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## RESEARCH ARTICLE

### The Influence of Cultural and Psychological Factors on Mental Health Status during COVID-19 in Saudi Arabia

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#### Abstract:

#### Background:

The World Health Organization (WHO) announced a public health emergency of international concern (PHEIC) on 30 January 2020 due to the rapid increase in the number of COVID-19 cases outside China. Every pandemic is associated with other problems such as psychological and mental health problems.

#### Methods:

The current research investigated the relationship between mental health status and demographic variables and the psychological impact of COVID-19. Furthermore, this study explored the relationship between collectivism and low infection rates. The sample included 1700 adults aged 18 years and older. The questionnaire started with demographic questions followed by the Impact of Event Scale-Revised (IES-R), a scale that was applied to the COVID-19 outbreak, and the Depression, Anxiety and Stress Scale (DASS-21).

#### Results:

Findings indicated that depression, anxiety, and stress were associated with the psychological impact of COVID-19. In addition, students experienced a higher level of psychological impact of COVID-19 than other occupational groups. Finally, cultural collectivism was associated with a lower COVID-19 infection rate.

#### Conclusion:

It is recommended based on the findings of this paper that the mental health of university students should be observed and assessed during epidemics. Training regarding mental health should be provided to university faculty and staff.

**Keywords:** COVID-19, Collectivism, Mental health, Psychological Impact, Anxiety, Stress Scale (DASS-21).

#### Article History

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## 1. INTRODUCTION

COVID-19 can be transmitted to and by humans, as reported by WHO [1]. According to the Saudi health ministry, COVID-19 can spread easily in public places, and public gatherings can raise the infection rate to 10% [2]. Social distancing, curfews, lockdowns, and associated health problems during the ongoing COVID-19 pandemic are all factors that might cause psychological and social impacts on individuals and societies.

Every pandemic is associated with problems in addition to the disease outbreak itself, such as psychological and mental health problems [3]. Research is needed to improve coping strategies in similar situations. Saudi Arabia, like every other

part of the world, was affected by the pandemic. However, the Saudi government responded in a timely manner and took several precautionary measures, such as lockdown of workplaces, increasing medical tests, educating the public regarding social distancing, and encouraging scientific research on the virus and its health, social, psychological, and economic effects. In this regard, this study is an attempt to add to the cumulative knowledge that will help manage this pandemic.

Although the issue of COVID-19 is new to the world, research to help understand the various effects of the pandemic is accumulating fast. In China, Wang *et al.* investigated the psychological impact of COVID-19 on 1210 respondents [4]. More than half of the sample rated the effect of the pandemic as moderate or severe. Furthermore, the psychological impact of COVID-19 was greater for females, and for students who showed higher levels of depression, anxiety, and stress [4].

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The COVID-19 pandemic has affected both developed and developing economies, and has resulted in a huge reduction in agricultural, tourism, trade, and industrial activities [5, 6]. In wealthy developed economies, such as most European countries, the pandemic has led to long-term economic consequences, increasing the unemployment rate [6]. Furthermore, the European Commission found an effect on household incomes, employment, and welfare. The economic impact of the pandemic was observed in developing countries not only in multiple industries, such as airline, but also in how these industries manage job insecurity [7].

COVID-19 social isolation magnified social class differences in societies with different isolation situations ranging from isolation in expansive houses to isolation in small houses [8]. In addition to the difficulty of maintaining social distance within poor families, Acciari (2020) discussed the difficulty faced by poorer families in obtaining essential personal protection products, such as gloves, masks, and alcohol gel [8].

A previous study by Qiu *et al.* examined the relationship between demographic variables, such as gender, level of education, and age, and the psychological impact of the COVID-19 pandemic. The findings showed that almost 35% of their sample experienced psychological distress. Female respondents showed significantly higher psychological distress as well as respondents between 18 and 30 years of age, those above 60, and more highly educated respondents [9 - 11].

Cao *et al.* studied the psychological impact of the COVID-19 pandemic on college students in China [12]. The results indicated that less than 1% of the respondents experienced severe anxiety, 2.7% moderate anxiety, and 21.3% mild anxiety. Furthermore, knowing that their relatives had been infected with COVID-19 increased their anxiety [12].

Puyod and Charoensukmongkol investigated the effect of social media crisis communication on change resistance of university employees [10]. The study collected data from 522 employees from three public universities in the Philippines and examined the role of organizational citizenship behavior (OCB) in predicting change resistance. Findings of this study showed that social media crisis communication could strongly lower employees' resistance to change when OCB is high [10].

Psychological distress associated with a diagnosis of COVID-19 was examined by Cai *et al.* among 126 survivors in China [13]. Having infected family members was significantly associated with high psychological distress. However, the survivors aged 60 or above experienced less severe stress symptoms and fewer emotional symptoms of depression and anxiety than younger survivors [13].

González-Sanguino *et al.* investigated the psychological impact of the COVID-19 outbreak in a sample of 3480 Spanish individuals and found that 18.7% of the sample had depressive symptoms, 21.6% had anxiety symptoms, and 15.8% had PTSD symptoms [14]. Furthermore, being female, having previous diagnoses of mental health problems, or having a close relative infected, were associated with higher levels of depression, anxiety, and PTSD symptoms [14].

In Saudi Arabia, there has been less research conducted on

the issue than in the other countries discussed above. Alsukah *et al.* examined the psychological impact of the pandemic on 1272 respondents [15]. Awareness of COVID-19 among the Saudi population was more than 90% and that was reflected in its psychological impact, as 75% of the sample showed a high level of positive psychological responses to the COVID-19 pandemic [15].

Although COVID-19 is a global pandemic, the level of impact is varied, and evidence suggests that cultural and social factors are among the causes of differences in the number of infected cases and the use of non-pharmaceutical technological interventions for pandemic easement [16, 17]. Governments and citizens from different cultures differ in their enactment and degree of compliance with public health measures during pandemics, such as COVID-19. Some countries may make COVID-19 vaccination compulsory, but others would have to make their immunization voluntary. What may work in Saudi Arabia is unlikely to work in the UK. Recent research examined the relationship between national culture and non-pharmaceutical technological interventions during pandemic easement. For example, countries with high collectivism and power distance index scores have used NPTIs to control the COVID-19 pandemic more than countries with low collectivism and power distance index scores [16].

Based on the work of Hofstede, in this study, cultural differences in the individualism-collectivism dimension were assessed [18, 19]. Hofstede derived his theory about cultural dimensions from his project conducted within a multinational corporation in 40 nations with responses from over 70,000 employees. The individualism-collectivism cultural dimension seems to be the most significant difference among cultures [20, 21]. The primary issue addressed by this dimension is the relationships between people. In individualistic societies, the ties between individuals are loose. A person is supposed to take care of his or her own self-interest and maybe the interest of his or her immediate family. In collectivist societies, the ties between individuals are tight. A person is supposed to take care of the interest of his or her ingroup and to have opinions and beliefs that serve the interests of their ingroup. In turn, the ingroup will take care of the individual when he or she needs help [18].

Saudi Arabia is often conceptualized as a collectivistic society [19]. Alharbi examined Saudi participants with respect to measures of individualism/collectivism and power distance and found that Saudi adults described social relationships as vertical, with clear and steep social hierarchies [22]. Furthermore, in comparison to Western European culture, Saudi culture emphasizes social hierarchies and respect for authority. Saudi society's structure is built on families, as they form the primary source of identity, personality, values, and behaviour development [23]. Moreover, the people of Saudi Arabia have been described as sensitive to criticism, resistant to change, conforming, obedient, and dependent. In Saudi society, social relations are more continuous and involuntary, and life satisfaction is impacted by social norms [24].

Past research has suggested that collectivism, among other cultural factors, is correlated with a lower infection rate [17]. Respect for authority, conformity, and adhering to cooperative

norms are all key concepts in collectivist cultures, and this can explain the slower growth of COVID-19 cases in collectivist than in individualistic cultures. Combining research in cross-cultural psychology on social norms with government institutions would give us a clear picture of the variation in how communities respond to collective threat [17].

The first aim of this study was to survey individuals in Saudi Arabia in order to examine the psychological impact of the COVID-19 outbreak. The second goal of this study was to explore the relationship between mental health status and demographic variables, and the psychological impact of COVID-19. Finally, the third goal of this study was to explore the relationship between collectivism and infection rates.

**2. METHODS**

An online survey was distributed *via* social media platforms, email, and Whatsapp for a period of one month. Participants were reached by circulating the questionnaire in Whatsapp groups, posting tweets on Twitter, and sending emails. Participants were asked whether they had been diagnosed with COVID-19 and administered a series of questionnaires. Demographic data were also obtained. Psychological impact of the pandemic was measured with the Impact of Event Scale-Revised (IES-R), a 22-item scale that can be applied to the COVID-19 outbreak. Mental health status was assessed with the Depression, Anxiety and Stress Scale (DASS-21), a 21-item scale divided into three sections.

**2.1. Participants**

Participants included Saudi and non-Saudi participants who were diverse in terms of age, gender, educational level, marital status, and occupation. Responses were collected from 1700 adults aged 18 years and older. Participants were recruited by distributing the questionnaire online. The sample consisted of 1699 adults, including 1259 females and 440 males. Missing data were removed. Demographic information was collected from participants, and included gender, marital status, educational status, occupation, whether they had been diagnosed with COVID-19, whether they had been diagnosed with any psychological disorders, and their place of residence. The majority of the participants were Saudi nationals ( $n = 1654$ ; 97.4%). Only 45 (2.6%) were non-Saudi nationals. Half of the participants were from the central region of Saudi Arabia ( $n = 913$ ; 53%), followed by the West region ( $n = 380$ ; 22%), East region ( $n = 192$ ; 11%), South region ( $n = 115$ ; 7%), and North region ( $n = 99$ ; 6%). The majority of the participants were single ( $n = 1240$ ; 71%); fewer were married ( $n = 425$ ; 25%), divorced ( $n = 65$ ; 4%), or widowed ( $n = 5$ ; 0.3%). Ninety-three percent of the participants had neither been infected with COVID-19 nor diagnosed with any psychological disorders.

**2.2. Procedure and Measures**

The study was approved by the Princess Nourah bint Abdulrahman University’s Faculty Ethics Committee. Participants were presented with a brief explanation of the study and they had to provide informed consent in order to take part in it. The questionnaire started with the demographic

questions followed by the Impact of Event Scale-Revised (IES-R), a scale that could be applied to the COVID-19 outbreak, and the Depression, Anxiety and Stress Scale (DASS-21).

The Impact of Event Scale-Revised (IES-R) by Weiss, D. S [25]. measures the psychological impact of events. It consists of 22 questions that ask the participants about their reactions when they think about the event in question (in this case, the coronavirus pandemic) such as “I tried to remove it from my memory.” Participants responded to each item on a scale with response options of 0, 1, 3, and 5, where 0 equals no occurrence of the symptom and 5 equals a high frequency of the symptom [14]. The questionnaire was translated to Arabic by the researcher using the back translation procedure. The IES was revised by Weiss [14] to cover all three major symptom clusters of PTSD according to the DSM-IV. Three scores were derived: avoidance ( $\alpha = .69$ ), intrusion ( $\alpha = .76$ ), and hyperarousal ( $\alpha = .74$ ).

Lovibond and Lovibond’s Depression, Anxiety and Stress Scale (DASS-21) [26] measures mental health status with a 21-item scale divided into three sections: Depression, Anxiety, and Stress. The scale asks participants to respond to each item on a scale from 0 (Did not apply to me at all) to 3 (Applied to me very much) [8]. An example of the scale items is: “I couldn’t seem to experience any positive feeling at all.” The questionnaire was translated to Arabic by the researcher and back translated to English. Three scores were derived: Depression ( $\alpha = .84$ ), Anxiety ( $\alpha = .78$ ), and Stress ( $\alpha = .82$ ).

**3. RESULTS**

**3.1. Descriptive Statistics**

The means and standard deviation of the study variables are presented in Table 1.

**Table 1. Means and standard deviations of demographic variables, DASS subscales and IES-R subscales.**

Variables	Mean	Std. Deviation
Marital status	1.34	.563
Educational status	1.88	.511
Occupation	3.55	2.519
Place of residence	2.42	1.699
Nationality	1.03	.161
Gender	1.74	.439
Covid-19 diagnose	.12	.471
Psychological disease	.11	.397
Stress	.8115	.66126
Anxiety	.6024	.61413
Depression	.7999	.71051
Avoidance	1.0863	.54423
Intrusion	.7270	.52594
Hyperarousal	.7183	.60833

Tables 2 and 3 show the correlations between demographic variables, DASS subscale scores, and IES-R subscale scores. Many correlated with each other, as expected. DASS subscale scores correlated positively with IES-R subscales, as expected. We expected correlations between certain occupations, such as

health worker, DASS subscale scores, and IES-R subscale scores, but occupation correlated negatively with intrusion, hyperarousal IES-R subscale scores, and depression and anxiety subscale scores. Furthermore, as expected, scores on the depression subscale positively correlated with being married. As expected, having been diagnosed with COVID-19 correlated positively with avoidance, intrusion, stress, and anxiety subscale scores. Having been diagnosed with a psychological disorder correlated positively with intrusion, hyperarousal, stress, anxiety, and depression subscale scores.

**Table 2. Correlation between the and Dass subscales and IES-R subscales.**

-	IES-R subscales		
	Avoidance	Intrusion	Hyperarousal
Dass subscales			
Anxiety	.202**	.487**	.554**
Depression	.162**	.458**	.498**
Stress	.216**	.524**	.568**

**3.1.1. The Predication of the Relationship between the Psychological Impact and the Mental Health Status**

For each IES-R subscale, hierarchical multiple linear regression analyses were conducted to examine the relationship between intrusion, avoidance, and hyperarousal IES-R subscale scores and potential predictors, such as marital status, gender, education, occupation, place of residence, having a diagnosis of COVID-19, and having a diagnosis of a psychological disorder. In Step 1, gender, marital status, education, occupation, and place of residence were entered into the model. In Step 2, diagnoses (or lack thereof) of COVID-19 and psychological disorders were additionally entered. In Step 3, DASS subscale scores were entered. The results of these analyses can be found in Table 4.

Concerning avoidance, in Step 1, no significant predictors were found,  $F(5, 1) = 1.24, p = .285, R^2 = .004$ . In Step 2, diagnosis of COVID-19 positively predicted psychological impact in the avoidance subscale, indicating that participants diagnosed with COVID-19 endorsed avoidance more,  $F(7, 1) = 1.80, p < .001, R^2 = .007$ . In Step 3, stress and anxiety significantly positively predicted psychological impact in the avoidance subscale, indicating that participants with high stress and anxiety endorsed avoidance more,  $F(10, 1) = 10.28, p < .001, R^2 = .057$  (Table 4).

Concerning intrusion, in Step 1, occupation significantly

predicted psychological impact in the intrusion subscale, indicating that students tend to endorse intrusion more,  $F(5, 1) = 1.24, p = .001, R^2 = .005$ . In Step 2, diagnoses of COVID-19 and psychological disorders positively and significantly predicted psychological impact in the intrusion subscale, indicating that participants diagnosed with COVID-19 and psychological disorders endorsed intrusion more,  $F(7, 1) = 3.55, p < .001, R^2 = .014$ . In Step 3, stress, depression, and anxiety significantly positively predicted psychological impact in the intrusion subscale, indicating that participants with a high level of stress, depression and anxiety endorsed intrusion more,  $F(10, 1) = 74.98, p < .001, R^2 = .307$  (Table 4).

Concerning hyperarousal, in Step 1, occupation significantly predicted psychological impact in the hyperarousal subscale, indicating that students tended to endorse hyperarousal more,  $F(5, 1) = 2.16, p = .05, R^2 = .006$ . In Step 2, diagnosis of psychological disorders positively and significantly predicted psychological impact in the hyperarousal subscale, indicating that participants diagnosed with psychological disorders endorsed hyperarousal more,  $F(7, 1) = 7.49, p < .001, R^2 = .03$ . In Step 3, stress, depression, and anxiety significantly positively predicted psychological impact in the hyperarousal subscale, indicating that participants with a high level of stress, depression and anxiety endorsed hyperarousal more,  $F(10, 1) = 99.55, p < .001, R^2 = .371$  (Table 4).

**3.1.2. The Predication of the Relationship between Collectivism and the Infection Rate of COVID-19**

Ninety-three percent of the participants had not been infected with COVID-19. The findings showed low level of infected cases with COVID-19 within the study sample that comprised 97.4% Saudi nationals.

**4. DISCUSSION**

In the current study, we aimed to assess the level of public health in Saudi Arabia to understand factors associated with psychological impact, anxiety, depression, and stress during the COVID-19 outbreak. Furthermore, we aimed to investigate the relationship between mental health status and demographic variables, and the psychological impact of COVID-19. In addition, we aimed to test Gelfand *et al.*'s assumption that collectivism as a cultural dimension is related to having a lower infection rate [17].

**Table 3. Correlation between the demographic variables and Dass subscales and IES-R subscales.**

-	IES-R Subscales			Dass Subscales		
	Avoidance	Intrusion	Hyperarousal	Anxiety	Stress	Depression
Demographic variables						
Marital status	.008	-.023	-.047	-.041	-.036	-.069**
Gender	.031	-.043	.015	-.006	-.012	-.019
Occupation	-.014	-.054*	-.069**	-.067**	-.035	-.055*
Place of residence	.042	.005	.019	.069**	.023	.022
Education	-.016	.016	-.004	-.042	.012	.003
Diagnosis of psychological disease	.010	.083**	.153**	.204**	.187**	.194**
Diagnosis of COVID-19	.061*	.059*	.031	.055*	.053*	.043

**Table 4. Result of hierarchical multiple linear regression analyses.**

Predictors	Avoidance Subscale		Intrusion Subscale		Hyperarousal Subscale	
	$\beta$	$\Delta R^2, p$	$\beta$	$\Delta R^2, p$	$\beta$	$\Delta R, p$
Step 1: Marital status	.014	.001, .285	-.007	.002, 1.36	-.030	.003, .056
Gender	.037		-.041		.023	
Education	-.016		.021		.001	
Occupation	-.019		-.050		-.061	
Place of residence	.045		.002		.020	
Step 2: Diagnose of COVID-19	.061	.003, .083	.056	.010, .001	.029	.026, .001
Diagnose of psychological disorder	.009		.079		.151	
Step 3: Stress	.158	.052, .001	.301	.303, .001	.296	.367, .001
Anxiety	.094		.197		.260	
Depression	-.009		.115		.104	

\* $p < .05$ ; \*\* $p < .01$

The current study investigated the relationship between demographic variables and mental health status, and the psychological impact of COVID-19. Depression, anxiety, and stress correlated positively with the psychological impact of COVID-19, as expected. In line with previous research [4], participants with a high level of stress, depression and anxiety tended to endorse intrusion, hyperarousal, and avoidance more. In terms of relationships with occupation, health care workers, military personnel, and teachers showed higher level of the psychological impact of COVID-19. In line with previous research [4, 11], there was a higher level of psychological impact of COVID-19 among students. Students tended to endorse intrusion and hyperarousal more than other occupational groups during the COVID-19 pandemic.

The current study investigated the relationship between being diagnosed with COVID-19 and psychological disorders, and the psychological impact of COVID-19. Having been diagnosed with COVID-19 predicted higher psychological impact in the avoidance and intrusion subscales, as expected. These findings are in line with Cai *et al.*, who also found that participants diagnosed with COVID-19 endorsed avoidance and intrusion more [13]. Furthermore, having been diagnosed with a psychological disorder was associated with a greater psychological impact of COVID-19 in the hyperarousal and intrusion subscales, as expected. These findings are in line with González-Sanguino *et al.*, whose participants diagnosed with psychological disorders tended to endorse hyperarousal and intrusion more [14].

Another goal of this study was to measure the number of COVID-19 cases. The findings showed that percentage infected with COVID-19 within the study sample was less than 5%. According to Gelfand and colleagues, collectivism as a cultural dimension is related to having a lower infection rate [17]. The findings closely replicated previously found cross-cultural differences in relation to number of COVID-19 infected cases. Given that Saudi Arabia is considered a collectivistic culture involving vertical social relationships with clear and steep social hierarchies and respect towards authorities, it is not surprising that the percentage of participants who reported having been infected with

COVID-19 in this study was very small.

**LIMITATIONS AND CONCLUSION**

The findings of this study significantly contribute to our knowledge in the field of general health, especially mental health. First, the relationship between demographic variables and mental health status, and the psychological impact of COVID-19, were examined. Our findings show that depression, anxiety, and stress correlate to the psychological impact of COVID-19. Moreover, students on average experience a higher level of psychological impact of COVID-19 than other occupational groups. In addition, we showed that having been diagnosed with a psychological disorder or COVID-19 predicted higher psychological impact of COVID-19. Second, this study provides support for the existence of cultural differences in the infection of COVID-19, in which collectivism as a cultural dimension is related to lower number of infected cases. The results showed the percentage of infected cases with COVID-19 within the study sample to be less than 5%, supporting previously found cultural differences in relation to number of COVID-19 infected cases by Gelfand *et al.* [17].

The COVID-19 pandemic has alarming implications for the mental health of society. In any society experiencing a pandemic, providing not only medical care but also psychological support for individuals is essential. It is recommended based on the findings of this paper that the mental health of university students should be observed and assessed during epidemics. Training regarding mental health should be provided to university faculty and staff.

There are several limitations associated with the current findings. First, this study relied only on self-reported data, which can be subject to social desirability. A possible area of future research would be to investigate this relationship by combining self-report measures and accurate hospital diagnoses to avoid social desirability bias. Second, lack of prior studies on mental health during the COVID-19 pandemic in the Middle East region might influence the base of our literature review, as most of the included studies were outside

the Middle East. Lack of prior cross-cultural studies on COVID-19 might make it hard to make assumptions regarding the relationship between collectivism as a cultural dimension and infection rates. More cross-cultural studies are needed on this topic to better assess the relationship between cultural differences and infectious disease incidence.

#### ETHICS APPROVAL AND CONSENT TO PARTICIPATE

This study was approved by the Institutional Review Board at PNU (IRB-PNU:21-0424) in Riyadh, Saudi Arabia.

#### HUMAN AND ANIMAL RIGHTS

Not applicable.

#### CONSENT FOR PUBLICATION

Informed consent was obtained from all the participants.

#### AVAILABILITY OF DATA AND MATERIALS

The data supporting the findings of the article are available in Zenodo at [<https://zenodo.org/record/5644606#.YYO10GBBw2w>], reference number [5644606].

#### FUNDING

None.

#### CONFLICT OF INTEREST

The author declares no conflict of interest, financial or otherwise.

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