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). 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 $\alpha$ 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.
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 $30.82 \pm 7.16$. In a study, 42.6% of students were reported to experience high levels of stress. Gupta et al. 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. On the other hand, Shaw et al. 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 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,
medications, deterioration in family relationships, change in body image, or pain) can cause stress, too. COVID-19 increases the likelihood of morbidity and mortality in individuals with chronic diseases. 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. 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.

| 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** | **%** | **X ± SD** | **Statistical value** | **X ± SD** | **Statistical value** | **X ± 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       |
| Middle                          | 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               | 32.28 ± 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 = -0.735     |
| 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         |
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.

Individuals who care about their health are expected to be sensitive to take responsibility for their health. Therefore, perceived health can be said to be effective in individuals’ health behaviors. 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, wearing personal protective equipment, wearing a mask, wearing protective goggles, wearing gloves, and using aprons. 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

### 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  | %    | X ± SD | Statistical value | X ± SD | Statistical value | X ± 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 | p = .412 | 15.33 ± 5.64 | p = .412 | 33.33 ± 10.56 | p = .412 |
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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