

ORIGINAL PAPER

Infectious diseases

An evaluation of the psychological impact of COVID-19 and the precautionary measure of social isolation on adults in the Asir region, Saudi Arabia

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Funding information

This work is supported by the Dean of Scientific Research at King Khalid University, Abha, Kingdom of Saudi Arabia for the financial support is greatly appreciated for the general research project under grant number GRP/339/42, awarded to GK.

Abstract

Background: The COVID-19 outbreak is worrying for people and society. The aim of this study is to evaluate the psychological impact of the COVID-19 pandemic and the precautionary measure of social isolation on adults in the Asir region of Saudi Arabia.

Methods: A descriptive cross-sectional survey design was carried out in the Asir region for a period of 5 months from May 2020 to September 2020 to assess the psychological response of the adult population during the COVID-19 pandemic using an anonymous online questionnaire. The questionnaire was adapted from previous research and involved three sections, namely sociodemographic data, Patient Health Questionnaire-9 (PHQ-9) and the Generalised Anxiety Disorder Scale (GAD-7 Scale). A total score of ≥ 10 indicates depression and anxiety. Data were analysed using SPSS V.25.

Results: Females had higher rates of COVID-19 depression than males. There was a significant correlation between age and home setting and anxiety, and a significant association between marital status and the level of education and depression. There was a significant association between gender and depression and anxiety, while there was no significant association between occupation and income, and depression and anxiety.

Conclusion: The findings of the study clearly show that depression and anxiety are highly prevalent among adults. Females had higher rates of COVID-19 depression and anxiety than males. The findings from this study show that implementing a strategy for the prevention and management of depression and anxiety is highly recommended to minimise the impact of these disorders.

1 | INTRODUCTION

In December 2019, several pneumonia patients of unknown aetiology were identified in the city of Wuhan in China, causing an extensive burden and more hospitalisation.¹ As of 26 January 2020, more than 2000 patients of 2019-nCoV infection have been confirmed among people living in or visiting Wuhan, resulting from human-to-human transmission.²

The initial infections were mostly linked to exposure in a seafood market in Wuhan.³ The pathogen was soon identified as a novel coronavirus (2019-nCoV), which is closely related to severe acute respiratory syndrome CoV (SARS-CoV).⁴ The first confirmed case of COVID-19 in Saudi Arabia was declared on 2 March 2020.⁵ As of 2 November 2020, 348 037 confirmed patients had been registered by the Kingdom of Saudi Arabia, with high recovery rates, including 334 672 recoveries, and 5437 fatalities.⁶ Coronaviruses (CoV)

can lead to several conditions, ranging from mild to extreme illness, such as common cold, fever, cough, pneumonia, shortness of breath, multi-organ failure or even death.⁷

While public health and healthcare officers rushed to identify and control the spread of the virus, information was spreading uninhibitedly over traditional and social media platforms at a strikingly rapid pace. This allowed it to propagate on social media and be amplified without any professional verification, which added to public anxiety.⁸ To achieve a good quality of life, mental health is important. Previous reports have emphasised a similar trend during recent public health emergencies, namely the outbreaks of Ebola, Zika and influenza virus H1N1.⁹⁻¹¹ Furthermore, responses to the COVID-19 pandemic resemble the fears over the severe acute respiratory syndrome (SARS) epidemic in 2003. These viruses are zoonotic, that is, they are transmitted between animals and humans. A couple of corona viruses had already been identified, namely Middle East respiratory syndrome (MERS-CoV) and severe acute respiratory syndrome (SARS-CoV), which was transmitted from animals to humans.^{12,13} The new 2019-n CoV is believed to have been transmitted zoonotically, in a wet market in Wuhan where game animals and meat were sold.¹⁴ The unexpected and near-constant flow of news reviews about a virulent disease can cause harmful effects on the public's mental health. It is important for people to get the facts, not rumours and misinformation. It is advisable to acquire information from the WHO website and local health agencies, to identify biased information about the pandemic.¹⁵

The risk of severity of infection from COVID-19 increases with older and immune-compromised people. Individuals with serious health issues and weak immune systems are more vulnerable. At present, there is no cure for COVID-19.¹⁶ As COVID-19 is a newly identified pathogen, there is no known pre-existing immunity in humans. According to the epidemiologic characteristics observed worldwide, every person is expected to be vulnerable, while there may be risk factors increasing vulnerability to infection. Further studies are needed to know the neutralising immunity after infection.¹⁷

Undeniably, the COVID-19 outbreak is worrying for people and societies. Fear of infection is very common during the COVID-19 pandemic. Individuals are also afraid that the present healthcare system cannot manage with the COVID-19 pandemic.¹⁸ There are not enough hospital beds and ventilators to handle the growing number of COVID-19 cases. Moreover, people worry that the global economy might become worse. Fear and anxiety about the COVID-19 pandemic can be overwhelming and cause strong emotions. Poor mental health during infectious disease outbreaks can also be related to an individual's misconceptions of health-related changes, such as bodily changes, making the individual excessively worried.¹⁹ Thus, there is a drive to assess the impact of COVID-19 on people's mental health.

Some psychosocial stressors—such as personal health fears and fear for one's family members—are associated with pandemics caused by the severe disruptions of routines, separation from family members and friends, shortages of daily necessities, salary deductions, social isolation and school closures.¹⁹ Psychosocial responses to infectious disease outbreaks are variable and can include feelings

What's known

- A few studies have reported changes in mental health during COVID-19 among the public.

What's new

- The findings of this study clearly show that depression and anxiety are highly prevalent among adults. Females had higher rates of COVID-19 depression and anxiety than males. This study highlights the need for the government to take appropriate action to develop psychological interventions and to improve the mental health of individuals for better health outcomes for the benefit of community during the COVID-19 pandemic.

of anxiety or depression, an overestimation of the chances of infection, the extreme and inappropriate adoption of precautionary measures^{19,20} and an increased demand for healthcare services in a time of shortage.²¹ Other people deny the risk of infection and fail to follow the precautionary measures, such as hand washing and social distancing.¹⁹

The occurrence of such psychological morbidities in a substantial proportion of the community can impact the daily functions of the affected individuals and lead to immediate social and economic consequences, such as lost job productivity and financial hardship.

Mental health interventions could assist in preserving the mental health of the community during the COVID-19 pandemic.²² The Saudi government have responded to the outbreak by implementing precautionary measures. Social distancing was achieved by locking down cities, prohibiting of social gatherings in public places, suspending the operation of most of the government sector, including all educational institutions, issuing a quarantine policy, and stopping all national and international flights, as well as closing all land borders with neighbouring countries. Other preventative measures necessitated banning prayers in mosques and visits to the two holiest cities in Islam, Mecca and Medina.²³ The main aim of this study was to evaluate the psychological impact of the COVID-19 pandemic and the precautionary measure of social isolation on adults in the Asir region of Saudi Arabia. This study would provide recommendations to help the government and healthcare professionals in protecting the mental health and well-being of the public in Saudi Arabia during times of hardship such as the COVID-19 pandemic.

2 | MATERIALS AND METHODS

2.1 | Study design and setting

A descriptive cross-sectional survey design was adopted in the Asir region for a period of 5 months from May 2020 to September 2020

to assess the psychological response of the adult population during the COVID-19 pandemic using an anonymous online questionnaire. The study participants included Saudi residents and nationals between the ages of 18 and 65.

2.2 | Data collection

A snowball sampling strategy was used to recruit the general community living in Abha, Asir region, Kingdom of Saudi Arabia, during the COVID-19 pandemic. The online questionnaire was first sent by email to the students of King Khalid University. The invitation to participate in the study involved a request to pass the study link to family members and any other contacts who met the inclusion criteria of the study. Subjects who did not give their consent to participating in the study were excluded.

2.3 | Questionnaire

The data collection form was adapted from previous research^{24,25} and involved three sections. Section 1 was designed to gather sociodemographic data, that is, gender, marital status, age, education, employment status and region. Section 2 involved a Patient Health Questionnaire-9 (PHQ-9), which measures mental health status. The last section evaluates generalised anxiety using the Generalised Anxiety Disorder Scale (GAD-7 Scale).²⁵

The PHQ-9 is used to screen for depression and assess symptom severity. The scale consists of nine items rated on a 4-point Likert-type scale (0—none at all, 1—several days, 2—more than half the days, 3—nearly every day). The PHQ-9 scale has a minimum possible score of 0 and a maximum possible score of 27. Cut-off points of 0-4, 5-9, 10-14, 15-19 and 20-27 indicate none, mild, moderate, moderately severe and severe levels of depression, respectively. A total score of ≥ 10 indicates major depression. The sensitivity and specificity of the PHQ-9 are more than 90%, and it is considered to show good validity, reliability and feasibility.²⁶

The GAD-7 Scale is used to screen for generalised anxiety and assess symptom severity. It contains seven items rated on a 4-point Likert-type scale (0—none at all, 1—several days, 2—more than half the days, 3—nearly every day). The total possible score ranges from 0 to 21 and is divided into four levels of increasing severity: 0 to 4, 5 to 9, 10 to 14 and 15 to 21 indicate none, mild, moderate and severe anxiety, respectively.²⁴ A total score of ≥ 10 indicates major anxiety.

2.4 | Ethical considerations

This study was approved by the research ethics committee of King Khalid University, approval number (ECM# 2020- 223 -HAPO -06- B-001). Participation in the study was voluntary and the questionnaire was anonymous. The potential participants had the right to decline the study invitation without any penalty or being

disadvantaged. Informed consent was obtained online from all the participants.

2.5 | Statistical analysis

The statistical analysis was performed by using the statistical package for social sciences (SPSS) version 21.0 for Windows (IBM SPSS Statistics, New York, United States). Both descriptive and inferential statistics were used for statistical analysis. Frequency and percentages were used to describe the sociodemographic characteristics of the study participants. χ^2 -test was used to identify the univariate association between sociodemographic characteristics and the presence of depression and anxiety. Multivariable linear regression analysis was used to explore the predictors on gender-stratified depression and anxiety scores. All tests were two-tailed, and *P* value $< .05$ was considered significant.

3 | RESULTS

3.1 | General characteristics of the study participants

A total of 1125 respondents returned the questionnaire, 290 of whom were excluded from the study as they provided incomplete responses. The questionnaire response rate was 74.22%, based on 835 respondents included in the study. 54.61% ($n = 456$) of the study participants were female, and 45.38% (379) were male. Just over half, 52.7% ($n = 440$) of the respondents were single, and those remaining were married. Out of 835, 760 subjects (91%) were aged between 18 to 65 years old, and 9% ($n = 75$) were above 65 years old. The education levels of the study subjects are as follows: 6.70% ($n = 56$) had no formal schooling, 9.6% ($n = 80$) had primary education, 24.8% ($n = 207$) had secondary education and 58.9% ($n = 492$) had college education or above. Just less than half, 48.6% ($n = 406$) of the study subjects are workers, which included healthcare workers, and 30.3% ($n = 253$) were students. The remaining participants were either retired or unemployed. Almost 63% ($n = 525$) of the study subjects were residing in the urban part of the Asir region. The demographic data of the study participants are listed in Table 1.

The overall prevalence of depressive and anxiety symptoms was 42.15% ($n = 352$) and 59.76% ($n = 499$), respectively. However, the prevalence rate of experiencing both depression and anxiety symptoms was 35.68% ($n = 298$). 11.37% ($n = 95$) of the study participants reported no depression (score 0 to 4); 46.46% ($n = 388$) reported a mild depression (scores 5 to 9); 27.18% ($n = 227$) reported a moderate depression (score 10 to 14); 11.73% ($n = 98$) reported a moderately severe depression (score 15 to 19) and 3.23% ($n = 27$) reported a severe depression (score 20 to 27).

Of all respondents, 16.62% ($n = 138$) were found to have no anxiety at all (score: 0 to 4); 23.71% ($n = 198$) were found to suffer from mild anxiety (score: 5 to 9); 39.88% ($n = 333$) were found to suffer

TABLE 1 Demographic characteristics of study subjects

Variables	Male (n = 379)	Female (n = 456)	Total (n = 835)
	N (%)	N (%)	N (%)
Age			
18 to 65 years	348 (91.8)	412 (90.4)	760 (91)
More than 65 years	31 (8.2)	44 (9.6)	75 (9)
Marital status			
Single	146 (38.5)	249 (54.6)	440 (52.7)
Married	233 (61.5)	207 (45.4)	395 (47.30)
Education			
Without formal schooling	10 (2.6)	46 (10.1)	56 (6.70)
Primary	40 (10.6)	40 (8.8)	80 (9.6)
Secondary	75 (19.8)	132 (28.9)	207 (24.8)
College and above	254 (67)	238 (52.2)	492 (58.9)
Employment			
Students	148 (39.1)	105 (23)	253 (30.3)
Working/healthcare workers	142 (37.5)	264 (57.9)	406 (48.6)
Retired	30 (7.9)	27 (5.9)	57 (6.8)
Unemployed	59 (15.6)	60 (13.2)	119 (14.3)
Region			
Rural	94 (24.8)	216 (47.4)	310 (37.1)
Urban	285 (75.2)	240 (52.6)	525 (62.9)

from moderate anxiety (score: 10 to 14) and 19.88% (n = 166) were found to suffer from severe and extremely severe anxiety (score: 15 to 21). The gender-stratified classification of depression and anxiety scores is presented in Table 2.

3.2 | Patient Health Questionnaire Depression Scale (PHQ-9)

Overall, 352 subjects were found to be positive for depression. All the sociodemographic characteristics included in the current study were found to have significant association with the presence of depression (PHQ \geq 10) ($P < .05$). The frequency of female subjects (57%) was significantly positive for depression. The adult population were found to be hugely positive for the presence of depression. The single population (66%), high-level education (80%) and students (52%) were found to be positive for depression. The details are provided in Table 3.

The overall depression scores are stratified according to gender to explore the factors predicting the depression scores for each gender. Marital status had a significant impact on the depression scores for females ($R^2 = 0.038$). Age group was also found to have a significant impact on overall depression scores but was not found to have individual impact on either male or female gender ($R^2 = 0.005$). Education status was found to have an impact on the depression scores of females and the overall population ($R^2 = 0.122$ and 0.116). Being a student had a significant impact on the depression scores of

Depression (PHQ-9)	Male (n = 379)	Female (n = 456)	Total (n = 835)
	N (%)	N (%)	N (%)
PHQ-9 score 0–4 (None)	49 (12.92)	46 (10.08)	95 (11.37)
PHQ-9 score 5–9 (Mild)	178 (46.96)	210 (46.05)	388 (46.46)
PHQ-9 score 10–14 (Moderate)	102 (26.91)	125 (27.41)	227 (27.18)
PHQ-9 score 15–19 (Moderately severe)	43 (11.34)	55 (12.06)	98 (11.73)
PHQ-9 score 20–27 (Severe)	7 (1.84)	20 (4.38)	27 (3.23)
PHQ-9 score \geq 10 ^a	152 (40.10)	200 (43.85)	352 (42.15)
Anxiety (GAD-7)			
	Male	Female	Total (n = 835) N (%)
GAD-7 score 0–4 (None)	76 (20.05)	62 (13.59)	138 (16.62)
GAD-7 score 5–9 (Mild)	55 (14.51)	143 (31.35)	198 (23.71)
GAD-7 score 10–14 (Moderate)	169 (44.59)	164 (35.96)	333 (39.88)
GAD-7 score 15–21 (Severe)	79 (20.84)	87 (19.07)	166 (19.88)
GAD-7 score \geq 10 ^a	248 (65.43)	251 (55.04)	499 (59.76)

TABLE 2 Gender-stratified classification of depression and anxiety scores among study population

Abbreviations: GAD 7, Generalised Anxiety Disorder Scale; PHQ-9, Patient Health Questionnaire Depression Scale.

^aPositive depression and positive anxiety.

TABLE 3 Association between demographic characteristics and the presence of depression (PHQ-9 scale for depression) (n = 835)

Category	Variables	Depression positive	Depression negative	Total (n = 835)	Pearson χ^2	P-value
		PHQ ≥ 10	PHQ < 10	N (%)		
Gender	Male	152 (43)	227 (47)	379 (45)	32	.000*
	Female	200 (57)	256 (53)	456 (55)		
Age	18-65 Years	336 (95)	224 (46)	760 (91)	14.651	.000*
	More than 65 years	16 (5)	59 (12)	75 (9)		
Marital status	Single	233 (66)	207 (43)	440 (53)	52.662	.000*
	Married	119 (34)	276 (57)	395 (47)		
Educational level	Without formal schooling	6 (2)	50 (10)	56 (7)	119	.000*
	Primary	16 (5)	64 (13)	80 (10)		
	Secondary	47 (13)	160 (33)	207 (25)		
	College and above	283 (80)	209 (43)	492 (59)		
Employment status	Students	182 (52)	71 (15)	253 (30)	134	.000*
	Working/healthcare workers	114 (32)	292 (60)	406 (49)		
	Retired	15 (4)	42 (9)	57 (7)		
	Unemployed	41 (12)	78 (16)	119 (14)		
Region	Urban	260 (74)	265 (55)	525 (63)	31	.000*
	Rural	92 (26)	218 (45)	310 (37)		

Abbreviations: GAD 7, Generalised Anxiety Disorder Scale; PHQ-9, Patient Health Questionnaire Depression Scale.

* $P < .05$.

both the genders ($R^2 = 0.091$ and 0.084). Living as part of an urban population makes people more prone to high depression scores in both genders ($R^2 = 0.068$ and 0.003). The details are provided in Table 4.

3.3 | Generalised Anxiety Disorder Scale (GAD-7)

Overall, 499 subjects were found to be positive for anxiety. All the sociodemographic characteristics included in the current study were found to have a significant association with the presence of anxiety ($GAD \geq 10$) ($P < .05$). Both the male and female subjects included in the current study were equally affected by anxiety (50%). The adult population were found to be hugely positive for the presence of anxiety (93%). The single population (57%), high-level education (65%), workers (45%) and students (40%) were also found to be highly positive for anxiety. The details are provided in Table 5.

The overall anxiety scores are stratified according to gender to explore the factors predicting the anxiety scores for each gender. Marital status had a significant impact on the anxiety scores among males ($R^2 = 0.057$). Age group was not found to have any impact on either male ($R^2 = 0.005$) or female gender ($R^2 = 0.003$). Secondary-level education had a high impact on the anxiety scores of females ($P = .001$). Being a student had a significant impact on anxiety scores overall ($P = .000$). Being a worker or a student had a high impact on the anxiety scores among males ($R^2 = 0.185$), whereas only being a

retired worker had a significant impact on the anxiety score among females ($R^2 = 0.031$). Living in an urban population had a greater impact on the anxiety scores of males ($R^2 = 0.082$). The details are provided in Table 6.

4 | DISCUSSION

The aim of this study was to evaluate the psychological impact of the COVID-19 pandemic and the precautionary measure of social isolation among adults in the Asir region of Saudi Arabia.

The study's findings revealed that nearly half of the population showed depression and more than half showed anxiety disorders. The current study revealed that women were more likely to suffer anxiety and depression than men. Similar to the results another piece of research by Gao et al, it emerged that female students scored significantly higher in anxiety than males.²⁷ The results of the previous study showed that females were at greater risk of depression and anxiety symptoms.²⁸ Our findings are also consistent with previous studies showing female students to be more susceptible to symptoms of anxiety and depression.^{29,30}

Our findings revealed that the overall prevalence of depressive and anxiety symptoms was 42.15% and 59.76%, respectively. The prevalence rate of depression and anxiety combined was 36.68%. The present study reports the early psychological response of the community to COVID-19 outbreak, and 27.18% of respondents had

TABLE 4 Multivariable linear regression analysis of depression scores stratified by gender (n = 835)

Depression Category	Variables	Male			Females			Total					
		R-square	Adjusted R-square	P-value	95 % confidence interval for B	R-square	Adjusted R-square	P-value	95 % confidence interval for B	R-square	Adjusted R-square	P-value	95 % confidence interval for B
Marital status	Married	0.005	0.002	.183	-0.403 to 2.099	0.038	0.035	.000*	1.079-2.970	0.026	0.025	.000*	1.097-2.637
	Single				Reference				Reference				Reference
Age group	18-65 years	0.003	0.000	.280	-3.447 to 0.999	0.007	0.004	.084	-3.049 to 0.191	0.005	0.004	.036*	-2.814 to -0.096
	More than 65 years				Reference				Reference				Reference
Educational status	Primary			.808	-3.532 to 4.532			.851	-1.806 to 1.490			.342	-2.742 to 0.0952
	Secondary			.989	-3.866 to 3.813			.000*	-5.412 to 2.312			.509	-2.134 to 1.060
	College	0.083	0.076	.059	-7.215 to 0.135	0.122	0.116	.452	-2.877	0.116	0.113	.000*	-5.974 to -2.984
	Without formal schooling				Reference				Reference				Reference
Employment status	Students			.000*	-5.351 to -1.854			.000*	-4.387 to -1.251			.000*	-4.537 to -2.977
	Working			.646	-2.170 to 1.348				-0.181 to 2.591			.172	-0.336 to 1.878
	Retired	0.091	0.084	.200	-0.885 to 4.208	0.110	0.104	.037	0.147-4.638	0.113	0.110	.023	0.270-3.691
	Unemployed				Reference				Reference				Reference
Residence status	Urban	0.068	0.065	.000*	-4.995 to -2.267	0.003	0.001	.252	-1.520 to 0.400	0.036	0.035	.000*	-3.038 to -1.454
	Rural				Reference				Reference				Reference

*P < .05.

TABLE 5 Association between demographic characteristics and the presence of anxiety (GAD 7—Generalised Anxiety Disorder Scale)

Category	Variables	Anxiety positive	Anxiety negative	Total (n = 835)	Pearson χ^2	P-value
		GAD ≥ 10	GAD < 10			
		N (%)	N (%)	N (%)		
Gender	Male	248 (50)	131 (39)	379 (45)	9.294	.002*
	Female	251 (50)	205 (61)	456 (55)		
Age	18-65 years	466 (93)	294 (88)	760 (91)	8.511	.004*
	More than 65 years	33 (7)	42 (13)	75 (9)		
Marital status	Single	283 (57)	157 (47)	440 (53)	20.271	.000*
	Married	216 (43)	179 (53)	395 (47)		
Educational level	Without formal schooling	22 (4)	34 (10)	56 (7)	22.723	.000*
	Primary	45 (9)	35 (10)	80 (10)		
	Secondary	108 (22)	99 (29)	207 (25)		
	College and above	324 (65)	168 (50)	492 (59)		
Employment status	Students	200 (40)	53 (16)	253 (30)	67.244	.000*
	Working/healthcare workers	224 (45)	182 (54)	406 (49)		
	Retired	19 (4)	38 (11)	57 (7)		
	Unemployed	56 (11)	63 (19)	119 (14)		
Region	Urban	345 (69)	180 (54)	525 (63)	20.845	.000*
	Rural	154 (31)	156 (46)	310 (37)		

Abbreviation: GAD 7, Generalised Anxiety Disorder Scale.

* $P < .05$.

moderate depression; 11.73% of respondents had moderate to severe depressive symptoms; 39.88% of respondents had moderate anxiety symptoms and 19.88% had severe and extremely severe anxiety levels. A previous study revealed the prevalence of anxiety and depression was 35.1% and 20.1%, respectively.³⁰ Recent studies have similarly shown that COVID-19 leads to 31.9% anxiety and 33.7% depression.³¹ COVID-19 is new, and the rate of its spread, the high mortality rate and worries about the future can be the causes of anxiety. When this anxiety exceeds the normal limits, it weakens the body's immune system and therefore increases the risk of infection.^{32,33} Misleading information about COVID-19, through various forms of social media, can aggravate the symptoms of depression and anxiety among those who follow the COVID-19 news regularly.²⁸ In another piece of research conducted in Hong Kong, out of 500 participants included in the study, 19% had depression, and 14% had anxiety.²⁹

The present study has shown that 91.01% were between 18 and 65 years old. Another study corroborated that participants under 35 were associated with a higher risk of depressive symptoms than those 35 years and older.³⁰ The data in this study suggested that the public's levels of anxiety-related symptoms increased when a major infectious disease occurred. Depression and anxiety occur in older adults as a result of social isolation. Self-quarantine will excessively affect older adults because their only social interaction is outside the home, such as holy places and community centres. There is a

further additional risk for those who do not have close relatives or friends and depend on the voluntary services for their needs.³⁴

The corona virus (COVID-19) is spreading all over the world at an unprecedented pace. It has challenged the financial, healthcare and socio-economic status of people and societies almost everywhere.³⁵ The COVID-19 epidemic has led to the parallel spread of fear, anxiety and depression. People with mental health conditions can be more substantially influenced by the emotional responses brought on by the COVID-19 epidemic, followed by the recurrence or deterioration of previously existing mental health conditions and greater vulnerability to anxiety compared with the general public.³¹

As the global prevalence of the virus increases, people have started hoarding medical supplies, isolating themselves physically, restricting their social interactions and entering into a constant state of health-anxiety, even over mild conditions that can mimic the illness, such as the common cold. People with mental illness are especially vulnerable to these effects, as are the healthcare workers in hospitals and laboratories, the volunteers and social service personnel and those quarantined for prolonged periods.³²

Furthermore, we found that the proportion of anxiety and depressive symptoms among students living in urban areas is significantly higher than among those in rural areas. A previous study found that females living in urban areas were at increased risk of depression and anxiety.³³ The shift to online learning could have contributed to depression and anxiety among the student

TABLE 6 Multivariable linear regression analysis of anxiety scores stratified by gender

Anxiety Category	Variables	Male			Female			Total			
		R-square	Adjusted R-square	95 % confidence interval for B	R-square	Adjusted R-square	95 % confidence interval for B	R-square	Adjusted R-square	95 % confidence interval for B	
Marital status	Married	0.057	0.054	.000*	0.001	-0.001	.488	0.026	0.025	.000*	1.009 to 2.446
	Single			Reference			Reference				Reference
Age group	18-65 years	0.005	0.002	.186	0.003	0.000	.269	0.004	0.003	.071	-2.440 to 0.098
	More than 65 years			Reference			Reference				Reference
Educational status	Primary			.840			.056			.241	-2.870 to 0.723
	Secondary			.665			.001*			.053	-3.088
	College	0.043	0.035	.125	0.026	0.020	.103	0.039	0.035	.000*	-4.649 to -1.741
	Without formal schooling			Reference			Reference				Reference
Employment status	Retired	0.185	0.178	.666	0.031	0.025	.027*	0.101	0.098	.285	-7.31 to 2.481
	Students			.000*			.334			.000*	-5.078 to 2.861
	Working			.003*			.165			.216	-1.695 to 0.384
	Unemployed			Reference			Reference				Reference
Residence status	Urban	0.082	0.080	.000*	0.001	-0.001	.414	0.023	0.022	.000*	-2.435 to -0.948
	Rural			Reference			Reference				Reference

*P < .05.

population. Findings from a previous piece of research suggested that Saudi students are not used to online learning and prefer traditional face-to-face sessions.³⁶ The results of a previous study also strongly suggest that there is an association between panic disorder and hypochondriasis.²⁸

5 | CONCLUSION

The findings of the study clearly show that depression and anxiety are highly prevalent among adults. Females had higher rates of COVID-19 depression and anxiety than males. The findings from this study demand the implementation of a strategy for the prevention and management of depression and/or anxiety. This is highly recommended to minimise the impact of these disorders, taking into account the more susceptible populations. The study alerts the government to the need to take appropriate action to develop psychological interventions and to improve the mental health of individuals for better health outcomes and for the benefit of the entire community during the COVID-19 pandemic.

6 | LIMITATIONS

This study has several limitations. Questionnaires are not filled in by trained professionals. Hence, this cross-sectional analysis may not confirm the cause and effect relationships. The study was limited to the COVID-19 outbreak, and we used online questionnaires to avoid infection. Therefore, the possibility of selection bias should be considered. Furthermore, as a result of the unexpected occurrence of the disaster, we were unable to evaluate a participants' psychological condition before the epidemic.

ACKNOWLEDGEMENTS

The authors would like to thank the Scientific Deanship at King Khalid University for their administrative and technical support. This work was supported by the Deanship of Scientific Research at King Khalid University, Abha, Kingdom of Saudi Arabia with project Number GRP/339/42.

DISCLOSURES

The authors declare no conflict of interest.

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How to cite this article: Kandasamy G, Almaghaslah D, Almanasef M, Vasudevan R, Easwaran V. An evaluation of the psychological impact of COVID-19 and the precautionary measure of social isolation on adults in the Asir region, Saudi Arabia. *Int J Clin Pract.* 2021;75:e14756. <https://doi.org/10.1111/ijcp.14756>