

## Research Article

# Mental-Health Impact of Quarantine Measures during the Coronavirus Disease 2019 (COVID-19) Outbreak in Eastern Province, Saudi Arabia

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## Abstract

**Objectives:** To explore, among residents of Dammam and Al-Khobar, Saudi Arabia, the impact of quarantining as a result of coronavirus disease 2019 (COVID-19) infection on depression, anxiety, and stress levels.

**Methods:** A cross-sectional study of all patients with COVID-19 in Dammam and Al-Khobar was conducted in July 5–18, 2020. Of the 395 patients targeted, 283 responded (response rate: 72%).

**Results:** The participants' mean age ( $\pm$  standard deviation) was 31.3 ( $\pm$  10.7) years; 46% were women. Loss of smell (26.5%), headache (25.4%), cough (25.1%), loss of taste (22.6%), and loss of motion (22.6%) were common symptoms. The main source of COVID-19 infection was family gatherings (38.2% of cases).

Overall, 47% of the sample showed depression, 37% showed anxiety, and 29% showed depression and anxiety. Approximately 50% of those with depression, anxiety, and/or stress developed symptoms after infection; of these, 90% experienced stress. For 75% of those with depression, anxiety, and/or stress, quarantining did not exacerbate these symptoms.

Depression was high among women, with diabetes mellitus, headache, loss of motion, body aches, lack of appetite, fatigue, shortness of breath, and loss of smell and taste showing significant associations in this regard. Anxiety was only significantly associated with fatigue.

**Conclusion:** Loss of smell and taste, fatigue, and headache indicate a risk of developing depression, anxiety, and/or stress. Early mental-health interventions are necessary to prevent patients entering COVID-19 quarantine from experiencing long-term symptoms.

## Introduction

The Coronavirus Disease 2019 (COVID-19) pandemic has represented a stressful event for many people. Negative emotional effects, such as those fostered by stress, have been proven to weaken people's immunity, which makes them more vulnerable to diseases [1]. Notably, "social distancing" (that is, maintaining a physical distance from other people and reducing the frequency of close contact with others), which is a common measure encouraged to reduce the transmission of COVID-19, has also been found to have both short and long-term effects on mental health and well-being [2]. In addition, traumatic events can have negative consequences for mental health, such as by fostering depression and anxiety [2]. Such effects were observed during the 2003 severe acute respiratory syndrome (more commonly known as "SARS") epidemic, with both patients and clinicians showing stress and psychological distress [3]; this indicates that the COVID-19 pandemic is fostering similar problems among certain populations.

Quarantine measures during outbreaks (that is, isolating people with infections from the rest of the population) can have extensive negative consequences in relation to mental health [4]. Mental-health

professionals agree that the introduction of quarantines to combat the COVID-19 pandemic should not be conducted without proper consideration, as these measures are exceptional, and involve the restriction of individual freedoms. Such quarantine efforts cause psychological problems for many people, especially those who fail to positively manage their new circumstances [5].

Mental-health problems, including depression and anxiety, represent approximately 60% of primary care clinic cases, and the majority of them are missed [6-7]. The Patient Health Questionnaire-9 (PHQ-9) and General Anxiety Disorder-7 (GAD-7) are clinical diagnostic tools that are widely utilized worldwide to screen for depression and Generalized Anxiety Disorder (GAD) [8].

During pandemic situations, prevention and intervention approaches for attenuating associated mental-health impacts should be an integral component of the crisis response [4,9]. To help individuals exit quarantine with minimal mental-health effects, there is a need to study the size and burden of the associated mental-health problems, determine early intervention methods, and improve the mental-health-related outcomes associated with the effects of outbreaks.

Considering the above, the present study aimed to explore, among Saudi civilians in Eastern Province, Saudi Arabia, the common mental-health problems, including depression, anxiety, and stress, that occurred as a result of being quarantined during the COVID-19 outbreak.

## Methods

This cross-sectional study was conducted in the cities of Dammam and Al-Khobar in Eastern Province, Saudi Arabia. The target population was all Saudi patients who were aged 18 years or older and who were quarantined as a result of COVID-19 infection. The sample was recruited over 2 weeks, from July 5–18, 2020.

### Data collection

Data collection was conducted using a questionnaire that focused on socio-demographic information and risk factors for mental-health problems. Patient data collected included existence of social issues, presence of chronic diseases, family history of psychological disease, and medication usage. Further, COVID-19-related health status and scores for the PHQ-9, GAD-7, and the Perceived Stress Scale (PSS) were also collected. Well-trained volunteers collected the required data through telephone calls, after informed consent was obtained from the participants.

The PHQ-9 is used as a diagnostic tool for depression, and the GAD-7 is used to diagnose anxiety [10-11]. The Arabic versions of these scales have been validated in terms of internal consistency reliability among the Saudi population, with Cronbach's alpha values of 0.857 for the PHQ-9, and 0.763 for the GAD-7 [12]. The Arabic version of the PSS has also been proven to be valid and reliable for assessing perceived stress among Arabic people [13].

All eligible patients during the study period were targeted; however, a representative sample size was calculated, using the estimated prevalence rate of depression and anxiety among the Saudi population (60%;  $p=0.6$ ) for the proportion value, a level of confidence of 95% ( $z=1.96$ ), and a margin of error of 5% ( $e=0.5$ ). The calculation was as follows:

$$N = [(Z^2p)(1-p)]/E^2; n = Z^2p'(1-p)/E^2.$$

$Z = 1.96$ ,  $p=0.6$ ,  $1-p=0.40$ ,  $E=0.05$ .  $N = [(1.96)^2 \cdot 0.6 \cdot 0.4] / 0.0025 = 369$ .

Six volunteers recruited from medical students and new graduate doctors participated in the data collection. For these volunteers, an introductory meeting was held to clarify the aim of the study, explain the interview process, and answer any queries.

### Statistical analysis

The collected data were analyzed through SPSS by using frequencies and cross-tabulations. Univariate analysis was applied to test the associated factors, and chi-square tests were used to test the association of non-parametric variables with depression. P-values, crude odds ratios and 95% confidence intervals were calculated, with  $P < 0.05$  representing statistical significance.

PHQ-9 scores of  $\geq 5$  were considered to indicate depression (5–9=mild; 10–14=moderate;  $>14$ =severe). An identical scoring system was used for the GAD-7 in relation to anxiety. For the PSS, scores of 0–13 indicated no stress, 14–26 indicated moderate stress, and 27–40

indicated high perceived stress.

### Ethical approval

Ethical approval was obtained from the Institutional Review Board of Eastern Province, Saudi Arabia (IRB study number: EXT0366).

## Results

Of the 395 patients approached for participation, 283 completed the questionnaire (response rate: 71.6%). The mean number of days ( $\pm$  Standard Deviation [SD]) spent in COVID-19 quarantine was 6.7 ( $\pm 4.0$ ), with a range of 1–38 days. The mean age ( $\pm$  SD) was 31.3 ( $\pm 10.7$ ), with a range of 18–65 years. Women represented 130 (46%) of the participants. Participant details are shown in Table 1.

Table 2 shows the prevalence of the main symptoms that are generally associated with COVID-19 infection. Loss of smell (26.5% of the patients), headache (25.4%), cough (25.1%), loss of taste (22.6%), and loss of motion (22.6%) were commonly presented symptoms. Fever was one of the least-presented symptoms, at 6.7%.

As illustrated in Table 3, family gatherings represented the source

**Table 1:** Socio-demographic characteristics of participants, MH among Covid-19 quarantine Study in Eastern Province, Saudi Arabia, 2020.

Demographic character		No.(%)	
Sex	Men	153 (54%)	
	Women	130 (46%)	
Marital status	Single	143 (50.5%)	
	Married	117 (41.3%)	
	Divorced	22 (7.8%)	
	Widow	1 (0.4%)	
Educational status	Illiterate	3 (1.1%)	
	Primary-intermediate	29 (10.2%)	
	Secondary	118 (41.7%)	
	Diploma	57 (20.1%)	
	University	69 (24.4%)	
Job	Postgraduate	7 (2.5%)	
	Jobless	81 (28.6%)	
	Student	37 (13.1%)	
	Governmental	47 (16.6%)	
	Private sector	95 (33.6%)	
	Medical sector	9 (3.2%)	
Other chronic diseases	Retired	14 (4.9%)	
	Smoking	Yes	77 (27.2%)
	Diabetes mellitus	Yes	17 (6.0%)
	Hypertension	Yes	17 (6.0%)
	Hear diseases	Yes	8 (2.8%)
	Bronchial Asthma	Yes	23 (8.1%)
	Family hx of +ve Covoid-19	Yes	191 (67.5%)
	Mental Health (MH) diseases	Yes	6 (2.2%)
	Family hx of MH disease	Yes	27 (9.6%)
	Other chronic diseases	Yes	6 (2.2%)

**Table 2:** Presented Symptoms of Covid-19, MH among Covid-19 quarantine Study in Eastern Province, Saudi Arabia, 2020.

Symptom	No (%)	Symptom	No (%)
1. Fever	19 (6.7%)	7. Cough	71 (25.1%)
2. Headache	72 (25.4%)	8. Productive Cough	28 (9.9%)
3. Loss motion	16 (22.6%)	9. Short of breath	42 (14.8%)
4. Body ache	53 (18.8%)	10. Loss of smell	75 (26.5%)
5. Lack of appetite	44 (15.5%)	11. Loss of taste	64 (22.6%)
6. Fatigue	51 (18%)		

**Table 3:** The suspected cause of Covid-19 infection, MH among Covid-19 quarantine Study in Eastern Province, Saudi Arabia, 2020.

Source of infection	No.	%
Unknown	87	30.7
Family gathering	108	38.2
Work place	47	16.6
Non-family gathering	20	7.1
Market/ shopping	8	2.8
Hospital	5	1.8
Back from travel	4	1.4
Patient escort	4	1.5
Total	283	100

**Table 4:** Prevalence of Depression and anxiety among participants, MH among Covid-19 quarantine Study in Eastern Province, Saudi Arabia, 2020.

	Depression [No.=133 (47.0%)]		GAD [No.=96 (33.9%)]	
	No.	%	No.	%
Normal <5	150	53.00%	187	66.10%
Mild (5-9)	70	24.70%	59	20.80%
Moderate (10-14)	53	8.70%	23	8.10%
Severe ≥15	10	3.60%	14	4.90%
Total	283	100	283	100

of the COVID-19 infections for 38.2% of the participants; the second most-common source was the workplace environment, at 16.6%. This indicates the importance of “social distancing”.

Table 4 shows the prevalence of depression and GAD among the participants. Depression was reported by 133 (47%) patients, GAD affected 256 (37%) patients, and 82 (29%) patients showed both depression and GAD. As shown in Table 5, approximately 50% of the patients who showed depression, anxiety, and/or stress only began to

**Table 5:** The perceived factors make Depression, anxiety, stress become obvious among participants, MH among Covid-19 quarantine Study in Eastern Province, Saudi Arabia, 2020.

	Feel Depressed		Feel Anxious		Feel Stress	
	No.	%	No.	%	No.	%
When feel symptoms were obvious						
I didn't feel it at all	146	51.6	122	43.1	137	48.4
Since I knew about being in contact with ill patient or diagnosed	72	25.4	100	35.3	74	26.6
Since I entered the quarry	21	7.4	16	5.7	12	4.2
Before I was infected with Corona virus	44	15.5	45	15.9	60	21.2
Total	283	100	283	100	283	100

**Table 6:** The Perceived Stress Scale among participants, MH among Covid-19 quarantine Study in Eastern Province, Saudi Arabia, 2020.

No.	%
0-13 " low stress"	28 9.9
14-26 " moderate stress"	228 80.6
27-40 " high perceived stress"	27 9.5
Total	283 100

experience symptoms after they had developed the infection.

Table 6 shows that the majority of the patients experienced stress (90%); approximately 10% of the patients had high perceived stress, and only 10% had low stress. For approximately 75% of the patients with stress, their stress levels were not affected by entering the COVID-19 quarantine.

Table 7 shows that, for 70% of the participants, their levels of depression and anxiety were not affected by their COVID-19 quarantines.

Table 8 summarizes the associations between the participants’ demographic characteristics and presentation of symptoms related to COVID-19 infection, depression, and GAD. The rate of depression was high among women, and diabetes mellitus, headache, loss of motion, body aches, lack of appetite, fatigue, shortness of breath, and loss of smell and taste showed significant associations in this regard. Meanwhile, GAD was only significantly associated with fatigue ( $\chi^2=7.53$ ,  $p$ -value=0.006).

## Discussion

This study represents a significant expansion of existing knowledge regarding the impact of quarantine measures on mental health. The findings raise concerns regarding the availability in the Saudi health system of effective supportive measures for people in quarantine.

The sample size was quite good in relation to representing the targeted population, returning a good response rate (71.6%). Most of the participants (91.9%) were physically healthy, with only 6–8.1 % having chronic diseases such as diabetes mellitus, hypertension, or bronchial asthma. The percentage of people with mental illness was low (2.2%) when compared to previous studies (50–60 %) [14-15]. This variation between the prevalence of mental illness among the present sample and those of previous studies may be a result of the stigma associated with mental disease and the fact that in the present study data collection was conducted using telephone interviews. In other words, when not in complete privacy (for example, when

**Table 7:** The effect of entering the Covid-19 quarantine on the anxiety, depression, and stress levels among participants, MH among Covid-19 quarantine Study in Eastern Province, Saudi Arabia, 2020.

	0	Minimum effect Maximum effect				
		1	2	3	4	5
Effect of entering the quarry on the anxiety level	192 (67.70%)	13 (4.60%)	24 (8.50%)	25 (8.80%)	14 (4.90%)	15 (5.30%)
Effect of entering the quarry on the depression level	201 (71%)	10 (3.40%)	19 (6.70%)	23 (8.10%)	14 (4.90%)	16 (5.70%)
Effect of entering the quarry on the stress level	199 (70.30%)	9 (3.20%)	21 (7.40%)	25 (8.80%)	12 (4.20%)	17 (6.00%)

**Table 8:** Association between some participants' characteristics and presented symptoms, and presence of depression and GAD, MH among Covid-19 quarantine Study in Eastern Province, Saudi Arabia, 2020.

Character	Depression		Anxiety	
	N (%)	X <sup>2</sup> (P-value)	n(%)	X <sup>2</sup> (P-value)
<b>Sex</b>				
Men	53 (34.6%)	x <sup>2</sup> = 20.41 p-value = 0.0001	27 (43%)	x <sup>2</sup> = 0.45 p-value = 0.50
Women	80 (61.5%)		36 (57%)	
<b>Age (years)</b>				
18-25	43 (40%)	x <sup>2</sup> = 6.495 p-value = 0.165	15 (24%)	x <sup>2</sup> = 9.119 p-value = 0.058
26-35	56 (57%)		25 (40%)	
36-45	18 (45%)		11 (18%)	
46-55	12 (43%)		9 (14%)	
56-65	4 (40%)		3 (5%)	
<b>Marital status</b>				
Married	52 (44%)	x <sup>2</sup> = 5.53 p-value = 0.137	28 (44%)	x <sup>2</sup> = 2.793 p-value = 0.425
Single	65 (46%)		28 (44%)	
Divorce	15 (68%)		6 (10%)	
<b>Smoking</b>				
Yes	39 (29%)	x <sup>2</sup> = 0.567 p-value = 0.452	14 (22%)	x <sup>2</sup> = 2.91 p-value = 0.088
No	94 (71%)		49 (78%)	
<b>Chronic diseases</b>				
<b>Diabetes mellitus</b>				
yes	4 (24%)	x <sup>2</sup> = 4.00 p-value = 0.046	3 (5%)	x <sup>2</sup> = 1.26 p-value = 0.26
No	129 (49%)		60 (95%)	
<b>Hypertension</b>				
yes	7 (41%)	x <sup>2</sup> = 0.246 p-value = 0.62	4 (6%)	x <sup>2</sup> = 0.283 p-value = 0.595
No	126 (47%)		59 (94%)	
<b>Symptoms of coronavirus</b>				
<b>Fever</b>				
Yes	13 (10%)	x <sup>2</sup> = 3.75 p-value = 0.053	9 (14%)	x <sup>2</sup> = 2.76 p-value = 0.097
No	120 (90%)		54 (86%)	
<b>Headache</b>				
Yes	46 (35%)	x <sup>2</sup> = 11.06 p-value = 0.001	26 (41%)	x <sup>2</sup> = 2.36 p-value = 0.124
No	87 (65%)		37 (59%)	
<b>Loss of motion</b>				
Yes	12 (9%)	x <sup>2</sup> = 5.34 p-value = 0.021	8 (13%)	x <sup>2</sup> = 1.97 p-value = 0.16
No	121 (91%)		55 (87%)	
<b>Body ache</b>				
Yes	35 (26%)	x <sup>2</sup> = 9.33 p-value = 0.002	21 (33%)	x <sup>2</sup> = 3.04 p-value = 0.081
No	98 (74%)		42 (67%)	

<b>Lack appetite</b>				
Yes	28 (21%)	x <sup>2</sup> = 5.79 p-value = 0.016	16 (25%)	x <sup>2</sup> = 1.36 p-value = 0.244
No	105 (79%)		47 (75%)	
<b>Fatigue</b>				
Yes	34 (26%)	x <sup>2</sup> = 9.66 p-value = 0.002	23 (36%)	x <sup>2</sup> = 7.53 p-value = 0.006
No	99 (74%)		40 (64%)	
<b>Cough</b>				
Yes	40 (30%)	x <sup>2</sup> = 3.32 p-value = 0.068	24 (38%)	x <sup>2</sup> = 3.66 p-value = 0.056
No	93 (70%)		39 (62%)	
<b>Short of breath</b>				
Yes	28 (21%)	x <sup>2</sup> = 7.66 p-value = 0.006	16 (25%)	x <sup>2</sup> = 1.36 p-value = 0.244
No	105 (79%)		47 (75%)	
<b>Loss of smell</b>				
Yes	44 (33%)	x <sup>2</sup> = 5.58 p-value = 0.018	20 (32%)	x <sup>2</sup> = 0.097 p-value = 0.756
No	89 (67%)		43 (68%)	
<b>Loss of taste</b>				
Yes	37 (28%)	x <sup>2</sup> = 3.88 p-value = 0.049	16 (25%)	x <sup>2</sup> = 0.350 p-value = 0.554
No	96 (72%)		47 (75%)	

discussing one's health over a telephone call rather than through a self-administered questionnaire), the social stigma associated with having a mental illness may cause individuals to refrain from expressing their true conditions.

Studies have confirmed that the primary mode of transmission of COVID-19 is through close contact with and droplet spread from (and, to a lesser extent, via airborne routes [16,17] individuals who are already infected with COVID-19; this applies to both symptomatic and asymptomatic individuals (almost 40% of people with COVID-19 are asymptomatic) [18,19]. This explains the high number of family members with COVID-19 among the participants of this study. It also reflects the importance of social distancing measures as a method of preventing the spread of COVID-19.

Among our participants, the reported symptoms associated with COVID-19 (including shortness of breath, dry cough, muscle pain, and gastrointestinal upset) were similar to those reported in previous studies [20]. It is notable that loss of smell and taste seem to be almost universal characteristics of COVID-19, because these symptoms have been mentioned in most previous publications [21,22]. Fever was less frequently reported among our sample than other symptoms; this is similar to the findings of Lechien et al. [23]. This suggests that symptoms other than fever, such as fatigue, headache, loss of smell, and loss of taste, should be considered indicators of patients who may be at risk of developing depression, anxiety, and/or stress.



The prevalence rates of depression and anxiety among our sample were similar to those previously documented among Saudi society, as 50% of the general population has some form of depressive or anxiety symptoms [6,14,24]. Almost half of our participants did not experience symptoms of anxiety, depression, or psychological stress as a result of COVID-19 infection; meanwhile, the other half developed such symptoms both after contracting the infection and after subsequent diagnosis. Entering quarantine only affected 5–7 % of the sample in regard to anxiety, depression, and/or stress level; this finding is contrary to previous reports [25]. This may reflect the level of awareness among the patients or the nature of Saudi society. Alternatively, it could reflect the patients' confidence in the availability of services, which are free of charge, to ensure their well-being during their quarantine.

However, most participants showed moderate to high stress (90%). People who are isolated in quarantine may develop a sense of being trapped, a perceived loss of control, and a fear of death. Such emotions foster more stressful feelings than do the development of depression or anxiety.

This finding indicates that, for people who are entering quarantine, a routine mental-health assessment should be performed, and the patients' needs regarding psychological support and intervention should be determined. Monitoring and support should continue for at least 6 months after the patients' exit from quarantine, as this is a period during which depression and anxiety can develop [26].

In previous outbreaks, symptoms of anxiety persisted in approximately one-fifth of the people who were quarantined.<sup>3</sup> Therefore, to create quarantine settings that both support public health measures and prevent adverse outcomes, the psychological effects of these settings must be reduced. Early interventions could prevent anxiety, depression, and anger symptoms from progressing into long-term stress disorders [26].

The rate of depression was high among the women in our sample, which accords with the findings of various studies [6,15]. Few of the participants had chronic diseases; thus, it would not be suitable to make conclusions in this regard based on the present findings. However, somatic symptoms such as fatigue, headache, loss of motion, body ache, lack of appetite, and shortness of breath were associated with the presence of depression. It is interesting that the loss of smell and taste, which is a characteristic symptom of COVID-19, is also scientifically linked to the presence of depression, but not anxiety. This field should be studied in detail in the future.

## Recommendations

- This study has highlighted the relevance of considering, among patients in quarantine, symptoms other than fever, such as loss of smell and taste, fatigue, and headache, as indicators of individuals who may be at risk of developing depression, anxiety, and stress.
- Patients with COVID-19 infections and who are at risk of mental-health problems should receive early mental-health care, diagnosis, and management interventions to prevent the development of long-term difficulties.
- Among patients in COVID-19 quarantines, early screening for objective stress-related traits, and the implementation of timely

interventions, can minimize the development of later stress.

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## References

1. Levy SM, Heiden L. Depression, distress, and immunity: Risk factors for infectious disease. *Stress and Health J.* 1991; 7: 45-51.
2. Galea S, Merchant RM, Lurie N. The Mental Health Consequences of COVID-19 and Physical Distancing: The Need for Prevention and Early Intervention. *JAMA Intern Med.* 2020; 180: 817–818.
3. Lee AM, Wong JG, McAlonan GM, et al. Stress and psychological distress among SARS survivors 1 year after the outbreak. *Can J Psychiatry.* 2007; 52: 233-240.
4. Röhr S, Müller F, Jung F, Apfelbacher C, Seidler A, Riedel-Heller SG. Psychosocial Impact of Quarantine Measures During Serious Coronavirus Outbreaks: A Rapid Review. *Psychiatr Prax.* 2020; 47: 179-189.
5. Xiang Y, Yang Y, Li W, Zhang L, Cheung T. et al. Timely mental health care for the 2019 novel coronavirus outbreak is urgently needed. *Lancet.* 2020; 7: P228-P229.
6. AlKhathami A, Alamin M, Alqahtani A, Alsaeeed W, AlKhathami M, Al-Dhafeeri A. Depression and anxiety among hypertensive and diabetic primary health care patients. Could patients' perception of their diseases control be used as a screening tool?. *Saudi Medical Journal.* 2017; 38: 621-628.
7. WHO|WHO/Wonca joint report: Integrating mental health into primary care—a global perspective. 2020.
8. Spitzer RL, Kroenke K, Williams JB. Validation and utility of a self-report version of PRIME-MD: the PHQ primary care study. *Primary Care Evaluation of Mental Disorders. Patient Health Questionnaire.* JAMA. 1999; 282: 1737–1744.
9. Kurstak E, Lipowski ZJ, Morozov PV. *Viruses, Immunity, and Mental Disorders.* Springer, New York. 1987.
10. Kroenke K, Spitzer RL, Williams JB. The PHQ-9: validity of a brief depression severity measure. *J General Intern Med.* 2001; 16: 606-613.
11. Kroenke K, Spitzer RL, Williams JB, Löwe B. The Patient Health Questionnaire Somatic, Anxiety, and Depressive Symptom Scales: a systematic review. *General Hospital Psychiatry.* 2010; 32: 345-359.
12. AlHadi A, AlAteeq D, Al-Sharif E, Bawazeer H, Alanazi H, AlShomrani A, et al. An arabic translation, reliability, and validation of Patient Health Questionnaire in a Saudi sample. *Annals of General Psychiatry.* 2017; 16: 32.
13. Almadi T, Cathers I, Ayman M, Mansour H, Chow C. An Arabic version of the Perceived Stress Scale: Translation and validation study. *International Journal of Nursing Studies.* 2012; 49: 84-89.
14. AlKhathami AD, AlKhaldi Y, Gazwani J, AlMetrek M, AlMontashri S, Awadh A, et al. Do tourists suffer from depression and anxiety disorders?. *World Family Medicine/Middle East Journal of Family Medicine.* 2020; 18: 44-47.
15. Alsulaimani M. Risk factors of depression among Saudi Females. *Ammarican Journal of psychology.* 2020; 2: 46-55.
16. Thaper R. Transmission of SARS-CoV-2 through the air. *Curr Med Res Pract.* 2020; 10: 196–197.
17. Jayaweera M, Perera H, Gunawardana B, Manatunge J. Transmission of COVID-19 virus by droplets and aerosols: A critical review on the unresolved dichotomy. *Environ Res.* 2020; 188: 109819.

18. Oran DP, Topol EJ. Prevalence of Asymptomatic SARS-CoV-2 Infection: A Narrative Review. *Ann Intern Med.* 2020.
19. Lidia M, Milton Donald K. It is Time to Address Airborne Transmission of COVID-19, *Clinical Infectious Diseases.* 2020.
20. Wiersinga WJ, Rhodes A, Cheng AC, Peacock SJ, Prescott HC. Pathophysiology, Transmission, Diagnosis, and Treatment of Coronavirus Disease 2019 (COVID-19): A Review. *JAMA - J Am Med Assoc.* 2020.
21. Alshami A, Alattas R, Anan H, Al Qahtani H, AlMulhim M, Alahilmi A, et al. Silent Disease and Loss of Taste and Smell are Common Manifestations of SARS-COV-2 Infection in a Quarantine Facility: Saudi Arabia. 2020.
22. Spinato G, Fabbris C, Polesel J, Cazzador D, Borsetto D, Hopkins C, et al. Alterations in Smell or Taste in Mildly Symptomatic Outpatients with SARS-CoV-2 Infection. *JAMA-J Am Med Assoc.* 2020.
23. Lechien JR, Chiesa-Estomba CM, Place S, Laethem YC, Cabaraux P, Mat Q, et al. "Clinical and Epidemiological Characteristics of 1,420 European Patients with Mild-to-Moderate Coronavirus Disease 2019." *Journal of Internal Medicine.* 2020.
24. Al-Qadhi<sup>1</sup> W, Saeed R, Ferwana MS, Abdulmajeed I. Adult depression screening in Saudi primary care:prevalence, instrument and cost . *BMC Psychiatry.* 2014; 14: 190.
25. Bai Y, Lin C-C, Lin C-Y, Chen J-Y, Chue C-M, Chou P. Survey of stress reactions among health care workers involved with the SARS outbreak. *Psychiatr Serv.* 2004; 55: 1055-1057.
26. Jeong H, Yim HW, Song YJ, Ki M, Min JA, Cho J, et al. Mental health status of people isolated due to Middle East Respiratory Syndrome. *Epidemiology and health.* 2016; 38: e2016048.