




The relationship between COVID-19 knowledge levels and anxiety states of midwifery students during the outbreak: A cross-sectional web-based survey

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Abstract

Purpose: To determine the relationship between the anxiety states and knowledge levels of female midwifery students about COVID-19 during the outbreak.

Design and Methods: This cross-sectional study carried out with online participation of 972 female midwifery students.

Findings: The anxiety levels of the female midwifery students were high among those visiting the hospital during the pandemic and having parents or relatives who had chronic diseases. Female midwifery students had a high level of knowledge regarding COVID-19.

Practice Implications: Female midwives of the future will take part in primary health care services in the protection and promotion of health as an important occupational group in the public health system. To determine mental health and psychological needs of them during the outbreak will greatly contribute to the pandemic management process.

KEYWORDS

anxiety, coronavirus, COVID-19, female, midwifery students, pandemic

1 | INTRODUCTION

The coronavirus disease which started in China was declared as a pandemic by the World Health Organization on 11 March 2020¹ (Coronavirus). The coronavirus disease (COVID-19) is a contagious disease caused by a newly discovered coronavirus and detected by pneumonia clusters. This disease was first detected in Wuhan, China. Later, it was seen in Japan, Thailand, the USA, Australia, and France. Preventive health measures have been taken on 11 March 2020 after the appearance of the first cases in Turkey. The number of cases and deaths is increasing day by day.² The coronavirus disease, like other pandemics, is predicted to cause serious mental health problems among communities and health workers.^{3,4} As a global public health problem, the coronavirus disease has become a pandemic that has caused the death of many people and led to great economic losses worldwide.⁵

COVID-19 is a rapidly spreading disease that is highly contagious, resulting in death in severe cases, and does not yet have a

vaccine and treatment⁵. At the time of this study, there were 110 000 cases and more than 4000 death. Clinical findings develop like any upper respiratory infection. Having a strong immunity plays an important role in the mild recovery of the disease.^{6,7} Most people infected with the COVID-19 virus experience a mild to moderate respiratory disease and recover without special treatment. Elderly individuals and those with underlying medical conditions, such as cardiovascular disease, diabetes, chronic respiratory disease, and cancer, constitute the risk group for COVID-19. The risk of death increases with increasing age.^{8,9} Infection with breast milk in children has not been reported so far. It was found that COVID-19 did not pass from mother to baby before and during the birth.^{10,11}

The primary purpose of health services is to ensure that individuals continue to live healthily and to prevent diseases. Outbreak management is one of the most important public health practices in maintaining health and preventing infectious diseases. Health professionals have many heavy responsibilities such as working in

healthcare services, educating the society about the infectious disease, prevention methods,¹² and conducting community mental health studies during the prevention, and slow down processes of the pandemic. Health professionals are also at great risk due to the pandemic. More than 76 000 cases of COVID-19 have occurred in China so far, and more than 3000 of them have been healthcare professionals.⁵ In addition to taking personal protective measures against the epidemic, healthcare professionals should also take measures to protect their mental health.

Managing the mental health and psychosocial well-being of healthcare workers during the outbreak is as important as managing their physical health (Mental Health Considerations).⁵ Fear, apprehension, and anxiety also occur in healthcare professionals during epidemic periods when they themselves face the risk of death. After the Covid-19 pandemic, some organizations that are working on improving the mental health of society have published guides^{13,14} and recommended online therapies.^{15,16} Traumatic events¹⁷ and being closed at home during epidemic periods¹⁸ increase the likelihood of anxiety. The preference of maladaptive coping mechanisms used to deal with this situation further deepens the anxiety experience.⁸ Female adolescents are more likely to experience anxiety than male peers. In addition to the impact of COVID-19 outbreak, female midwifery students are one of the risk groups for anxiety regarding their age.¹⁹⁻²² When the literature is examined, studies on the probability of experiencing anxiety and COVID-19 knowledge levels of female midwifery students, who have to stay at home during the epidemic as members of the society and follow the literature closely as candidates to take part in health services in the future, are limited. In this context, this study was conducted to determine the relationship between the COVID-19 knowledge levels of female midwifery students and their anxiety states during the pandemic.

2 | METHOD

2.1 | Design, data collection, and sample

This study was designed as a cross-sectional study that covers all female midwifery students in Turkey. Through the Midwifery Student Commission of the Anatolian Midwives Association, ~10 000 female midwifery students were invited to participate in the study between 15 and 30 March 2020 by sharing the prepared online form with a messaging application. A total of 972 female midwifery students participated in the study and the rate of return is 9.7%. The data began to be collected after the first coronavirus-infected cases began to appear and the government demanded the public to stay at home.

2.2 | Measurements

The "Survey Form" and the "Beck Anxiety Inventory" prepared by the researchers through scanning the literature were used to collect the data of the research.

2.2.1 | Questionnaire form

This form, developed by the researchers, consists of three parts. There are six questions about students' age, grade, and chronic disease status in the first section; four questions about changes in their daily lives due to COVID-19 in the second section; and 18 questions to evaluate their knowledge about COVID-19 in the third section. Correct answers given to the knowledge measurement questions are scored as 1 point, and participants can get 0 to 18 points in total.

2.2.2 | Beck anxiety inventory

It is a self-assessment scale developed by²³ and was used to determine the frequency of anxiety symptoms experienced by individuals. It is a 4-point Likert-type scale consisting of 21 items each scored between 0 and 3. The reliability and validity of the scale in Turkey were conducted by Ulusoy et al.²⁴ The high score obtained from the scale indicates the severity of the anxiety experienced by the individual. The score between 0 and 21 indicates 'low anxiety', 22 to 35 'moderate anxiety', 36 and above 'potentially concerning levels of anxiety'. The Cronbach α coefficient of the scale was reported to be .93,²⁴ whereas the Cronbach's α coefficient was .90 in the internal consistency analysis in the present study.

2.3 | Ethical considerations

Ethical approval (decree code: 2020/0046) was obtained for this research work from the ethics committee of the University where the second author worked before commencing the study. We informed all participants about the aim of the study by sending them an e-mail and invited them to attend the study. To ensure the confidentiality of participant information, we did not include any identifying information in the online questionnaire.

2.4 | Statistical analysis

We used SPSS for Windows version 25.0 for the statistical analysis of the research data. The normality of the distribution of the data was evaluated using Shapiro-Wilk values. We performed frequency, percentage, mean, and standard deviation for reporting demographic data of the participants. Additionally, independent samples *t* test and analysis of variance were used for comparing the continuous data averages.

3 | RESULTS

Table 1 shows that of the 972 participants, 51.1% were 20 to 21 age with the mean of 20.79 (standard deviation = ± 1.91 ; range 18-38), 54.0% live with 4 or fewer cohabitants. The majority-female

TABLE 1 The mean scores of BAI according to some coronavirus related factors and sociodemographic characteristics of midwifery students

Variable	n (%)	Mean (\pm SD)	t Test/P
Age group		20.79 (\pm 1.91)	0.149 ^a /.86
\leq 19	211 (21.7)	7.51 (\pm 7.92)	
20-21	497 (51.1)	7.17 (\pm 7.24)	
\geq 22	264 (27.2)	7.22 (\pm 8.02)	
Term			0.517 ^a /.67
First year	261 (26.9)	7.74 (\pm 7.52)	
Second year	261 (26.9)	7.08 (\pm 7.33)	
Third year	247 (25.4)	6.98 (\pm 7.85)	
Fourth year	203 (20.9)	7.26 (\pm 7.62)	
Cohabitant		4.58 (\pm 1.56)	
\leq 4	525 (54.0)	7.20 (\pm 7.33)	0.477/.79
\geq 5	447 (46.0)	7.32 (\pm 7.95)	
Presence of chronic diseases			0.931/.45
Yes	92 (9.5)	7.82 (\pm 8.89)	
No	880 (90.5)	7.20 (\pm 7.47)	
Presence of chronic diseases among parents or relatives			3.260/.00
Yes	493 (50.7)	8.06 (\pm 7.85)	
No	479 (49.3)	6.43 (\pm 7.28)	
Hospital visit after Corona outbreak			1.893/.01
Yes	47 (4.8)	9.98 (\pm 8.49)	
No	925 (95.2)	7.12 (\pm 7.55)	
Frequency of going out to meet people after Corona outbreak			1.579 ^a /.21
Decreased	944 (97.1)	7.33 (\pm 7.61)	
Same	23 (2.4)	4.87 (\pm 8.05)	
Increased	5 (0.5)	4.20 (\pm 4.92)	
Do you comply with the state rules regarding coronavirus infection?			0.691 ^a /.50
Yes	866 (89.1)	7.16 (\pm 7.53)	
No	1 (0.1)	5.00 (\pm 0.00)	
Partly	105 (10.8)	8.06 (\pm 8.28)	
Do people around you comply with the state rules regarding coronavirus infection?			2.672 ^a /.70
Yes	467 (48.0)	6.68 (\pm 7.51)	
No	44 (4.5)	7.41 (\pm 7.78)	
Partly	461 (47.4)	7.82 (\pm 7.68)	
Coping methods with coronavirus infection ^b			
Following the mass media	846 (87.0)	7.21 (\pm 7.68)	0.042/.69
Prefer to stay alone	269 (27.7)	7.84 (\pm 8.38)	3.927/.14
Praying	578 (59.5)	7.05 (\pm 7.21)	1.522/.30
Exercising/working out	176 (18.1)	7.19 (\pm 7.41)	0.036/.90
Meditation/yoga	56 (5.8)	7.27 (\pm 8.17)	0.295/.99
Nothing works	68 (7.0)	7.13 (\pm 6.57)	0.379/.89
None	36 (3.7)	6.39 (\pm 6.44)	1.212/.49
Anxiety level			
Low anxiety	819 (94.4)		
Moderate anxiety	44 (4.5)		
Potentially concerning levels of anxiety	10 (1.0)		

Abbreviation: BAI, Beck Anxiety Inventory.

^aAnalysis of variance.

^bFrequency and percentages were calculated based on the number of participants.

TABLE 2 Means, standard deviations, and Spearman's rank-order correlation between BAI score and knowledge level of coronavirus infection

Variables	M	SD	1	P
BAI	7.26	7.62		
Knowledge level of coronavirus infection	16.57	1.29	- 0.023	.48

Abbreviation: BAI, Beck Anxiety Inventory.

midwifery students (90.561%) did not have any chronic diseases, but more than half of their parents (50.7%) had at least one chronic disease. Approximately 5% of female midwifery students visited the hospital after the coronavirus outbreak. Most of the participants complied with the state's rule regarding coronavirus infection (89.1%) and decreased social contact with friends (97.1%). Almost half of the people around the female midwifery students complied with the state's rules regarding coronavirus infection (48.0%). Female midwifery students usually preferred to follow mass media (87.0%) and to pray (59.5%) for coping with coronavirus infection diseases.

As is shown in Table 1, The majority-female midwifery students (94.4%) had low anxiety, followed by moderate anxiety (4.5%) and potentially concerning levels of anxiety (1.0%). There was a statistically significant difference in BAI score according to presence of

chronic diseases among female midwifery students' parents or relatives (t test = 3.260; $P < .05$) and students visiting the hospital after coronavirus outbreak (t test = 1.893; $P < .05$) (Table 1).

As depicted in Table 2, we present Pearson correlations among BAI score and knowledge level of coronavirus infection. We did not find a significant correlation between BAI score and knowledge level of coronavirus infection ($r = -.0275$; $P = .39$) (Table 2).

Female midwifery students had a high level of knowledge regarding COVID-19 with 16.57 (± 1.29). Female midwifery students frequently respond to the following questions: "Handwash is important for protection from COVID-19 (at least 20 seconds)." (99.7%), "Hand sanitizer could be used for protection from COVID-19" (99.0%), "There is a precise treatment for coronavirus diseases." (98.1%) and "Fever, cough, difficulty in breathing, diarrhea, nausea, and vomiting are the most common symptoms of coronavirus diseases." (97.6%) (Table 3).

4 | DISCUSSION

In this study, it was investigated whether there was a relationship between the anxiety status of the female midwifery students and their sociodemographic characteristics, the changes they experienced in daily life due to coronavirus, and their levels of knowledge

TABLE 3 A knowledge level of coronavirus infection of midwifery students

Items	True n (%)	False n (%)
1. The incubation period of the corona virus is range 2 to 14 d.	939 (96.6)	33 (3.4)
2. COVID-19 spreads as efficiently in warmer regions.	80 (8.2)	892 (91.8)
3. COVID-19 stays alive on the hands and surfaces for a while.	932 (95.9)	40 (4.1)
4 The coronavirus is transmitted through blood transfusion.	97 (10.0)	875 (90.0)
5. The coronavirus causes serious lung infection.	936 (96.3)	36 (3.7)
6. Fever, cough, difficulty in breathing, diarrhea, nausea and vomiting are the most common symptoms of coronavirus diseases.	949 (97.6)	23 (2.4)
7. COVID-19 is transmitted by contact with the mouth, nose and eyes.	927 (95.4)	45 (4.6)
8. When sick people cough, the coronavirus hangs in the air and is transmitted through breathing.	756 (77.8)	216 (22.2)
9. The risk of death is the same for all age groups.	22 (2.3)	941 (96.8)
10. The test for COVID-19 could be used for diagnosing.	934 (96.1)	38 (3.9)
11. There is COVID-19 vaccine.	30 (3.1)	942 (96.9)
12. There is a precise treatment for coronavirus diseases.	18 (1.9)	954 (98.1)
13. COVID-19 transmits to fetus.	193 (19.9)	779 (80.1)
COVID-19 transmits to human breast milk.	122 (12.6)	850 (87.4)
15. COVID-19 causes miscarriage and prematurity.	211 (21.7)	761 (78.3)
16. Handwash is important for protection from COVID-19 (at least 20 s).	963 (99.7)	3 (0.3)
17. Hand sanitizer could be used for protection from COVID-19.	962 (99.0)	10 (1.0)
18. Animal products should not be consumed as raw or uncooked.	802 (82.5)	170 (17.5)

about the coronavirus disease. According to the results of this research work, the anxiety levels of the female midwifery students who applied to a hospital after the COVID-19 outbreak and who had chronic diseases in their parents or relatives were higher. However, there was no significant relationship among the age of the student, the presence of chronic disease in the student, the grade of the student, the number of households, leaving the house during the pandemic, his or his neighbors' compliance with the rules taken by the state, coping methods and their anxiety levels. Only 5% of the female midwifery students were found to have moderate or high levels of anxiety, and the relationship between the anxiety and coronavirus knowledge levels was not statistically significant.

According to the studies conducted, the frequency of anxiety among young people has increased rapidly in recent years due to external factors such as success pressure, social media, and the widespread use of the internet^{20,22,25,26} as well as many complicated reasons within the family.²⁷ Anxiety rates because of diseases are also higher in young people, affecting the majority people,²⁸ and such conditions may be the onset of mental illnesses for older ages.²⁹ Especially, the prevalence of anxiety is more prevalent among female adolescents compared to male agemates.¹⁹⁻²² The average age of the female midwifery students participated in the study was about 21%, and 94% of them experienced a low level of anxiety and 5.5% of them experienced a moderate or high level of anxiety. According to the studies by Merikangas et al,²⁰ approximately one-third of the youth meet the DMS-IV anxiety criteria and the frequency of anxiety becomes more frequent towards the age of 18. Similarly, in a study conducted on 9282 adolescents in the USA, the frequency of anxiety was 35% among females and it was more frequent than the anxiety frequency of males.³⁰

Studies show that diseases that cause great destruction in societies, such as coronavirus, increase the anxiety rate of humans.^{4,8,31} According to a study conducted by the Mental Health Association (MHA) in our country, the statements of the participants showed that 50% of the society were afraid of being infected by coronavirus; that 59% of them increased anxiety about their health; that 61% of them increased anxiety about their future; that 48% of them had increased feelings of restlessness; that 64% of them began to fear more from diseases; and that 59% of people began to be annoyed more by the symptoms of the disease (MHA, 2020).³² According to the study conducted by Huang and Liu⁹ on emotional response and coping methods developed against the coronavirus disease in nurses and nursing students, students' anxiety levels related to the coronavirus disease were found to be lower than nurses. In this study, 94.4% of the female midwifery students were found to have low anxiety levels. It was observed that the female midwifery students with chronic illness in their parents or relatives experienced more anxiety about the coronavirus disease. People with chronic health conditions such as cardiovascular disease, diabetes mellitus, asthma, chronic obstructive lung diseases, chronic kidney diseases have a high risk to be infected and emerged severe outcomes of COVID-19.³³⁻³⁵ The high level of anxiety in female midwifery students whose parents or relatives had chronic diseases could be explained by this increased risk.

87% of the female midwifery students in our study started to follow the media after the coronavirus disease cases started to appear, and this rate was 72% in adults in the society (MHA, 2020).³² Studies show that the intenseness of the news in the press after major disasters increases the level of anxiety in people.^{4,36} However, in this study, 5% of the students in Turkey were found to have moderate or high levels of anxiety. It is evaluated that most of the cases with a low anxiety level may be due to the precautionary measures that the students take in their home environment. Additionally, the majority of people in Turkey are Muslim³⁷ and previous studies reported that there is a significant relationship between religious behaviors and anxiety level in adolescents.^{38,39} Therefore, the low anxiety level in our sample may be related to using prayer as a method of coping with the COVID-19 outbreak by more than half of female midwifery students.

According to the study of the Mental Health Association, 61% of the participants increased the pandemic-related measures. According to the results of this study, while 89.1% of the female midwifery students comply with the measures taken by the state, 48.0% of the other individuals in society follow these measures. According to the results of this study, the frequency of leaving the house during the outbreak in the female midwifery students decreased by 97.1%. According to the report of the Mental Health Association, 23% of the participants stated that their frequency of leaving the house during the outbreak decreased, 39% stated that their frequency of choosing to use public transportation decreased, and 11% stated that their frequency of entering a crowded environment decreased, while 79% stated that their routines did not change. According to the study conducted by⁴⁰ in the European region, people have an unrealistic optimistic perspective against the coronavirus disease. 27.7% of the female midwifery students stated that they preferred to be alone to cope with the stress they experienced, whereas, in the study of the Mental Health Association, 23.3% of the participants stated that they preferred to move away from the places in which people spoke about the disease. However, it should not be overlooked that using ineffective coping methods such as avoidance increases the level of anxiety.⁸

The statement about which most of the female midwifery students gave the correct answer is "Handwash is important for protection from COVID-19 (at least 20 seconds)" (99.7%). According to the study of the Mental Health Association, 62% of the participants stated that their frequency of handwashing increased. According to the results of this study, 4.8% of the female midwifery students applied to a hospital after the cases of the coronavirus disease started to appear. According to the study of the Mental Health Association, the desire to be examined increased by 23% of the participants (MHA, 2020). In an online survey conducted by a public research company on 2400 people in Turkey, 94% of the respondents stated that they started washing their hands regularly.⁴¹ Similarly, in this study, the question with the highest correct answer rate is about whether it is correct to use hand washing as a protective measure.

When the students were asked about the symptoms of COVID-19, almost all of them answered correctly by agreeing with the

statement that “Fever, cough, difficulty in breathing, diarrhea, nausea, and vomiting are the most common symptoms of coronavirus diseases”. The study of Next Generation⁴¹ reported that 64% of the participants had enough information about COVID-19 and 96% knew that the disease had symptoms such as high fever, difficulty in breathing, and cough. Those results are consistent with the results of this study.

5 | CONCLUSIONS

These study findings demonstrated that the anxiety levels of the female midwifery students who applied to a hospital after the COVID-19 outbreak and who had chronic diseases in their parents or relatives were higher. However, there was no significant relationship between the other variables examined in the study and anxiety levels. It has been observed that only 5% of the female midwifery students have moderate or high levels of anxiety. The relationship between the anxiety and coronavirus knowledge levels was not statistically significant.

This study was conducted at the beginning of the COVID-19 outbreak in Turkey and there were few COVID-19 cases. Midwifery education was interrupted, and students were at their home where was a safe place to be protected from the COVID-19. These two situations could be asserted as reasons for experiencing a low level of anxiety. The psychological impact of outbreaks on individuals and society is inevitable and these psychological consequences may continue for a long time after the outbreak ends. Therefore, further studies are recommended to be conducted in the late stages of the crisis and after the COVID-19 outbreak.

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CONFLICT OF INTERESTS

The authors declare that there are no conflict of interests.

RELEVANCE FOR CLINICAL PRACTICE

COVID-19 is an important global health problem that has a major impact on both individuals and society. Different individuals and groups may experience different levels of psychological crisis, but health professionals are fundamentally affected. Female midwives of the future will take part in primary health care services in the protection and promotion of health as an important occupational group in the public health system. It is very important for female midwives to manage their own apprehension and anxiety to provide healthy psychosocial care to pregnant women they will give care to before, during and after birth. Descriptive studies for the determination of mental health and psychological needs of midwifery students during the outbreak will greatly contribute to the pandemic management process.

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