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Determining University Students' Anxiety and Problem Solving Skills in the COVID-19 Pandemic Process

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Abstract

Objective: This study is a descriptive cross-sectional study that was conducted to assess the problem-solving skills and anxiety levels of all students who agreed to participate in the study at the vocational school of health services.

Methods: The population of the study included 1800 students from all departments of the 2021-2022 academic year health services vocational school at a state university in Konya, and the sample included 356 students who voluntarily agreed to participate in the study and provided informed consent. Frequency, percentage, mean, standard deviation, t-test, one-way analysis of variance Kruskal-Wallis H, and Mann-Whitney U tests were used to analyze the data.

Results: When the total mean scores of the Problem-Solving Inventory (PSI) were compared based on the variables of gender, department of education, class, childhood location, income level, family type, and status of receiving problem-solving education, no statistical significance was found. The mean approach PSI score of those with chronic diseases, on the other hand, showed a statistically significant difference. The Generalized Anxiety Disorder (GAD) score was found to be statistically significantly higher in smokers, those with chronic diseases, and those with low income (p-value<0.05).

Conclusion: It is important to plan initiatives and, if necessary, revise curricula to improve the problem-solving and anxiety-management abilities of future healthcare professionals.

Key words: Problem-solving inventory, Anxiety, University student

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INTRODUCTION

One of the fundamental functions of the brain's natural intelligence is problem-solving. In addition to being one of the most important components of a person's cognitive process, problem-solving is a cerebral process used to seek a solution to a specific problem or to achieve a specific goal. This process involves the interaction of other cognitive processes such as abstraction, research, learning, decision-making, inference, analysis, and synthesis to solve a problem (1-4). The problem-solving process is made up of a series of behaviors, such as gathering information about the perceived and defined problem, determining and applying the most appropriate coping skills in the face of the challenges encountered while solving the problem, as well as how the experiences are perceived (5). Dealing with problems in life necessitates knowledge and skills. It is reported that regardless of how complex and difficult the problem is if the individual has the necessary knowledge and skills, they could indeed find the most appropriate approach to solving the problem (6).

The COVID-19 pandemic has affected almost every aspect of life and altered the social dynamics globally (4, 7). According to the literature, the Covid-19 pandemic causes negative emotional reactions such as anxiety, fear, and anger, especially in different age groups, raises stress levels, and increases susceptibility to psychological disorders such as anxiety disorders, depressive disorders, post-traumatic stress disorder, and it has been linked to a variety of psychological symptoms suicidal thoughts (8), insomnia, and so on (9-17). Another significant effect of the pandemic has been a profound impact on the entire educational system, including health education. Knowledge gained in practice-based health fields must be put into action. During the pandemic period, however, applications that require skills are either attempted to be learned on a mannequin or simulation in laboratories or are passed without any application (7).

According to the literature, cognitive status, psychological adjustment, social-emotional competence level, self-confidence, decision-making style, effective communication skills, academic and social self-esteem, self-perception, creative thinking, imperturbability, assertiveness (18), age, gender, family income, residential area, parents' education and employment status (19) can all influence individuals' problem-solving skills. In fact, according to a study conducted to evaluate university students' problem-solving skills, university students evaluate their problem-solving skills more positively as their families' monthly income, perceived academic success, and satisfaction with the department they study increase; another study on the same subject found that variables such as school type, age, gender, and father's occupation influenced students' perception of their problem-solving skills, whereas mother's

occupation and parental education levels had no effect (20). The purpose of this study is to identify the factors that influence the anxiety and problem-solving skills of students in the vocational school of health services during the COVID-19 pandemic.

The hypotheses of the research are listed below.

H0: According to the sociodemographic characteristics of the students, there is no relationship between their anxiety and their problem solving skills.

H1: There are differences in anxiety levels according to the sociodemographic characteristics of the students.

H2: There are differences in problem solving skills according to the sociodemographic characteristics of the students.

METHODS

Design

This is a descriptive and relationship-seeking study that was carried out to assess the relationship between problem-solving skills and anxiety levels of students in the vocational school of health services.

Sample and Setting

This study was conducted in a vocational school of health services in Turkey's Central Anatolia region between April and June 2022. The research population consisted of first and second-year students (n=1800) in 2021-2022. The minimum number of participants was calculated using Cohen's formula, which is used for calculating sample size for known target groups, and the result was p=0.50, and q=317 with a 95% confidence interval (α=0.05 table value 1.96), and d=0.05 sampling error. Students had to be actively attending school (obligatory attendance) and give their consent to take part in the study to meet the inclusion criteria. Three hundred fifty-six students who met the inclusion criteria volunteered for the study.

Data Collecting

Due to the COVID-19 outbreak, data were gathered through an online survey. The health services vocational school students were informed about the study, and they signed an informed consent form. In two months, data were collected online using the "Personal Information Form", "Problem-Solving Inventory", and "Generalized Anxiety Disorder" scale. Completing the questionnaires takes an average of 15-20 minutes.

Instruments

Personal Information Form

The researchers created the form in accordance with the current literature. It contains fourteen questions about the participants' sociodemographic characteristics (age, gender, department, class, family type, economic situation, where they lived for a long time, where they live now, chronic disease condition, smoking, alcohol use, and whether there is a change in the amount of consumption during the pandemic) (21)

Problem-Solving Inventory (PSI)

The Problem-Solving Inventory is a Likert-type self-assessment questionnaire consisting of 35 items scored between 1 and 6, which measures an individual's self-perception of problem-solving abilities. Heppner and Petersen's 1982 inventory was translated into Turkish by Şahin and Heppner (1993). The scoring excludes the use of items 9, 22, and 29. Reverse scoring is used for items 1, 2, 3, 4, 11, 13, 14, 15, 17, 21, 25, 26, 30 and 34. After evaluating the remaining 32 items, the scale yields the lowest possible score of 32 and the highest possible score of 192. For the scale's evaluation, no cut-off point was specified. A high total score on the inventory indicates that the individual believes they are inadequate at problem-solving, whereas a low total score indicates that the individual believes they are adequate at problem-solving. The inventory is divided into three subscales: The "Problem-solving confidence" subscale (5, 10, 11, 12, 19, 23, 24, 27, 33, 34, 35) assesses self-perceived confidence in solving problems. The "approach-avoidance" subscale (1, 2, 4, 6, 7, 8, 13, 15, 16, 17, 18, 20, 21, 28, 30, 31) refers to the assessment of initial problem-solving efforts. The "personal control" subscale (13, 14, 25, 26, 27, 32) measures an individual's ability to control their emotions, refer to them in the future, and actively seek out various alternative solutions. In the inventory adaptation process, the total Cronbach's alpha coefficient was calculated to be 0.88 (3).

Generalized Anxiety Disorder Scale (GAD-7)

GAD-7 is a brief self-reported test developed by Spitzer et al. according to DSM-IV-TR criteria (10). It is a 7-item Likert type quartet scale (0=none, 1=many days, 2=more than half of the days, 3=almost every day) that assesses the experiences asked in the scale items during the last 2 weeks. The total scores of 5, 10, and 15 obtained on the scale are cut-off points for mild, moderate, and severe anxiety, respectively. Patients with a total score of 10 and above should be investigated using other methods and the diagnosis should be confirmed. When the threshold for the total score is selected as 10, the sensitivity for the diagnosis of GAD is 89% and the specificity is 82% (22).

Data Analysis

The SPSS 22.0 package program was used to analyze the data obtained in this study. A total of 356 associate degree candidates took part in the survey. Demographic data frequency and percentage distributions are provided. Using the Cronbach alpha value, the questionnaire's reliability analysis was obtained. The Cronbach alpha coefficient measures the homogeneity of Likert-type scale items. The higher the alpha coefficient of the relevant scale, the more it can be interpreted that the items in this scale are consistent with each other and the scale consists of items that examine related features. The Pearson Chi-Square test was used to examine the relationships between variables. The Kolmogorov-Smirnov test was used to determine whether the form is parametric or non-parametric

(to examine the data's compliance with the normal distribution), and the Levene test was used to determine variance homogeneity. For variables that satisfy both of these assumptions, a parametric test will be used, and for those that do not, a non-parametric test will be used. To compare the two groups, the independent two-sample t-test or Mann-Whitney U test was used. When comparing more than two groups, one-way analysis of variance (ANOVA) or the Kruskal-Wallis H test was used. In post hoc tests, the Tukey test or Mann-Whitney U test in pairs was used to compare groups with differences. The level of significance was set at 0.05.

Validity and Reliability Analysis

The validity and reliability analysis revealed that the problem-solving inventory (32 questions) had a Cronbach alpha coefficient of 0.706 and the generalized anxiety disorder (7 questions) had a Cronbach alpha coefficient of 0.879. It was determined that both scales, for which validity and reliability studies had previously been conducted, are reliable for this study as well.

Ethical Value

Before beginning the study, the ethics committee (approval dated March 2022 and numbered 2022/07), the Ministry of Health's scientific research permission for Covid-19 period research, and institutional permission were all obtained. The students were informed about the purpose of the study, and their permission to participate was obtained.

RESULTS

Sociodemographic Characteristics of Students:

The average age of the students participating in the research was 20±2.1 (Min 18–Max 40). Of the participants in the study, 291 (81.7%) were female and 65 (18.3%) were male. 135 (37.9%) of the students were in the 1st grade and 221 (62.1%) of them were in the 2nd grade (Table 1). While 77 (21.6%) of the students participating in the study were in the Audiometry department, 13 (3.7%) were studying in the Anesthesia department. 68 (19.1%) of the participants had extended families, and 288 (80.9%) had nuclear families. Considering the distribution by income, 47 (13.2%) participants' income was more than their expenses, 98 (27.5%) participants' income was less than their expenses, and 211 (59.3%) participants' income was equal to their expenses. 41 (11.5%) of the participants' families lived in the village, 77 (21.6%) in the district, and 238 (66.9%) in the city center. During the education period, 19 (5.3%) of the participants lived with their friends, 118 (33.1%) in the dormitory, and 219 (61.5%) with their families. While 30 (8.4%) of the 356 students participating in the study had a chronic illness, 326 (91.6%) did not have a chronic illness. Of the participants, 69 (19.4%) were smokers, and 18 (5.1%) were drinking alcohol. While internet use increased in 337 (94.7%) of the participants during the pandemic, phone use increased in all of them (Table 1).

Table 1. Sociodemographic characteristics of the participants (n=356)

Variable	n	%
Gender		
Female	291	81.7
Male	65	18.3
Grade		
1st grade	135	37.9
2nd grade	221	62.1
Department		
Operating Room Services	22	6.2
Anesthesia	13	3.7
Dialysis	15	4.2
Physiotherapy	25	7.0
First and Emergency Aid	17	4.8
Audiometry	77	21.6
Medical Imaging	17	4.8
Medical Imaging Evening Education	75	21.1
Elderly Care	36	10.1
Disabled Care and Rehabilitation	30	8.4
Child Development	29	8.1
Family Type		
Extended Family	68	19.1
Nuclear Family	288	80.9
Family Income Level		
Income is more than expenses	47	13.2
Income is equal than expenses	211	59.3
Income is less than expenses	98	27.5
Long-term Residence		
Village	41	11.5
District	7	21.6
City	238	66.9
Current Residency		
Dormitory	118	33.1
With parents	219	61.5
With Flat-mates	19	5.3
Chronic Disease		
Yes	30	8.4
No	326	91.6
Smoking		
Yes	69	19.4
No	287	80.6
Have you smoked more since the pandemic started?		
Yes	40	11.2
No	316	88.8
Do you use alcohol?		
Yes	18	5.1
No	338	94.9
Has your alcohol consumption increased during the pandemic?		
Yes	9	2.5
No	347	97.5
Has the time you spend on the Internet increased during the pandemic period?		
Yes	337	94.7
No	19	5.3
Has the time you spend on your mobile phone increased during the pandemic period?		
Yes	356	100.0
No	0	0.0
Total	356	1000

Average Scores of Students:

The average score from the problem-solving inventory for all students was 90.30, with a standard deviation of 11.91. The average score on the generalized anxiety disorder scale was 16.09, with a standard deviation of 4.39. The average score on confidence in problem-solving, one of the subscales of the problem-solving inventory, was 28.98, with a standard deviation of 4.81; the average score on the approach-avoidance subscale was 47.23, with a standard deviation of 8.30; and the average score on personal control was 14.05, with a standard deviation of 3.35. (Table 2).

Table 2. Problem-Solving Inventory and Generalized Anxiety Disorder total and sub-dimension mean scores of students (n=356)

Scale	X ±SD	Min-Max
Problem-Solving Inventory	90.30±11.91	60.00-127.00
Problem-Solving Confidence	28.98±4.81	18.00-47.00
Approach Avoidance	47.23±8.30	27.00-68.50
Personal Control	14.05±3.35	5.00-22.00
Generalized Anxiety Disorder	16.09±4.39	7.00-28.00

The Correlation Between the Problem-Solving Inventory and the Generalized Anxiety Disorder Scale:

The problem-solving inventory and generalized anxiety disorder scale were found to have a weak positive correlation (r=0.107), which was statistically significant (p-value=0.044) (Table 3).

The Generalized Anxiety Disorder Scale and the Problem-Solving Inventory in Relation to Student Sociodemographic Characteristics:

There was no statistically significant difference in the mean scores of any scale based on the students' gender, class, family type, place of residence, or alcohol use (p-values >0.05). There was a statistically significant difference in the mean scores of generalized anxiety disorder based on income status (p-value<0.05). The Mann-Whitney test was used to determine the difference between the groups in pairs. There was no statistical difference between the groups whose income was more than their expenses and those whose income was less than their expenses as a result of the test, however, the group whose income was equal to their expenses had a lower generalized anxiety disorder score.

Table 3. Correlation between the Results of Problem-Solving Inventory and Generalized Anxiety Disorder

		Problem-Solving Inventory	Generalized Anxiety Disorder Scale
Problem-Solving Inventory	p-value		
	r	1	
Generalized Anxiety Disorder Scale	p-value		
	r	**0.107**	1
	p-value	**0.044**	

There was a statistically significant difference in the mean general anxiety disorder score based on smoking (p-value<0.05). Smokers had a statistically significant higher score for generalized anxiety disorder. There was a statistically significant difference in the mean approach-avoidance score based on chronic disease status (p-value<0.05). In those without chronic disease, the approach-avoidance score was found to be statistically significantly higher.

There was a statistically significant difference in the mean approach problem-solving inventory scores based on chronic disease conditions (p-value<0.05). The score on the problem-solving inventory was found to be statistically significantly higher in those who did not have chronic illnesses. There was a statistically significant difference in the mean general anxiety disorder ores based on chronic disease conditions (p-value0.05) (Table 4).

Table 4. Generalized Anxiety Disorder Scale, Problem-Solving Inventory Total and Subscale Mean Scores in Relation to Sociodemographic Characteristics of Students (n=356)

Basic characteristics			Problem-Solving Inventory x±SD		Problem-Solving Confidence x±SD		Approach Avoidance x±SD		Personal Control x±SD		Generalized Anxiety Disorder x±SD	
Gender	Female	65	91.89±12.01	t: 1.193[2]	28.43±4.92	t:8764.00[1]	48.86±8.41	t:1.754[2]	14.60±3.10	t: 1.147[2]	15.49±34.41	t:8910.500[1]
	Male	291	89.94±11.88	p: 0.234	29.10±4.79	p:0.354	46.86±8.25	p:0.080	13.93±3.40	p:0.149	16.23±4.39	p: 0.463
Grade	1st grade	135	90.18±11.91	t:-0.147[2]	28.88±5.19	t:14364.500[1]	47.27±8.27	t:0.081[2]	14.02±3.41	t:-0.149[2]	15.65±4.31	t:13601.500[1]
	2nd grade	220	90.37±11.94	p:0.884	29.04±4.58	p:0.556	47.20±8.34	p:0.936	14.07±3.32	p:0.882	16.36±4.43	p: 0.160
Family Type	Extended	68	89.90±12.34	t:-0.304[2]	29.02±4.55	t:-0.427[2]	46.84±8.52	t: -0.427[2]	14.02±3.66	t:-0.073[2]	16.16±4.75	t: 9756.000[1]
	Nuclear	288	90.39±11.83	p:0.761	28.97±4.88	p:0.686	47.32±8.26	p: 0.670	14.06±3.28	p:0.942	16.07±4.31	p:0.962
Chronic Disease	Yes	30	85.96±11.05	t:**-2.092[2]**	28.46± 4.38	t:4693.50[1]	43.80±7.91	t:**-2.381[2]**	13.70±2.96	t:-0.607[2]	18.23±5.47	t: **3639.500[1]**
	No	325	90.70±11.92	p:**0.037**	29.03±4.85	p:0.715	47.54±8.28	p:**0.018**	14.08±3.39	p:0.544	15.89±4.24	p: **0.020**
Economic Status	Income is more than expenses	47	87.75±12.43	t: 1.191[4]	28.12±4.87	t:1.598[3]	45.30±8.42	t:2.030[4]	14.31±3.05	t:2.626[4]	17.14±4.96	t: **8.572[3]**
	Income is equal than expenses	211	91.22±11.95	p: 0.148	29.05±4.86	p:0.450	47.86±8.56	p:0.133	14.30±3.28	p: 0.074	15.51±4.20	p: **0.014**
	Income is less than expenses	97	89.52±11.45		29.24±4.68		46.78±7.55		13.39±3.57		16.83±4.36	
Longest Residence	Village	40	92.77±12.52	t:1.025[4]	12.52±5.00	t:0.475[3]	49.15±9.00	t: 1.279[4]	13.75±3.54	t:0.526[3]	15.85±4.15	t: **3639.500[3]**
	District	77	89.60±12.24	p:0.360	12.24±4.68	p:0.789	46.66±8.09	p: 0.280	14.01±3.79	p:0.769	15.54±3.62	p: **0.020**
	City	238	90.10±11.70		11.70±4.83		47.09±8.24		14.12±3.17		16.31±4.65	
Smoking	Yes	69	90.65±11.95	t: 0.273[2]	29.13±4.57	t: 9290.000[1]	46.75±8.37	t: -0.533[2]	14.76±3.13	t: 1.971[2]	17.63±4.68	t: **7410.500[1]**
	No	286	90.21±11.92	p: 0.785	28.94±4.87	p: 0.424	47.34±8.30	p: 0.594	13.88±3.38	p: 0.051	15.72±4.25	p: **0.001**
Alcohol Use	Yes	18	91.00±10.60	t: 0.255[2]	28.88±4.14	t: 2947.00[1]	46.83±8.37	t: -0.209[2]	15.27±2.94	t: 1.589[2]	18.66±5.05	t: 2358.000[1]
	No	337	90.26±11.99	p: 0.799	28.98±4.85	p: 0.823	47.25±8.31	p: 0.835	13.99±3.36	p: 0.113	15.98±4.34	p: 0.106

DISCUSSION

The COVID-19 outbreak had an impact on all aspects of society around the world, both directly and indirectly. Schools were closed for extended periods of time in order to control the pandemic and protect students from COVID-19. Students who were isolated at home for an extended period of time and had to attend online classes experienced a variety of emotional stressors. Due to the rapid spread of COVID-19, college students who received a large amount of negative information were more likely to develop psychological maladjustment. As a result, it is critical to pay close attention to the psychological state of university students who have been isolated at home for an extended period of time and to provide timely and appropriate interventions to protect and improve their mental health (4).

Problem-Solving Skills of Students

One of the most important aspects of a person's cognitive process is problem-solving. In healthcare, problem-solving skills necessitate critical thinking abilities that allow knowledge to be applied to find solutions23. The ability to solve problems effectively is a critical step in the health care process that promotes creative thinking (24). The mean problem-solving inventory score in our study was 90.30±11.91. The mean problem-solving inventory pre-test score was 87.55±2.65 in the study conducted by Kanbay (25) et al. (2017) and 90.65±19.03 in the study conducted by Bayram (24) et al. (2022). The mean problem-solving inventory score was reported as 100.31±17.3 in a study that examined the factors influencing the problem-solving skills of undergraduate nursing program students. Health professionals with strong problem-solving abilities can help to improve health care quality by ensuring the successful implementation of the care process. The students' moderate problem-solving abilities demonstrate that their education and experience, as well as the methods they employ, are insufficient. According to the World Health Organization (WHO), healthcare professionals must be able to take the necessary precautions and use a problem-solving approach while providing appropriate care to individuals (26). The problem-solving abilities of the research participants were found to be moderate in this study, as in many other studies in the literature. A moderate level of problem-solving ability can reduce the content and quality of care, negatively affecting quality, effectiveness, efficiency, transformation, professionalism, autonomy, and power (27-29).

Anxiety Levels of Students

One of the most distinctive psychological consequences of the COVID-19 pandemic is anxiety. University students in general, and especially students studying medicine, are the most affected. The current study discovered a mean anxiety score of 16.09±4.39. This indicates a high level of anxiety. Furthermore,

in our study, the prevalence of high-level anxiety was found to be 35.4%. This result is consistent with the literature. Several systematic reviews and meta-analyses have been conducted to investigate the prevalence of anxiety in college students in general during the Covid-19 crisis. In their study, Batra et al (30) discovered a 39.4% prevalence of anxiety in university students, Wang et al (31) discovered a 31% prevalence discovered. Because anxiety impairs interpersonal communication and empathy, this can have a negative impact on their academic performance, professionalism, and empathy toward patients during their education.

Do Sociodemographic Characteristics Affect Students' Anxiety Levels and Problem-Solving Skills?

The study investigated whether gender, economic status, school year, long-term residence, family type, chronic disease, smoking, and alcohol use affect respondents' scale scores. According to the findings, there was no statistically significant difference in total problem-solving inventory scores based on gender, school year, longest place of residence, smoking status, economic status, or family type. Also, Fu et al (2021) found no significant difference between gender and mean Problem-Solving Inventory score, which is consistent with the findings of other studies (4). In line with the results of this study, the H2 hypothesis was accepted.

Those with a high income, those who spent the majority of their lives in the city center, those with chronic diseases, and those who smoked had higher anxiety scores in the study, and the difference was statistically significant. In line with the results of this study, the H1 hypothesis was accepted accordingly Male students and those living in extended families had higher anxiety score averages, but there was no statistical significance. In line with earlier studies (4), the current study did not detect any gender-related differences that were statistically significant. As a result of the COVID-19 pandemic, male and female college students are experiencing similar stresses and negative emotions. Furthermore, we discovered that first-year students were more anxious than second-year students, but this difference was not statistically significant. Academic pressure is greater for more senior students, and some are facing graduation, employment, and application, among other things, but we believe that the COVID-19 pandemic is inextricably linked to a variety of factors affecting their development. In contrast to previous research, we discovered that college students with low economic status were less likely to experience anxiety symptoms than those with higher economic status. This could be due to the higher life expectancy of students with higher incomes. In this study, a weak positive (r=0.107) relationship was found between the problem solving inventory and generalized

anxiety disorder, and this relationship was found to be statistically significant (p-value=0.044) (Table 4). Ho hypothesis is rejected

CONCLUSION

Initiatives should be planned to improve prospective health care providers' self-perceptions of problem-solving skills and anxiety management, and curricula should be revised as needed. To mitigate the psychological damage caused by the COVID-19 pandemic, university students should receive timely and appropriate psychological interventions. The regulation of the psychological state of students who receive health education will affect the quality of care they will provide to patients after graduation in this process.

Limitations of the Study

This research is a descriptive cross-sectional study conducted in order to evaluate the problem-solving skills and anxiety levels of all students who accepted to participate in the research in vocational school of health services. That is, it is based on students' self-reports and is not taken from their medical records. Therefore, personal reports often provide objective indicators. sample size; A larger sample of students could have yielded more reliable results by including the social and health departments of different faculties.

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Ethical Approval: Prior to the study, ethics committee approval (approval dated March 2022 and numbered 2022/07), scientific research permission for Covid-19 period research from the Ministry of Health and institutional permission from SHMYO were obtained. The students were informed about the purpose of the research and their consent was obtained to participate in the research.

Author Contributions

Concept: USD, Design: AV, GK, Supervision: GP, Data Collection and/or Processing: ÜSD, AV, GK, GP, Analysis and/or Interpretation: ÜSD, AV, GK, GP, Writing: ÜSD, AV, GK, GP

Conflict of Interest: The authors declare that no conflict of interest exists in the study.

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