Original Research Article

Assessing depression, anxiety, stress and associated factors during COVID-19 lockdown among adult population in Al Ahsa, Saudi Arabia

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ABSTRACT

Background: Depression, anxiety, and stress are challenging constraints that can greatly affect mental well-being leading to social, occupational, and physical impairments. Lockdown and social distancing have come to be the norms for preventing and controlling COVID-19, however maintaining these preventive measures for months could add to the burden of mental health. This study aims to assess the prevalence of depression, anxiety, and stress during COVID-19 lockdown and to identify associated factors among adult individuals in Al Ahsa, Saudi Arabia.
Methods: The study utilized a quantitative descriptive design and data were gathered by means of online survey during the 10th week of lockdown. The survey contained demographic queries and other questions helping in identifying possible factors that may led to the three stressors along with DASS-21. A total of 1874 respondents participated in the study.
Results: Results revealed the prevalence of depression was (55.2%), anxiety was (64.5%) and stress was (45%), with degrees ranging from mild to extremely severe. Age was noted to negatively correlate with depression, anxiety and stress. The prevalence of DAS is found to be positively correlated with having a family history of depression or anxiety. Additionally, having chronic illnesses has been noted to have a positive relationship with both anxiety and stress. Taking care of an elderly or sick family member have a positive correlation with anxiety.
Conclusions: This study highlights the impact of COVID-19 lockdown on depression, anxiety and stress levels among adult population. The findings of this study revealed mild depression, moderate anxiety and mild stress. In more details, near to third of respondents were having moderate to extremely severe depression level. Participants with moderate to extremely severe anxiety comprised nearly half of the sample and one third of respondents were having moderate to extremely severe stress.

Keywords: Anxiety, Coronavirus, COVID-19, DASS-21, Depression, SARS-CoV-2

INTRODUCTION

Depression, anxiety, and stress are challenging constraints that can greatly affect mental well-being leading to social, occupational, and physical impairments. Lockdown and social distancing have come to be the norms for preventing and controlling coronavirus (COVID-19) pandemic, however maintaining these preventive measures in place for months on end could add to the burden of mental health.[1]

Depression and anxiety are estimated to affect one in every 10 people globally. In more detail, depression is ranked by world health organization (WHO) as the major contributor to worldwide disability, and anxiety is ranked at the 6th place. In terms of disability-adjusted life years, depression and anxiety disorders are contributing to 50% of the global disease burden.[2] Additionally, depression and other mental stressors have been linked to lower compliance with therapeutic guidelines, consequently leading to worse prognosis.[3] Early recognition of these mental health

stressors is important to provide psychological interventions for individuals undergoing these negative emotional conditions. Depression is a common mental health problem that is defined as a persistent feeling of sadness and loss of interest or pleasure.[4] Anxiety and stress often go hand in hand with depression. Anxiety is described as a feeling of tension, distress, overwhelming apprehension as well as having uncontrollable worried thoughts.[5] Also, anxiety is expressed by American psychological association (2020), as feelings of stress, worried thoughts, and bodily alterations like raised blood pressure, whereas stress is a physical or emotional response to any change that requires an adjustment and it can be both the cause and the outcome of a problem.[6] The causes of these mental health problems can be a blend of genetic, biological, psychological, and environmental factors.[5]

COVID-19 is a lower respiratory tract infection with severity ranging from asymptomatic, mild clinical presentation or to severe and possibly fatal atypical novel coronavirus infected pneumonia (NCIP).[7] The first appearance of the disease was in the city of Wuhan, China, and has been widely spreading around the globe, resulting in an overwhelming number of deaths.[8] It is well established that COVID-19 can be transmitted via respiratory droplets.[9] This human-to-human Coronavirus transmission has led to considerable efforts to minimize its spreading. Responses to contain COVID-19 pandemic have differed from one country to another. With no vaccine is currently available, preventive measures have been taking place for the last several months such as implementation of nationwide lockdown and social distancing.[10] Lockdown is a part of the emergency protocol for controlling COVID-19 pandemic. At the same time, it can have some effect on the population psychological health.[11]

Studies have shown that sudden outbreak can take a toll on the mental health of those with pre-existing mental health diseases resulting in conditions that are difficult to endure and to cope with.[1] The great destruction that caused by COVID-19 may be compared with the damage caused by SARS (severe acute respiratory syndrome) epidemic in 2003. The population of the areas that were severely affected by SARS epidemic, showed symptoms of moderate to severe post-traumatic stress.[12]

Having up-to-date estimates of the occurrence and extent of these common mental health problems and the potential factors which may impute them during the current lockdown is critical in helping raising the awareness, developing strategies and interventions to overcome mental health problems and potentially improving the overall health and well-being of the general population.

Objectives of study were to assess prevalence of depression, anxiety, and stress during COVID-19 lockdown and to identify associated factors that affect DASS level among adult individuals in Al Ahsa, Saudi Arabia.

METHODS

Study design

The study utilized a quantitative descriptive design, and data were gathered by means of online survey during the 10th week of lockdown, between 27 May 2020 and 31 May 2020.

Subjects

Accessible population is all citizens who are living in Al Ahsa city. In the last census, the population reached approximately 1,220,655 individuals in Al Ahsa. Out of Al Ahsa population, 1874 individuals participated in the study. The subjects were male and female adult, 18 years of age or older (age ≥18), and living in Al Ahsa, Saudi Arabia. Due to the inability to carry out a community-based survey during the pandemic, a convenience snowball sampling of the general population was used in gathering the participants of the study. The survey was conveyed through various social networks and further shared by participants. The larger the target sample size, the higher the external validity and the greater the generalizability of the study.

Data collection

In this study, survey method was used. A self-administered questionnaire was designed to assess the prevalence and severity of depression, anxiety, stress and to identify the possible factors which may impute them during COVID-19 lockdown among the participants. The questionnaire contained three sections. The first section was about demographic characteristics. The second section was DASS-21 scale (depression anxiety stress scale-21). The last section contained questions that aimed to identify the factors that may influence the three stressors.

DASS-21 is a well-established instrument which was designated for assessing depression, anxiety, stress levels and it was constructed by Lovibond et al.[13] It is a self-reporting questionnaire with 21 items (three subscales and each one contains seven items to assess each category) with a rating of a 4-point scale.[14] Ratings is done by series of 0 (did not apply to me at all) to 3 (applied to me very much). Results on extent of depression, anxiety and stress are made on calculating all items scores for each category. The higher the score, more severe level of each stressor. The DASS-21 has shown an excellent validity in assessing depression, anxiety, and stress in many studies.[15,16]

The survey was translated to Arabic, reviewed by two experts, and modified meticulously to be validated before use. A pilot study was done for 50 participants to give feedback about simplicity and quality of the transformed questionnaire.

Ethical consideration

The study was approved by the research and ethical committee of college of applied medical sciences, king Faisal university. In the matter of ethical guidelines, participation in the study was completely voluntary and a through explanation of the study objectives was provided at the beginning of the survey. The gathered data are held confidential and subjects remained anonymous.

Statistical analysis

All obtained data were entered, organized, and analyzed using the statistical package for the social sciences software (SPSS) version for Windows 26.0.[17] Number and percentage were calculated for qualitative variables. The mean and standard deviations of depression, anxiety and stress scores were analyzed using descriptive statistics along with median and interquartile range (IQR). Spearman's rho, Chi square, and Kruskal Wallis test followed by Mann Whitney test were also used to determine correlations between variables. P value that is equal to 0.05 or less is considered statistically significant.

RESULTS

Table 1 illustrates the demographic characteristics of the participants. the total number of participants was 1,874 participants aged from 18 and above. Most of subjects were female (n=1432, 76.4%) and Saudi (n=1848, 98.6%). The majority of the respondents attained a high level of education, "college degree n= 1299 (69.3%). A significant number of the respondents were students (46.7%) and one third of them were employed (27.7%). Approximately half of the respondents were married (48.3%) and the other half were single (49.3%). Participants who have chronic diseases comprised (13.2%) of the total subjects. Only

(17%) of the participants have family history of depression or anxiety. In respond to a question that asked about caring of elderly of sick family member, (24.3%) responded with "YES", and (65%) of the participants reported living with more than five individuals in the household.

Table 2 presents participants' data regarding COVID-19. (n=9, 0.5%) of the participants had COVID-19. The vast majority of the sample (n=1757, 93.7%) were following the recommendations of staying at home or leaving the home only for necessity. When asked about how their lives differ during lockdown, almost 1/3 of the participants (27.5%) reported that the lockdown during COVID-19 had a lot of different on their lives. Also, (10.1%) of participants reported that their lives became completely different.

Table 3 shows the overall prevalence of depression, anxiety, and stress levels among the participants. Findings showed that prevalence of depression was 55.2% (n=1033), 64.5% (n=1207) for anxiety and 45% (n=843) for stress, with degrees that range from mild to extremely severe. For depression subscale, 17.8% of the participants were noted to have mild degree of depression, 19.9% with moderate degree, 8.5% were reported severe and 9% were considered to have extremely severe depression degree. For anxiety subscale, participants with mild anxiety were 9.7%, moderate anxiety were 23.2%, severe anxiety comprised 10%, and extremely severe anxiety comprised 21.6% of the total sample. For stress subscale, it was reported that 13.3% were having mild stress level, 14.9% were having moderate level, 11% were having severe level, and 5.8% were found to have extremely severe stress. The average level of each subscale scores was expressed as mean and median. The mean score for the depression level was (12.4±9.4, mild), anxiety level (11.9±9.1, moderate), and (15.1±9.8, mild) for the stress level.

Table 1: Demographic characteristics of the participants.

Characteristics		Descriptive statistics n=1874 (%)
Age (year)	18-25	999 (53.3)
	26-30	261(13.9)
	31-50	494 (26.4)
	>50	120 (6.4)
Sex	Male	442 (23.6)
	Female	1432 (76.4)
Nationality	Saudi	1848 (98.6)
	Non-Saudi	26 (1.4)
Education level	Did not enter school	2 (0.1)
	Primary school	10 (0.5)
	Intermediate school	50 (2.7)
	Secondary school	513 (27.4)
	College degree	1299 (69.3)
Employment status	Housewife	368 (19.6)
	Current student	876 (46.7)
	Unemployed	110 (5.9)
	Employed	520 (27.7)

Continued.

Characteristics		Descriptive statistics n=1874 (%)
Marital status	Single	924 (49.3)
	Married	905 (48.3)
	Divorced	35 (1.9)
	Widow	10 (0.5)
Do you have any chronic illnesses?	Yes	248 (13.2)
	No	1625 (86.8)
Do you have a family history of depression or anxiety?	Yes	318 (17)
	No	1556 (83)
Do you take care of an elderly or sick family member?	Yes	455 (24.3)
	No	1419 (75.7)
How many individuals are living in the household with you?	1	68 (3.6)
	2	143 (7.6)
	3	184 (9.8)
	4	260 (13.9)
	5 or more	1219 (65)

Table 2: Participants' data regarding COVID-19.

Variables		Descriptive statistics n=1874 (%)
Have you had COVID-19?	Yes	9 (0.5)
	No	1865 (99.5)
How are you currently isolating your self during the lockdown?	I am fully isolating myself and not leaving my home at all	810 (43.2)
	I am staying at home, only leaving for walking exercise, grocery, shopping or pharmacy and work or another essential task (e.g., volunteering)	446 (23.8)
	I am staying at home, only leaving for walking exercise, grocery, shopping, pharmacy, or essential activities which are permitted by the government	501(26.7)
	I am not following the recommendations of staying at home, but I am keeping social distancing when in public (e.g., staying 2 meters away from others)	95 (5.1)
	I am not following the recommendations of staying at home and social distancing when I am out	22 (1.2)
When compared to your life before COVID-19, how has your life changed during lockdown?	Entirely the same	132 (7)
	Slightly different	286 (15.3)
	Quite a few differences	750 (40)
	A lot of differences	516 (27.5)
	Entirely different	190 (10.1)

Table 3: Prevalence of depression, anxiety, and stress levels.

Prevalence of depression, anxiety, and stress levels		Descriptive statistics n=1874 (%)
Depression level	Normal	841 (44.9)
	Mild	333 (17.8)
	Moderate	373 (19.9)
	Severe	159 (8.5)
	Extremely severe	168 (9)
	Range	(0-42)
	Mean±SD	12.4±9.4
	Median/IQR	10 (6-18)
Anxiety level	Normal	667 (35.6)
	Mild	181 (9.7)
	Moderate	435 (23.2)

Continued.

Prevalence of depression, anxiety, and stress levels		Descriptive statistics n=1874 (%)
Anxiety level	Severe	187 (10)
	Extremely severe	404 (21.6)
	Range	(0-42)
	Mean±SD	11.9±9.1
	Median/IQR	10 (4-18)
Stress level	Normal	1031 (55)
	Mild	249 (13.3)
	Moderate	279 (14.9)
	Severe	207 (11)
	Extremely severe	108 (5.8)
	Range	(0-42)
	Mean ± SD	15.1±9.8
	Median/IQR	14 (8-22)

Table 4: The correlation between variables and DAS-21 scores.

Correlation between variables and DAS-21 scores	Depression level		Anxiety level		Stress level	
	R	P value	R	P value	R	P value
Age	-0.127	<0.001*	-0.139	<0.001*	-0.141	<0.001*
Do you have any chronic illnesses?	0.031	0.184	0.080	0.001*	0.051	0.027*
Do you have family history of depression/anxiety?	0.187	<0.001*	0.212	<0.001*	0.220	<0.001*
Do you take care of an elderly or sick family member?	0.014	0.556	0.052	0.025*	0.020	0.382
How many individuals are living in the household with you?	0.014	0.550	0.007	0.775	-0.013	0.574
Have you had COVID-19?	0.011	0.649	0.024	0.306	-0.007	0.775
How different has life been impacted for you during lockdown when compared to life before Covid-19?	-0.021	0.354	0.043	0.060	037	0.108
How often do you watch COVID-19 news on TV or social media?	0.075	0.001*	0.123	<0.001*	6	<0.001*

-Spearman's rho correlation, *: Significant level at p value<0.05

Table 5: The correlation between the gender and DAS-21 scores.

Correlation between the gender and DAS-21 scores		Gender		P value
		Male (n=442) (%)	Female (n=1432) (%)	
Depression level	Range	(0-42)	(0-42)	0.097
	Mean±SD	11.7±9.0	12.6±9.5	
	Median / (IQR)	10/ (4-16)	10/ (6-18)	
	Normal	204 (46.2)	637 (44.5)	0.494
	Mild	84 (19)	249 (17.4)	
	Moderate	89 (20.1)	284 (19.8)	
	Severe	30 (6.8)	129 (9)	
	Extremely severe	35 (7.9)	133 (9.3)	
Anxiety level	Range	(0-38)	(0-42)	0.043*
	Mean ± SD	11.0±8.5	12.2±9.2	
	Median / (IQR)	10/(4-16)	10/(4-18)	
	Normal	169 (38.2)	498 (34.8)	0.059
	Mild	39 (8.8)	142 (9.9)	
	Moderate	105 (23.8)	330 (23)	
	Severe	53 (12)	134 (9.4)	
	Extremely severe	76 (17.2)	328 (22.9)	

Correlation between the gender and DAS-21 scores		Gender		P value
		Male (n=442) (%)	**Female (n=1432) (%)**	
Stress level	Range	(0-42)	(0-42)	
	Mean ± SD	14.0±9.5	15.5±9.9	0.007*
	Median/(IQR)	12/(6-20)	14/(8-22)	
	Normal	262 (59.3)	769 (53.7)	
	Mild	55 (12.4)	194 (13.5)	
	Moderate	64 (14.5)	215 (15)	0.224
	Severe	42 (9.5)	165 (11.5)	
	Extremely severe	19 (4.3)	89 (6.2)	

Mann Whiteny test foe non-parametric quantitative data between the two groups, Chi square test for qualitative data between the two groups, *: Significant level at p value <0.05

Table 6: The correlation between marital status and DAS-21 scores.

Correlation between marital status and DAS-21		Marital status				P value
		Single (%)	**Married (%)**	**Divorced (%)**	**Widowed (%)**	
Depression level	Range	(0-42) [a,c]	(0-42) [b]	(0-42) [b,c]	(0-22) [b]	<0.001*
	Mean±SD	13.6±10.1	11.2±8.5	11.7±10.5	10±7.2	
	Median/(IQR)	12/(6-20)	10/(6-16)	8/(4-18)	8/(4-17)	
	Normal	366 (39.6)	449 (49.6)	20 (57.1)	6 (60)	
	Mild	[a]176 (19)	[b]154 (17)	2 (5.7)	1 (10)	
	Moderate	184 (19.9)	180 (19.9)	7 (20)	2 (20)	<0.001*
	Severe	91 (9.8)	64 (7.1)	3 (8.6)	1 (10)	
	Extremely severe	107 (11.6)	58 (6.4)	3 (8.6)	0 (0)	
Anxiety level	Range	(0-42)[a]	(0-38) [b]	(0-42) [b]	(0-22) [b]	<0.001*
	Mean ± SD	13±9.4	10.8±8.5	10.5±12	10±7.4	
	Median/(IQR)	12/(6-20)	10/(4-16)	6/(2-18)	8/(4-17)	
	Normal	281 (30.4)[a]	363 (40.1) [b]	20 (57.1)[b]	3 (30)	
	Mild	94 (10.2)	81 (9)	3 (8.6)	3 (30)	
	Moderate	206 (22.3)	226 (25)	2 (5.7)	1 (10)	<0.001*
	Severe	104 (11.3)	80 (8.8)	2 (5.7)	1 (10)	
	Extremely severe	239 (25.9)	155 (17.1)	8 (22.9)	2 (20)	
Stress level	Range	(0-42) [a]	(0-42) [b]	(0-42) [b]	(0-26) [b]	0.001*
	Mean ± SD	16±10.1	14.4±9.4	12.4±10.6	13.4±8.9	
	Median/(IQR)	14/(8-22)	12/(8-20)	8/(6-18)	12/(5-22)	
	Normal	474 (51.3) [a]	527 (58.2) [b]	24 (68.6)	6 (60)	
	Mild	129 (14)	116 (12.8)	4 (11.4)	0 (0)	
	Moderate	139 (15)	135 (14.9)	2 (5.7)	3 (30)	0.062
	Severe	118 (12.8)6	85 (9.4)	3 (8.6)	1 (10)	
	Extremely severe	4 (6.9)	42 (4.6)	2 (5.7)	0 (0)	

Kruskal Wallis test for non-parametric quantitative data between the four groups followed by Mann Whitney test between each two groups, Chi square test for qualitative data between groups, superscripts with different small letters indicate significant difference between each two groups and *Significant level at p value <0.05

Table 5 illustrates the correlation between the gender of the responders and DAS-21 scores. The analysis did not reveal any correlation between the gender and depression (p=0.097). On the other hand, data showed a correlation between the gender and anxiety and stress with p value of (0.043) for anxiety and (0.007) for stress. In details, the anxiety prevalence of female participants was 62.2% (n=934), while the prevalence of anxiety of the male participants was 61.8% (n=273). Furthermore, the stress

prevalence of the female participants was 46.2% (n=663), and for the male participants was 40.7% (n=180). Results also revealed that on average, both females and males had mild depression and moderate anxiety. However, Males had merely marginally normal stress, while females had mild stress.

Table 6 illustrates the correlation between marital status and DAS-21 scores, marital status is found to be associated

with depression prevalence. Levels of depression, anxiety and stress were noted to higher among single individuals compared with the other marital status categories.

DISCUSSION

In the present study, we explored the prevalence of depression, anxiety, and stress during COVID-19 lockdown among adult individuals in Al Ahsa, Saudi Arabia, as well as identifying associated factors. By utilizing DASS-21, the finding of this study revealed mild depression, moderate anxiety and mild stress. In more details, 37.4% of respondents were having moderate to extremely severe depression level. Participants with moderate to extremely severe anxiety comprised 54.8% of the sample and 31.7% of respondents were having moderate to extremely severe stress. These finding are considerably higher than the national survey on the psychological effects of the coronavirus outbreak done on China, using the same instrument it showed that 16.5% of respondents reported moderate to extremely severe depressive symptoms, 28.8% of respondents reported moderate to extremely severe anxiety symptoms; and 8.1% reported moderate to extremely severe stress levels.[18] The data of the current study were collected in the 10th week of lockdown, while Wang's study was conducted within the first two weeks of the COVID-19 outbreak. Hence, the timing of both investigations may explain the higher difference in the current study. Despite that communities continue to adapt and cope with COVID19 crisis, many individuals may begin to exhibit signs of cumulative stress that leads to negative psychological effects.[19]

On comparison of the three stressors among both genders, our finding showed higher prevalence of anxiety and stress in females. Regarding different age groups and having chronic illnesses, significantly higher level of depression, anxiety and stress were noted in young adult compared to older adult, and higher level of anxiety and stress among those with chronic illnesses. Similar trends were observed in recent studies in Egypt and China which revealed that female gender, young adulthood, and having chronic illnesses were associated with a greater psychological impact of the pandemic and higher levels of stress, anxiety, and depression.[18,20] Results from previous studies suggest that female may show significantly higher psychological distress than their male counterparts because women are much more susceptible to stress and more likely to have post-traumatic stress disorder, and that young individuals are more psychologically effected by the pandemic probably because of two factors, firstly, levels of depression, anxiety, and psychological distress were found to correlate positively with time investment in social media and internet addiction which are more common in young adults and more prevalent in the current situation, secondly, young individuals tend to obtain a huge amount of COVID-19 information from social networking that can cause higher level of stress.[21,22] This is in accordance with our finding that the three stressors noticed to be associated with watching COVID-19 news on TV or social media.

Limitations

The inability to include illiterate and individuals who live in extreme poverty in which they do not have access to social networking.

CONCLUSION

To sum up, this study highlights the impact of COVID-19 lockdown on depression, anxiety and stress levels among adult population. The findings of this study revealed mild depression, moderate anxiety and mild stress. In more details, near to third of respondents were having moderate to extremely severe depression level. Participants with moderate to extremely severe anxiety comprised nearly half of the sample and one third of respondents were having moderate to extremely severe stress. The findings of this study serve as a warning of the potential mental health impacts caused by the pandemic, and illustrate the extreme importance of establishing mental health improving strategies that can be applied in consideration to social distancing.

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