

ORIGINAL ARTICLE

Prevalence of generalized anxiety disorder among Saudi youth during COVID-19 pandemic in Saudi Arabia

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ABSTRACT

Background: Generalized anxiety disorder (GAD) is a condition in which a person is worried excessively over little things. Adolescents who experienced Coronavirus disease (COVID-19) are more prone to GAD. Thereby, the study aimed to study the prevalence of GAD among Saudi youth during the COVID-19 pandemic in Saudi Arabia, and to identify the variables related to COVID-19 that could predict anxiety among youth.

Methodology: A cross-sectional study was carried out among the general youth in different regions of Saudi Arabia from April to October 2020. A pretested questionnaire was used for data collection. A convenient non-probability sampling technique was employed to collect the data from the participants.

Result: Out of total 480 participants, 78.3% were male and 21.7% were female. The study included 351 (73.1%) Saudi nationals. Regarding the prevalence of GAD, 53 (11%) had mild GAD symptoms, 268 (55.8%) had moderate, and 39 (8.1%) had extremely severe GAD symptoms. A statistically significant association was found among anxiety, age, and history of diagnosis or exposure to COVID-19.

Conclusion: More than half the youth in this study had shown symptoms of GAD. Anxiety was associated with age and whether the participant had been diagnosed with or exposed to COVID-19.

Keywords: COVID-19, youth, generalized anxiety disorder, prevalence, Saudi Arabia.

Introduction

Many countries across the world have been affected by the novel coronavirus. The affected countries were quarantined for several months, followed by distancing measures. To slow down the transmission of coronavirus disease (COVID-19) and break the chain of infection, lockdowns were enforced in affected areas of many countries, thus affecting lifestyle, educational activities, festivals, tourism, and international meetings. People were devastated by being quarantined in their houses [1]. The beginning of March was horrible for Saudi Arabia when the first case of COVID-19 was identified. The number of reported cases reached above 137,300 from March to June, of which many patients died and recovered. Still, there are many active cases in the country [2]. Quarantine and lockdown have affected many people mentally. The people in quarantine were negatively affected by social factors [3]. Adolescence between the

ages of 15 and 25 years had many physical, mental, and social changes. Most importantly, mental illness has been characterized in this duration, among which generalized anxiety disorder (GAD) is the most common. In Saudi Arabia, there was a 71% prevalence of GAD [4].

GAD is a condition in which a person is worried excessively over little things, such as family, money, or health, and shows overly concerns. Several studies have

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identified the occurrence of GAD symptoms among teenagers [5]. The outbreak of COVID-19 has majorly affected the young population who were infected with the virus or close relatives of infected patients. In Saudi Arabia, teenagers were the victims of the deadly virus because the quarantine increased their depression and stress levels [6]. GAD often showed co-occurrence with posttraumatic stress disorder (PTSD). Adolescents who experienced COVID-19 were more prone to GAD [7]. COVID-19 has also affected the mental health of healthcare workers (HCW) and nursing staff. The symptoms of GAD included poor sleep quality, high depression, hyperarousal, physical pain, hyperactivity, and perceived anxiousness [8,9]. The college and university students were more prone to GAD, which has now become a great health concern. In Saudi Arabia, physicians had acquired GAD because of the challenging hospital routines during the COVID-19 pandemic [10].

Many genetic factors predispose GAD along with the depression. However, GAD has recently been shown to share heritability with neuroticism. The physicians and HCW in Saudi Arabia have shown GAD prevalence up to 15% because of the economic burden and increased facilitation of healthcare services [11]. Teenagers during the COVID-19 pandemic showed more frequency to GAD because the pandemic had negatively affected their academic performance, professional development, and academic grades [12,13]. However, the prevalence of GAD in female teenagers was higher than males in Saudi Arabia [14].

Only minimal investigation was performed on uncontrolled and dangerous symptoms of GAD among teenager population in the past [15]. A recent study reported that GAD, anxiety, and stress could have a significant outcome on daily work routine and lifestyle. Since the young population during the pandemic was confined to isolation, the chances of developing GAD and emotional distress were increased due to social avoidance [16]. Significant levels in stress, nervousness, GAD, and PTSD were shown in individuals who were kept isolated or experienced quarantine during the pandemic. The high mortality rate due to the pandemic had scared people psychologically, ranging from physicians and patients to students, families, and mentally ill patients [17].

Furthermore, very little knowledge about the impact of COVID-19 on the psychiatric health of the people is known. Almost 50% of the young population in the United Kingdom had suffered from GAD along with depression during the pandemic [18]. It is important to diagnose the GAD in early stages without disturbing the quality of life. The COVID-19 pervasiveness has affected people with severe symptoms of GAD and anxiety. If left untreated, the outcomes could become complicated. Therefore, there is a need for preventive measures and early detection to prevent the youth population from GAD during the COVID-19 outbreak [14].

In the Kingdom of Saudi Arabia (KSA), the chances of psychological distress due to the pandemic were greater

because of various reasons. KSA had shown a large number of reported cases due to which fear of infection and pressure on the healthcare services were increased. Because of little knowledge about mental illnesses, no research was carried out to determine the groups of people who have psychological disorders [19]. Khaled et al. [20] conducted research about the effects of the COVID-19 pandemic on psychological distress among the general population of Saudi Arabia. It was shown that distress levels were 40% in the Saudi population.

Li et al. [21] examined the comorbidity of PTSD and GAD in young adolescents and children who were infected with COVID-19 in Hubei, China. It was concluded that perceived infection of COVID-19 has increased the comorbidity symptoms in young adolescents. A survey was also conducted among HCW in Wuhan, China. The results reported that depression (12.8%) and anxiety (20%) levels were elevated during the pandemic. The symptoms included poor sleep, loss of appetite, and increased distress levels [22]. Islam et al. [23] conducted a cross-sectional survey among Bangladesh residents and showed the prevalence of panic (80%) and GAD (37%). Al Omari et al. [24] investigated anxiety and stress among the youth and showed a high prevalence of depression (45%) in the female teenagers who had a close relationship with friends having psychiatric disorders. Thereby, the study aimed to study the prevalence of GAD among Saudi youth during the COVID-19 pandemic in Saudi Arabia and to identify the variables related to COVID-19 that could predict anxiety among youth.

Subject and Methods

A cross-sectional study was carried out among the general youth in different regions of Saudi Arabia, from April to October 2020. Any adult Saudi resident who agreed to participate in the study, being 15-24 years old at the time of the study, both sexes, any nationality, could read, and had a social media account were included in the study.

The sample size was calculated using EPI info program. Based on 95% confidence interval, 5% margin of error and total youth population of Saudi Arabia. The estimated sample size was 384 and was adjusted to 422 to compensate for 10% non-response rate. The study was conducted using an online self-administered questionnaire via Google Forms. The generated link was randomly shared on social media (i.e., Facebook, WhatsApp, Telegram, Twitter). The aim of the study was clearly explained in the interface. A validated questionnaire was used based on previous studies. The questionnaire contained socio-demographic characteristics of the participants like age group, sex, nationality, and residence. The questionnaire also included questions about prevalence of GAD. The anxiety scale assesses the subjective experience of the anxiety effect, autonomic arousal, skeletal muscle effects, and situational anxiety. Scores were classified as normal (0-7 points), mild [8,9], moderate [10-14], and severe [15-19], with scores of 20 or more indicating extremely severe anxiety.

The questionnaire was pretested in a pilot study over a sample of 20 participants whose results were not included in the study. Some modifications were done accordingly to ensure clarity and easy understanding of the questions. A convenient non-probability sampling technique was employed to collect the data from the participants. Data were coded, entered, and analyzed using the Statistical Package for Social Science version 23. Qualitative data were expressed in the form of number and percentage (No. & %). Chi-square (χ^2) test was used to examine qualitative data between two groups.

Result

A total of 480 individuals completed the online questionnaire. Out of them 376 (78.3%) were male and 104 (21.7%) were female. Regarding their age, 104 (21.7%) participants were 15-16 years of age and 100 (20.8%) were 23-24 years of age. The study included 351 (73.1%) Saudi nationals. Regarding their educational level, most of the participants were intermediate schools or secondary school students (47.7% and 34.4%, respectively). Most of the study participants (158, 32.9%) were residing in the northern region and 128 (26.7%) were residing in the southern region (Table 1).

Furthermore, 186 (38.8%) participants said that they were diagnosed or exposed to COVID-19 during the pandemic and 209 (43.5%) claimed having a relative or a friend diagnosed with COVID-19. In addition, 140 (29.2%) participants had a history of GAD and 173 (36%) claimed having a relative or a friend who was diagnosed with GAD.

Additionally, results also showed that more than half of the participants had symptoms of GAD which ranged from mild to extremely severe symptoms. Almost 53 (11%) had mild GAD symptoms, while 39 (8.1%) had extremely severe GAD symptoms. The percentage of the participants who had moderate to severe symptoms of anxiety was 67.9% (Table 2).

Moreover, a chi-square test of independence showed an association between age and anxiety ($p = 0.000$), with the highest anxiety level recorded among the age group of 19-20 years (100%), followed by the age group of 23-24 years (95%). It was also found that more people who were diagnosed or exposed to COVID-19 had anxiety when compared to those who were not exposed to COVID-19 (87.6% vs. 73.5%, respectively, $p = 0.000$) (Table 3).

Discussion

Public health emergencies could have a significant psychological impact on the mental health of adolescence [25]. This could be expressed as anxiety, fear, and

Table 2. Prevalence of GAD among the participants stratified by severity.

Anxiety	N	%
Normal	101	21
Mild	53	11
Moderate	268	55.8
Severe	19	4
Extremely severe	39	8.1

Table 1. Socio-demographic information of the study participants (n = 480).

Variable	Category	Frequency (n)	Percent (%)
Gender	Male	376	78.3
	Female	104	21.7
Age (Years)	15-16	104	21.7
	17-18	111	23.1
	19-20	99	20.6
	21-22	66	13.8
	23-24	100	20.8
Nationality	Saudi	351	73.1
	Non-Saudi	129	26.9
Level of education	Primary	40	8.3
	Intermediate	229	47.7%
	Secondary	165	34.4
	Other	46	9.6
City of residence	Central region	53	11%
	Western region	108	22.5
	Eastern region	33	6.9
	Northern region	158	32.9
	Southern region	128	26.7

Table 3. The relationship between anxiety and certain variables.

Variable	Anxiety		p value
	Yes	No	
Gender			
Male	291 (77.4%)	85 (22.6%)	0.110
Female	88 (84.6%)	16 (15.4%)	
Age (Years)			
15-16	72 (69.2%)	32 (30.8%)	0.000*
17-18	96 (86.5%)	15 (13.5%)	
19-20	99 (100%)	0	
21-22	17 (25.8%)	49 (74.2%)	
23-24	95 (95%)	5 (5%)	
Have you been diagnosed/exposed to COVID-19?			
Yes	163 (87.6%)	23 (12.4%)	0.000*
No	216 (73.5%)	78 (26.5%)	
Do you have a relative/friend diagnosed with COVID-19?			
Yes	171 (81.8%)	38 (18.2%)	0.177
No	208 (76.8%)	63 (23.2%)	

*Statistically significant.

worry, among other things. The aim of this study was to investigate the prevalence of GAD among youth living in KSA during the COVID-19 pandemic and to explore factors that could influence their anxiety symptoms. The survey included 480 participants with an age ranging from 15 to 24 years from different regions of KSA.

Current results indicated that more than half of the youths who had participated in this study were affected with the symptoms of GAD during the COVID-19 pandemic, which is quite high. Of these individuals, 11% had mild symptoms, 55.8% had moderate symptoms, and 12.1% had severe to extremely severe symptoms. Many factors were related to the anxiety among those individuals during the COVID-19 pandemic, including the effect of the pandemic on their studies and future employments [26,27]. It was also hypothesized that this anxiety was caused by the gradually increasing social distances between people because of quarantine, and it was well documented that anxiety disorders were more likely to happen in the absence of interpersonal communication [28].

A similar study was conducted by Al-Omari et al. [24] immediately after COVID-19 lockdown to estimate the prevalence and predictors of depression, anxiety, and stress. The study reported a prevalence of 33.1% for anxiety disorders among youths of Saudi Arabia, with 2.5% having mild symptoms, 16.5% having moderate symptoms, 4.1% having severe symptoms, and 9.9% having extremely severe symptoms. Another study by Khaled et al. [20] was conducted among the general population of Saudi Arabia and showed that distress levels during the COVID-19 pandemic was 40% among the Saudi population with 33% individuals mildly distressed, while 7% were severely distressed. The

distress levels were particularly high among the youngest age group [18].

A recent study was conducted in Saudi Arabia in Qassim region, just before the pandemic by Alharbi et al. [4] to assess the prevalence of anxiety and depression among the Saudi adolescences. It was found that about 66.5% participant were having anxiety. The results showed that 34.1% adolescents were having mild anxiety, 19.5% had moderate anxiety, and 9.8% had severe anxiety [4].

It was indicated that the public worries were elicited by the increasing number of patients and suspected cases of COVID-19, in addition to the increasing number of regions and countries affected by this pandemic. All these factors have raised public worries about being infected during this outbreak, which has increased the susceptibility of developing anxiety [29]. In addition, the significant shortage of masks and disinfectants during the pandemic, the lockdown and social distancing measures, the overwhelming news headlines, and the misleading news reports have also added to anxiety, and fear among the population [30].

Although more women had GAD symptoms than men, this association did not reach the statistically significant level. Thereby, it was indicated that both males and females experienced similar anxiety symptoms as a result of the pandemic.

Conclusion

More than half of the youth in this study showed symptoms of GAD. Anxiety was associated with age and whether the participant had been diagnosed with or exposed to COVID-19.

List of Abbreviations

GAD Generalized anxiety disorder
PTSD Post-traumatic stress disorder

Conflict of interest

The authors declare that there is no conflict of interest regarding the publication of this article.

Funding

None.

Consent to participate

Informed consent was signed by all the participants.

Ethical approval

The study was approved by the institutional review board.

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References

1. Wilder-Smith A, Freedman DO. Isolation, quarantine, social distancing and community containment: pivotal role for old-style public health measures in the novel coronavirus (2019-nCoV) outbreak. *J Travel Med.* 2020;27(2):taaa020. <https://doi.org/10.1093/jtm/taaa020>
2. Yezli S, Khan A. COVID-19 social distancing in the Kingdom of Saudi Arabia: Bold measures in the face of political, economic, social and religious challenges. *Travel Med Infect Dis.* 2020; 37:101692. <https://doi.org/10.1016/j.tmaid.2020.101692>
3. Algaissi AA, Alharbi NK, Hassanain M, Hashem AM. Preparedness and response to COVID-19 in Saudi Arabia: building on MERS experience. *J Infect Public Health.* 2020;13(6):834–8. <https://doi.org/10.1016/j.jiph.2020.04.016>
4. Alharbi R, Alsuhaibani K, Almarshad A, Alyahya A. Depression and anxiety among high school student at Qassim Region. *J Family Med Prim Care.* 2019;8(2):504. https://doi.org/10.4103/jfmpc.jfmpc_383_18
5. Li Y, Duan W, Chen Z. Latent profiles of the comorbidity of the symptoms for posttraumatic stress disorder and generalized anxiety disorder among children and adolescents who are susceptible to COVID-19. *Children Youth Serv Rev.* 2020;116:105235. <https://doi.org/10.1016/j.chidyouth.2020.105235>
6. El Keshky ME, Basyouni S, Al Sabban A. The psychological and social impacts on personal stress for residents quarantined for COVID-19 in Saudi Arabia. *Arch Psychiatr Nurs.* 2020. <https://doi.org/10.1016/j.apnu.2020.09.008>
7. Huang Y, Zhao N. Generalized anxiety disorder, depressive symptoms and sleep quality during COVID-19 outbreak in China: a web-based cross-sectional survey. *Psychiatry Res.* 2020;288:112954. <https://doi.org/10.1016/j.psychres.2020.112954>
8. Alzaid EH, Alsaad SS, Alshakhis N, Albagshi D, Albeshar R, Aloqaili M. Prevalence of COVID-19-related anxiety among healthcare workers: a cross-sectional study. *J Family Med Prim Care.* 2020;9(9):4904. https://doi.org/10.4103/jfmpc.jfmpc_674_20
9. Kang L, Ma S, Chen M, Yang J, Wang Y, Li R, et al. Impact on mental health and perceptions of psychological care among medical and nursing staff in Wuhan during the 2019 novel coronavirus disease outbreak: a cross-sectional study. *Brain Behav Immun.* 2020;87:11–17. <https://doi.org/10.1016/j.bbi.2020.03.028>
10. Alzahrani AS, Alghamdi EAS, Alyamani MNA, Alowdhah MAM, Aseeri OMS, Aljadani MF. Prevalence and associated factors of generalized anxiety disorder among physicians, Jeddah, Saudi Arabia. *Int J Med Res Prof.* 2016;2(6):140–146. <https://doi.org/10.21276/ijmrp.2016.2.6.028>
11. Wittchen HU. Generalized anxiety disorder: prevalence, burden, and cost to society. *Depress Anxiety.* 2002;16(4):162–71. <https://doi.org/10.1002/da.10065>
12. Quek TTC, Tam WWS, Tran BX, Zhang M, Zhang Z, Ho CSH, et al. The global prevalence of anxiety among medical students: a meta-analysis. *Int J Environ Res Public Health.* 2019;16(15):2735. <https://doi.org/10.3390/ijerph16152735>
13. Auerbach RP, Alonso J, Axinn WG, Cuijpers P, Ebert DD, Green JG, et al. Mental disorders among college students in the World Health Organization World Mental Health Surveys. *Psychol Med.* 2016;46(14):2955–70. <https://doi.org/10.1017/S0033291716001665>
14. Alatawi A, Alghamdi A, Albalwi A, Altayar M, Jalal M. Prevalence of generalized anxiety disorder (GAD) among Saudi Medical students and associated risk factors. *Int J Med Res Health Sci.* 2020;5:01–9.
15. Main A, Zhou Q, Ma Y, Luecken LJ, Liu X. Relations of sars-related stressors and coping to chinese college students' psychological adjustment during the 2003 beijing sars epidemic. *J Couns Psychol.* 2011;58(3):410–23. <https://doi.org/10.1037/a0023632>
16. Dratva J, Zysset A, Schlatter N, von Wyl A, Huber M, Volken T. Swiss university students' risk perception and general anxiety during the covid-19 pandemic. *Int J Environ Res Public Health.* 2020;17(20):1–11. <https://doi.org/10.3390/ijerph17207433>
17. Salari N, Hosseini-Far A, Jalali R, Vaisi-Raygani A, Rasoulpoor S, Mohammadi M, et al. Prevalence of stress, anxiety, depression among the general population during the COVID-19 pandemic: a systematic review and meta-analysis. *Glob Health.* 2020;16(1):1–11. <https://doi.org/10.1186/s12992-020-00589-w>

18. Li LZ, Wang S. Prevalence and predictors of general psychiatric disorders and loneliness during COVID-19 in the United Kingdom. *Psychiatry Res.* 2020;291:113267. <https://doi.org/10.1016/j.psychres.2020.113267>
19. Al-Hanawi MK, Alsharqi O, Almazrou S, Vaidya K. Healthcare finance in the Kingdom of Saudi Arabia: a qualitative study of householders' attitudes. *Appl Health Econ Health Policy.* 2018;16(1):55–64. <https://doi.org/10.1007/s40258-017-0353-7>
20. Khaled Al-Hanawi M, Mwale ML, Alshareef N, Qattan AMN, Angawi K, Almubark R, et al. Psychological distress amongst health workers and the general public during the COVID-19 pandemic in Saudi Arabia. *Risk Manag Healthc Policy.* 2020;13:733–42. <https://doi.org/10.2147/RMHP.S264037>
21. Li Y, Duan W, Chen Z. Latent profiles of the comorbidity of the symptoms for posttraumatic stress disorder and generalized anxiety disorder among children and adolescents who are susceptible to COVID-19. *Child Youth Serv Rev.* 2020;116:105235. <https://doi.org/10.1016/j.childyouth.2020.105235>
22. Du J, Dong L, Wang T, Yuan C, Fu R, Zhang L, Liu B, Zhang M, Yin Y, Qin J, Bouey J, Zhao M, Li X. Psychological symptoms among frontline healthcare workers during COVID-19 outbreak in Wuhan. *Gen Hosp Psychiatry.* 2020 Nov-Dec;67:144-145. <https://doi.org/10.1016/j.genhosppsy.2020.03.011>
23. Islam MS, Ferdous MZ, Potenza MN. Panic and generalized anxiety during the COVID-19 pandemic among Bangladeshi people: an online pilot survey early in the outbreak. *J Affect Disord.* 2020;276:30–7. <https://doi.org/10.1016/j.jad.2020.06.049>
24. Al Omari O, Al Sabei S, Al Rawajfah O, Abu Sharour L, Aljohani K, Alomari K, et al. Prevalence and predictors of depression, anxiety, and stress among youth at the time of COVID-19: an online cross-sectional multicountry study. *Depress Res Treat.* 2020;2020:1–9. <https://doi.org/10.1155/2020/8887727>
25. Wenjun C, Ziwei F, Guoqiang H, Mei H, Xinrong X, Jiaxin D, et al. The psychological impact of the COVID-19 epidemic on college students in China. *Psychiatry Res.* 2020;287:1–5. <https://doi.org/10.1016/j.psychres.2020.112934>
26. Cornine A. Reducing nursing student anxiety in the clinical setting: an integrative review. *Nurs Educ Perspect.* 2020;41(4):229–34. <https://doi.org/10.1097/01.NEP.000000000000633>
27. Wang C, Horby PW, Hayden FG, Gao GF. A novel coronavirus outbreak of global health concern. *Lancet.* 2020;395(10223):470–3. [https://doi.org/10.1016/S0140-6736\(20\)30185-9](https://doi.org/10.1016/S0140-6736(20)30185-9)
28. Xiao C. A novel approach of consultation on 2019 novel coronavirus (COVID-19)-related psychological and mental problems: structured letter therapy. *Psychiatry Investig.* 2020;17(2):175–6. <https://doi.org/10.30773/pi.2020.0047>
29. Bao Y, Sun Y, Meng S, Shi J, Lu L. 2019-nCoV epidemic: address mental health care to empower society. *Lancet.* 2020;395(10224):e37–8. [https://doi.org/10.1016/S0140-6736\(20\)30309-3](https://doi.org/10.1016/S0140-6736(20)30309-3)
30. Ayittey FK, Ayittey MK, Chiwero NB, Kamasah JS, Dzuovor C. Economic impacts of Wuhan 2019-nCoV on China and the world. *J Med Virol.* 2020;92(5):473–5. <https://doi.org/10.1002/jmv.25706>