



Research article

Psychological impacts during the COVID-19 outbreak among adult population in Jordan: A cross-sectional study

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ABSTRACT

In response to the initial outbreak of the Coronavirus Disease 2019 (COVID-19) pandemic and the pandemic-related restraints and preventive measures implemented, the global population has been experiencing a wide range of immediate psychological reactions, such as fear and psychological distress. The present study aimed to assess the psychological impacts of the COVID-19 pandemic among a sample of adults during the national lockdown implemented in Jordan. A quantitative, descriptive, correlational, cross-sectional design was used. An anonymous online questionnaire was used to collect data on the participants' sociodemographic characteristics, the changes in daily life they had experienced, their fear of COVID-19, and their depression, anxiety, and stress levels. A total of 725 Jordanian adults aged 18–65 years (mean = 33.7, SD = 9.3) were included in this study, with most of the participants being female (n = 409, 56.4%). The majority of the participants reported changes in their daily routines and activities during the COVID-19 lockdown, with 62.8% of the participants reporting weight changes, 92% reporting increased social media use, and 86.5% reporting increased mobile phone use and checking. Further, 41.4% of the participants reported high levels of fear of COVID-19, while 41.8%, 24.5%, and 22.8% reported mild to extremely severe depression, anxiety, and stress symptoms, respectively. Female participants had significantly higher levels of fear of COVID-19 and stress than did males. Fear of COVID-19 was significantly positively correlated with depression, anxiety, and stress scores. Anxiety, stress, gender, having physical disorders, and having mental disorders were identified as being significant predictive factors of fear of COVID-19. The findings of this study highlight the urgent need to pay further attention towards maintaining the psychological well-being of the public during this global crisis. The findings may guide the development of appropriate public health strategies aimed at promoting healthy living, improving mental health, and reducing fear and other psychological problems among at-risk groups during the COVID-19 pandemic. Additionally, the findings may guide further qualitative, longitudinal, and experimental studies both during and after the lockdown.

1. Introduction

Interest in the psychological impacts of the COVID-19 pandemic has been increasing across the world (Huang and Zhao 2020; Salari et al., 2020; Van Bavel et al., 2020). Studies in the literature have indicated that the outbreak of the COVID-19 pandemic may have had adverse impacts on people's mental health, with many people worldwide experiencing fear, depression, anxiety, stress, panic attacks, posttraumatic stress disorder (PTSD), social isolation, anger, and loneliness (Ahorsu et al., 2020; Bao et al., 2020; Brooks et al., 2020; Lazzerini et al., 2020; Röhr et al., 2020; Rubin and Wessely, 2020). For example, in China, Wang et al.

(2020) reported that the prevalence of depression, anxiety, and stress among 1210 adults during the initial outbreak of COVID-19 was 16.5%, 28.8%, and 8.1%, respectively. Similarly, another study conducted by Stanton et al. (2020) among 1491 adults in Australia during the lockdown reported prevalence rates of depression, anxiety, and stress of 38.2%, 21.2%, and 27.7%, respectively. These findings were consistent with the results of other recent studies conducted during the lockdown period by Mamun et al. (2021) in Bangladesh, Solomou and Constantinidou (2020) in Cyprus, Alkhamees et al. (2020) in Saudi Arabia, Arafa et al. (2021) in Egypt, and Rehman et al. (2021) in India.

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Moreover, the implementation of restrictions and preventive measures by governments to limit the spread of COVID-19, including measures such as lockdowns, quarantine, isolation, and social distancing policies, has been reported to have led to immediate negative consequences on people's mental health (Armitage and Nellums 2020; Rodríguez-Rey et al., 2020). Further, the rapid spread of COVID-19 and the high fatality rate associated with the disease have intensified fear among people worldwide, causing stigma, discrimination, and a range of mental health problems (Lima et al., 2020). Such problems and concerns, if left unrecognized or unaddressed by proper psychological interventions, may increase people's risk of experiencing mental health problems. Evidence has indicated that the ultimate consequences of such psychological impacts, particularly fear of COVID-19, include delay in accessing healthcare (Lazzerini et al., 2020) and suicide (Goyal et al., 2020; Mamun et al., 2021; Xiang et al., 2020). For example, a recent study conducted by Mamun et al. (2021) in Bangladesh reported that around 6.1% of 3388 participants had COVID-19-related suicidal behaviors. This finding was consistent with the results of other recent studies on suicidal behaviors related to the COVID-19 pandemic (Dsouza et al., 2020; Mamun and Ullah 2020). Fear of infection with COVID-19, economic distress, social distancing, isolation, and quarantine are the most commonly reported causative factors of suicide related to COVID-19 (Dsouza et al., 2020; Mamun and Griffiths 2020; Mamun et al., 2021; Mamun and Ullah; 2020). To mitigate and contain the spread of COVID-19 and its negative consequences on mental health, it is essential to assess psychological distress (e.g., fear, depression, anxiety, and stress) among the general population and to develop, implement, and monitor psychological interventions which target these psychological impacts at an early stage (Duan and Zhu 2020; Xiang et al., 2020). Therefore, further research and interventions are required to prevent the occurrence of negative psychological consequences among the general population during the COVID-19 pandemic (Salari et al., 2020).

Similar to most other countries around the world, Jordan was impacted by the COVID-19 pandemic. According to the Jordanian Ministry of Health, there were 1269 cases and 11 deaths from March to July 2020 (Jordan Ministry of Health, 2021). After the first case of COVID-19 in Jordan was reported on March 3, 2020, the Jordanian government immediately activated the National Defense Law and implemented a national lockdown, along with other emergency and preventive measures such as quarantine and social distancing policies (Alqutob et al., 2020). In response to these pandemic-related restraints and preventive measures, the lives and daily activities of people in Jordan were disrupted, forcing Jordanians to adapt to the novel circumstances. As COVID-19 continues to spread and the number of infected cases continues to increase, it is necessary to explore the immediate psychological reactions of the general population in Jordan to the initial outbreak of the COVID-19 pandemic during the national lockdown implemented in Jordan. Although this phenomenon has been investigated in Western countries, the immediate psychological responses to the COVID-19 pandemic during the national lockdowns implemented and the factors contributing to these responses have not been adequately addressed in Arab countries like Jordan. Therefore, the current study is one of the first studies to investigate the immediate psychological reactions to the outbreak of the COVID-19 pandemic during the national lockdown implemented in Jordan among a sample of Jordanian adults. More specifically, this study aimed to:

1. Describe the changes in daily life (i.e., routines and activities) experienced by a sample of adults in Jordan during the COVID-19 lockdown period.
2. Determine the prevalence rates of fear of COVID-19, depression, anxiety, and stress among a sample of adults in Jordan during the COVID-19 lockdown period.
3. Examine any gender-based differences in fear of COVID-19, depression, anxiety, and stress scores.

4. Assess the correlations between fear of COVID-19, depression, anxiety, stress, and age.
5. Identify the predictive factors of fear of COVID-19 among a sample of adults in Jordan during the COVID-19 lockdown.

Despite the preliminary nature of this study, the findings are of practical significance at the community level, as they provide information which can be used to maintain and enhance the psychological wellbeing of the general population. This information can also be used to guide the development of interventions aimed at preventing the risk of suicide and mental disorders among the general population in Jordan during the COVID-19 pandemic. A multidisciplinary approach needs to be adopted for the provision of effective, safe, and holistic pandemic/crisis management. The findings of this study may assist healthcare leaders, administrators, and professionals in the development and implementation of appropriate psychological strategies and interventions, particularly for at-risk groups (Dieljtjens et al., 2014; Shultz et al., 2016). The findings also shed light on the importance of providing online educational programs which cover aspects related to the COVID-19 disease for the public (e.g., students, families, and communities) and healthcare professionals. Lastly, the findings may guide further qualitative, longitudinal, and experimental studies aimed at better understanding the full psychological impacts of the COVID-19 pandemic on the general population both during and after the lockdown.

2. Methods

2.1. Design

A quantitative, descriptive, correlational, cross-sectional design was employed to guide this study. An anonymous online survey targeted at the adult population in Jordan was used for data collection.

2.2. Sample and setting

The study population included all adults who were aged 18 years or over and who were living in Jordan during the COVID-19 lockdown. Jordan is an Arab country located in the Middle East and has an estimated population of about 10.5 million people, with 52.9% of the population being male and 47.1% being female (Jordan Department of Statistics, 2020). A convenience sampling technique was used to recruit the study participants. The inclusion criteria for participation in the current study were: (a) being an adult aged between 18 and 65 years, (b) living in Jordan, and (c) being able to read and write in Arabic. The exclusion criteria were: (a) being aged under 18 or over 65 years, (b) not being resident in Jordan during the COVID-19 lockdown, and (c) being unable to read and write in Arabic. The sample size was calculated using the G*power 3.1 software (Faul et al., 2009). For multiple regression analysis, a medium effect size (Cohen's $f = .15$) (Cohen, 1988) was utilized. Statistical power and alpha threshold were set at 0.80 and 0.05, respectively. The required sample size was 123 and a total of 725 adults completed the current study survey.

2.3. Data collection procedures

Prior to conducting the study, institutional review board (IRB) approval (No. 132-2020) was obtained from the principal investigator's affiliated university. Potential participants were invited to participate through social media platforms (i.e., Facebook and WhatsApp). The snowball sampling method was also used to reach a greater number of participants. Informed consent was obtained from the participants electronically at the beginning of the online survey. The participants were informed about the study purpose and procedures and how the collected data would be used. The participants were also informed that their participation was completely voluntary, that they had the right to withdraw from the study at any time without consequences, and that

they would receive no compensation for their participation. After agreeing to participate in the study, the participants were asked to complete and submit only one online self-report survey. The online survey was distributed to the potential participants through Facebook or WhatsApp via a Google Forms link. Data were collected between 1st and 12th May, 2020, during the second month of the outbreak of COVID-19 (i.e., during the lockdown period) in Jordan. The online survey was closed on the twelfth day, and no missing data were identified.

2.4. Study variables and measures

2.4.1. Sociodemographic

A sociodemographic questionnaire was used to collect data related to the sociodemographic characteristics of the participants. The questionnaire included items related to age, gender, educational level, marital status, having children, employment status, having physical health problems, and lastly, having mental health problems.

2.4.2. Changes in daily life during the COVID-19 lockdown period

The participants reported the changes that they had experienced in their daily life during the COVID-19 lockdown period. The following changes in daily life were assessed: physical exercise, smoking, night sleep duration (hours), weight changes, increase in mobile phone usage and checking, frequency of mobile phone usage and checking per day, increase in social media usage, and use of mobile phones and social media increases their psychological distress. The methods that the participants used to reduce their levels of psychological distress during the lockdown period were also assessed.

2.4.3. The fear of COVID-19 scale (FCV-19S)

Fear was assessed using the Fear of COVID-19 Scale (FCV-19S). The FCV-19S is a unidimensional 7-item scale used to assess the level of fear among the general population during the COVID-19 pandemic (Ahorsu et al., 2020). The items of the FCV-19S are scored on a 5-point Likert scale ranging from 1 to 5, with 1 = strongly disagree, 2 = disagree, 3 = neither agree nor disagree, 4 = agree, and 5 = strongly agree. The total possible score ranges from 7 to 35, with higher scores indicating greater fear of COVID-19. The FCV-19S has been evidenced to be a reliable and valid tool, with a reported internal consistency of 0.82 and good concurrent validity supported by other measures (Ahorsu et al., 2020). No Arabic versions of the FCV-19S were available at the time this study was conducted. Therefore, the procedures of Beaton et al. (2000) were followed to translate the FCV-19S into Arabic whilst ensuring the reliability, validity, and cultural adaptation of the translation. Initially, the original English version of the FCV-19S was translated into Arabic by a bilingual professor. After that, the translated Arabic version was back-translated into English by another bilingual professor who was blinded to the original English version. Then, experts in the area of measures covering reviewed the translations to ensure that the final translated version accurately reflected the item content of the original version, including the instructions, items content, and response options (Epstein et al., 2013). No discrepancies or unclear meanings were identified between the original English version and the back-translated version. Finally, the Arabic version was pilot tested among 30 Jordanian adults. More details on the psychometric properties of this Arabic version of the FCV-19S are provided elsewhere (Al-Shannaq et al., 2021b). In this current study, the internal consistency (Cronbach's α) for the Arabic version of FCV-19S was .91.

2.4.4. Depression, anxiety, and Stress Scale -21 (DASS-21)

Depression, anxiety, and stress symptoms were assessed using the Depression, Anxiety, and Stress Scale (DASS-21). The DASS-21 is a self-report measure used to assess the negative emotional states/symptoms of depression, anxiety, and stress experienced by the respondents in the preceding week (Lovibond and Lovibond 1995). The DASS-21 consists of 21 items, with 7 items under each subscale as follows: items 3, 5, 10, 13,

16, 17, and 21 under the depression subscale, items 2, 4, 7, 9, 15, 19, and 20 under the anxiety subscale, and items 1, 6, 8, 11, 12, 14, and 18 under the stress subscale. The scale items are scored on a 4-point Likert scale ranging from 0 to 3, with 0 = 'Did not apply to me at all', 1 = 'Applied to me to some degree, or some of the time', 2 = 'Applied to me to a considerable degree, or a good part of the time', and 3 = 'Applied to me very much, or most of the time'. The total possible score for each subscale ranges from 0 to 42 and is calculated by summing up the scores for each of the subscale items and then multiplying the sum by two. According to Lovibond and Lovibond (1995), the cutoff scores for classifying the level/severity of the symptoms under each subscale are as follows: normal (0–9), mild (10–13), moderate (14–20), severe (21–27), and extremely severe (28–42) for depression; normal (0–7), mild (8–9), moderate (10–14), severe (15–19), and extremely severe (20–42) for anxiety; and normal (0–14), mild (15–18), moderate (19–25), severe (26–33), and extremely severe (34–42) for stress (Chew et al., 2020). For internal consistency, Cronbach's alpha coefficient values of .94, .87, and .91 have been reported for the depression, anxiety, and stress subscales, respectively (Antony et al., 1998). Concurrent validity was supported by other measures (Antony et al., 1998). A validated Arabic version of the DASS-21 was used in the present study (Moussa et al., 2017; Al-Modallal, 2012; Hamaideh, 2017). In this study, the Cronbach's α for three subscales of DASS-21 were .89 for depression, .89 for anxiety, and .91 for stress.

2.5. Data analysis

The Statistical Package for the Social Sciences (SPSS) for Windows, version 25, was used to analyze the collected data. Descriptive statistics were used to describe the sample characteristics (i.e., sociodemographic characteristics and changes in daily life during the COVID-19 lockdown period) and the study measures' total scores (i.e., FCV-19S and DASS-21 subscales scores). Means, standard deviations, and ranges were used for the continuous variables, whilst frequencies and percentages were used for the categorical variables. Pearson's correlation coefficient (r) was used to examine the bivariate correlations between age, fear of COVID-19, depression, anxiety, and stress. Independent-samples t-tests were used to examine whether significant differences existed between female and male participants in levels of fear of COVID-19, depression, anxiety, and stress. Simultaneous multiple regression was performed to determine the significant predictive factors of fear of COVID-19 among the study participants. The FCV-19S total score was entered as the outcome variable, while the sociodemographic variables (i.e., age, gender, educational level, marital status, having children, employment status, and physical and mental health problems) and the three DASS-21 subscales (i.e., depression, anxiety, and stress) were entered as potential factors (i.e., 11 predictors). The categorical variables were entered as dummy codes. The reference group was the most frequent category. For example, females were the reference group for the gender variable. In addition, no violations of the regression assumptions, including normality, linearity, or homoscedasticity, were identified from the preliminary analysis. The level of significance was set as $p < 0.05$.

3. Results

3.1. Sample characteristics

Out of 736 potential participants, a total of 725 participants completed the online survey and 11 refused to participate, leading to a response rate of 98.5%. The participants' demographic characteristics during the COVID-19 lockdown are presented in Table 1. The mean age of the participants was 33.7 years ($SD = 9.3$), with ages ranging from 18 to 65 years. In total, 56.4% ($n = 409$) of the participants were female, whilst 43.6% ($n = 316$) were male. As with regards to educational level, the majority of the participants held undergraduate degrees ($n = 539$, 74.3%). Most of the participants ($n = 490$, 67.6%) were married and

Table 1. Sample characteristics (N = 725).

Characteristic	Category	n	%	M	SD
Age				33.7	9.3
Gender					
	Male	316	43.6		
	Female	409	56.4		
Education Level					
	High school and below	78	10.8		
	Undergraduate degree	539	74.3		
	Graduate degree	108	14.9		
Marital Status					
	Single	205	28.3		
	Married	490	67.6		
	Divorced	15	2.1		
	Widowed	15	2.1		
Children					
	Yes	463	63.9		
	No	262	36.1		
Occupation Status					
	Employed	449	61.9		
	Unemployed	128	17.7		
	Retired	120	16.6		
	Student	28	3.9		
Physical Health Problems					
	Yes	118	16.3		
	No	607	83.7		
Mental Health Problems					
	Yes	56	7.7		
	No	669	92.3		

63.9% (n = 463) of the participants had children. Further, most of the participants (61.9%, n = 449) reported being employed. Among the participants, 83.7% (n = 607) reported not having any chronic health problems, and 92.3% (n = 669) reported not having any mental health problems. See [Table 1](#).

3.2. Participants' changes in daily life during the COVID-19 lockdown period

[Table 2](#) presents the changes in daily life experienced by the participants during the COVID-19 lockdown period. Most of the participants did not practice physical exercise (n = 496, 68.4%), 71.9% (n = 521) were non-smokers, and 58.1% (n = 421) reported receiving between 7-9 h of sleep per night. As with regards to weight changes, the majority of the participants (n = 455, 62.8%) reported having experienced weight changes during the lockdown period, with 48.75 (n = 353) reporting an increase in their weight. Further, 92% (n = 667) of the participants reported an increase in their mobile phone usage and checking, with 78.1% (n = 566) of the participants reporting that they used or checked their mobile phones every 30 min. Also, 86.5% (n = 627) of the participants reported an increase in their use of social media during the lockdown. Approximately two thirds of the sample (n = 505, 69.7%) reported that their increased mobile phone use and checking and social media use had increased their levels of psychological distress. Lastly, the participants were asked to select which methods they used to reduce their levels of psychological distress during the lockdown. The most frequently reported methods were (1) browsing the internet, (2) obtaining correct scientific health information from accurate sources, (3) adapting to the current situation, and (4) taking precautionary measures and following governmental instructions. These methods were followed by practicing religious beliefs and activities, watching TV, and satisfaction and acceptance. Meanwhile, the least frequently reported methods were talking to family or others, trying to focus more on the present than on

the future, and lastly, doing personal hobbies and visiting family, relatives, and friends. See [Table 2](#).

3.3. Psychological reactions during the COVID-19 lockdown – fear of COVID-19, depression, anxiety, and stress

[Table 3](#) presents the descriptive statistics and the participants' fear of COVID-19 levels and depression, anxiety, and stress levels as identified by the FCV-19S and the DASS-21 scales, respectively. With regards to fear of COVID-19, the analysis of the participants' FCV-19 scale scores indicated a mean total score of 16.7 (SD = 6.5), with scores ranging from 7 to 35. According to the cut-off value (i.e., the mean score), the participants' fear scores were categorized as low and high levels of fear. Low fear refers to scores less than or equal to the mean, whilst high fear refers to scores above the mean. The analysis showed that 41.4% had a high level of fear. As with regards to the participants' depression, anxiety, and stress levels, the analysis of the participants' DASS-21 scale scores indicated an overall mean depression subscale score of 9.7 (SD = 9.5), an overall mean anxiety subscale score of 5.2 (SD = 7.8), and an overall mean stress subscale score of 9.6 (SD = 9.5). As for the distribution of the respondents according to their total scores on the three DASS-21 subscales (i.e., severity levels), the analysis showed that 41.8%, 24.5%, and 22.8% reported mild to extremely severe depression, anxiety, and stress symptoms, respectively. See [Table 3](#).

3.4. Differences in fear of COVID-19, depression, anxiety, and stress scores based on gender

[Table 4](#) presents the results of the independent samples t-test which examined the differences in the participants' mean fear of COVID-19, depression, anxiety, and stress scores based on gender. The analysis indicated differences between female and male participants only in fear of COVID-19 scores and stress scores, with female participants showing

Table 2. The changes in daily life during the COVID-19 lockdown.

Characteristic	Category	n	%
Physical exercise	Yes	229	31.6
	No	496	68.4
Smoking	Yes	204	28.1
	No	521	71.9
Night sleep duration (hours)	Less than 7 h	87	12.0
	7–9 h	421	58.1
	More than 9 h	217	29.9
Weight changes	Increased	353	48.7
	Decreased	102	14.1
	No weight changes	270	37.2
Increase in mobile phone usage and checking	Yes	667	92.0
	No	58	8.0
Frequency of mobile phone usage and checking per day	Every 30min	566	78.1
	Every 2 h	93	12.8
	More than 3 h	63	8.7
	Do not have a mobile phone	3	0.4
Increasing in social media usage	Yes	627	86.5
	No	98	13.5
Use of mobile phones and social media increases psychological distress	Yes	505	69.7
	No	220	30.3
Methods used to reduce psychological distress	1. Browsing the internet	430	59.3
	2. Obtaining correct scientific health information from accurate sources	402	55.4
	3. Adapting to and living with the current situation	398	54.9
	4. Taking precautionary measures and following governmental instructions	368	50.8
	5. Practicing religious beliefs and activities	365	49.1
	6. Watching TV	347	47.9
	7. Satisfaction and acceptance	304	41.9
	8. Talking to family and others	201	27.7
	9. Trying to focus more on the present than on the future	173	23.9
	10. Doing personal hobbies	141	19.4
	11. Visiting family, relatives, and friends	80	11.0

significantly higher levels of fear of COVID-19 and stress than males. Meanwhile, no gender-based differences were identified in the participants' depression or anxiety scores. See [Table 4](#).

3.5. Correlations between fear of COVID-19, depression, anxiety, stress, and age

[Table 5](#) presents the bivariate correlations between fear of COVID-19, depression, anxiety, stress, and age. Using Pearson's correlation coefficient (r), the analysis showed that fear of COVID-19 had a significant positive correlation with depression, anxiety, and stress. In addition, depression had a significant positive correlation with anxiety and stress, and stress had a significant positive correlation with anxiety. The results indicated that participants with higher levels of fear of COVID-19 were more likely to report higher levels of depression, anxiety, and stress. Meanwhile, age was not found to be significantly correlated with fear of

COVID-19, but it had a significant negative correlation with depression, anxiety, and stress scores. See [Table 5](#).

3.6. Factors predicting fear of COVID-19

Multiple liner regression analysis was performed to identify the factors of the participants' fear of COVID-19 total scores, the results of which are presented in [Table 6](#). The participants' demographic characteristics and the three DASS-21 subscales explained 36.9% of the variance in fear of COVID-19 total scores (R^2 Adj = 0.369, $F(16, 708) = 25.83$, $p < 0.001$). As evident in [Table 6](#), only five predictors were identified as being significant. Anxiety, stress, gender, having physical health problems, and having mental health problems affected the participants' fear of COVID-19 total scores. More specifically, higher fear of COVID-19 total scores was predicted by participants who scored higher on the DASS-21 anxiety subscale, those who scored higher on the DASS-21 stress

Table 3. Descriptive statistics and levels of fear of COVID-19, depression, anxiety, and stress (N = 725).

Scale M(SD)	Category	Frequency (%)
Fear of COVID-19S 16.7 (6.5)		
	Low	425 (58.6)
	High	300 (41.4)
DASS Depression Subscale 9.7 (9.5)		
	Normal	422 (58.2)
	Mild	103 (14.2)
	Moderate	102 (14.1)
	Severe	48 (6.6)
	Extremely severe	50 (6.9)
DASS Anxiety Subscale 5.2 (7.8)		
	Normal	547 (75.4)
	Mild	29 (4.0)
	Moderate	66 (9.1)
	Severe	29 (4.0)
	Extremely severe	54 (7.4)
DASS Stress Subscale 9.6 (9.5)		
	Normal	560 (77.2)
	Mild	61 (8.4)
	Moderate	42 (5.8)
	Severe	41 (5.7)
	Extremely severe	21 (2.9)

subscale, being female, participants who had physical health problems, and those who had mental health problems. See Table 6.

4. Discussion

This study is one of the first studies to investigate the immediate psychological reactions to the outbreak of the COVID-19 pandemic during the national lockdown implemented in Jordan among a sample of Jordanian adults. Specifically, this study aimed to identify the prevalence rates of psychological reactions and the predictors of fear of COVID-19 among adults in Jordan. The uniqueness of this study lies in it being

conducted at the initial outbreak of the COVID-19 pandemic during the lockdown period in Jordan. Therefore, the findings of the present study only provided evidence regarding the immediate psychological reactions of the general population in Jordan to the initial outbreak of COVID-19 during the national lockdown implemented in the country. Moreover, our study findings shed light on the at-risk groups requiring early psychological interventions, which is essential aspect in our study for improving psychological well-being and preventing suicidal behaviors among these at-risk groups. This study identified the sociodemographic and psychological variables that contribute to the prevalence rate of fear of COVID-19 during the lockdown period among the study sample. However, as the disease continues to spread and the number of COVID-19 cases in Jordan continues to rise, further research is required for providing a more in-depth understanding of the current situation regarding this global health crisis.

Among the 725 respondents, 41.4% (n = 300) reported a high level of fear of COVID-19, with an overall mean FCV-19S score among the study sample of 16.7 ± 6.7. These findings are in line with the findings of recent studies conducted during COVID-19 lockdown periods among adult populations (Doshi et al., 2020; Nguyen et al., 2020). For example, a recent study conducted in India by Doshi et al. (2020) reported that 45.2% (n = 677) of the participants had a high level of fear of COVID-19, with a total mean FCV-19S score of 18.00 ± 5.68. Additionally, our findings indicated that 41.8%, 24.5%, and 22.8% of the participants reported mild to extremely severe depression, anxiety, and stress symptoms, respectively. These findings are also consistent with the findings of recent studies conducted during COVID-19 lockdown periods among adult populations (Alkhamees et al., 2020; Al-Shannaq et al., 2021a; Arafa et al., 2021; Rehman et al., 2021; Shah et al., 2021; Stanton et al., 2020; Wang et al., 2020). For example, in a study conducted in Saudi Arabia, 40.9%, 29.9%, and 29.8% of the participants reported mild to extremely severe depression, anxiety, and stress symptoms, respectively (Alkhamees et al., 2020). Similarly, in a study conducted in Australia, 38.2%, 21.2%, and 27.8% of the participants reported mild to extremely severe depression, anxiety, and stress symptoms, respectively (Stanton et al., 2020). The lower prevalence rates of psychological reactions among our study sample may be explained by the fact that at the time this study was conducted (i.e., at the beginning of the outbreak of the COVID-19 in the country), only a few cases of COVID-19 had been reported in Jordan. Therefore, the COVID-19 pandemic was not yet perceived to be of much relevance or severity by many adults in Jordan.

As with regards to gender-based differences in psychological reactions among our sample, the findings indicated that female participants

Table 4. Gender differences in fear of COVID-19, depression, anxiety, and stress scores.

Variable	Female (n = 409) Mean (SD)	Male (n = 316) Mean (SD)	t	P value
Fear of COVID-19	17.50 (6.40)	15.76 (6.61)	3.579	.000**
Depression	10.11 (9.38)	9.22 (9.70)	1.247	.213
Anxiety	5.66 (8.03)	4.63 (7.44)	1.785	.075
Stress	10.34 (9.65)	8.60 (9.15)	2.473	.014*

Note. *p < 0.05; **p < 0.001 statistically significant.

Table 5. Correlations between fear of COVID-19, depression, anxiety, stress, and age.

Scale	1	2	3	4	5
1 FCV-19 Total	-				
2 DASS Depression Subscale	0.465**	-			
3 DASS Anxiety Subscale	0.538**	0.752**	-		
4 DASS Stress Subscale	0.509**	0.840**	0.812**	-	
5 Age	-0.007	-0.119**	-0.080*	-0.101**	-

Note. ** Correlation is significant at the 0.01 level (2-tailed); * Correlation is significant at the 0.05 level (2-tailed).

Table 6. Regression analysis of factors associated with fear of COVID-19.

Independent Variable	FCV-19 Total Score				
	B	SE	St. B	t	P Value
DASS-21 Depression Subscale	0.03	0.04	0.05	0.81	.420
DASS-21 Anxiety Subscale	0.24	0.05	0.29	5.34	<.001**
DASS-21 Stress Subscale	0.12	0.05	0.17	2.60	.009**
Age	0.01	0.03	0.02	0.42	.673
Gender ^a	-1.61	0.43	-0.12	-3.79	<.001**
Educational Level:					
Undergraduate Degree vs High school and below	0.56	0.66	0.03	0.84	.400
Undergraduate Degree vs Graduate Degree	-0.52	0.58	-0.03	-0.89	.375
Marital Status:					
Married vs Single	0.08	0.87	0.01	0.10	.922
Married vs Divorced	2.37	1.47	0.05	1.62	.106
Married vs Widowed	2.88	1.52	0.06	1.90	.058
Children ^b	1.36	0.77	0.10	1.76	.080
Occupation:					
Employed Unemployed	-0.90	0.59	-0.05	-1.54	.124
Employed vs Retired	1.62	1.12	0.05	1.45	.147
Employed vs Student	0.68	0.78	0.04	0.87	.384
Physical Health Problems ^c	1.52	0.60	0.09	2.53	.012*
Mental Health Problems ^d	3.25	0.84	0.13	3.89	<.001**
Adjusted R ²	0.369				
F	25.83**				

Note. * $p < 0.05$; ** $p < 0.001$.

B: beta coefficient (non-standardized); SE: Standard Error; St. B: beta coefficient (Standardized); t: t-test value.

^a Females were the reference group.

^b Participants who had children were the reference group.

^c Participants who without having physical health problems were the reference group.

^d Participants who without having mental health problems were the reference group.

had significantly higher fear of COVID-19 and stress scores than did male participants. This finding may be explained by the fact that women are usually expected to take care of their families and household chores at home, and so being forced to stay home, along with the closure of schools and childcare centers, during the lockdown period may have placed women at a higher risk of experiencing increased burdens and concerns (Ferreira et al., 2021; Malkawi et al., 2021; Mantovani et al., 2020). Further, women may also fear and worry about their children and family members becoming infected with COVID-19 (Afshari et al., 2021). The literature indicates that the emergency and preventive measures implemented during the pandemic, which include restricting movement and prohibiting people from leaving their homes, may have had negative psychological impacts, such as fear (Brooks et al., 2020) and depressive, anxiety, and stress symptoms (Duan and Zhu 2020; Ferreira et al., 2021; Malkawi et al., 2021), on the general population. Our findings are consistent with the findings of previous studies which reported that in comparison to males, females have experienced greater psychological impact as a result of the outbreak of COVID-19 (Afshari et al., 2021; Alkhamees et al., 2020; Al-Shannaq et al., 2021; Arafa et al., 2021; Ferreira et al., 2021; Rehman et al., 2021; Shah et al., 2021; Solomou and Constantinidou 2020; Stanton et al., 2020; Wang et al., 2020). The results of our study also showed gender to be a significant predictor of fear of COVID-19, whereby females reported significantly higher fear of COVID-19 scores than did males. This finding is also consistent with the findings of previous studies which reported higher levels of fear of COVID-19 among females than among males (Doshi et al., 2020; Nguyen et al., 2020). Meanwhile, age, educational level, marital status, having children, employment status, and having depression symptoms were not found to predict fear of COVID-19 among the sample of the current study. In contrast, Doshi et al. (2020) reported that being female, being married, having a low educational level, and being a health care worker were significant predictors of fear of COVID-19.

Among the psychological variables, the simultaneous regression model indicated that having anxiety symptoms and having stress symptoms were significant predictors of fear of COVID-19, while having depression symptoms was not. In support of this, our results revealed that anxiety and stress had a significant positive association with fear of COVID-19 among the study sample. This association indicates that participants who have anxiety and stress symptoms are more likely to have significantly higher levels of fear of COVID-19. This latter statement highlights the need for further research aimed at determining the changes in anxiety and stress symptoms and the effect of having anxiety and stress symptoms on fear of COVID-19. Due to the descriptive, cross-sectional nature of the current study, it was not possible to assess the causal association between anxiety and stress symptoms and fear of COVID-19 among the study sample. However, our findings may be explained by the fact that feelings of fear experienced during the COVID-19 pandemic may have increased levels of anxiety and stress among healthy persons and aggravated symptoms among individuals with mental illnesses (Shigemura et al., 2020). Another possible explanation is the fact that about 70% of the participants reported that the increase in their social media use and mobile phone checking had increased their psychological distress levels during the lockdown. Further, 92% of the participants reported that their mobile phone use and checking had increased during the lockdown period, 78% reported that they checked their phones every 30 min, and 87% reported that their social media use had increased. Whilst our study findings provide insight into the use of technology, it was not possible, due to the cross-sectional nature of this study, to determine the causal relationship between the use of technology (i.e., the internet, social media, and mobile phones) and fear, anxiety, and stress symptoms during the lockdown among the study sample. Therefore, further research is needed to examine the associations between the use of technology and psychological status among the general population during the pandemic.

The results indicated that 16.3% of the participants reported having chronic physical disorders, and these participants were identified as being more likely to have higher levels of fear of COVID-19 as compared to participants without chronic physical disorders. One possible explanation for this is that people who have physical health problems may view their health status as poor and may therefore feel more susceptible to becoming infected with new diseases (Wang et al., 2020), as well as experiencing greater psychological impacts of the COVID-19 pandemic (Alkhamees et al., 2020). Additionally, in our study, 7.7% of the participants reported having mental disorders, and these participants were identified as being more likely to have higher levels of fear of COVID-19 as compared to participants without mental disorders. Similar findings were reported by previous studies conducted during the initial outbreak of COVID-19 (Alkhamees et al., 2020; Al-Shannaq et al., 2021a; Hao et al., 2020; Solomou and Constantinidou 2020; Wang et al., 2020). One possible explanation is that the COVID-19 pandemic may have led to psychiatric disorder relapse or the intensification of existing psychiatric disorders (Yao et al., 2020). Our findings are consistent with the results of previous studies conducted during the initial outbreak of COVID-19, which reported that having physical disorders and having mental disorders are factors associated with experiencing greater psychological impacts of the COVID-19 pandemic (Alkhamees et al., 2020; Al-Shannaq et al., 2021a; Hao et al., 2020; Solomou and Constantinidou 2020; Wang et al., 2020). The findings of the present study emphasize the need to provide the required support and help for at-risk populations, which includes women, people with medical disorders, and people with mental symptoms/disorders, both during and after the COVID-19 lockdown period. People with psychological problems may develop mental disorders during the pandemic, which may ultimately lead to suicidal behaviors (Xiang et al., 2020). Access to medical and psychiatric healthcare services may be limited during the COVID-19 pandemic, and thus, governments and healthcare institutions should develop and implement suitable psychological interventions (Alkhamees et al., 2020). This includes providing telehealth services and services of home delivery of medications (Alkhamees et al., 2020). Such interventions may help in reducing and preventing mental illness relapse and suicidal behaviors during this pandemic, particularly among at-risk groups.

The integration of public mental health strategies into pandemic management is urgently needed both during and after the COVID-19 pandemic (Shultz et al., 2016). No universal protocols or policies have been found to provide effective psychosocial support during emergencies and disasters, and therefore, providing psychological first aid is required (Dijtjens et al., 2014). It is also necessary that the general public are provided with access to correct and up-to-date information and news related to COVID-19, and there is a need for healthcare teams to adopt a multidisciplinary approach in order to provide psychological support and counseling based on the available resources (Afshari et al., 2021; Xiang et al., 2020). In support of these implications, the most frequently reported methods of reducing psychological distress during the COVID-19 lockdown among the participants were (1) browsing the internet, (2) obtaining correct scientific health information from accurate sources, (3) adapting to and living with the current situation, and (4) taking precautionary measures and following governmental instructions.

There are limitations to the current study. First, the use of an online survey and snowball sampling methods for data collection during the lockdown period may have led to selection bias and influenced the response rate, as only adults who had access to the internet and the study link were able to participate. Second, the use of a self-report questionnaire for assessing the psychological reactions of the general population to the COVID-19 pandemic may have led some participants to provide responses which they perceived to be socially desirable. Third, the short data collection period limited the size of the study sample, and the sample included only adults. Therefore, future studies conducted on larger and more representative samples, including different populations and people of different ages (i.e., children, adolescents, and elderly people), is highly recommended. Fourth, due to the use of a cross-

sectional design, fear of COVID-19, depression, anxiety, and stress levels were measured at one point of time without providing causal inferences between the variables. Thus, given the descriptive nature of this study and the use of a cross-sectional design, our findings need to be verified by further longitudinal studies which examine the changes in the levels of the study variables among the general population over time. However, despite these limitations, the present study contributed to the literature by providing evidence regarding the immediate psychological reactions to the initial outbreak of the COVID-19 pandemic during the national lockdown implemented in Jordan among a sample of Jordanian adults.

In conclusion, studies in the literature have indicated that the COVID-19 pandemic has had several psychological impacts on the general population (Al-Shannaq et al., 2021a; Bao et al., 2020; Brooks et al., 2020; Lazzarini et al., 2020; Röhr et al., 2020; Rubin and Wessely, 2020; Shah et al., 2021). The current study explored the prevalence rates of fear of COVID-19 and other psychological reactions (i.e., depression, anxiety, and stress) experienced by a sample of adults in Jordan during the COVID-19 lockdown. This study also assessed the sociodemographic and psychological factors contributing to the prevalence rate of fear of COVID-19 among the study sample. Given that the COVID-19 pandemic is not yet over and the disease continues to spread, our findings highlight the urgent need for healthcare policymakers and governments to increase their focus on maintaining the psychological well-being of the public during this pandemic. Our findings may be used to guide healthcare policymakers and public health authorities in the development and implementation of online educational programs for the general population and for at-risk groups in particular. Specifically, no clear strategies, policies, or protocols were adopted for maintaining the psychological well-being of the general population in Jordan during the early stages of the outbreak of the COVID-19 pandemic. Thus, the findings of the current study may be used to guide further research among different populations and representative study samples. For example, qualitative studies are needed in order to gain a more in-depth understanding of how the general population has dealt with the pandemic and managed their psychological problems and concerns. In addition, experimental studies are needed to test and evaluate the effectiveness of specific psychological interventions for the public during the COVID-19 pandemic. Such studies will guide pandemic/crisis management in the future. Finally, our findings may also be of significance in the future in case of the outbreak of any new pandemics.

Declarations

Author contribution statement

Yasmin Al-Shannaq: Conceived and designed the experiments; Performed the experiments; Analyzed and interpreted the data; Contributed reagents, materials, analysis tools or data; Wrote the paper.

Anas A. Mohammad: Performed the experiments; Analyzed and interpreted the data; Contributed reagents, materials, analysis tools or data; Wrote the paper.

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Data availability statement

Data will be made available on request.

Declaration of interests statement

The authors declare no conflict of interest.

Additional information

No additional information is available for this paper.

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