Covid-19 cases are reported to be 14.5%

in the UK, 12.9% in the USA, and 10.6-20% in Italy [7-10]. In Turkey, it was announced that 10.9% of infected patients were healthcare professionals until February 2021; 216 of them died due to Covid-19 [11]. In a study conducted in the People's Republic of China (2020) with 2431 healthcare professionals who worked during the pandemic; it was reported that 60% of the employees were nurses and 30% were physicians [12].

Isolation methods known as standard precautions in the hospital environment are considered as a whole for patients and healthcare professionals. Standard precautions are the ones taken on the assumption that each individual is potentially infected and/or colonised with a pathogen that may cause infection. Isolation is the precautions taken by the health personnel and the patient against the known route of transmission of the infection in addition to the standard precautions [13]. The main objective of the standard precautions for healthcare professionals is to prevent the transmission of all pathogenic microorganisms from patient blood, urine and stool, secretions and mucous membranes [14]. During the pandemic process, nurses' compliance with standard precautions due to their close contact with patients infected with Covid-19 is extremely important in terms of infection control [15]. Standard precautions that nurses should apply in the fight against Covid-19 include ensuring the continuity of hand hygiene, effective use of PPE and management of wastes that are properly eliminated [16]. Standard precautions taken for healthcare professionals for Covid-19 include the use of PPE to prevent the transmission of microorganisms from body fluids such as blood, urine, stool, and environmental waste management [14]. Standard precautions must always be applied. Hand hygiene and respiratory hygiene are the most basic precautions. Hand washing and the use of alcohol-based antiseptics are the most effective and simplest ways to prevent the spread of respiratory infections [17]. Rational, consistent and correct use of PPE is essential to prevent the spread of pathogens. The effectiveness of PPE is largely dependent on regular and adequate supplies, adequacy of staff training, proper hand hygiene and appropriate individual behaviour [18]. Patients should cover their mouth and nose with a napkin or elbow when sneezing or coughing. Hands hygiene should be maintained before and after touching a patient, before any aseptic procedure is performed, after contact with body fluid, after touching the patient's environment, before and after putting on PPE [17,19]. Hand hygiene should be provided with soap and water for at least 20 seconds or with 60-95% alcohol-based hand sanitisers. If there is no visible contamination, alcohol-based disinfectants should be preferred. If there is visible contamination, hands should be washed with soap and water [19].

Isolation precautions taken in hospitals have been determined by institutions with competence in global standards such as CDC, ECDC (European Centre for Disease Prevention and Control) [20]. In Turkey, these standards are carried out by "Infection Control Committees" established by the relevant persons in hospitals under the Ministry of Health [21]. Compliance of healthcare professionals with infection control methods is important in terms of minimizing nosocomial infections [22].

Material and methods

Aim

It was a descriptive and cross-sectional study to determine the nurse's compliance with standard precautions during Covid-19.

Place and date

The study was conducted between September and December 2021 at a training and research hospital, a tertiary healthcare institution in Gaziantep city centre and serving in two separate buildings. The total number of beds in hospital is 840. The hospital has internal and surgical inpatient wards, general

intensive care, internal and surgical intensive care, neonatal intensive care wards.

Population and sample

The study population consisted of 896 nurses. The sample size was calculated as 270, which was determined by power analysis with a significance level of 0.05, a confidence interval of 0.95, an effect size of 0.5, and a 95% representativeness of the universe. The 12 nurses who were on leave during the data collection period, 25 nurses who did not want to participate in the study and 14 nurses who collected incomplete data forms were excluded from the study and the study was completed with 219 nurses. In the study, simple random sampling method was used.

Inclusion criteria

- Volunteering for the study
- Being in the nursing profession during the pandemic

Exclusion criteria

- Not working in the hospital where data is collected during the pandemic
- Not volunteering
- Failure to complete data forms in full

Data collection

The data were collected online. After the data collection forms were created from Google form, the executive nurses were contacted. Necessary explanations about the study were made. E-mail addresses or mobile phone numbers of the nurses were obtained. The link to the data collection forms was shared with the nurses to be included in the study. The necessary explanation about the study and consent for participation in the study were added to the data collection form.

Descriptive characteristics form

In this form, which was prepared by the researcher by examining the relevant literature, there are 5 questions including descriptive characteristics of the nurses such as age, gender, marital status, duration of professional experience and the unit of employment.

Compliance with Standard Precautions Scale (CSPS)

The Compliance with Standard Precautions Scale (CSPS) is a scale that aims to reveal the compliance of healthcare professionals with standard protective precautions, which are evaluated within the scope of precautions to be taken for infection control. In other words, it is a measurement tool in which healthcare professionals make self-assessments to determine whether they exhibit protective and safe behaviours in infection control and prevention [23]. The scale was developed by Simon Ching Lam in 2011 based on the international protective precautions published by the CDC [24]. The Turkish validity and reliability study of the scale was conducted by Samur et al. in 2020. The one-dimensional and four-point Likert scale is graded as "1=never", 2=rarely", "3=sometimes", "4=always". In the evaluation of the scale, the "always" response to the positively scored items (items 1, 3, 5, 7, 8, 9, 10, 11, 12, 13, 14, 16, 17, 18, 19 and 20) is coded with "1 point" and the other responses are coded with "0 points". The "never" response to the negatively scored items in the scale (items 2, 4, 6 and 15) is coded as "1 point" and the other responses are coded as "0 points". The total score that can be obtained from the scale varies between "0 - 20". Cronbach's alpha value of the original scale is 0.73. Cronbach's alpha value in this study was found to be 0.86.6.

Data evaluation

The evaluation of the data was carried out using SPSS 22 programme. Frequency and percentage calculations were used in the evaluation of data related to descriptive characteristics, mean and standard deviation values, ANOVA test, t-test and Mann Whitney-U test were used for the analysis of the nurses' level of compliance with standard precautions.

Ethical dimension of the study

Before starting the study, the necessary approvals were obtained and the principle of "Informed Consent" was fulfilled by explaining the purpose of the study to the nurses included in the study, the principle of "Confidentiality and Protection of Confidentiality" by stating that the information obtained would be kept confidential, and the principle of "Respect for Autonomy" was fulfilled by voluntary participation of all nurses.

Results

Table 1 shows the nurses' socio-demographic characteristics and 57.5% were female and 63.9% were married. 31.5% of the nurses were between 26-35 years of age, 23.7% of them were working in intensive care unit and the working years of 32.9% were between 26-30 years. It was determined that 63.5% of the nurses believed that standard precautions were protective and 63.9% did not experience any negative effects of standard precautions. In our study, it was determined that 79% of the nurses were not diagnosed with Covid-19, 92.7% did not lose any relatives due to Covid-19, and 73.5% did not live with a Covid-19 risk individual (Table 1).

The mean total score of the Standard Precautions Scale of the nurses participating in the study was found to be 14.48 ± 2.80 , which was above the literature and the average (Table 2).

The comparison of the socio-demographic characteristics of the nurses and the mean scores of the standard precautions compliance scale is given in Table 3. When the mean scores of the scale of compliance with standard precautions according to the age groups of the nurses are analyzed in the table, the mean scale score of those in the 56-65 age group was 16.25 ± 0.95 , which was higher than the other age groups, and the statistically significant difference was found ($p < 0.05$). The mean score (15.18 ± 3.64) of nurses with chronic disease on the scale of compliance with standard precautions is higher than the mean score (14.25 ± 2.82) of nurses without chronic disease and the statistically significant difference was found ($p < 0.05$). The mean scale score of the nurses working in the Intensive Care Unit (14.94 ± 2.09) was higher than the mean score of the nurses working in other units and the difference was statistically significant ($p < 0.05$). The mean scale score of nurses working 40 hours or less per week (15.22 ± 2.32) was higher than the mean scale score of nurses working 41 hours or more (14.21 ± 2.92) and the statistically significant difference was found ($p < 0.05$).

Discussion

Isolation precautions taken in hospitals have been determined by institutions with competence in global standards such as CDC, ECDC (European Centre for Disease Prevention and Control) [20]. In Turkey, these standards are carried out by "Infection Control Committees" established by the relevant persons in hospitals under the Ministry of Health [21]. In the literature, factors affecting compliance with standard precautions are reported as age, gender, educational status, frequency of managerial controls. It has also been reported that compliance with standard precautions increases with effective training provided within the organizations themselves [25].

The mean total score of the Standard Precautions Scale of the nurses participating in the study was found to be 14.48 ± 2.80 , which was above the literature and the average (Table 2). In a

Table 1

Distribution of Nurses' Socio-demographic Characteristics (N=219)

	n=219	%
Gender		
Female	126	57,5
Male	93	42,5
Marital Status		
Single	79	36,1
Married	140	63,9
Age		
18-25	32	14,6
26-35	69	31,5
36-45	47	21,5
46-55	67	30,6
56-65	4	1,8
Education Status		
High school	33	15,1
Associates Degree	82	37,4
Bachelor's Degree	91	41,6
Master's Degree	13	5,9
Chronic Disease		
Yes	55	25,1
No	164	74,9
Worked Unit		
Surgical service	40	18,3
Internal Medicine service	37	16,9
Intensive care unit	52	23,7
Operating room	26	11,9
Covid-19 unit	31	14,2
Emergency	33	15,1
Weekly Working Hours		
40 hours and less	59	26,9
41 hours and more	160	73,1
Year in the Profession		
1-5 year	63	28,8
6-10	34	15,5
11-15	14	6,4
16-20	14	6,4
21-25	22	10,0
26-30	72	32,9
Belief in the protection of standard precautions		
Yes	139	63,5
No	80	36,5
Negative effect of standard precautions (dermatitis, allergy, etc.)		
Yes	79	36,1
No	140	63,9
Receiving education about Covid-19		
Yes	119	54,3
No	100	45,7
Diagnosed with Covid-19		
Yes	46	21,0
No	173	79,0
Lost of relatives due to Covid-19		
Yes	16	7,3
No	203	92,7
Living with person in Covid-19 risk		
Yes	58	26,5
No	161	73,5

study conducted by Pereira et al. (2021), it was reported that the average compliance of nurses with standard precautions in the Covid-19 pandemic was 12.8 [5]. We think that the differences in the Covid-19 pandemic are due to the fact that the process is managed and monitored with different practices in different countries.

Table 2

Average of Nurses' Compliance with Standard Precautions Scale Total Scores

	Min.	Max.	X±SS
Standard Measures Scale Total Score	0	20	14,48±2,80

Pereira et al. (2021) reported in their study that the compliance of nurses with higher education level with standard precautions was higher than nurses with lower education level [5]. In this study, there is no significant difference between compliance with standard precautions and educational status. Similarly, the results of the study conducted by İkbāl and Özdemir are in parallel with our study [26]. It is thought that training can increase awareness, improve behaviour and create changes in practices. Considering that the education levels of the participants in both studies were similar, we think that the differences may be due to the courses taken during the training sessions and the courses given during Covid-19.

According to Table 3, the mean score of compliance with standard precautions scale of female nurses (14.30±2.90) was lower than that of male nurses (14.73±2.66) and the difference was not statistically significant ($p>0.05$). In the literature, it has been reported that there is a relationship between the mean scores of compliance with standard precautions and the mean scores of gender [14,25]. Cruz et al. (2020) reported that male student nurses showed higher compliance with standard precautions than females [25]. Pereira et al. reported that women were more likely to comply with standard precautions than men [5]. In our country, especially in the Covid-19 process, we think that the fact that nursing practices are expected to be performed by each nurse in accordance with the standards, regardless of gender, is the reason why no relationship was found between compliance with standard precautions and gender

When the compliance with standard precautions according to the age groups of the nurses participating in our study is analyzed, it was found that the mean scale score of nurses in the 56-65 age group was (16.25±0.95) and higher than the other age groups, the mean age of nurses with the lowest mean score (14.09±2.88) was 18-25 and there was a statistically significant relationship between age and mean scale score ($p<0.05$). In terms of Covid-19, it has been reported that individuals over 65 years of age who are in the risk group have higher compliance with protective precautions/standard precautions compared to younger individuals [26,27]. We assume that this difference between the age of the nurses participating in the study and their compliance with standard precautions is related to the fact that they are not in a risky age group in terms of Covid-19.

When the mean scores of compliance with standard precautions according to the units in which nurses work were analyzed, The mean scores of the nurses working in the emergency department (14.87±2.76) were higher than those working in other units and the difference was statistically significant ($p<0.05$). We believe that the main source of this difference is that emergency departments undertook important tasks in identifying and isolating patients, preventing in-hospital infections and informing public health authorities during the Covid-19 outbreak.

In the literature, there are studies indicating that compliance with standard precautions increases with increasing clinical experience [14,28]. In this study, unlike the literature, no significant difference was found between occupational working time and compliance with standard precautions scores.

Global health organizations such as WHO and CDC have identified risk groups where the disease can cause serious illness

Table 3

Comparison of Nurses' Socio-Demographical Characteristics and Mean Scores of the Scale of Compliance with Standard Precautions

	Scale of Compliance with Standard Measures X±SS	Test and p
Gender		
Female	14,30±2,90	t=5356,5 p=,274
Male	14,73±2,66	
Medeni Durum		
Single	14,68±2,70	t=5,347 p=,682
Married	14,37±2,86	
Age		
18-25	14,09±2,88	
26-35	14,30±3,13	t=4,072 p=,036
36-45	14,38±2,62	
46-55	14,82±2,58	
56-65	16,25±0,95	
Education Status		
High school	14,72±2,38	
Associate's degree	14,32±2,88	t=6,051 p=,109
Bachelor's Degree	14,74±2,88	
Master's Degree	13,00±2,48	
Chronic Disease		
Yes	15,18±3,64	t=3673,5 p=,038
No	14,25±2,82	
Worked Unit		
Surgical Service	14,82±2,62	
Internal Medicine Service	14,48±3,12	
Intensive care unit	14,94±2,09	
Operating room	13,61±3,22	t=6,032 p=,033
Covid-19 unit	13,58±3,15	
Emergency	14,87±2,76	
Weekly Working Hours		
40 hours and less	15,22±2,32	t=3874,5 p=,040
41 hours and more	14,21±2,92	
Year in the Profession		
1-5 year	13,82±3,19	
6-10	14,79±2,77	
11-15	14,50±2,06	t=9,780 p=,082
16-20	13,07±3,17	
21-25	15,18±2,57	
26-30	14,97±2,42	
Belief in the protection of standard precautions		
Yes	14,40±3,00	t=5407,5 p=,733
No	14,62±2,42	
Negative effect of standard precautions (dermatitis, allergy, etc.)		
Yes	14,59±3,08	t=5178,0 p=,431
No	14,21±2,64	
Receiving education about Covid-19		
Yes	14,45±3,09	t=2,245 p=,135
No	14,52±2,42	
Diagnosed with Covid-19		
Yes	14,67±2,59	t=1,412 p=,236
No	14,43±2,86	
Lost relatives due to Covid-19		
Yes	15,12±2,70	t=1423,5 p=,407
No	14,43±2,81	
Living with person in Covid-19 risk		
Yes	14,84±2,98	t=1,144 p=,775
No	14,35±2,73	

*ANOVA test, t-test and Mann Whitney-U

while combating Covid-19. Some of these groups are; being over 65 years of age, having a chronic disease [20]. In the literature, it is reported that people with chronic diseases show more compliance with preventive precautions/standard precautions [17,27]. In this study, the mean score of nurses' compliance with standard precautions with chronic disease was higher than those without chronic disease and the difference was found significant statistically.

Strength and limitation

The limitation of this study is that the study data were not collected during the pandemic process and the nurses could not spare enough time.

Conclusion and recommendations

According to the results, the level of compliance of the participants with standard precautions is above the average value. In order to carry out the Covid-19 fight against the pandemic more effectively, it is recommended to increase training, counselling, monitoring and supervision activities aimed at further increasing

the level of compliance with standard precautions, with priority to nurses working in clinics.

As a result of the study, the recommendations are as follows:

- Provision of the minimum materials required in the working environment, especially and primarily in terms of standard protective precautions (apron, mask, etc.),
- Making standard protective precautions and safety training part of orientation programmes,
- Mandatory and regular training of nurses on the use of protective equipment
- Evaluation of nurses' protective use through observations and improvement with feedbacks.

Disclosures: There is no conflict of interest for all authors.

Acknowledgements: None.

Funding: None.

References

1. Caliskan Pala S., Metintas S. Healthcare Workers In The Covid 19 Pandemic. *Estudam Journal of Public Health*. 2020; 156-168. <https://doi.org/10.35232/estudamhsd.789806>
2. Huang L., Lin G., Tang L., Yu L., Zhou Z. Special Attention to Nurses' Protection During The COVID 19 Epidemic. *BioMed Central*. 2020. <https://doi.org/10.1186/s13054-020-2841-7>
3. Maben J., Bridges J. Covid-19: Supporting Nurses' Psychological and Mental Health. *Wiley Online Library*. 2020; 2742–50. <https://doi.org/10.1111/jocn.15307>
4. Lindholt, M. F., Jørgensen, F. J., Bor, A., & Petersen, M. B. Willingness to use an approved COVID 19 vaccine: cross-national evidence on levels and individual-level predictors. *Preprint at PsyArXiv*. 2020. <https://doi.org/10.31234/osf.io/8kn5f>
5. Pereira V. H., Torres L. N., Rodrigues N. M., Monteiro D. A. T., Moraes J. T., Pereira-Ávila F. M. V., et al. Compliance With Standard Precautions By Nursing Professionals and Related Factors. *Escola Anna Nery*. 2021;25(3). <https://doi.org/10.1590/2177-9465-EAN-2020-0193>
6. Sahu A. K., Amrithanand V., Mathew R., Aggarwal P., Nayer J., Bhoi S. COVID 19 in Health Care Workers—A Systematic Review and Meta-Analysis. *The American Journal of Emergency Medicine*. 2020. <https://doi.org/10.1016/j.ajem.2020.05.113>
7. Remuzzi A., Remuzzi G. COVID 19 and Italy: What Next? *The Lancet*. 2020; 395(10231):1225-8. [https://doi.org/10.1016/S0140-6736\(20\)30627-9](https://doi.org/10.1016/S0140-6736(20)30627-9)
8. Lombardi A., Consonni D., Carugno M., Bozzi G., Mangioni D., Muscatello A., et al. Characteristics of 1573 Healthcare Workers Who Underwent Nasopharyngeal Swab Testing for SARS-CoV-2 in Milan, Lombardy, Italy. *Clinical Microbiology and Infection*. 2020; 26(10):1413.e9-1413.e13. <https://doi.org/10.1016/j.cmi.2020.06.013>
9. Wang X., Ferro E. G., Zhou G., Hashimoto D., Bhatt D. L. Association Between Universal Masking in a Health Care System and SARS-CoV-2 Positivity Among Health Care Workers. *JAMA*. 2020;324(7):703-4. <https://doi.org/10.1001/jama.2020.12897>
10. Hunter E., Price D. A., Murphy E., Van Der Loeff I. S., Baker K. F., Lendrem D., et al. First Experience of COVID 19 Screening of Health-Care Workers in England. *The Lancet*. 2020;395(10234):77-8. [https://doi.org/10.1016/S0140-6736\(20\)30970-3](https://doi.org/10.1016/S0140-6736(20)30970-3)
11. BBC News Turkish. Health Minister Husband: 216 of our health workers have lost their lives since the beginning of the epidemic 2020 [Available from: <https://www.bbc.com/turkce/live/haberler-turkiye55240692>. Access Date: 08.10.2021.
12. Wang J., Zhou M., Liu F. Reasons for Healthcare Workers Becoming Infected With Novel Coronavirus Disease 2019 (COVID-19) in China. *Journal of Hospital Infection*. 2020;105(1):100-1. <https://doi.org/10.1016/j.jhin.2020.03.002>
13. Beklevic A. C. COVID 19 and Infection Control Measures in Healthcare Centers. *Western Black Sea Journal of Medicine*. 2021;5(2):125-131. <https://doi.org/10.29058/mjwbs.896673>
14. Donati D., Biagioli V., Cianfrocca C., De Marinis M. G., Tartaglini D. Compliance With Standard Precautions Among Clinical Nurses: Validity and Reliability of The Italian Version of The Compliance With Standard Precautions Scale (CSPS-It). *International Journal of Environmental Research and Public Health*. 2019;16(1):121. <https://doi.org/10.3390/ijerph16010121>
15. Haile T. G., Engeda E. H., Abdo A. A. Compliance With Standard Precautions and Associated Factors Among Healthcare Workers in Gondar University Comprehensive Specialized Hospital, Northwest Ethiopia. *Journal of Environmental and Public Health*. 2017;2017. <https://doi.org/10.1155/2017/2050635>
16. Ahorsu D. K., Lin C.-Y., Imani V., Saffari M., Griffiths M. D., Pakpour A. H. The Fear of COVID 19 Scale: Development and Initial Validation. *International Journal of Mental Health and Addiction*. 2020. <https://doi.org/10.1007/s11469-020-00270-8>
17. Jordan V. Coronavirus (COVID-19): infection control and prevention measures. *Journal of Primary Health Care*. 2020;12(1):96-97. <https://doi.org/10.1071/HC15950>
18. World Health Organization. Infection prevention and control during health care when COVID 19 is suspected: interim guidance, 19 March 2020 (No. WHO/2019 nCoV/IPC/2020.3).

19. Annak I. M., & Karaveli E. O. Isolation measures that nurses should take in the care of patients with COVID-19. *YIU Journal of Health Sciences*. 2020; 1:48-52.
20. Center for Disease Control and Prevention. Optimizing Personal Protective Equipment (PPE) Supplies 2019 [Available from: <https://www.cdc.gov/coronavirus/2019-ncov/hcp/ppestrategy/index.html>]. Erişim Tarihi: 06.10.2021
21. Republic of Turkey Ministry of Health. COVID 19 (SARS-CoV-2 Infection) Guide. *Scientific Committee Study*. 2020;14.
22. Temoçin F., Köse H., Sürel A. A. Preparation of clinical decision support systems for infection control measures and evaluation of effectiveness. *Journal of Health Sciences and Medicine*. 2019;2(2):54-57. <https://doi.org/10.32322/jhsm.458438>
23. Samur M., Seren Intepeler S., Lam S. C. Adaptation And Validation of The Compliance With Standard Precautions Scale Amongst Nurses in Turkey. *International Journal of Nursing Practice*. 2020:e12839. <https://doi.org/10.1111/ijn.12839>
24. Lam S. C. Validation and Cross-Cultural Pilot Testing of Compliance With Standard Precautions Scale: Self-Administered Instrument for Clinical Nurses. *Infect Control Hosp Epidemiol*. 2014;35(5):547-55. <https://doi.org/10.1086/675835>
25. Cruz J. P., Colet P. C., Al-otaibi J. H., Soriano S. S., Cacho G. M., Cruz C. P. Validity and Reliability Assessment of the Compliance with Standard Precautions Scale Arabic Version in Saudi Nursing Students. *Journal of Infection and Public Health*. 2020;9(5):645-53. <https://doi.org/10.1016/j.jiph.2016.01.010>
26. Jorgensen F. J., Bor A., Petersen M. B. Compliance Without Fear: Predictors of Protective Behavior During The First Wave of The COVID 19 Pandemic. *PsyArXiv May*. 2020;19. <https://doi.org/10.31234/osf.io/8kn5f>
27. Rothgerber H., Wilson T., Whaley D., Rosenfeld D. L., Humphrey M., Moore A., ve ark. Politicizing The COVID 19 Pandemic: Ideological Differences in Adherence to Social Distancing. *PsyArXiv Preprints*. 2020. <https://doi.org/10.31234/osf.io/k23cv>
28. Alshammari F., Cruz J. P., Alquwez N., Almazan J., Alsolami F., Tork H., et al. Compliance With Standard Precautions During Clinical Training of Nursing Students in Saudi Arabia: A Multi-University Study. *The Journal of Infection in Developing Countries*. 2018;12(11):937- 45. <https://doi.org/10.3855/jidc.10821>