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Prevalence of generalized anxiety disorder among nursing students in Iran during the COVID-19 pandemic: A web-based cross-sectional study

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ABSTRACT

Background: The Coronavirus disease 2019 (COVID-19) is a public health emergency that poses anxiety symptoms to nursing students (P. Li et al., 2020). Therefore, this study aimed to examine the prevalence of anxiety and its associated factors in nursing students in Iran during the COVID-19 pandemic.

Methods: We performed this web-based cross-sectional study on 174 nursing students in Iran, between 4 and 24 April 2020. Data were collected through an online questionnaire using social media like Telegram and WhatsApp. Anxiety was measured via the Generalized Anxiety Disorder-7 (GAD-7). Simple and multiple logistic regression analyses were undertaken to examine independent predictors of anxiety. Statistical analysis was performed using SPSS for Windows, version 16.0.

Results: The mean GAD-7 total score was 6.05 ± 4.77 , and the prevalence of GAD using a cut-off value of 10 for the GAD-7 was 20.7%. According to the adjusted analysis, GAD was significantly associated with having chronic diseases (OR = 5.74, 95% CI: 1.39–23.72), long time thinking about COVID-19 (OR = 14.09, 95% CI: 4.36–45.54), and death of family members, relatives or friends due to COVID-19 (OR = 4.53, 95% CI: 1.08–18.93).

Conclusion: The prevalence of GAD is considerably high in nursing students during the COVID-19 pandemic in Iran. Thus, a holistic approach, including management policies, psychosocial interventions, and training, is critical to reducing anxiety symptoms during the COVID-19 pandemic as well as during any outbreaks of other infectious diseases in the future.

1. Introduction

Anxiety is a psychological condition that all human beings have almost experienced during their lives in different degrees. But when it rises and reaches a level that causes distress and conflict, it is known as a disorder. Generalized Anxiety Disorder (GAD) is one of the most common disorders characterized by persistent, excessive, and unrealistic concerns about everyday issues (Yu et al., 2018). GAD can cause sleeping, concentration, and physical problems such as; Exhaustion, headaches, muscle aches and pains and many other problems in the future (Rijn & Wild, 2013). There is evidence that this disorder is more common in people who have had life crises (Li, Wang, Xue, Zhao, and Zhu, 2020). Nursing students have experienced stress and anxiety over

their course during the Coronavirus disease 2019 (COVID-19) outbreak (Beck and Srivastava, 1991). In addition to the prevalence of the disease and physical and clinical problems, their concerns are related to continuing classes and internships (Tully, 2004). Preliminary studies in China showed an increase in anxiety and stress among nursing students (Admi, 1997). Coronavirus is a large family of viruses. A new type of coronavirus has recently spread in Wuhan, China, in December 2019, and the virus has been called COVID-19 (Li, Fu et al., 2020). The symptoms of the virus range are from mild to severe. Signs and symptoms of infection include fever of 89%, cough 68%, fatigue 38%, sputum production 34% and shortness of breath 19% (Guan et al., 2020). COVID-19 can be asymptomatic or cause a mild infection in the upper respiratory tract. In more severe cases, it can lead to more severe

Abbreviations: COVID-19, Coronavirus Disease 2019; GAD-7, Generalized Anxiety Disorder-7; SD, Standard Deviation; OR, Odds Ratio; CI, Confidence Interval.

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respiratory infections, which can even lead to death (Covid & Team, 2020). Preventive measures revolve mainly around social distance and quarantine. One of the most important is to avoid being in crowded places and being safe from people and also hand washing (Sallam et al., 2020). COVID-19 spreads easily in infected areas of the community. COVID-19 has infected 213 countries and territories and 2 international conveyances around the world (Wu & McGoogan, 2020). The world has been severely affected by the COVID-19. In addition to affecting health care systems, it causes anxiety among the population which leads to a deficit in economic and educational system (Sallam et al., 2020). In total, 6,204,725 people around the world and 151,466 people in Iran were infected with this virus, of which 118,848 people recovered and 7797 people died, and this trend continues (Diet, 2003). COVID-19 has also spread in Iran since late 2019 and quickly endangered people's physical and mental health (Wu & McGoogan, 2020). Anxiety is a common symptom in patients with chronic respiratory disorders and can significantly reduce patients' quality of life. In almost all cases, anxiety assessment includes physical cases that can overlap with the symptoms of chronic respiratory illness and the side effects of medications. Clinical anxiety affects up to two-thirds of chronic respiratory patients, leading to reduced quality of life and physical function. Little research has been done on anxiety experiences in patients with severe respiratory symptoms (Bajema et al., 2020). Anxiety about COVID-19 is also common among people in the community and seems to be due in large part to the unknown and cognitive ambiguity in people about the virus. Fear of the unknown reduces the perception of immunity in humans and has always been a concern for humans. Low scientific knowledge about COVID-19 also exacerbates this anxiety (Beck and Srivastava, 1991). At this time, people are looking for more information to relieve their anxiety. Anxiety can make people unable to recognize right and wrong information, so they may be exposed to false news. Stress and anxiety can weaken the immune system and make them vulnerable to diseases such as COVID-19 (Al-Rabiaah et al., 2020). As a result, people need to learn strategies to deal with anxiety. Some evidence suggests that literacy can be a predictor of stress, anxiety, depression, and quality of life (Bajema et al., 2020). Li S et al (2020) conducted a study to investigate the psychological consequences of coronary heart disease in China through online polls, and concluded that the disease has increased anxiety, stress and reduced happiness among people (Li et al., 2020b). Iran has the highest epidemic rate of COVID-19 in the Eastern Mediterranean (WHO) and information on the awareness and attitude of Iranian nurses about this infectious disease is not available (Nemati et al., 2020). It seems that the students in the field of healthcare should fulfill their social responsibility to help the people in the society to overcome the physical and mental problems. Evidence suggests that students in this area, like the general public at the time, have been experiencing problems such as stress and anxiety and are unable to perform their social duties (Al-Rabiaah et al., 2020). Therefore, the present study aimed to investigate the prevalence of generalized anxiety disorder associated with COVID-19 among nursing students in Iran.

2. Material and Methods

2.1. Design and sampling

This study was a web-based cross-sectional which done in 31 provinces in Iran. The sample size was 174 people. The study sample consists of nursing students in Iran. Sampling was done by sending electronic surveys to the nursing students' group on social networks such as Telegram and WhatsApp.

2.2. Data collection tools

2.2.1. Demographic variables

Demographic variables included age, sex, marital status, parent status, education, and occupation.

2.2.2. COVID-19-related variables

The COVID-19-related variables included: (1) having chronic diseases, (2) times to focus on COVID-19 per day, (3) contact with suspected or confirmed COVID-19 cases, (4) death of family member, relatives or friends due to COVID-19.

2.2.3. Generalized anxiety disorder-7 (GAD-7)

The GAD-7 is a 7-item self-report measure that assesses GAD symptoms during the last two weeks based on DSM-IV criteria (Spitzer, Kroenke, Williams, & Löwe, 2006). Each item is rated on a 4-point Likert-type scale ranging from 0 (not at all) to 3 (nearly every day). Total scores range from 0 to 21, with higher scores indicating greater GAD symptoms. A total score of 10 or more is considered indicative of GAD symptoms. The Persian version of this measure has been shown to have good reliability and validity (Omani-Samani, Maroufizadeh, Gha-heri, & Navid, 2018). The obtained Cronbach's alpha coefficient in the current study was 0.864.

2.3. Data analysis method

In the present study, continuous variables were expressed as "mean \pm standard deviation (SD)" and categorical variables as "frequency (percentage)". Simple and multiple logistic regression analyses were performed to examine the predictors of GAD symptoms. The crude and adjusted odds ratio (OR) and 95% confidence interval (CI) were calculated. Statistical analysis was performed using SPSS for windows, version 16.0 (SPSS Inc., Chicago, IL, USA), and a $P < 0.05$ was considered statistically significant.

2.4. Ethical consideration

This study was approved by the Ethics Committee of Tehran University of Medical Sciences, Tehran, Iran (Ethics Code: IR.TUMS.VCR.REC.1399.089), and all nursing students were fully informed about the purpose of the research and the voluntary nature of their participation.

3. Results

3.1. Participants characteristics

Table 1 shows the demographic and COVID-19-related characteristics of the nursing students. The mean age of the students was 23.07 ± 3.74 years (range: 18–43 years). Most of them were female (73.0%), single (84.5%), and BSc students (82.2%).

3.1.1. Distribution of GAD-7 total score

The mean GAD-7 total score was 6.05 ± 4.77 (range: 0–20). Distribution of scores falling within GAD-7 severity cut-offs were as follows: no anxiety, 78 (44.8%); mild, 60 (34.5%); moderate, 22 (12.6%); and severe, 14 (8.0%). Based on a cut-off value of 10, the prevalence of GAD was 20.7% ($n = 36$).

3.2. Factors associated with GAD

Simple and multiple logistic regression analyses were performed to identify factors associated with GAD among nursing students (see Table 2). Unadjusted analysis showed that each one-year increase in age increases the odds of GAD by 10% ($OR_{Crude} = 1.10$, 95% CI: 1.01–1.20). Students with chronic diseases were 5.31 times more likely to have GAD than other participants ($OR_{Crude} = 5.31$, 95% CI: 1.66–16.98). Employed nursing students were more likely to have GAD than unemployed students ($OR_{Crude} = 2.41$, 95% CI: 1.00–5.78). The prevalence of GAD among MSc/PhD student were higher than the BSc students, although the difference was not statistically significant ($P = 0.084$). Finally, the odds of GAD increased with increasing the times of focusing on COVID-19 per a day.

Table 1
Demographic characteristics of the nursing students (n = 174).

	Mean ± SD or n (%)
Age (years)	23.07 ± 3.74
Sex	
Male	47 (27.0)
Female	127 (73.0)
Marital status	
Single	147 (84.5)
Married	27 (15.5)
Parent status	
No child	163 (93.7)
One or more children	11 (6.3)
Education	
BSc	143 (82.2)
MSc	29 (16.7)
PhD	2 (1.1)
Occupation	
No	112 (64.4)
Yes	32 (18.4)
Volunteer nurses	30 (17.2)
Chronic diseases	
No	161 (92.5)
Yes	13 (7.5)
Times to focus on COVID-19 per day (hours)	
<0.5	85 (48.9)
0.5–1	36 (20.7)
1–2	21 (12.1)
>2	32 (18.4)
Contact with suspected or confirmed COVID-19 cases	
No	134 (77.0)
Yes	40 (23.0)
Death of families, relatives or friends due to COVID-19	
No	162 (93.1)
Yes	12 (6.9)

COVID-19: Coronavirus Disease 2019; SD: Standard deviation.

Table 2
Association between GAD and demographic/COVID-19-related variables among nursing students.

Variables	Prevalence, n (%)	Simple logistic regression		Multiple logistic regression	
		OR Crude (95% CI)	P	OR Adjusted (95% CI)	P
Age (years)	–	1.10 (1.01–1.20)	0.031	1.02 (0.85–1.23)	0.807
Sex					
Male	9 (19.1)	1		1	
Female	27 (21.3)	1.14 (0.49–2.64)	0.760	0.91 (0.32–2.58)	0.861
Marital status					
Single	29 (19.7)	1		1	
Married	7 (25.9)	1.42 (0.55–3.69)	0.467	0.95 (0.21–4.26)	0.951
Parent status					
No child	33 (20.2)	1		1	
One or more children	3 (27.3)	1.48 (0.37–5.88)	0.580	0.71 (0.07–7.17)	0.772
Education					
BSc	26 (18.2)	1		1	
MSc/PhD	10 (32.3)	2.14 (0.90–5.09)	0.084	1.19 (0.31–4.57)	0.799
Occupation					
No	20 (17.9)	1		1	
Yes	11 (34.4)	2.41 (1.00–5.78)	0.049	1.80 (0.48–6.57)	0.384
Volunteer nurses	5 (16.7)	0.92 (0.31–2.70)	0.879	0.63 (0.18–2.24)	0.476
Chronic diseases					
No	29 (18.0)	1		1	
Yes	7 (53.8)	5.31 (1.66–16.98)	0.005	5.74 (1.39–23.72)	0.016
Times to focus on COVID-19 per day (hours)					
<0.5	7 (8.2)	1		1	
0.5–1	6 (16.7)	2.23 (0.69–7.17)	0.179	2.65 (0.76–9.23)	0.127
1–2	6 (28.6)	4.46 (1.31–15.13)	0.017	3.78 (0.94–15.11)	0.060
>2	17 (53.1)	12.63 (4.47–35.70)	<0.001	14.09 (4.36–45.54)	<0.001
Contact with suspected or confirmed COVID-19 cases					
No	24 (17.9)	1		1	
Yes	12 (30.0)	1.96 (0.88–4.41)	0.101	1.11 (0.31–3.95)	0.873
Death of families, relatives or friends due to COVID-19					
No	32 (19.8)	1		1	
Yes	4 (33.3)	2.03 (0.58–7.17)	0.271	4.53 (1.08–18.93)	0.039

COVID-19: Coronavirus Disease 2019; CI: Confidence Interval; OR: Odds Ratio.

In adjusted analysis, GAD was significantly associated with having chronic diseases (OR_{Adj} = 5.74, 95% CI: 1.39–23.72), long time thinking about COVID-19 (>2 h per day) (OR_{Adj} = 14.09, 95% CI: 4.36–45.54), and death of family members, relatives or friends due to COVID-19 (OR_{Adj} = 4.53, 95% CI: 1.08–18.93).

4. Discussion

The main aim of the present study was to determine the prevalence of GAD among Nursing Students in Iran during the COVID-19 pandemic. The results of this study showed that GAD was significantly associated with having chronic diseases and also Employed nursing students had more GAD than unemployed students. The prevalence of GAD among MSc/PhD student were higher than the BSc students. The odds of GAD increased with increasing the amount of time focusing on COVID-19 per day, death of family members, relatives or friends because of this disease.

The finding of this study showed that prevalence of GAD was 20.7%. No anxiety was 44.8%, mild anxiety was 34.5%, moderate anxiety was 12.6%, and severe anxiety was 8.0%. The anxiety prevalence in the present study is considerably higher than what was reported in the general population (Moghanibashi-Mansourieh, 2020, Johansson, Carlbring, Heedman, Paxling, & Andersson, 2013).

The prevalence of COVID-19 disease causes harmful consequences and anxiety in people. Both nurses and nursing students experienced it but this anxiety is highest in nurses (Loh et al., 2005).

A study in Saudi Arabia was done on associated stress among medical students at a university teaching hospital during the outbreak of COVID-19 (Al-Rabiaah et al., 2020). This study showed that 77% of students had minimal anxiety, 18.4% of students had mild anxiety, 4.6% of students had moderate anxiety and none of them had severe anxiety. In our study the anxiety rate in nursing students of Iran was more than in Saudi Arabia (Al-Rabiaah et al., 2020).

A study in China (Wang et al., 2020) was done on immediate psychological responses and associated factors during the initial stage of the 2019 coronavirus disease epidemic among the general population in China. This study showed that more than a quarter of participants experienced moderate to severe anxiety. In our study 20.7% of the sample (more than a quarter) had anxiety (Wang et al., 2020).

This study has several limitations that should be taken into account. First, the generalizability of the findings may be limited due to the web-based setting of the study. Second, the sample size was small, which may have precluded detection of significant differences due to subjects' variability. Third, due to the cross-sectional nature of the study design, causal inferences between variables cannot be made.

5. Conclusion

The prevalence of GAD is considerably high in nursing students during the COVID-19 pandemic in Iran. Furthermore, the findings indicated that more attention needs to be paid to nursing students with chronic diseases. In all, a compressive approach, including management policies, psychosocial interventions, and training, is critical to reduce anxiety symptoms of students during COVID-19 pandemic as well as during any outbreaks of other infectious diseases in the future.

6. Consent for publication

Not applicable.

7. Availability of data and materials

The datasets used and/or analyzed during the present study are available from the corresponding author on reasonable request.

8. Authors' contributions

Study concept and design: MH, SM, FN, HM, MA.

Acquisition, analysis, or interpretation of data: MH, SM, FN, HM, MA.

Drafting of the manuscript: MH, SM, FN, MH, and MA.

Critical revision of the manuscript for important intellectual content: MH, SM, FN, MH, MA.

Statistical analysis: SM.

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Administrative, technical, or material support: MH, HM, FN, MA.

Study supervision: FN.

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Declaration of Competing Interest

The authors declare that they have no known competing financial

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