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The determination of the perceived stress levels and health-protective behaviors of nursing students during the COVID-19 pandemic

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Abstract

Purpose: The study was carried out to determine the perceived stress levels and health-protective behaviors of nursing students during the COVID-19 pandemic.

Design and Methods: This study used a descriptive design. The sample consisted of a total of 372 students.

Findings: The examination of the protective measures adopted by the students against COVID-19 indicated that the mean perceived stress subscale scores of the students who did not use a mask and disposable wipes when coughing/sneezing were statistically significantly higher ($p < .005$).

Practice Implications: The stress levels of students should be determined at certain intervals, and interventional studies on coping methods that will reduce stress levels should be planned.

KEYWORDS
health-protective behaviors, nursing students, perceived stress

1 | INTRODUCTION

Today, stress (strain) has become an important part of modern life.[1] Stress can occur as a result of interaction with the external environment, sometimes due to time pressure, sometimes as a result of an unexpected reaction or event, as well as factors associated with the inner world of the person.[2] The COVID-19 outbreak is also an unexpected circumstance for society and still prevails with its global effects that are not known clearly. Health authorities in Turkey as well as in the world have taken a number of measures to combat the pandemic. Despite all precautions taken, the number of confirmed cases and deaths and the number of patients who need to be treated in intensive care units vary in our country and the world. Therefore, COVID-19 has turned into a stressful phenomenon due to its effects on human life in various ways.[3] Also, widespread social isolation, quarantine, lockdown, and similar measures cause stress and panic levels to increase.[4,5] According to a study, for instance, the global COVID-19 pandemic is an important source of stress due to the uncertainties experienced.[6] In another study, it has been stated that approximately 18%–35% of young individuals in countries apart from the United States, who are concerned about COVID-19 have mental health problems.[7] Nursing students who receive distance education at home because of the pandemic have faced stress factors that affect their academic performance and quality of life since the first moments of their education life.[8,9] Nursing students' exposure to long-term and uncontrollable stress affects their professional identity and health status negatively.[10,11] The continuation of the pandemic and the position of healthcare personnel at the forefront during this process might have adversely affected nursing students. We have not reached any studies on the perceived stress levels and health-protective behaviors of nursing students during the COVID-19 pandemic in Turkey. Therefore, the present study was carried out to determine the perceived stress levels and health-protective behaviors of nursing students during the COVID-19 pandemic.

2 | METHODS

2.1 | Research design and sampling

This study used a descriptive design. The study was carried out between 5 and 10 June, 2020 with students from the Faculty of Health Sciences Nursing Department. No sampling method was employed in the study; instead, 535 students who were already enrolled in the nursing department were targeted. The sample of the study consisted of 372 students who voluntarily agreed to participate in the study (participation rate: 69.5%).

2.2 | Data collection tools

The study data were collected using a questionnaire designed by the researchers and the perceived stress scale (PSS).

The Questionnaire has an introductory information form (11 questions) and questions about COVID-19 (six questions).[6,25] The introductory information form consists of questions about students' school year, age, gender, marital status, income level, perceived health, chronic disease status, smoking status, regular exercise status, regular sleeping status, and regular nutrition status. The questions about COVID-19 are as follows: are there any individuals in your family/circles who tested positive for COVID-19? Have you thought you have been infected with COVID-19 in this process? If yes, did you have a test and were you quarantined? Are you following the developments about COVID-19? What do you do to protect yourself from COVID-19 when you go out? The question about measures against COVID-19 has 13 subheadings (wearing a mask, wearing gloves, wearing protective goggles, wearing a N95 mask, wearing a face shield, washing hands with enough soap and water after a contact, washing hands with enough soap and water after coughing or sneezing, using disposable wipes while coughing or sneezing, ventilating the environment frequently, washing the items bought with enough water, staying at home, keeping social distance, and contacting others through phone calls).

The PSS was developed by Cohen et al.[12] and its Turkish validity and reliability study was conducted by Eskin et al.[1] The scale consists of 14 items and aims to measure the extent to which certain circumstances in one's life are appraised as stressful. It has two subscales: perceived self-efficacy and perceived stress/strain. Also, it has a 5-point Likert type scoring system. Each item on the scales is scored with options, such as "never = 0 points," "almost never = 1 point," "sometimes = 2 points," "fairly often = 3 points," and "very often = 4 points." The scores of the seven positive items on the scale are inversed. The scores of the scale range from 0 to 56, and high scores indicate a high level of stress. The internal reliability coefficient of the items about perceived stress on the scale is 0.84.[1] In the current study, Cronbach's α coefficient of the scale was calculated as .86.

2.3 | Variables of the study

The dependent variable was the perceived stress level. The independent variables, on the other hand, included school year, gender, marital status, educational status, income status, perceived health, chronic diseases, smoking, regular nutrition and sleep, doing regular exercise, wearing a mask, wearing gloves, wearing protective goggles, wearing a face shield, washing hands with enough soap and water after a contact, washing hands with enough soap and water after coughing or sneezing, using disposable wipes while coughing or sneezing, ventilating the environment frequently, washing the items bought with enough water, staying at home, keeping social distance, and contacting others through phone calls.

2.4 | Data collection

The study data were collected by sharing the online questionnaire link. After the data collection tools of the research had been designed on Google forms and the students had been informed by the researchers, the forms were shared through the social media groups of the students. The confidentiality of students' responses was ensured, and the responses were only viewed on Google forms through the e-mail account defined on behalf of the researchers.

2.5 | Statistical analysis

The study data were analyzed on SPSS (statistical package for social sciences) 22.00 statistical software package. Descriptive statistics (numbers, percentages, mean scores), t test, variance analysis, and Kruskal-Wallis analyses were employed in the analysis of the data.

2.6 | Ethical considerations

To conduct the study, necessary approvals were obtained from the related institution, the Clinical Research Ethics Committee of the university (Date: 01.06.2020, Issue: HRU.20.10.08), the Ministry of Health General Directorate of Health Services COVID-19 Scientific Research Evaluation Commission, the participants, and the author of the scale. Before the data collection tools were filled out, the students were informed about the study on the first page of the online link, and they were asked to check the statement "I agree to participate in the study" if they agreed to participate in the study. On their social media groups, the students were informed that they had the right to quit the study at any stage and that participation in the study was voluntary. Students who completed the form online were deemed to have agreed to participate in the study.

TABLE 1 Distribution of students' descriptive characteristics related to COVID-19

Characteristics	*n*	%
An individual who tested positive for COVID-19 in family/circles		
Yes	33	8.9
No	339	91.1
The thought that one got infected with COVID-19 in the pandemic process		
Yes	114	30.6
No	258	69.4
The status of having a COVID-19 test		
Yes[a]	5	1.3
No	367	98.7
Quarantine status		
Yes	9	2.4
No	363	97.6
Keeping up with developments on COVID-19		
Yes	351	94.4
No	21	5.6

[a]The result of the all tests was negative.

3 | RESULTS

The mean age of the students participating in the study was 21.06 ± 2.23 years. Also, 77.7% of the students were female, 96.8% were single, 8.9% had good income level, 72.3% had middle income, 18.8% had low income, 20.0% were 1st-year students, 22.3% were 2nd-year students, 26.1% were 3rd-year students, and 29.6% were 4th-year students. Besides, 49.2% of the students had a moderate level, 47.3% had a good level, and 3.5% had a bad level of perceived health. Moreover, 89.8% did not have any chronic diseases, 8.1% were smokers, 43.3% did exercise regularly, 56.7% had an irregular sleep pattern, and 58.1% had a regular diet.

On the other hand, 8.9% of the students had someone who tested positive for COVD-19 in their circles, 30.6% thought that they had been infected with COVID-19 during the pandemic, 1.3% got tested for the virus, and 2.4% had been quarantined. Besides, 94.4% of the students stated they followed the developments related to COVID-19 (Table 1).

To protect from COVID-19, 88.2% of the students wore face masks, 43% wore gloves, 1.9% wore protective goggles, 5.4% wore N95 masks, and 2.2% wore face shields. Also, 94.1% of the students participating in the study stated they paid attention to social distancing, 96.5% washed their hands with enough soap and water after a contact, 88.7% washed their hands after coughing/sneezing, 73.1% used disposable wipes when coughing/sneezing, 97.6% ventilated their physical environment frequently, % 84.1 washed the items they bought, and 94.4% stayed at home and contacted others through phone calls.

The mean score of the students was 30.82 ± 7.16 from the overall scale, 17.61 ± 4.29 from the perceived stress/strain subscale, and 13.20 ± 3.75 from the perceived self-efficacy subscale.

The mean perceived stress subscale scores of female students were found to be statistically significantly higher than those of males ($p < .005$). Also, the mean perceived stress subscale scores of the students who expressed their income level as poor, perceived their health as bad, had chronic diseases, did not sleep regularly, and did not eat regularly were determined to be statistically significantly higher ($p < .005$; Table 2).

The examination of protective measures adopted by students against COVID-19 indicated that the mean perceived stress subscale scores of the students who did not wear a mask and use disposable wipes when coughing/sneezing were statistically significantly higher ($p < .005$; Table 3).

4 | DISCUSSION

This study was carried out to determine the perceived stress levels and health-protective behaviors of nursing students during the COVID-19 pandemic. However, since there were no studies conducted on this topic, the discussion section included comparisons with studies on different topics using the perceived stress scale. In the present study, the mean perceived stress scale score of the students was determined as 30.82 ± 7.16. In a study, 42.6% of students were reported to experience high levels of stress.[13] Gupta et al.[14] stated that 35.4% of the students in their study experienced high levels of stress. The result obtained from the study was important in terms of showing that the perceived stress levels of the students increased. Also, the increasing trend of students' stress levels during the COVID-19 pandemic process was an expected result.

In the present study, the perceived stress level of females was found to be significantly higher. Contrary to this study, gender was stated to not affect the stress level in a study.[15] On the other hand, Shaw et al.[16] determined the stress levels of males higher. The roles that society imposes on women may have caused them to be more sensitive and their stress levels to increase during the pandemic process.

The perceived stress level of students in the current study was determined to increase as their school year increased, but the difference was not statistically significant. Similar to this study, Özden[17] stated that there was no significant difference between students' school years and stress levels. In the study, the finding that students' stress levels increased as their school years increased suggested that their awareness of the health field was high. This may be because as the school year increases, students receive more information relating to the field of health and put this information into practice. For this reason, students might have realized the necessity to behave more sensitively during the COVID-19 pandemic in light of the information they had received, and this may have increased their stress levels.

The perceived stress levels of students with chronic diseases were significantly higher in the study. Although chronic diseases are among the primary stressors that change the ability of the individual to adapt, several other accompanying factors (treatments,

TABLE 2 Comparison of students' descriptive characteristics and their mean Perceived Stress Scale scores

Descriptive characteristics			Perception of disturbance/stress		Insufficient self-efficacy perception		Stress scale total score	
	n	%	X̄ ± SD	Statistical value	X̄ ± SD	Statistical value	X̄ ± SD	Statistical value
Gender								
Female	289	77.7	17.98 ± 4.16	*t* = 3.173	13.32 ± 3.71	*t* = 1.141	31.31 ± 7.00	*t* = 2.495
Male	83	22.3	16.31 ± 4.49	**p = .002**	12.79 ± 3.88	*p* = .255	29.10 ± 7.47	**p = .013**
Marital status								
The married	12	3.2	15.08 ± 5.35	*z* = −2.020	12.25 ± 4.95	*z* = −0.671	27.33 ± 9.19	*z* = −1.859
Single	360	96.8	17.70 ± 4.23	**p = .043**	13.24 ± 3.71	*p* = .502	30.94 ± 7.07	*p* = .063
Income status								
Good	33	8.9	16.78 ± 4.79	*F* = 4.653	12.93 ± 4.74	*F* = 3.490	29.72 ± 8.69	*F* = 5.128
Midle	269	72.3	17.36 ± 4.24	**p = .010**	12.96 ± 3.48	**p = .032**	30.33 ± 6.78	**p = .006**
Bad	70	18.8	18.97 ± 4.01		14.27 ± 4.10		33.24 ± 7.38	
Grade level								
1st	82	22.0	17.30 ± 4.06	*F* = 0.885	12.63 ± 3.05	*F* = 2.086	29.93 ± 6.27	*F* = 1.644
2nd	83	22.3	17.15 ± 4.63		12.93 ± 4.01		30.09 ± 7.57	
3rd	97	26.1	17.77 ± 4.34	*p* = .449	13.13 ± 3.81	*p* = .102	30.90 ± 7.19	*p* = .179
4th	110	29.6	18.05 ± 4.14		13.90 ± 3.92		31.96 ± 7.36	
Health perception								
Good	176	47.3	15.97 ± 4.19	K-W = 51.195	11.77 ± 3.75	K-W = 53.167	27.74 ± 6.98	K-W = 67.246
Middle	183	49.2	18.93 ± 3.80	**p = .000**	14.34 ± 2.98	**p = .000**	33.28 ± 5.79	**p = .000**
Bad	13	3.5	21.23 ± 3.72		16.61 ± 5.69		37.84 ± 8.95	
Chronic disease								
Yes	38	10.2	20.07 ± 4.91	*t* = 3.799	15.63 ± 4.84	*t* = 4.291	35.71 ± 8.61	*t* = 4.554
No	334	89.8	17.33 ± 4.13	**p = .000**	12.93 ± 3.51	**p = .000**	30.26 ± 6.77	**p = .000**
Smoking								
Yes	30	8.1	18.10 ± 5.13	*t* = −0.236	14.40 ± 4.78	*t* = −1.152	32.50 ± 9.02	*t* = −.735
No	342	91.9	17.57 ± 4.21	*p* = .813	13.10 ± 3.64	*p* = .249	30.67 ± 6.97	*p* = .462
Regular exercises								
Yes	60	16.1	17.51 ± 5.08	*t* = −0.195	12.81 ± 4.58	*t* = −0.884	30.33 ± 8.80	t = -0.580
No	312	83.9	17.63 ± 4.13	*p* = .846	13.28 ± 3.57	*p* = .377	30.91 ± 6.81	p = 0.562
Regular sleep								
Yes	161	43.3	16.70 ± 4.11	*t* = −3.644	12.60 ± 3.53	*t* = −2.718	29.31 ± 6.83	t = -3.621
No	211	56.7	18.31 ± 4.30	**p = .000**	13.66 ± 3.86	**p = .007**	31.98 ± 7.20	**p = 0.000**
Regular diet								
Yes	216	58.1	16.68 ± 3.99	*t* = −5.052	12.43 ± 3.50	*t* = −4.847	29.12 ± 6.61	t = -5.621
No	156	41.9	18.89 ± 4.37	**p = .000**	14.28 ± 3.83	**p = .000**	33.18 ± 7.24	**p = 0.000**

medications, deterioration in family relationships, change in body image, or pain) can cause stress, too.[18] COVID-19 increases the likelihood of morbidity and mortality in individuals with chronic diseases.[19-21] For this reason, it was an expected result that students with chronic diseases had high stress levels.

In the present study, the stress levels of the students who regularly slept, ate, and did exercise were found to be significantly low. However, the number of students who exercised regularly was not at the desired level. Lifestyle factors, such as nutrition, sleep, and exercise, are stated to be effective in strengthening the immune system and preventing diseases during the COVID-19 pandemic.[22] The result obtained from the study indicated that students might have grasped the importance of positive health behaviors and put them into practice. Also, the low number of students exercising may have resulted from the inadequate conditions (unsuitable physical conditions for exercise) due to the pandemic.

In the current study, students with low-income status were determined to have higher stress levels, and a significant difference was found between income status and stress levels. In a study, a significant difference was determined between the income and stress levels of students. Also, in the same study, students with low-income levels were found to have high levels of perceived stress.[17]

TABLE 3 Comparison of students' health protective behaviors for COVID-19 and their mean Perceived Stress Scale Scores

Health protective behaviors			Perception of disturbance/stress		Insufficient self-efficacy perception		Stress scale total score	
	n	%	$\bar{X} \pm SD$	Statistical value	$\bar{X} \pm SD$	Statistical value	$\bar{X} \pm SD$	Statistical value
Mask								
Yes	328	88.2	17.37 ± 4.25	$t = -3.021$	13.02 ± 3.62	$t = -2.573$	30.39 ± 6.99	$t = -3.169$
No	44	11.8	19.43 ± 4.17	**$p = .003$**	14.56 ± 4.56	**$p = .010$**	34.00 ± 7.69	**$p = .002$**
Glove								
Yes	160	43.0	17.26 ± 4.74	$t = -1.380$	13.08 ± 4.03	$t = -0.544$	30.35 ± 7.90	$t = -1.112$
No	212	57.0	18.88 ± 3.91	$p = .169$	13.30 ± 3.53	$p = .587$	31.18 ± 6.54	$p = .267$
Goggles								
Yes	7	1.9	16.14 ± 7.49	$z = -0.173$	10.85 ± 4.22	$z = -1.253$	27.00 ± 10.86	$z = -0.563$
No	365	98.1	17.64 ± 4.22	$p = .863$	13.25 ± 3.73	$p = .210$	30.89 ± 7.07	$p = .573$
N95 mask								
Yes	20	5.4	16.40 ± 4.38	$z = -1.431$	11.80 ± 3.51	$z = -1.635$	28.20 ± 7.02	$z = -1.643$
No	352	94.6	17.68 ± 4.28	$p = .152$	13.28 ± 3.75	$p = .102$	30.97 ± 7.15	$p = .100$
Face shield								
Yes	8	2.2	15.87 ± 5.86	$z = -0.767$	12.25 ± 6.20	$z = -1.104$	28.12 ± 11.33	$z = -0.983$
No	364	97.8	17.65 ± 4.25	$p = .443$	13.23 ± 3.69	$p = .270$	30.88 ± 7.05	$p = .325$
Keeping social distancing								
Yes	350	94.1	17.58 ± 4.27	$z = -0.749$	13.15 ± 3.69	$z = -0.727$	30.73 ± 7.04	$z = -0.936$
No	22	5.9	18.18 ± 4.71	$p = .454$	14.04 ± 4.66	$p = .467$	32.22 ± 8.89	$p = .349$
Washing hands with plenty of soap and water after contact								
Yes	359	96.5	17.61 ± 4.25	$z = -0.138$	13.16 ± 3.66	$z = -1.380$	30.77 ± 7.01	$z = -0.701$
No	13	3.5	17.61 ± 5.48	$p = .890$	14.53 ± 5.85	$p = .167$	32.15 ± 10.76	$p = .484$
After coughing/sneezing, washing hands with plenty of soap and water								
Yes	330	88.7	17.54 ± 4.38	$t = -0.883$	13.05 ± 3.68	$t = -2.244$	30.60 ± 7.16	$t = -1.705$
No	42	11.3	18.16 ± 3.48	$p = .378$	14.42 ± 4.10	$p = .25$	32.59 ± 6.94	$p = .89$
Using disposable wipes after coughing/sneezing								
Yes	272	73.1	17.38 ± 4.29	$t = -1.705$	12.77 ± 3.59	$t = -3.770$	30.15 ± 7.03	$t = -2.995$
No	100	26.9	18.24 ± 4.24	$p = .890$	14.40 ± 3.93	**$p = .000$**	32.64 ± 7.23	**$p = .003$**
Frequent ventilation of the physical environment								
Yes	363	97.6	17.64 ± 4.30	$z = -0.820$	13.17 ± 3.76	$z = -1.020$	30.81 ± 7.18	$z = -0.008$
No	9	2.4	16.55 ± 3.94	$p = .412$	14.55 ± 3.16	$p = .308$	31.11 ± 6.37	$p = .994$
Washing the materials bought with plenty of water								
Yes	313	84.1	17.69 ± 4.22	$t = 0.770$	13.11 ± 3.65	$t = -1.158$	30.80 ± 6.95	$t = -0.145$
No	59	15.9	17.22 ± 4.64	$p = .442$	13.72 ± 4.25	$p = .248$	30.94 ± 8.22	$p = .885$
No	21	5.6	18.00 ± 5.39		15.33 ± 5.64		33.33 ± 10.56	

Income status is very important for students to protect and promote their health during the pandemic. Considering that students with good income have many opportunities to protect from the pandemic, the high levels of stress among students with low income was an expected result.

Individuals who care about their health are expected to be sensitive to take responsibility for their health.[23] Therefore, perceived health can be said to be effective in individuals' health behaviors.[24] Most of the students in the study perceived their health as good during the pandemic, which is important in developing positive health behaviors. Besides, the stress levels of the students who perceived their health as good were low as expected.

A number of precautions to be taken to protect from the COVID-19 pandemic have been cited in the literature. These measures include hand hygiene, using personal protective equipment, wearing a mask, wearing protective goggles, wearing gloves, and using aprons.[25-29] During the COVID-19 pandemic, the application of some protective measures by individuals will reduce the level of possible stress. In the current study, most of the students were found to apply measures to protect from COVID-19, and those who were

applying measures were found to have low levels of stress. However, the students who did not apply any measures were determined to have high levels of stress. Considering these results, the high level of stress experienced with an increasing trend may have prevented taking protective measures against COVID-19.

5 | CONCLUSION AND RECOMMENDATIONS

The stress levels of students tended to increase, and they were found to apply many of the protective measures outside their homes. For this reason, we may recommend that topics about COVID-19 and protective measures should be integrated into the curriculum to control the stress levels of students. Besides, it would be useful to plan regular online interviews to emphasize the importance of developing and maintaining protective behaviors.

6 | IMPLICATIONS FOR NURSING PRACTICE

Students are greatly likely to encounter patients diagnosed with COVID-19 during nursing practices. For this reason, students' stress levels will decrease when necessary measures are taken by their institution and the hospital administration to protect them and when they are aware of these measures.

CONFLICT OF INTERESTS

The authors declare that there are no conflict of interests.

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