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RESEARCH ARTICLE

Anxiety Level and Coping Methods related to the Coronavirus Pandemic among female university students in Aljouf Region, Saudi Arabia

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Abstract:

Background:

Mental health problems are highly prevalent among university students. However, the COVID-19 pandemic and public health actions to prevent it added another burden on university students' lives with subsequent psychological impacts.

Objective:

The present study aims to determine the anxiety level and coping methods related to the coronavirus pandemic among Saudi university students.

Methods

A cross-sectional study was conducted among female university students in the Aljouf region, Saudi Arabia. Anxiety level was assessed using Zung's self-rating anxiety scale, and the coping level was assessed using Brief Resilient Coping Scale. The SPSS program, version 24, was used for data analysis.

Results:

A total of 663 female university students participated in the present study. The mean age of the studied participants was 20.94 ± 1.69. Overall, 31.5% of the students had anxiety and 28.2% had mild to moderate anxiety, and 3.3% had marked to severe anxiety. The present study reveals that the significant predictors of anxiety in the regression analysis were age, family income, health condition of the student, and having relatives infected with COVID-19. Participants of the present study were classified as low resilient copers (41.6%), medium resilient copers (37.6%), and high resilient copers (20.8%). Age was the significant predictor of coping level in regression analysis. The most coping methods done by the participants in the present study were using the internet (41.6%), doing fun with friends and family (40.7%), doing religious activities (39.4%), and going out in the wild or on farms (35.6%).

Conclusion:

University students in the present study suffered from a variable degree of anxiety during the COVID-19 pandemic. The present study highlights the importance of providing appropriate intervention measures for COVID-19-related anxiety and helping students with efficient methods to cope with this pandemic.

Keywords: Coronavirus, Anxiety, Coping, University students, Mental health, Pandemic.

Article History

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1. INTRODUCTION

The Coronavirus disease 19 (COVID-19) was first identified in Wuhan, China, last December 2019 with the manifestation of pneumonia of unknown origin [1]. It acquired high prevalence because of its rapid spread and was declared a

pandemic by the World Health Organization (WHO) [2]. The causative agent of this pandemic is called Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) [3]. SARS-CoV-2 is the cause of acute respiratory distress syndrome and organ failure in susceptible individuals, such as elderly people and those with chronic debilitating diseases, such as type 2 diabetes mellitus and hypertension [4]. In 213 countries within the past year, there have been more than 58

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million recorded cases of COVID-19, with roughly 1.4 million fatalities [5]. A nationwide lockdown was carried out in Saudi Arabia from March 24 to June 20, 2020, in all places to limit the spread of the wild virus. This nationwide lockdown affected the social support received from relatives and friends, causing psychological morbidities with a high prevalence of anxiety, stress, and depression [6]. Anxiety level among university students was recognized as a public health problem. Several studies have shown students' anxiety, stress, and depression and demonstrated determinant factors that might affect the mental health of the students [7 - 11]. To mitigate the COVID-19 pandemic, people used some coping methods to help them to adapt to the new situation [12]. Many coping methods had been adopted, including psychological and behavioral strategies aiming at tolerating and lowering stressful life events [12]. Positive coping methods had been correlated with lowering anxiety levels and led to greater well-being, whereas negative coping methods were correlated with enhancing anxiety levels [13]. The literature has shown that people's coping mechanisms for anxiety have an impact on the quality of their lifestyles [14]. In Saudi Arabia, the mental health of the students was influenced by virtual teaching done in classrooms, which was considered an unexpected experience. This, in addition to fear of having infection with the new virus or loss of close relatives, led to a huge pressure among university students. The COVID-19 pandemic is currently declining; however, it is still present with the expectation to increase in the future. Subsequently, virtual teaching, which affected the mental health of the students, will be adopted. Therefore, the aim of this study is to evaluate the anxiety level and coping methods related to the coronavirus pandemic among Saudi university students.

2. MATERIALS AND METHODS

2.1. Study Setting

The present study was cross-sectional and done at the time of the COVID-19 pandemic to investigate anxiety levels and coping methods among female university students in the Aljouf region, Saudi Arabia. Aljouf region is in the north of Saudi Arabia, with an area of 107.794 km² and a population estimated at 33533631.

2.2. Study Design

The present sample was selected from the female campus at Jouf University. The only university now servicing the Aljouf region is Jouf University, one of Saudi Arabia's official universities. Eight colleges made up the female campus of Jouf University: Medical, Pharmacy, Computer, Science, Education, Applied Medical Sciences, Administrative Sciences, and Sharia. According to data for the academic year 2021–2022, 8035 female students were registered overall at the female campus of Jouf University.

2.3. Sample Size

Calculation of the sample size was done using the Epi-Info version 7 StatCalc. The following criteria were used to calculate the least required sample size: an expected frequency of 50%, a confidence level of 99%, a margin of error of 5%,

and a design effect of 1%. The calculated sample size was 663. There was no missing data.

2.4. Sampling Technique

There were 8 colleges at the female campus of Jouf University, Saudi Arabia. The selection of one theoretical and 3 applied out of the 8 colleges was done using a simple random sampling technique. Then, the number of students selected in each college was proportional to the total number of students in the college until reaching the calculated sample size.

2.5. Data Collection Tool

The questionnaire used consisted of three parts. The first part inquired about sociodemographic characteristics, such as age, type of college, academic year, accommodation, family income, and the number of sleeping hours. In addition, the first part included questions regarding the health condition of the students and any relatives infected or who died because of COVID-19. The second part of the questionnaire was Zung's self-rating anxiety scale. It is a validated 20-item self-report tool with an estimated Cronbach's alpha of 0.897 [15]. A four-point Likert scale is used in Zung's self-rating anxiety scale, with 1 denoting "Never or very rare," 2 "Sometimes," 3 "Often," and 4 "Very Often." The emotional pointers of anxiety were presented in questions 1–5, whereas the physical symptoms of anxiety were demonstrated in questions 6–20. The sum of the scores for 20 items on Zung's self-rating anxiety scale ranges from 20 to 80. An Anxiety score <45 indicates anxiety within the normal range, a score between 45–59 indicates mild to moderate anxiety, a score between 60–74 denotes marked to severe anxiety, and a score ≥75 denotes most extreme anxiety [16, 17]. The third part of the questionnaire was the Brief Resilient Coping Scale (BRCS). This scale is a 4-item created to identify the tendency to handle stress in a highly adaptive way [18]. There are five possible replies for each question, with 1 denoting "it does not describe you at all," 2 denoting "it does not describe you," 3 denoting "neutral," 4 denoting "it describes you," and 5 denoting "it describes you very well." Low-resilient copers (4–13), medium-resilient copers [14 - 17], and high-resilient copers are the three categories, with a total score ranging from 4 to 20 [18]. The reliability of BRCS, as estimated by Cronbach's alpha coefficient, was 0.76 [19]. Furthermore, the questionnaire inquired about different coping methods used to reduce the stress caused by the ongoing COVID-19 pandemic, such as practicing exercise, doing religious activities, playing online, and others.

2.6. Pilot Study

A pilot study was conducted among 30 students to assess the participants' clarity and understanding of the questions. No inclusion of the results of the pilot study in the present study was done.

2.7. Data Analysis

SPSS program, version 24, was used for data analysis. Quantitative data were presented as mean and standard deviation whereas qualitative data were presented as number

and percent. An independent sample t-test was utilized to compare two quantitative variables, and an ANOVA test for comparing more than two quantitative variables. Determination of the significant predictors of Zung's self-rating anxiety scale and Brief Resilient Coping Scale was done using regression analysis. P value ≤ 0.05 was considered statistically significant.

3. RESULTS

Table 1 depicts the demographic and clinical features of the participants. A total of 663 female university students participated in the present study. The mean age of the studied participants was 20.94 ± 1.69 , with 65% in the age group 20-22. Approximately 73% of the students were in the second, third, and fourth academic years. Nearly 93% of the students lived with their family or friends, and 48% had a family income of more than 1000 RS. The majority of the studied students (94.6%) were healthy, and only 5.4% reported some chronic diseases. Regarding the number of sleeping hours, 58.7% of the students sleep 6-9 hours per day. Table 1 also shows that 60.3% of the students had relatives infected with COVID-19, and only 9% had relatives who died because of it. Table 2 reveals the anxiety level of the studied participants. The majority of the students (68.5%) were normal and did not

suffer from any form of anxiety. Overall, 31.5% of the students had anxiety as 28.2% had mild to moderate anxiety, and 3.3% had marked to severe anxiety. Table 3 shows the factors associated with anxiety among the participants. Higher age was associated with more level of anxiety ($p=0.000$). In addition, students in their final years suffered more anxiety ($p=0.01$). Students with family income < 5000 RS had higher anxiety levels ($p=0.002$). Healthy students and students with adequate sleeping hours (6-9 hours) had less anxiety ($p=0.000$ and 0.02 , respectively). Students who had relatives infected with COVID-19 were more likely to have anxiety ($p=0.004$). Table 4 demonstrates that the significant predictors of anxiety were age, family income, health condition of the student, and having relatives infected with COVID-19. Table 5 shows the coping level depending on Brief Resilient Coping Scale among the participants. Participants of the present study were classified as low resilient copers (41.6%), medium resilient copers (37.6%), and high resilient copers (20.8%). Table 6 demonstrates that age was the significant predictor of coping level in regression analysis. The most coping methods done by the participants in the present study were using the internet (41.6%), doing fun with friends and family (40.7%), doing religious activities (39.4%), and going out in the wild or on farms (35.6%) (Table 7).

Table 1. Demographic and clinical features of female university students in Aljouf region, Saudi Arabia.

Demographic and Clinical Features	N (%) (n = 663)
Age	128 (19.3)
17-19	431 (65.0)
20-22	94 (14.2)
23-25	10 (1.5)
>25	20.94 \pm 1.69
Mean \pm SD	
Type of College	299 (45.1)
Theoretical	364 (54.9)
Applied	
Academic Year	54 (8.1)
Preparatory year	79 (11.9)
First year	140 (21.1)
Second year	186 (28.1)
Third year	156 (23.5)
Fourth year	48 (7.2)
Fifth year	
Accommodation	618 (93.2)
Living with family/friends	45 (6.8)
Living alone	
Family income	140 (21.1)
<5000 RS	205 (30.9)
5000-10000 RS	318 (48.0)
>10000 RS	
Health Condition	627 (94.6)
Healthy	36 (5.4)
Have a chronic disease	
Number of Sleeping Hours	163 (24.6)
<6 hours	389 (58.7)
6-9 hours	111 (16.7)
>9 hours	
Any of your relatives infected with COVID 19	400 (60.3)
Yes	263 (39.7)
No	

(Table 1) contd.....

Demographic and Clinical Features	N (%) (n = 663)
Any of your relatives died because of COVID 19	60 (9.0)
Yes	603 (91.0)
No	

Abbreviation: RS (Saudi Riyal).

Table 2. Anxiety level depending on Zung's classification among female university students in the Aljouf region, Saudi Arabia.

Anxiety Level	N (%) (n = 663)
Normal	454 (68.5)
Mild to Moderate Anxiety	187 (28.2)
Marked to Severe Anxiety	22 (3.3)
Mean Anxiety Score	41.28 ± 8.87

Table 3. Factors associated with anxiety among female university students in the Aljouf region, Saudi Arabia.

	Mean ± SD	P value
Age		
17-19	40.03 ± 8.27	0.000*
20-22	40.91 ± 8.76	
23-25	43.72 ± 9.03	
>25	50.30 ± 11.59	
Type of College	41.93 ± 8.89	0.089**
Theoretical	40.75 ± 8.83	
Applied		
Academic Year	39.09 ± 8.78	0.010*
Preparatory year	40.86 ± 8.42	
First year	39.84 ± 7.85	
Second year	40.27 ± 8.52	
Third year	42.90 ± 8.97	
Fourth year	42.75 ± 11.16	
Fifth year		
Accommodation	41.19 ± 8.81	0.353**
Living with family/friends	42.47 ± 9.67	
Living alone		
Family income	42.78 ± 8.91	0.002*
<5000 RS	41.89 ± 10.52	
5000-10000 RS	40.05 ± 7.85	
>10000 RS		
Health Condition	40.87 ± 8.69	0.000**
Healthy	48.39 ± 9.20	
Have a chronic disease		
Number of Sleeping Hours	42.68 ± 10.47	0.002*
<6 hours	40.26 ± 7.91	
6-9 hours	42.80 ± 9.09	
>9 hours		
Any of your relatives infected with COVID 19	42.08 ± 8.88	0.004**
Yes	40.06 ± 8.74	
No		
Any of your relatives died because of COVID 19	41.92 ± 10.75	0.560**
Yes	41.22 ± 8.67	
No		

Note: *ANOVA test; **Independent t test

Table 4. Linear regression model revealing the predictors of anxiety among Female University students in the Aljouf region, Saudi Arabia.

Variables	Beta	t	P value	95% Confidence Interval	
				Lower Limit	Upper Limit
Age	0.129	3.134	0.002	0.252	1.098
Type of College	- 0.070	-1.855	0.064	-2.564	0.073
Academic Year	- 0.005	- 0.114	0.909	- 0.549	0.489
Accommodation	0.002	0.030	0.976	-3.956	4.080
Family income	- 0.084	-2.180	0.030	-1.794	- 0.094
Health Condition	0.185	4.907	0.000	4.346	10.144
Number of Sleeping Hours	0.004	0.107	0.915	-1.000	1.115
Any of your relatives infected with COVID 19	- 0.123	-3.191	0.001	-3.589	- 0.855
Any of your relatives died because of COVID 19	0.013	0.334	0.738	-1.953	2.753

Table 5. Coping level depending on Brief Resilient Coping Scale among female university students in Aljouf region, Saudi Arabia.

Level of Coping	N (%) (n = 663)
Low resilient copers	276 (41.6)
Medium resilient copers	249 (37.6)
High resilient copers	138 (20.8)
Mean Coping Scale	13.75 ± 3.56

Table 6. Linear regression model revealing the predictors of coping level among female university students in the Aljouf region, Saudi Arabia.

Variables	Beta	t	P value	95% Confidence Interval	
				Lower Limit	Upper Limit
Age	0.133	3.123	0.002	0.103	0.454
Type of College	- 0.002	- 0.063	0.950	- 0.564	0.529
Academic Year	- 0.060	-1.436	0.151	- 0.372	0.058
Accommodation	0.064	1.072	0.284	- 0.755	2.573
Family income	0.009	0.239	0.811	- 0.309	0.395
Health Condition	- 0.003	- 0.081	0.936	-1.250	1.151
Number of Sleeping Hours	- 0.020	- 0.497	0.619	- 0.549	0.327
Any of your relatives infected with COVID 19	- 0.037	- 0.924	0.356	- 0.833	0.300
Any of your relatives died because of COVID 19	0.075	1.874	0.061	- 0.045	1.904

Table 7. Coping methods among female university students in the Aljouf region, Saudi Arabia.

Coping methods	No	Little	Moderate	Always
Exercise regularly	304 (45.9%)	220 (33.2%)	105 (15.8%)	34 (5.1%)
Watching movies and playing electronic games	88 (13.3%)	193 (29.1%)	208 (31.4%)	174 (26.2%)
Fun with friends and family	50 (7.5%)	148 (22.3%)	195 (29.4%)	270 (40.7%)
Doing religious activities	35 (5.3%)	153 (23.1%)	214 (32.3%)	261 (39.4%)
Learn how to live and accept the current situation with the pandemic	224 (33.8%)	215 (32.4%)	145 (21.9%)	79 (11.9%)
I refuse to believe the current situation of the pandemic	181 (27.3%)	264 (39.8%)	167 (25.2%)	51 (7.7%)
The internet helps me give advice and feel happy	61 (9.2%)	136 (20.5%)	190 (28.7%)	276 (41.6%)
Cultural and historical reading	429 (64.7%)	125 (18.9%)	83 (12.5%)	26 (3.9%)
Going out to the wild, farms or beaches	72 (10.9%)	157 (23.7%)	198 (29.9%)	236 (35.6%)

4. DISCUSSION

College students' anxiety levels are already a public health concern. Several earlier studies investigated students' stress,

anxiety, and depression, as well as potential influences on their mental health [20 - 22]. This is mostly because they are worried about the future, under scholastic pressure to perform

better academically, and manage difficult tasks and assignments [23]. The aim of this study was to assess the anxiety level and coping methods related to the coronavirus pandemic among Saudi university students.

Previous studies conducted in Saudi Arabia before the Covid-19 pandemic revealed that the students usually suffered from anxiety. A study by Abdel-Salam *et al.* revealed anxiety symptoms among 84.7% of the participants [10], and according to research by Bahhawi *et al.*, 65.7% of students reported having some anxiety symptoms [11]. About 35% of the students in a different study that assessed the anxiety levels of university students in Saudi Arabia reported having moderate to severe levels of anxiety [9].

In the current study, 31.5% of the students had anxiety, 28.2% had mild to moderate anxiety, and 3.3% had marked to severe anxiety. A study conducted in Saudi Arabia during the COVID-19 pandemic showed an anxiety prevalence of 18% [24]. In Southeast Ethiopia, 16.58% of the entire population had dysfunctional anxiety related to COVID-19 [25].

On the other hand, a study conducted in Egypt revealed that nearly 70% of students experienced anxiety as a psychological impact of the COVID-19 pandemic [26], while another study revealed that 82.4% and 64% were screened positive for anxiety and psychological stress, respectively [27]. In Malaysia, 20.4%, 6.6%, and 2.8% of university students, respectively, had minimal to moderate, marked to severe, and most extreme levels of anxiety [28].

For most students around the world, the COVID-19 pandemic and the responses taken to it, such as closing schools and universities, could have created a novel kind of anxiety and interruptions to daily life [26]. College students are among the age groups that move rapidly and actively participate in the community. As a result of the COVID-19 epidemic, they were abruptly forced to stop going to their universities, stay at home, avoid social gatherings, exercise, and travel because of fear of contracting the disease or spreading it to their friends or relatives [26]. High levels of stress could have negative effects on brain function and level of academic achievement [29].

In the present study, the anxiety is more with the increasing age of the students. In addition, students in their final years suffered more anxiety compared to students in other years. Final-year students may have justifiable concerns about virtual education and its effect on their results. These findings were similar to a study carried out in Saudi Arabia which revealed that moderate stress was significant in the 5th year medical students [22]. Another study revealed that anxiety was highly correlated with the age of university students [24].

The current study revealed that healthy students and students who have adequate sleeping hours had less anxiety. Students who were categorized as poor sleepers had more issues with their emotional and physical well-being. It has been demonstrated that enhancing sleep quality lowers the risk of chronic diseases, such as depressive disorders, substance dependence, and heart and autoimmune conditions [30]. Frontini *et al.* showed that participants with higher levels of sleep quality showed reduced anxiety levels [31].

The present study showed that students with family

members infected with COVID-19 were more likely to have anxiety. Students are always concerned for the health of their loved ones. According to previous studies, having a relative infected with COVID-19 strongly predicts greater anxiety. It raises the probability of presenting depressive symptomatology by three times more than it does in the general population of university students [32, 33].

This study also showed that students with a low family income (<5000 RS) had higher anxiety levels, and students with a higher family income had fewer anxiety levels. This is concomitant with the studies conducted by Sareen *et al.*, who demonstrated that many lifelong mental problems are linked to low levels of family income [34]. Another study showed that youths from homes who had declining and chronically poor incomes throughout time had a higher probability of experiencing psychological issues [35].

Coping techniques are employed by an individual, a group, or an organization to lessen the consequences of stress [36]. According to Chirombe *et al.*, people used a variety of social, emotional, religious, and physiological coping mechanisms during the closure to lessen stress and anxiety and continue living their regular lives despite being physically cut off from the outside community [37]. Zhao *et al.* stated that students with high levels of resilience may bounce back from setbacks more rapidly and deal with issues more forcefully, reducing their vulnerability to psychological issues during the pandemic [38]. The current study reported that nearly 58% of participants were classified as medium and high resilient copers; this was concomitant with the findings of Engida *et al.*, who stated that about half of the participants in the study (50.6%) dealt with COVID-19-related anxiety [25].

Evidence suggests that during a period of extreme social change brought on by a pandemic, people typically have a high demand for information and sense-making. The internet and mass media are typically seen as the best options to meet these needs [39]. To lessen the anxiety brought on by ambiguity during the pandemic period, people typically need more data within the framework of the pandemic time [40].

In the current study, the most coping methods done by the participants were using the internet, doing fun with friends and family, doing religious activities, and going out in the wild or on farms. A study in the Philippines concluded that the use of the Internet as a coping strategy was the seventh among all strategies detected [41]. In other studies, students employed a variety of coping mechanisms, including optimism, avoidance, problem-solving, and transference [42, 43]. On the other hand, Abdulghani *et al.* noticed that most of the severely stressed students found that engaging in religious activities was the most beneficial coping mechanism for dealing with stress [22].

The prohibition of female authors from conducting survey studies among male students by administrative authorities in Saudi Arabia is a limitation in the present study. Therefore, the authors were unable to determine the gender-specific prevalence rate of anxiety. In addition, the participants were from one location in Saudi Arabia, so this study has limitations regarding the data-gathering setting. Findings from the study should not be generalized to other cultures because they only

represent the opinions and experiences of a small sample of respondents.

CONCLUSION

Saudi students experienced variable degrees of anxiety during the COVID-19 pandemic. The increasing age of the students, low family income, chronic disease, and family members infected with COVID-19 were associated with more vulnerability to anxiety. More than half of the participants of the present study were classified as medium and high resilient copers. The higher age of the students was associated with more coping with the COVID-19 pandemic. The present study recommends that throughout the COVID-19 pandemic, university students' mental health should be closely checked to mitigate the psychological impact of this situation.

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

The Ethical Review Committee of Jouf University was responsible for the revision of the proposal of the study. Data was collected after ethical clearance (Approval No.: 7-03-43).

HUMAN AND ANIMAL RIGHTS

No animals were used in this research. All procedures performed in studies involving human participants were in accordance with the ethical standards of institutional and/or research committee and with the 1975 Declaration of Helsinki, as revised in 2013.

CONSENT FOR PUBLICATION

The researchers were adherent to the ethical aspects of the current study by explaining the purpose of the current study to the students before they filled out the questionnaire, taking informed written informed consent from the students who agreed to take part in the study and assure the confidentiality of the collected data. Consent for the publication of the present study was obtained from the target population.

STANDARDS OF REPORTING

STROBE guidelines were followed.

AVAILABILITY OF DATA AND MATERIALS

The data that support the results of this study are accessible from the corresponding author [R.A.M] upon reasonable request.

FUNDING

None.

CONFLICT OF INTEREST

Conflict of interest was not declared in the present study.

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