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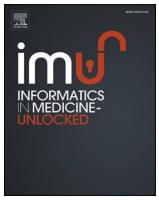

# Depression, stress, anxiety among jordanian people during COVID-19 pandemic: A survey-based study

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ABSTRACT

COVID-19 pandemic is associated with negative impacts on mental health. The study investigated mental health measures that include depression, stress, and anxiety, and their correlation with gender and age among Jordanians in the COVID-19 era. This investigation adopted a quantitative, cross-sectional, and descriptive design and included 1587 subjects recruited through a convenient sampling approach. Jordanians (≥18 years old) were recruited in the study. The total DASS score of the whole sample was 32.7 ± 0.67. The DASS scale showed significantly high scores for stress, anxiety, and depression in the groups that perceived a moderate-high probability of infection with COVID-19 ($P < 0.05$). The stress score was greater ($P < 0.001$) in the men (11.39 ± 0.469) compared to the women (10.74 ± 0.33). On the other hand, anxiety and depression scores were higher in women than men (8.13 ± 0.25, and 12.71 ± 0.30 respectively). Finally, DASS total score significantly decreased with the increasing age of the participants ($P < 0.001$). Many Jordanians experienced moderate to severe depression, stress, and anxiety during the COVID-19 era. Such experience was associated with the sex and age of subjects. The results of this study will benefit decision-makers in establishing a plan to prevent the consequences of these mental disorders during pandemics.

## 1. Introduction

Pandemics that occurred in the past caused fear to the public, and most people developed anxiety and fear-related behavioral issues. Coronavirus disease of 2019 (COVID-19) overwhelmed the world with panic, uncertainties, and possibilities of fatal outcomes [1–3]. The public has experienced anxiety, depression, psychological distress, post-traumatic stress disorder, and insomnia [3,4]. A systematic review documenting studies from Asia and Europe revealed that 29.6%, 31.9%, and 33.7% have experienced stress, anxiety, and depression, respectively [5]. Similar findings were reported in studies that included several countries from three continents [6,7]. These psychological changes have been attributed mainly to fear of contracting the disease, the financial need to work, and the inability to avoid interacting with the public [8,9].

The infections or death of a family member could impact the mental wellbeing of individuals including experiencing fear and depression [10,11]. At the same time, those in quarantine experience loneliness, boredom, and anger. Studies have shown that individuals experiencing overwhelming emotional traumas and socioeconomic stressors during COVID-19 were more vulnerable to committing suicide [12,13]. It is suggested that governments that implemented strict measures to reduce transmission of COVID-19 during the onset of the pandemic could benefit the mental health of their population [14].

According to recent publications, mental health issues during COVID-19 have been linked to socioeconomic status, gender, occupation, COVID-19-like symptoms, social support, interpersonal conflicts, and perceptions of the impact of COVID-19 [15–17]. As argued by Holmes et al. [18], older adults and those with low incomes are more susceptible to poor mental health. In addition, a meta-analysis showed that people with pre-existing mood disorders are at increased risk of hospitalization and death for COVID-19 compared to the general population [19]. Furthermore, it has been shown that the risk of depressive symptoms persists for weeks after infection with COVID-19 [20]. Thus, it is crucial to determine the psychological changes to develop strategies to

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mitigate the psychological risks and consequences of the current and future pandemics [21,22]. Therefore, this study determined the relationship of age and gender with the prevalence of psychological measures among Jordanians during the COVID-19 era.

## 2. Methods

### 2.1. Study design and sampling method

This study adopted a quantitative, cross-sectional, and descriptive design to assess the measures of mental health during COVID-19. Additionally, the relationship of age and gender with mental health measures was examined.

A convenience sampling method was used to select study participants. Jordanians aged 18 years and above were included in the study. Further, individuals younger than 18 years old and those not residing in Jordan were excluded from the study. The purpose, voluntary participation, survey length, confidentiality issues, and potential risks and benefits of the study were explained on the first page. The first page also includes instructions for the participants to read the consent and click on the agreement button if they agreed to participate. No information revealing the participant's identity was included or collected with the survey. All completed surveys were then saved on password-protected Google forms that the researcher could only access and fill by every recipient.

### 2.2. Data collection method

An online Google form was used to collect the survey data. The link to the survey was distributed in all Jordanian cities through social media platforms. The survey was designed so that respondents were limited to providing one response per individual. The study was conducted in April–July 2020.

### 2.3. Measures

The researchers used the Depression Anxiety Stress Scales (DASS-21) tool to explore mental health measures. The scale is a reliable and valid measure of mental health [23]. DASS-21 was validated in different countries during the COVID-19 pandemic [20,24–29]. Therefore, the scale is a valid measure to assess mental health during the COVID-19 pandemic. The details of the scale have been previously described thoroughly [30]. However, will be briefly described. Three emotional conditions are measured with the scale, depression (DASS-D), anxiety (DASS-A), and stress (DASS-S), each of which consists of seven items. The DASS-D scale is used to determine hopelessness, dysphoria, life devaluation, self-deprecation, inertia, and anhedonia among study participants. The DASS-A scale assesses the study participant's autonomic stimulation, situation anxiety, skeletal muscle effects, and personal experiences of anxiety symptoms. Lastly, the DASS-S scale examines the participants' levels of severe non-specific arousal such as irritability, nervous stimulation, difficulty relaxing, and impatience [30].

The DASS-21 is a self-administering scale where the respondents rate the level to which specific experiences apply to them. The respondents rated these experiences on a 4-point scale that ranges from 0 (does not relate to me) to 3 (mostly apply to me). The researchers then calculated the scores for each of the three scales by adding the scores for the applicable elements. The totals of all three scales were then multiplied by two to compare the scores to DASS-42.

The study was approved by the Institutional Review Board of Jordan University of Science and Technology (Approval ID: 225/2020).

### 2.4. Statistical analysis

The SPSS version 24 was used to analyze data. The researcher calculated the descriptive statistics of means, ranges, standard deviations, and frequencies to describe the intention to get tested perceived barriers of testing, and demographics of the participants. The ANOVA test was used to compare the DASS score according to age and gender.

## 3. Results

### 3.1. Demographical characteristics

The study includes 1578 participants (Table 1). The mean age of the sample was 33.6 ± 11.2 years. Participants were sorted into 3 groups according to the age of participants: 18–29 (41.7%), 30–39 (29.4%), and ≥40 (28.9%). The men represent about 30% of the sample. The majority was from middle income (77.3%) and worked in the governmental sector (50.8%).

### 3.2. Distribution of participants according to DASS score

Table 2 shows the DASS scores of the participants. The mean ± SD DASS stress score was 13.2 ± 0.27 while was 11.95 ± 0.25 for depression and 7.6 ± 0.20 for anxiety. The total DASS score of the whole sample was 32.7 ± 0.67.

### 3.3. DASS scores based on the perceived probability of infection with COVID-19

The participants were enquired about their perception of the possibility of getting COVID-19 disease. Most participants indicated low probability (n = 936, 59.5%), whereas 34.6% (n = 544) and 14.8% (n = 97) indicated moderate and high probability respectively. The DASS scores (Table 3) show significantly high scores for stress, anxiety, and depression in the groups that perceived moderate to a high probability of infection with COVID-19 ($P < 0.05$). The post-hoc test indicated a significant difference ($P < 0.05$) between the low group and the high/moderate groups in all examined DASS score parameters.

### 3.4. DASS scores according to the gender of jordanian people

As in Table 4, the stress score was greater ($P < 0.001$) in the men (11.39 ± 0.469) compared to the women (10.74 ± 0.33). On the other hand, anxiety and depression scores were higher in women than men (8.13 ± 0.25, and 12.71 ± 0.30 versus 6.48 ± 7.88, and 10.24 ± 0.420, respectively). In addition, the total DASS score was higher in the women participants than the men participants ($P < 0.01$).

### 3.5. DASS scores according to age groups of jordanian people

A separate ANOVA, shown in Table 5, revealed that DASS total score significantly decreases with the increasing age of the participants (P <

**Table 1**
Demographical characteristics of Jordanian people (N = 1578).

| Variable | Subcategory | Value N (%) or mean ± SD |
|---|---|---|
| Age | – | 33.6 ± 11.2 |
| Age groups | 18 - < 30 | 658(41.7) |
| | 30–39 | 464(29.4) |
| | ≥40 | 456(28.9) |
| Gender | Men | 484(29.4) |
| | Women | 1086(68.8) |
| BMI | – | 26.1 ± 5.0 |
| Income (JD) | <600 | 246(15.6) |
| | 600–1200 | 1220(77.3) |
| | >1200 | 109(6.9) |
| Job sector | Governmental | 801(50.8) |
| | Private | 373(23.6) |
| | Not employed | 271(23.5) |

**Table 2**
Distribution of participants according to DASS scores.

| Parameter | Subcategory | Mean ± SD |
|---|---|---|
| DASS score | Stress | 13.2 ± 0.27 |
| | Anxiety | 7.6 ± 0.25 |
| | Depression | 11.95 ± 0.20 |
| | Total | 32.7 ± 0.67 |

**Table 3**
DASS scores according to perceived probability of infection with COVID-19.

| DASS score | Low | Moderate | High | F value, P value |
|---|---|---|---|---|
| Stress | 12.44 ± 0.341 | 14.32 ± 0.33 | 14.80 ± 1.24 | 6.37, <0.01 |
| Anxiety | 6.99 ± 0.255 | 8.53 ± 0.358 | 8.77 ± 0.932 | 7.34, <0.001 |
| Depression | 11.12 ± 0.313 | 13.19 ± 0.432 | 13.33 ± 1.105 | 8.54, <0.001 |
| Total | 30.55 ± 0.837 | 35.96 ± 1.15 | 36.9 ± 3.08 | 8.44, <0.001 |

**Table 4**
DASS scores according to the gender of participants.

| DASS score | Men | Women | F value, P value |
|---|---|---|---|
| Stress | 11.39 ± 0.469 | 10.74 ± 0.33 | 20.7, <0.001 |
| Anxiety | 6.48 ± 0.340 | 8.13 ± 0.25 | 13.9, <0.001 |
| Depression | 10.24 ± 0.420 | 12.71 ± 0.30 | 21.3, <0.001 |
| Total | 28.02 ± 1.15 | 34.8 ± 0.81 | 22.7, <0.001 |

**Table 5**
DASS scores according to age groups of Jordanian people.

| DASS score | 18–29 | 30–39 | ≥40 | F value, P value |
|---|---|---|---|---|
| Stress | 14.89 ± 0.45 | 12.73 ± 0.49 | 11.30 ± 0.43 | 16.1, <0.000 |
| Anxiety | 8.80 ± 0.34 | 7.34 ± 0.37 | 6.16 ± 0.31 | 14.9, <0.000 |
| Depression | 14.00 ± 0.43 | 11.20 ± 0.45 | 9.76 ± 0.36 | 27.6, <0.000 |
| Total | 37.68 ± 1.12 | 31.17 ± 1.22 | 27.22 ± 1.00 | 22.8, <0.000 |

0.001). The trend in the decrease of DASS scores was evident in all parameters (i.e., stress, anxiety, and depression). In addition, posthoc analysis showed significant differences between all examined age groups ($P < 0.05$, Table 5).

## 4. Discussion

According to previous results from pandemics (e.g., Ebola and SARS) outbreaks can cause uncertainties and fear. These negative psychological feelings are associated with experiencing depression, anxiety, and stress which can trigger mental disorders considering [31,32]. This is the first national study examining the mental health among Jordanian adults using DASS during COVID-19.

The current study detected that stress score was 13.2, depression was 11.95, and anxiety was 7.6, indicating moderate to severe stress, moderate to severe depression, and mild to moderate anxiety. A previous study showed that 16.3% reported moderate-serious mental impact, 16.9% experienced mild-serious depressive symptoms, 13.4% stated experiencing moderate-severe stress, and 28.8% experienced serious anxiety signs [28]. The negative psychological scores reported in this study were lower than those reported by Salari et al. [5]. According to their research, Salari et al. [5] found that 33.7% of the respondents experienced depression symptoms, 31.9% experienced anxiety symptoms, and 29.6% experienced stress symptoms. Studies in China showed that the overall mean mental health score was higher than 24, which is indicative of worse (or compromised) mental effects of COVID-19. The authors concluded that the general Chinese population experienced post-traumatic stress disorder symptoms during the pandemic [16].

The current study showed that most participants (59.5%) indicated a low probability of infection, whereas 34.6% and 14.8% indicated moderate and high probability respectively. The DASS scores showed significantly high scores for stress, anxiety, and depression in the groups that perceived a moderate-high probability of infection with COVID-19. In a previous study, respondents reported that they perceived lower chances of contracting COVID-19 and more chances of surviving if infected [28]. Besides, the respondents were self-assured about the abilities of their doctors, and the perceptions of the respondents were protective against severe mental states [28]. The study also showed that almost half of the study participants experienced at least one physical symptom of stress, anxiety, or depression within the last two weeks.

In the current study, the total DASS score was higher in women than men. Similarly, a survey study reveals that the COVID-19 pandemic impacted the mental status of women more than the men [33]. In the influenza pandemic, it is suggested that women experience reduced social and emotional support and a high perceived threat to wellbeing, isolation, uncertainties, and anxiety [34]. A meta-analysis that investigated depression in the community from 30 countries between 1994 and 2014 showed that point prevalence of depression was significantly higher in women [35]. In another survey study, a preponderance of depression, stress, and anxiety among the women was reported(28). Yet, the study found a clinically significant relationship between the mean total DASS score ($p = 0.04$) and stress score ($p = 0.03$) between women and men [28]. Multicounty data also illustrated that 5.1% of the women versus 3.6% of the men were depressed and 4.6% of the women experienced anxiety versus 2.4% among the men [36,37]. Another similar study showed an annual 1.7-fold more depressive incidences among women than men [38]. A different study conducted on healthcare practitioners revealed no differences between male and female doctors in the scores [39]. The discrepancies between different studies could be due to the type of used scale or the nature of the studied population.

The present findings reported that stress, anxiety, and depression are higher among younger people (18–30 years old). Similarly, a study showed that individuals aged 40 years have higher stress levels compared to those below the age of 40 [39]. The reason behind such differences is that with aging, the probability of isolation, mortality, and morbidity if they contracted COVID-19 increases [39,40]. At the same time, people aged 40 and above within their entrepreneurial peaks experience financial and emotional demands. Before the COVID-19 health crisis, a study showed that people aged 60 years and below chose to retire early because of high-stress levels and anxieties [39]. Holmes et al. [18], showed that older adults and those with low incomes are susceptible to poor mental health.

The present findings using the DASS scale report an increased risk of depression during the COVID-19 pandemic. Hence, it is necessary to implement management strategies to overcome these risks. Among the proposed interventions is online cognitive behavioral therapy (CBT) that has been implemented during the pandemic [41]. For example, a randomized controlled trial demonstrated the effectiveness of CBT in improving mental health among COVID-19 patients, especially those with a severe form of the disease [41]. In addition, CBT can be used for treatment of psychiatric symptoms such as insomnia [42]. The cost of implementing CBT can be significantly reduced using open-source learning platforms such Moodle [43]. Engaging psychiatrists and mental health professionals to advise government on mental health policies could be beneficial for developing a country-specific intervention during a pandemic [44].

The first limitation of this study is that it used the descriptive method while studying the research variables. The questionnaire was also self-reporting, hence the possibility of social bias. As a result, it is recommended that future research use qualitative or mixed-methods designed to investigate factors influencing depression, anxiety, and stress in COVID-19 testing to obtain a more in-depth understanding of the phenomenon. Besides, functional neuroimaging can assess depression in

more objective ways [45–49]. Finally, the impact of vaccinations introduction on mental health and Jordanian views and attitudes toward vaccinations are highly recommended in future studies [50].

## 5. Conclusion

People around the world have experience pandemic uncertainties and fear, which can exacerbate the feeling of anxiety and stress which can trigger mental disorders. This is a large national study in Jordan regarding mental health problems that include different health measures during the COVID-19 pandemic. The study found that many Jordanian experience moderate to severe depression, stress, and anxiety during the pandemic. The results of this study will benefit decision-makers in establishing a plan to prevent the consequences of these mental disorders.

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## Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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