Disaster Medicine and Public Health Preparedness

www.cambridge.org/dmp

Original Research

Cite this article: Sagkal Midilli T, Kalkim A, Uslu B. Relationship between health anxiety and psychological resilience among nursing students and predictors of psychological resilience in the last period of the COVID-19 pandemic. *Disaster Med Public Health Prep*. **18**(e92), 1–8. doi: https://doi.org/10.1017/dmp.2024.71.

Keywords:
anxiety; COVID-19; nursing students; psychological resilience

Corresponding author:
Asli Kalkim; Email: asli.kalkim@ege.edu.tr

Relationship Between Health Anxiety and Psychological Resilience Among Nursing Students and Predictors of Psychological Resilience in the Last Period of the COVID-19 Pandemic

Tulay Sagkal Midilli PhD[1], Asli Kalkim PhD[2] and Burcu Uslu MSc[3]

[1]Manisa Celal Bayar University, Faculty of Health Sciences, Manisa, Türkiye; [2]Ege University, Faculty of Nursing, İzmir, Türkiye and [3]Trakya University, Faculty of Health Sciences, Trakya, Türkiye

Abstract

Objective: The study aimed to determine health anxiety and psychological resilience and to investigate the relationship between health anxiety and psychological resilience among nursing students in the last period of the coronavirus disease (COVID-19) pandemic.

Methods: This cross-sectional and descriptive study was conducted with 507 students in Turkey. The questionnaires used in the study were a student nurse information form, the Health Anxiety Inventory, and the Resilience Scale for Adults.

Results: The mean age of the students was 20.70 ± 1.77 years. The health anxiety mean score was 36.19 ± 6.55, and the resilience scale mean score was 117.13 ± 16.00. There was a weak negative correlation between the students' psychological resilience and their health anxiety ($r = -0.207$, $P < 0.001$).

Conclusion: Having an extended family and having good relationships with family and friends were the predictors of psychological resilience. Social support and psychological care services under a biopsychosocial model by the management of university or faculty should be implemented for university students in order to preserve their resilience and well-being, to cope with the pandemic.

Coronavirus disease (COVID-19) has caused an outbreak of acute infectious disease, which spread very rapidly in China and many other countries[1,2] and reached Turkey in a short time. Because of the coronavirus, the country was exposed to many things that it had not experienced in the recent past. Based on the number of reported cases, Turkey had the fourth highest number of reported cases as of February 21-27, 2022.[3] The outbreak brought not only the risk of death from a viral infection, but also at the same time exposed the people of China and the rest of the world to unbearable psychological pressure.

The COVID-19 outbreak and the pandemic conditions resulted in worry, fear, and many psychological problems.[2,4–6] Both in this country[6–9] and in other countries,[2,5,10] people's health anxiety levels rose during the current COVID-19 outbreak, and this caused signs of general anxiety to appear. Health anxiety is a psychological experience arising from the belief that an individual is under a great health threat, triggering physical and mental symptoms of anxiety.[11]

Resilient individuals have a tendency to maintain a stable psychological condition. Psychological resilience is defined by the APA as "a good process of accommodation to distress, trauma, tragedy, threats, or other significant sources of stress (family and relation problems, serious health, or financial problems)."[1] If an individual's communication skills are stable and flexible, there will be no long-term symptom activation, but rather they will quickly recover from a stressful life event. On the other hand, individuals who are not resilient are more prone to developing a psychological disorder such as trait anxiety after a stressful life experience.[2,5] Psychological resilience has emerged as a basic variable in the reduction and prevention of the negative psychological effects of the pandemic.[5,12]

In Turkey, the social isolation, lockdowns, and quarantines during the pandemic led to various changes in individual and social life. Social life was and still is affected physically, medically, socially, psychologically, professionally, economically, politically, and morally.[13] Quarantine and infectious diseases are an important source of stress, which can have negative effects on the general psychological health of students. Videos on COVID-19 shared on the Internet, news on the media, and relatives who become seriously ill or lose their lives can cause high levels of stress, worry, and fear. These have had a negative effect on the quality of students' lives and on their education.[6,12,14] Universities all over the world moved from face-to-face education to teaching online during the

COVID-19 quarantine. This change has increased social isolation and has caused psychological problems such as anxiety, stress, and depression in university students.[12]

In Turkey, the students who had the greatest problems during the COVID-19 pandemic, when they were unable to perform practical work and work experience in health institutions, were students of nursing departments. Not only did the pandemic itself cause stress and anxiety in nursing students, but also the situation was made worse by the education process. It was seen that conducting lessons and exams on a web-based distance learning system caused anxiety in students.[15] In the literature, it is also stated that psychological resilience has an important role in the reduction of anxiety.[2,5] In order for nursing students to achieve professional change and development and to carry out their duties in the best way possible, their psychological resilience must be increased. In doing this, it is important to determine the factors involved, and, for this reason, human psychological reactions during the pandemic should be researched.

No studies were found in the literature researching the effect of levels of health anxiety and psychological resilience in nursing students during the current COVID-19 pandemic and the affecting factors. This study was conducted at the beginning of February 2022, when the number of COVID-19 cases was still rising in Turkey, and, as in many other countries, university students were being taught face-to-face and/or online, when lockdown restrictions were being lifted and social meeting places continued to operate, and when most people had received at least 2 COVID-19 vaccinations. The study can provide critically important information for policy-makers in the Higher Education Council and university managements to understand the effect of COVID-19 on the relation between nursing students' anxiety concerning infectious disease and their psychological resilience. In this way, the study can contribute to deciding on the measures to be taken by universities to protect students' mental health in the present outbreak or in future outbreaks of disease.

In line with this information, the aim of this study was to determine health anxiety and psychological resilience and to investigate the relationship between health anxiety and psychological resilience among nursing students in Turkey in the last period of the COVID-19 pandemic.

Research Questions

- Is there a relationship between nursing students' health anxiety and psychological resilience?
- What are the factors affecting nursing students' health anxiety?
- What are the factors affecting nursing students' psychological resilience?
- What are the variables predicting nursing students' psychological resilience?

Methods

Design and Participants

This study was a descriptive and cross-sectional survey carried out between February and April 2022 in the last period of the COVID-19 pandemic with nursing students in a university in a city in the west of Turkey. The population of the study consisted of the nursing students (N = 850) who were studying in the Nursing Department of the Health Sciences Faculty. The sample of students was selected randomly by the multiclustered stratified sampling method. The formula $n = N.t^2.p.q/d.(N-1) + t^2.p.q$ was used to determine the size of the sample, where N is the population size, *P* is the probability of occurrence, q = 1–p, and d is the effect size.[16] The minimum size of the sample was determined to be 265. The criteria for inclusion in the study were (1) being a student in the nursing department where the study was conducted, (2) attending face-to-face education in the faculty, and (3) being willing to participate in the study. The criteria for exclusion from the study were (1) attending online education in the faculty and (2) not being willing to participate in the study. The sample consisted of 507 nursing students.

Data Collection and Instruments

The questionnaires used in the study were a Student Nurse Information Form, the Health Anxiety Inventory, and the Resilience Scale for Adults. The questionnaires were prepared on Google Forms by the researchers, and the link of the forms was shared with the students face to face in the classroom before lesson time. The form links were checked by the researchers after questions had been answered. It took approximately 15 minutes to complete the questionnaires.

Student Nurse Information Form

This form was prepared by the researchers after an examination of the relevant literature[2,5,15] and consisted of 14 questions, including sociodemographic characteristics (age, gender, marital status, classroom level, income level, family type, etc.), measures taken against the COVID-19 pandemic and perception of health (regard for perceived health, social support systems, etc.).

Health Anxiety Inventory (HAI)

The Health Anxiety Inventory was developed by Salkovskis et al. (2002), and the validity and reliability of the Turkish version were tested by Aydemir et al. (2013). It is a self-reporting scale consisting of 18 items.[17] Fourteen of the items on the scale consist of statements containing 4-way ordered responses asking about the individual's mental state. The remaining 4 questions ask about existing serious health conditions in the individuals. Each item on the scale is scored from 0 to 3, and the total score of the scale consists of the arithmetic total of the score of each item. The total score is between 0 and 54. High scores obtained on the scale give information on the level of worry of individuals concerning their health. These worries mostly include excessive sensitivity to an individual's bodily symptoms and thoughts concerning the negative outcomes of a possible disease to the extent of anxiety. According to reliability analysis of the HAI, the Cronbach's alpha internal consistency coefficient was 0.92.[17] In the present study, the Cronbach's alpha value was found to be 0.83.

Resilience Scale for Adults (RSA)

This scale was developed by Friborg et al. (2003) and consists of 33 items in the 6 subscales of perception of self, perception of the future, social competence, family coherence, social support, and structural style.[18] The validity and reliability of the Turkish scale was tested by Basım and Çetin (2011).[18] On the scale, structural style and perception of the future are each measured with 4 items, family coherence, perception of self, and social competence with 6 items, and social support with 7 items. The scale is arranged in

https://doi.org/10.1017/dmp.2024.71 Published online by Cambridge University Press

5-way Likert form. Some of the items on the scale (1, 3, 4, 8, 11, 12, 13, 14, 15, 16, 23, 24, 25, 27, 31, and 33) are scored in reverse.[18] An increase in the mean score on the scale is interpreted as an increase in psychological resilience, and a low score as low resilience. The Cronbach's alpha coefficient for the reliability of the scale was found to be 0.86.[18] In the present study, the Cronbach's alpha value was found to be 0.87.

Data Analysis

Data were analyzed using SPSS for Windows, Version 21.0 (IBM Corp, Armonk, NY). Descriptive statistics (numbers, percentage distribution, mean, and standard deviation) were used to describe the nursing students' sociodemographic characteristics and other variables. Independent t-test, Mann–Whitney U test, Pearson's product-moment correlation, and Kruskal–Wallis analysis were used to assess associations between scale scores and the variables. Multiple regression analysis was used to identify the factors contributing to psychological resilience. The level of significance was set at 0.05.

Ethical Standards

Ethical approval for conducting this study was obtained from the management of the Health Sciences Faculty of the university and the ethics committee of the university's Medical Faculty (approval date, December 8, 2021; No.: 20.478.486-1098). An informed consent statement was attached to the front part of the questionnaire and was obtained from all the nursing students at the beginning of the online questionnaire. The information included the purpose and procedures of the study, the voluntary nature of their participation, and the option to withdraw at any time. After that, informed written consent was obtained from the nursing students voluntarily taking part in the study. The online survey tools were collected with respect for students' privacy and anonymity. The study procedures were in compliance with the Helsinki Declaration.

Results

Sociodemographic Characteristics of the Nursing Students

The mean age of the students was 20.70 ± 1.77 years, ranging from 18 to 33 years. The sample included 78.7% females, of whom 30.4% were first-year nursing students. Also, 82.8% of the students had a nuclear family and 43.4% had a good family relationship (Table 1). It was found that 22.9% of the students had had COVID-19, and that 20.9% had lost a relative to COVID-19. Other sociodemographic characteristics of the students are presented in Table 1.

Regarding social support, 89.7% of the students said that it came from their families, and 57.6% credited their friends (Figure 1). Activities that the students said they liked when they were at home included being with family (63.3%), self-care (68%), and using social media (29%) (Figure 2).

Factors Affecting Nursing Students' Health Anxiety and Psychological Resilience

The students' total score on the HAI ranged from 19 to 63, and the mean score was 36.19 ± 6.55. Their total scores on the RSA ranged from 66 to 161, with a mean of 117.13 ± 16.00, 13.97 ± 3.18 (min. = 4, max. = 20) from the subscale of structured style, 13.88 ± 3.26 (min. = 4, max. = 20) from perception of future, 21.86 ± 4.38 (min. = 9, max. = 30) from family cohesion, 20.24 ± 4.27 (min. = 7, max. = 29) from perception of self, 20.39 ± 4.09 (min. = 9, max. = 30) from social competence, and 26.79 ± 4.47 (min. = 11, max. = 35) from social resources.

Female students scored significantly higher than male students on the HAI ($t = 4.028$, $P < 0.001$). Students who had a bad family relationship scored significantly higher on the HAI than those who had a good family relationship ($x^2 = 30.822$, $P < 0.001$). The HAI score of students who lived in a student dormitory with friends was higher than that of those who lived in a house with friends ($x^2 = 14.899$, $P = 0.002$). The HAI scores of students who thought that they had bad or moderate physical health were higher than the scores of those with good or very good physical health ($x^2 = 51.740$, $P < 0.001$). The HAI scores of those who thought they had bad or moderate psychological health were higher than the scores of those who thought they had good psychological health ($F = 31.160$, $P < 0.001$). The HAI scores of those with a moderate level of friendship were higher than the scores of those with good or very good level of friendship ($x^2 = 14.235$, $P = 0.003$). The HAI scores of those who were unable to cope with their problems were higher than the scores of those who coped ($t = 5.196$, $P < 0.001$).There was no significant difference between year of study, family type, income level, having a disease, smoking, having COVID-19, or having lost a relative to COVID-19 and the HAI score ($P > 0.005$; see Table 1).

Students with an extended family scored significantly higher on the RSA than those with a nuclear or fragmented family ($F = 7.459$, $P = 0.001$). Students who had a very good or good family relationship scored significantly higher on the RSA than those who had a bad family relationship ($x^2 = 89.268$, $P < 0.001$). The RSA scores of students with a low or moderate income were higher than the scores of those who had a high income ($F = 5.932$, $P = 0.003$). The RSA scores of those who lived at home with their families were higher than the scores of those who lived in a dormitory with friends ($x^2 = 8.263$, $P = 0.041$). The RSA scores of those who thought that they had very good physical health were higher than the scores of those who thought that they had bad or moderate physical health ($x^2 = 33.837$, $P < 0.001$). The RSA scores of those who thought that they had good psychological health were higher than the scores of those who thought that their psychological health was bad ($F = 43.120$, $P < 0.001$). The RSA scores of those who had good or very good friendships were higher than the scores of those who had bad friendships ($x^2 = 95.961$, $P < 0.001$). The RSA scores of those who coped with their problems effectively were higher than the scores of those who could not cope ($t = 10.010$, $P < 0.001$). There was no significant difference between gender, having a disease, smoking, having COVID-19, or having lost a relative to COVID-19 and the RSA score ($P > 0.005$; see Table 1).

Relationship Between Nursing Students' Health Anxiety and Psychological Resilience and Predictors of Psychological Resilience

There was a relationship between the HAI mean score and the RSA mean score of the nursing students ($r = -0.207$, $P < 0.001$, Table 2).

Table 3 presents the multiple regression result for the relationship between resilience and the independent variables. The model showed a significant association between the independent variables and resilience ($F = 31.636$, $P < 0.001$). Family type

https://doi.org/10.1017/dmp.2024.71 Published online by Cambridge University Press

Table 1. Mean scores of health anxiety, psychological resilience by the students' characteristics

Variables		n	%	Anxiety M ± SD	Test *P*-value	Resilience M ± SD	Test *P*-value
Age (years) M ± SD = 20.70 ± 1.77		507	100.0		r = 0.016 *P* = 0.712		r = 0.011 *P* = 0.810
Gender	Female	399	78.7	36.79 ± 6.22	T = 4.028 *P* < 0.001***	116.78 ± 16.22	t = 0.947 *P* = 0.344
	Male	108	21.3	33.97 ± 7.24		118.43 ± 15.13	
Year of faculty	1st year	154	30.4	35.98 ± 6.19	F = 0.425 *P* = 0.735	116.95 ± 15.05	F = 0.925 *P* = 0.428
	2nd year	128	25.2	35.81 ± 7.09		115.96 ± 15.90	
	3rd year	88	17.4	36.49 ± 6.09		116.28 ± 16.88	
	4th year	137	27.0	36.59 ± 6.55		118.98 ± 16.57	
Family	Nuclear[a]	420	82.8	36.42 ± 6.45	F = 1.711 *P* = 0.182	116.48 ± 15.82	F = 7.459 *P* = 0.001** b>a, b>c
	Extended[b]	55	10.8	34.75 ± 7.86		124.51 ± 15.54	
	Broken[c]	32	6.3	35.66 ± 4.99		112.97 ± 15.96	
Family relationship	Very good[a]	210	41.4	34.76 ± 5.99	x^2 = 30.822 *P* < 0.001*** d>c>a b>a, d>b	124.50 ± 15.13	x^2 = 89.268 *P* < 0.001*** a>b>c a>d
	Good[b]	220	43.4	36.38 ± 6.72		114.08 ± 14.13	
	Good or bad[c]	65	12.8	38.70 ± 5.61		106.01 ± 14.12	
	Bad[d]	12	2.4	44.08 ± 8.01		104.33 ± 12.69	
Income level	Low[a]	59	11.6	34.71 ± 4.67	F = 2.379 *P* = 0.094	121.13 ± 16.46	F = 5.932 *P* = 0.003** a>c, b>c
	Middle[b]	321	63.3	36.16 ± 6.49		117.90 ± 15.29	
	High[c]	127	25.0	36.95 ±7.32		113.32 ± 16.89	
Location	Student dormitory with friends[a]	291	57.4	37.03 ± 6.93	x^2 = 14.899 *P* = 0.002** a>b	115.62 ± 16.31	x^2 = 8.263 *P* = 0.041* c>a
	Home with friends[b]	32	6.3	33.43 ± 5.19		115.34 ± 12.84	
	Home with family[c]	171	33.7	35.43 ± 5.89		119.75 ± 16.17	
	Home only[d]	13	2.6	34.15 ± 5.87		120.84 ± 7.89	
Physical health	Very good[a]	33	6.5	33.67 ± 9.46	x^2 = 51.740 *P* < 0.001*** d>c>a d>c>b	124.48 ± 17.69	x^2 = 33.837 *P* < 0.001*** a>c, a>d, b>c
	Good[b]	316	62.3	34.87 ± 5.12		119.64 ± 14.43	
	Middle[c]	153	30.2	39.07 ± 6.77		110.86 ± 16.48	
	Bad[d]	5	1.0	47.60 ± 15.15		101.40 ± 20.20	
Psychological health	Good[a]	220	43.4	34.82 ± 5.49	F = 31.160 *P* < 0.001*** c>b>a	123.58 ± 14.35	F = 43.120 *P* < 0.001*** a>b>c
	Middle[b]	228	45.0	36.02 ± 6.02		113.78 ± 15.44	
	Bad[c]	59	11.6	41.96 ± 8.80		106.06 ± 14.04	
Having a disease	Yes	41	8.1	35.46 ± 5.11	t = 0.742 *P* = 0.458	120.90 ± 14.38	t = 1.576 *P* = 0.116
	No	466	91.9	36.25 ± 6.66		116.80 ± 16.11	
Smoking	Never	372	73.4	36.08 ± 6.30	x^2 = 0.926 *P* = 0.819	117.26 ± 15.77	F = 4.123 *P* = 0.249
	Every day	59	11.6	36.32 ± 6.40		119.07 ± 16.81	
	Sometimes	53	10.5	37.41 ± 8.09		113.85 ± 14.43	
	Stopped	23	4.5	34.91 ± 7.01		117.70 ± 20.53	
Friendship	Very good[a]	100	9.7	36.50 ± 7.71	x^2 = 14.235 *P* = 0.003** c>a, c>b	126.31 ± 13.98	x^2 = 95.961 *P* < 0.001*** a>b>c>d
	Good[b]	333	65.7	35.50 ± 5.58		117.66 ± 14.89	
	Middle[c]	68	13.4	39.19 ± 8.05		103.77 ± 12.54	
	Bad[d]	6	1.2	35.50 ± 8.50		86.33 ± 6.53	
Effective coping with problems	Yes	343	67.7	35.17 ± 6.13	t = 5.196 *P* < 0.001***	121.63 ± 14.28	t = 10.010 *P* < 0.001***
	No	164	32.3	38.32 ± 6.90		107.73 ± 15.34	
Having COVID-19	Yes	114	22.5	35.51± 5.76	t = 1.264 *P* = 0.207	118.24 ± 13.86	t = 0.837 *P* = 0.403
	No	393	77.5	36.39 ± 6.75		116.81 ± 16.57	
Having lost a relative to COVID-19	Yes	104	20.5	37.26 ± 7.85	t = 1.887 *P* = 0.060	116.90 ± 16.21	t = 0.163 *P* = 0.871
	No	403	79.5	35.91 ± 6.15		117.19 ± 15.96	

M, mean; SD, standard deviation; x^2, Kruskal-Wallis test; t, Independent t-test; F, Mann–Whitney U test, *$P < 0.05$, **$P < 0.01$, ***$P < 0.001$.

(β = 0.113, $P < 0.01$), family relationship (β = 0.247, $P < 0.001$), psychological health (β = 0.120, $P < 0.01$), relationship with friends (β = 0.235, $P < 0.001$), and effective coping with problems (β = 0.205, $P < 0.001$) were significantly associated with resilience. There was no significant interaction between the RSA and students' anxiety, income, the people they lived with, and physical health ($P > 0.05$).

Discussion

Recently, such factors as social isolation and economic uncertainty caused by COVID-19 have led to an increase in mental health concerns such as loneliness, anxiety, and depression.[2,4,5] The concept of psychological resilience, which explains how individuals

https://doi.org/10.1017/dmp.2024.71 Published online by Cambridge University Press

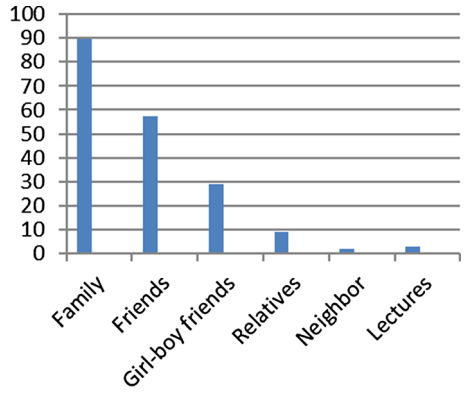

Figure 1. Social supports of students.

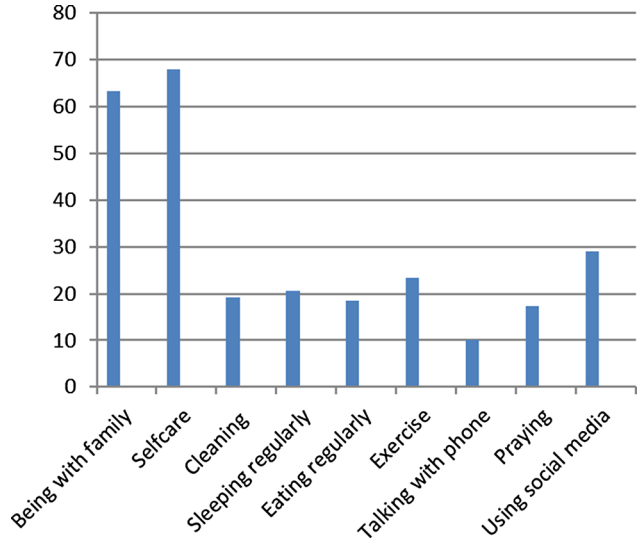

Figure 2. Students' the best activities for them in the process of staying at home.

react to mental health worries like these, has begun to attract greater attention from researchers.

Factors Affecting Nursing Students' Health Anxiety and Psychological Resilience

Health anxiety

In a study by Saeed et al. (2022) with a population of 755 180, it was found that in the COVID-19 pandemic, university students (34.7%) had the second highest prevalence of anxiety.[19] In this way we can see that university students, the professionals of the future, experience mental distress. Consistent with previous studies,[7,20] female students have higher levels of anxiety than male students. This may be because the prevalence of emotional disorders is more prevalent in females than in males, and in this study the number of female students was greater.[21–23] In the study, health anxiety was greater in students whose relationship with their family was poor, whose relationship with their friends was poor, who lived in a dormitory with friends, who stated that their physical and mental health was poor, and who could not cope with their problems. Consistent with this, it was found in previous studies that mental health during the pandemic was higher in individuals who had a poor relationship with their families,[24–27] who had a poor relationship with their friends,[28,29] who lived in a dormitory with friends,[19,30,31] who had a physical or chronic illness,[30–32] whose mental health was poor or who currently had or had previously had a psychiatric illness,[7,19,32–34] and who could not cope with their problems.[35,36] A student's poor relationships with their family and friends show that their social support is not good, and, in this way, their health anxiety increases.[37] Students living in a dormitory show more signs of anxiety than those not living in a dormitory; the financial difficulties of living on campus without working to provide for themselves leave many university students defenseless against mental problems.[20] Also, because students living in a dormitory live in more crowded conditions than those who live in a house or with their families, their likelihood of catching an infectious disease like COVID-19 is greater. Since the risk of contracting infectious diseases increases due to the high number of students in a dormitory room and the numbers of people in common areas (4-6), it is recommended to take the necessary precautions, such as reducing the number of people and improving cleaning conditions.

Psychological resilience

In the study, gender was not found to be a factor affecting the psychological resilience of students. In China, it was found that gender did not affect the psychological resilience of university students[1] and health workers.[38] In Chinese society, the psychological resilience of females has been found to be lower than that of males,[2] and similarly in Turkey it has been found to be lower in female nursing students than in males.[23,39] Because most of these studies were performed in different population groups, different results were obtained because of the different gender roles in different cultures. As the Apaydın et al.[39] (2021) study was conducted during the pandemic, the difference in the psychological resilience between men and women is more apparent. Since our study was conducted at the last period of the pandemic, it was assumed that psychological resilience improved in both genders during the pandemic period.

In the study, psychological resilience was greater in students who had an extended family, whose income level was low, who had very good relationships with their families, who lived with their families, whose relationships with their friends were very good, who stated that their physical and mental health was good, and who were able to cope with their problems effectively. It is thought that low-income students have high psychological resilience to cope with these difficulties because they grow up without many opportunities and have various economic difficulties in their lives. In the regression analysis to determine the predictive variables relating to psychological resilience, psychological resilience was found to be higher in students who had an extended family, who had very good relationships with their family and friends, whose mental health was good, and who were able to cope with their problems.

Similar to most previous studies, psychological resilience during the pandemic was greater in individuals who had an extended family,[40,41] whose income level was high,[41–44] whose relationships with their families were very good,[43,45,46] who lived with their families,[40,43,47] whose relationships with their friends were very good,[14,43,45,46,48,49] who did not have a physical or chronic illness[41,44] and whose mental health was good or who did not currently have and had not previously had a psychiatric disorder,[14,39,50] and who could cope with their problems.[13,47,48] It was found in a study by Wu et al.[1] (2020) that, in studies conducted with university and high school students, developing the psychological resilience of students could cushion negative feelings of stress,

https://doi.org/10.1017/dmp.2024.71 Published online by Cambridge University Press

Table 2. Correlations between health anxiety, psychological resilience, and their subscales

		Anxiety scale	Psychological resilience	Structured style	Perception of future	Family cohesion	Perception of self	Social competence	Social resources
Anxiety	r	1	−0.207	0.030	−0.151	−0.106	−0.324	−0.154	−0.096
Scale	*P*	.	0.000***	0.506	0.001**	0.017*	0.000***	0.000***	0.030*

*$P < 0.05$, ** $P < 0.01$, *** $P < 0.001$, r, Pearson's product-moment correlation.

Table 3. Regression model predicting nursing students' resilience (n = 507)

Factors	Beta 95.264	t-statistics 21.815	*P*-value 0.000
Anxiety	−0.015	−0.388	0.698
Family type (extended family)	0.113	3.085	0.002*
Family relationship (very good)	0.247	6.406	0.000**
Income (low + middle)	0.060	1.623	0.105
Life with family	0.043	1.177	0.240
Physical health (very good + good)	0.067	1.652	0.099
Psychological health (good + middle)	0.120	2.838	0.005*
Relationship with friends (very good/good)	0.235	6.164	0.000**
Coping style (positive)	0.205	5.115	0.000**
$R^2 = 0.364$	F (9, 507) = 31.636**	Durbin–Watson = 1.867	

*$P < 0.01$, **$P < 0.001$.

contribute to success in academic performance and to coping with stressful events, and improve feelings of well-being. This emphasizes the importance of individuals' coping skills and coping strategies, which are the 2 most important concepts at the base of psychological resilience.[39,41] Having an extended family and having good relationships with family and friends are important variables for social support. Therefore, the variables of social support, mental well-being, and the ability to cope effectively with problems, which protect an individual from stressful life events, are seen as the most important factors affecting psychological resilience.

Relationship Between the Nursing Students' Health Anxiety and Psychological Resilience

It was found in the results of this study that the health anxiety of nursing students was at a medium level, and their psychological resilience was at a medium or high level. On the other hand, it is seen in studies conducted at times when the negative effects of the pandemic in society were greater that the COVID-19 pandemic increased the health anxiety of nursing students[2,5–10] and reduced their psychological resilience levels.[12,51,52] The data of this study were collected in the final stages of the COVID-19 pandemic, and so it was seen that the students' health anxiety levels were not very high, and at the same time their psychological resilience was better, because most of the students were receiving face-to-face education at school, lockdown restrictions had been lifted, social meeting places were functioning, and most of the students had received at least 2 doses of vaccination.

Previous studies have examined the relationship between resilience and anxiety in general populations,[2,53] health personnel,[19,38,54] and university students[14,37] in different countries. However, the relationship between resilience and health anxiety among nursing students has not so far been examined in the literature. Therefore, the relation between the health anxiety and psychological resilience of Turkish nursing students during the COVID-19 pandemic was examined as a contribution to the literature. A weak negative correlation was found in this research between the nursing students' psychological resilience and their health anxiety. It shows that there is a causative relationship between the students' anxiety and psychological resilience. The findings obtained in the abovementioned studies, similar to the findings of our study, show that there is a negative correlation between psychological resilience and symptoms of depression and anxiety,[2,14,19,38,53,54] and that psychological resilience, as a potential skill of self-preservation, helps people cope with upheavals and save themselves from crises.[14] While students are facing up to all the difficulties brought on by the pandemic with psychological resilience, at the same time, their health anxiety regarding the pandemic is reduced. Thus, the students' psychological resilience can be seen as a resource to cope with feelings of anxiety concerning the pandemic, or as a protective factor.[14,19,47]

Implications for Nursing Practice

It was seen from the results of our research that social support and psychological care services need to be implemented for university students to cope with the pandemic. A crisis plan can be prepared beforehand, which can be implemented quickly and effectively by the nursing administration of the Ministry of Health and the management of the university or faculty. Also, topics such as developing strategies to cope with stress or in a crisis situation should be integrated into the nursing curriculum. In situations such as the COVID-19 outbreak, support mechanisms for university students will reduce the effects of the pandemic to a minimum and should be implemented under a biopsychosocial model in order to preserve their resilience and well-being. Collaborative dialog with students, the reflection method, and

https://doi.org/10.1017/dmp.2024.71 Published online by Cambridge University Press

teaching methods that provide solidarity between members of university communities can be used.

Limitations

There are several limitations to this study. First, all the instruments used depend on self-evaluation questionnaires given online. Second, the study was conducted in 1 department of a single faculty of a university in Turkey, and the number of participants was lower than in studies in other countries. Therefore, the results are inadequate for a potential generalization. Finally, our findings showed how anxiety and psychological resilience were occurring in nursing students, but since then the vaccine has come into use and this situation may have changed.

Conclusions

The nursing students' health anxiety was at a medium level, and their psychological resilience was between medium and high. As students' psychological resilience increased, their health anxiety decreased. Psychological resilience was higher in students who had an extended family, who had very good relationships with family and friends, whose mental health was good, and who were able to cope with their problems.

Data availability statement. The data sets generated during and/or analyzed during the current study are available from the corresponding author on reasonable request.

References

1. **Wu Y, Yu W, Wu X, *et al.*** Psychological resilience and positive coping styles among Chinese undergraduate students: a cross-sectional study. *BMC Psychol.* 2020;8(1):1-11. https://doi.org/10.1186/s40359-020-00444-y
2. **Xiao X, Xiao J, Yao J, *et al.*** The role of resilience and gender in relation to infectious-disease-specific health literacy and anxiety during the COVID-19 pandemic. *Neuropsychiatr Dis Treat.* 2020;16:3011-3021. https://doi.org/10.2147/NDT.S277231
3. World Health Organization. Weekly epidemiological update on COVID-19 – 3 March 2023. Accessed March 3, 2023. https://www.who.int/publications/m/item/weekly-epidemiological-update-on-covid-3—3-march-3
4. **Ahorsu DK, Lin CY, Imani V, *et al.*** The fear of COVID-19 scale: development and initial validation. *Int J Ment Health Addict.* 2022;20:1537-1545. https://doi.org/10.1007%2Fs11469-020-00270-8
5. **Blanc J, Briggs AQ, Seixas AA, *et al.*** Addressing psychological resilience during the coronavirus disease 2019 pandemic: a rapid review. *Curr Opin Psychiatry.* 2021;34(1):29-35. https://doi.org/10.1097/YCO.0000000000000665
6. **Köktürk Dalcalı B, Durgun H, Taş AS.** Anxiety levels and sleep quality in nursing students during the COVID-19 pandemic. *Perspect Psychiatr Care.* 2021;57(4):1999-2005. https://doi.org/10.1111/ppc.12839
7. **Özdin S, Bayrak Özdin S.** Levels and predictors of anxiety, depression and health anxiety during COVID-19 pandemic in Turkish society: the importance of gender. *Int J Soc Psychiatry.* 2020;66(5):504-511. https://doi.org/10.1177%2F0020764020927051
8. **Okuyan CB, Karasu F, Polat F.** The effect of nursing students' fear of exposure to COVID-19 on health anxiety levels: a university example. *Van J Health Sci.* 2020;13(COVID-19 Special Issue):45-52.
9. **Bahçecioğlu Turan G, Özer Z, Çiftçi B.** Analysis of anxiety levels and attitudes of nursing students toward the nursing profession during the COVID-19 pandemic. *Perspect Psychiatr Care.* 2021;57(4):1913-1921. doi: 10.1111/ppc.12766
10. **Jungmann SM, Witthöft M.** Health anxiety, cyberchondria, and coping in the current COVID-19 pandemic: which factors are related to coronavirus anxiety? *J Anxiety Disord.* 2020;73:102239. doi: 10.1016/j.janxdis.2020.102239
11. **Özdelikara A, Ağaçdiken Alkan S, Mumcu N.** Determination of health perception, health anxiety and effecting factors among nursing students. *Bakirkoy J Med.* 2018;14:275-282. https://doi.org/10.5350/BTDMJB.20170310015347
12. **Asghar MZ, Arif S, Barbera E, *et al.*** Support through social media and online class participation to enhance psychological resilience. *Int J Environ Res Public Health.* 2021;18(22):11962. https://doi.org/10.3390/ijerph182211962
13. **Yanık D, Yesilçınar İ.** The effects of social isolation experienced during the COVID-19 pandemic on nursing students: qualitative research. *J Health Acad.* 2021;8(2):103-112.
14. **Yalçın İ, Can N, Mançe Çalışır Ö, *et al.*** Latent profile analysis of COVID-19 fear, depression, anxiety, stress, mindfulness, and resilience. *Curr Psychol.* 2022;41(1):459-469. doi: 10.1007/s12144-021-01667-x
15. **Kürtüncü M, Kurt A.** The problems experienced by nursing students about distance education during the COVID-19 pandemic period. *Eurasian J Soc Econ Stud.* 2020;7(5):66-77.
16. **Sümbüloğlu V, Sümbüloğlu K.** *Research Methods in Health Sciences.* Ankara: Hatipoğlu Publishing; 2013. p. 45.
17. **Aydemir Ö, Kirpinar İ, Sati T, *et al.*** Reliability and validity of the Turkish version of the Health Anxiety Inventory. *Noro Psikiyatr Ars.* 2013;50(4):325-331. doi: 10.4274/npa.y6383
18. **Basım HN, Çetin F.** Reliability and validity study of the resilience scale for adults. *Turk Psikiyatri Derg.* 2011;22(2):104-114.
19. **Saeed H, Eslami A, Nassif NT, *et al.*** Anxiety linked to COVID-19: a systematic review comparing anxiety rates in different populations. *Int J Environ Res Public Health.* 2022;19(4):2189. doi: 10.3390/ijerph19042189
20. **Luceño-Moreno L, Talavera-Velasco B, García-Albuerne Y, Martín-García J.** Symptoms of posttraumatic stress, anxiety, depression, levels of resilience and burnout in Spanish health personnel during the COVID-19 pandemic. *Int J Environ Res Public Health.* 2020;17(15):5514. doi: 10.3390/ijerph17155514
21. **Gao W, Ping S, Liu X.** Gender differences in depression, anxiety, and stress among college students: a longitudinal study from China. *J Affect Disord.* 2020;263:292-300. doi: 10.1016/j.jad.2019.11.121
22. **Miao Q, Xie L, Xing B, *et al.*** Emotional states and coping methods in nursing and non-nursing students responding to COVID-19: a cross-sectional study in China. *BMJ Open.* 2021;11(8):1-7. doi: 10.1136/bmjopen-2021-054007
23. **Özdemir HNÇ, Özyürek P, Kılıç İ.** The relationship between psychological resilience, perceived stress, and anxiety levels of nursing students during the COVID-19 pandemic process. *J Psychiatr Nurs.* 2023;14(2):175-183. doi: 10.14744/phd.2022.80037
24. **Crandall A, Daines C, Hanson CL, Barnes MD.** The effects of COVID-19 stressors and family life on anxiety and depression one-year into the COVID-19 pandemic. *Fam Process.* 2023;62(1):336-351. doi: 10.1111/famp.12771
25. **Mousavi SK, Kamali M, Azizkhani H, Mohammadi S.** Health anxiety among nurses caring for patients with COVİD-19. *Iran J Nurs Midwifery Res.* 2022;27(2):139-143. doi: 10.4103/ijnmr.ijnmr_213_20
26. **Lu T, Yu Y, Zhao Z, Guo R.** Mental health and related factors of adolescent students during coronavirus disease 2019 (COVID-19) pandemic. *Psychiatry Investig.* 2022;19(1):16-28. doi: 10.30773/pi.2020.0416
27. **Cao C, Wang L, Fang R, *et al.*** Anxiety, depression, and PTSD symptoms among high school students in China in response to the COVID-19 pandemic and lockdown. *J Affect Disord.* 2022;296:126-129. doi: 10.1016/j.jad.2021.09.052
28. **Ma Z, Zhao J, Li Y, *et al.*** Mental health problems and correlates among 746 217 college students during the coronavirus disease 2019 outbreak in China. *Epidemiol Psychiatr Sci.* 2020;29:e181. doi: 10.1017/S2045796020000931
29. **Rogers AA, Ha T, Ockey S.** Adolescents' perceived socio-emotional impact of COVID-19 and implications for mental health: results from a U.S.-based mixed-methods study. *J Adolesc Health.* 2021;68(1):43-52. doi: 10.1016/j.jadohealth.2020.09.039
30. **Kurcer MA, Erdogan Z, Cakir Kardes V.** The effect of the COVID-19 pandemic on health anxiety and cyberchondria levels of university

students. *Perspect Psychiatr Care.* 2022;58(1):132-140. doi: 10.1111/ppc.12850

31. **Pooyanmehr N, Asgari SA.** Study of stress, anxiety, and students' self-care behaviors after the early epidemic of COVID 19 and the reopening of Iranian higher education centers; a general study. SSRN Elsevier; 2022.
32. **Kazan Kızılkurt O, Yılmaz A, Noyan CO, Dilbaz N.** Health anxiety during the early phases of COVID-19 pandemic in Turkey and its relationship with postpandemic attitudes, hopelessness, and psychological resilience. *Perspect Psychiatr Care.* 2021;57(1):399-407. doi: 10.1111/ppc.12646
33. **Koç A, Tok HH, Uzun LN, Ensari H.** Depression, anxiety and state guilt in individuals under quarantine in an institution due to COVID-19 and the related factors. *Noro Psikiyatr Ars.* 2021;58(2):146-153. doi: 10.29399/npa.27329
34. **Wang C, Zhao H.** The impact of COVID-19 on anxiety in Chinese university students. *Front Psychol.* 2020;11:1168. doi: 10.3389/fpsyg.2020.01168
35. **Achour M, Souici D, Bensaid B, *et al.*** Coping with anxiety during the COVID-19 pandemic: a case study of academics in the Muslim world. *J Relig Health.* 2021;60(6):4579-4599. doi: 10.1007/s10943-021-01422-3
36. **Zhao Y.** Investigation on anxiety and coping style of college students during COVID-19 epidemic. *Psychiatr Danub.* 2021;33(4):651-655. doi: 10.24869/psyd.2021.651
37. **Muyor-Rodríguez J, Caravaca-Sánchez F, Fernández-Prados JS.** COVID-19 fear, resilience, social support, anxiety, and suicide among college students in Spain. *Int J Environ Res Public Health.* 2021;18(15):8156. doi: 10.3390/ijerph18158156
38. **Rayani M, Rayani S, Najafi-Sharjabad F.** COVID-19-related knowledge, risk perception, information seeking, and adherence to preventive behaviors among undergraduate students, southern Iran. *Environ Sci Pollut Res Int.* 2021;28(42):59953-59962. doi: 10.1007/s11356-021-14934-y
39. **Apaydın Cırık V, Aksoy B, Gül U.** Resilience levels and coping strategies of nursing students during the COVID-19 process: a descriptive study. *Turkiye Klinikleri J Nurs Sci.* 2021;13(3):693-703. https://doi.org/10.5336/nurses.2020-79559
40. **Arslan HN, Karabekiroglu A, Terzi O, Dundar C.** The effects of the COVID-19 outbreak on physicians' psychological resilience levels. *Postgrad Med.* 2021;133(2):223-230. https://doi.org/10.1080/00325481.2021.1874166
41. **Kimter N.** Investigation of psychological resilience levels of individuals in terms of some variables in COVID-19 days. *IBAD J Soc Sci.* 2020;Special Issue:574-605. https://doi.org/10.21733/ibad.805481
42. **Parvar SY, Ghamari N, Pezeshkian F, Shahriarirad R.** Prevalence of anxiety, depression, stress, and perceived stress and their relation with resilience during the COVID-19 pandemic, a cross-sectional study. *Health Sci Rep.* 2022;5(1):e460. doi: 10.1002/hsr2.460
43. **Kılınç T, Sis Çelik A.** Relationship between the social support and psychological resilience levels perceived by nurses during the COVID-19 pandemic: a study from Turkey. *Perspect Psychiatr Care.* 2021;57(3):1000-1008. doi: 10.1111/ppc.12648
44. **Yörük S, Acikgoz A, Güler D.** The predictors of secondary traumatic stress and psychological resilience in healthcare workers during the COVID-19 pandemic: a cross-sectional study in Turkey. *Stress Health.* 2022;38(4):746-754. doi: 10.1002/smi.3129
45. **Ye Z, Yang X, Zeng C, *et al.*** Resilience, social support, and coping as mediators between COVID-19-related stressful experiences and acute stress disorder among college students in China [published correction appears in *Appl Psychol Health Well Being.* 2023;15(1):447]. *Appl Psychol Health Well Being.* 2020;12(4):1074-1094. doi: 10.1111/aphw.12211
46. **Bozdağ F, Ergün N.** Psychological resilience of healthcare professionals during COVID-19 pandemic. *Psychol Rep.* 2021;124(6):2567-2586. doi: 10.1177/0033294120965477
47. **Song S, Yang X, Yang H, *et al.*** Psychological resilience as a protective factor for depression and anxiety among the public during the outbreak of COVID-19. *Front Psychol.* 2021;11:618509. doi: 10.3389/fpsyg.2020.618509
48. **Park CL, Finkelstein-Fox L, Russell BS, *et al.*** Psychological resilience early in the COVID-19 pandemic: stressors, resources, and coping strategies in a national sample of Americans. *Am Psychol.* 2021;76(5):715-728. doi: 10.1037/amp0000813
49. **Pauly C, Ribeiro F, Schröder VE, *et al.*** The moderating role of resilience in the personality-mental health relationship during the COVID-19 pandemic. *Front Psychiatry.* 2021;12:745636. doi: 10.3389/fpsyt.2021.745636
50. **Chan ACY, Piehler TF, Ho GWK.** Resilience and mental health during the COVID-19 pandemic: findings from Minnesota and Hong Kong. *J Affect Disord.* 2021;295:771-780. doi: 10.1016/j.jad.2021.08.144
51. **Killgore WDS, Taylor EC, Cloonan SA, Dailey NS.** Psychological resilience during the COVID-19 lockdown. *Psychiatry Res.* 2020;291:113216. doi: 10.1016/j.psychres.2020.113216
52. **Li ZS, Hasson F.** Resilience, stress, and psychological well-being in nursing students: a systematic review. *Nurse Educ Today*. Published online April 19, 2020. doi: 10.1016/j.nedt.2020.104440
53. **Ran L, Wang W, Ai M, *et al.*** Psychological resilience, depression, anxiety, and somatization symptoms in response to COVID-19: a study of the general population in China at the peak of its epidemic. *Soc Sci Med.* 2020;262:113261. doi: 10.1016/j.socscimed.2020.113261
54. **Heath C, Sommerfield A, von Ungern-Sternberg BS.** Resilience strategies to manage psychological distress among healthcare workers during the COVID-19 pandemic: a narrative review. *Anaesthesia.* 2020;75(10):1364-1371. doi: 10.1111/anae.15180