

## The Impact of the Corona Covid-19 Epidemic on the Mental Health of Doctors in a Desert Environment

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### Abstract:

The study aimed to determine the extent of the impact of the Covid-19 coronavirus epidemic on the mental health of doctors in the Algerian desert environment, in the light of certain personality variables. The researchers used a descriptive approach, using an electronic questionnaire they had developed containing 42 statements distributed over 5 dimensions. After checking its psychometric properties, it was administered to a sample of 295 people covering most of the wilayas (provinces) of southern Algeria. After data processing and analysis, it was found that the Covid-19 coronavirus epidemic has a moderate impact on the mental health of doctors. There are also statistically significant differences between the individuals in the study sample in terms of the impact of the Covid-19 coronavirus epidemic on their mental health, which can be attributed to the gender variable in favour of women, as well as the location of the workplace (geographical area). However, there were no statistically significant differences in the variables of age, marital status, length of service, type of work and work institution. In light of these findings, the researchers proposed practical recommendations that could mitigate the impact of the Covid-19 corona virus epidemic on doctors' mental health and improve their ability to cope with crises.

**Keywords:** Covid-19, the mental health, doctors, desert environment.

### Introduction:

The outbreak of major infectious diseases, such as the novel coronavirus (COVID-19) pandemic, has caused immense distress to the general population worldwide and placed a heavy burden on the health care systems tasked with caring for the affected individuals and containing the spread of the disease. This is not the first pandemic in human history to have a profound impact on the mental health of people worldwide.

The COVID-19 pandemic is more than a health crisis; it has become a mental health crisis for all people worldwide. This period is characterised by deep anxiety, fear and uncertainty that has a significant impact on general behaviour, from threats to personal and family safety, to difficulties in obtaining rapid diagnosis of infection, to the use of containment measures that restrict personal mobility, to the lack of effective treatments available for use.

The coronavirus pandemic has had a global health, economic, social and psychological impact, disrupting and paralysing people's lives. The psychological impact has been significant, as people have been forced to stay at home and only go out for essential reasons. The most significant of these threats are the restrictions imposed on individuals and their psychological effects, as well as the social distance in daily interactions between individuals, which contradicts communication, which is considered one of the most important social processes in the lives of individuals, as indicated by the theories explaining psychological and social stress, such as psychological loneliness and isolation, anxiety, and sleep disorders (Khraiesat, 2021, 217).

### 2- Research Problem:

Studies examining the historical impact of epidemics such as Ebola and SARS on the mental, physical and social health of frontline health workers have shown that they often experience fear, anxiety and emotional disturbance. Difficulties they face at the beginning of an outbreak include social stigma and social distancing due to fears that they are carriers of the virus, which also has a negative impact on their families (Dhafer, 2020).

The COVID-19 pandemic in Algeria, as in the rest of the world, put considerable pressure on health facilities to cope with the massive number of infected patients. Healthcare workers, especially frontline doctors, were more exposed to the virus and therefore had to take strict precautions and

follow all measures to protect themselves when dealing with patients. This had a negative impact on their mental as well as physical health, including anxiety about their families and fear of transmitting the infection, low morale at work, depression and guilt, fatigue, stress and professional pressure.

From this point of view, the research problem can be formulated in the following questions:

1. What is the impact of the COVID-19 pandemic on the mental health of doctors in the desert environment?
2. Are there statistically significant differences between the study samples in the level of impact of the COVID-19 pandemic on the mental health of physicians attributable to personal variables (gender, age, seniority, marital status, job, type of work, workplace institution, and workplace location)?

### **3- Research hypotheses:**

There is no doubt that humanitarian work has a positive impact on lives, and there is ample evidence that doctors and nurses who respond to crises have positive experiences in terms of self-development, appreciation of life and a sense of accomplishment. In most cases, exposure to trauma does not lead to serious long-term psychological consequences, as most health workers who suffer stress recover after the crisis has passed. However, there is also evidence that health workers and other crisis responders are at risk of immediate and long-term emotional disturbance. Factors that increase the likelihood of doctors experiencing psychological distress include having a history of mental illness, experiencing stressful life events prior to the crisis, being exposed to high levels of stress during the crisis, performing difficult tasks or roles beyond their usual responsibilities, knowing someone who died or was injured during the crisis, or lacking social support or coping skills.

On this basis, we can formulate the research hypotheses as follows:

1. We expect a moderate level of impact of the COVID-19 pandemic on the mental health of doctors in the desert environment.
2. We expect statistically significant differences among the study sample in the level of impact of the COVID-19 pandemic on the mental health of physicians, attributable to personal variables (gender, age, seniority at work, marital status, occupation, type of work, work institution, and work location).

### **4- Objectives of the research:**

1. To know the extent of the impact of the COVID-19 pandemic on the mental health of doctors in the desert environment.
2. To know the impact of personal variables (gender, age, seniority, marital status, occupation, type of work, work institution, and work location) on the mental health of doctors in dealing with the COVID-19 pandemic.

### **5- Importance of the research:**

This research has both theoretical and practical importance. The theoretical importance lies in its contribution to enriching scientific knowledge in the field of mental health among physicians, in addition to the studies conducted at the local level during the pandemic period. The practical importance lies in the field investigation of the suffering experienced by doctors due to the impact of the COVID-19 pandemic on their mental health. In addition, this research has a national character, as it included a representative sample of the study population in the desert environment (workplace), in order to find realistic field-based solutions to help doctors deal positively with this pandemic and adapt to other epidemics, while preserving their mental health.

### **6- Operational definitions:**

#### **COVID-19 Coronavirus:**

The terms “coronavirus” and “COVID-19” are often used to refer to the same infection, but coronaviruses are actually a family of viruses, some of which cause disease in humans and some of which do not. The coronavirus associated with Severe Acute Respiratory Syndrome 2 (SARS-CoV-2) is the one responsible for COVID-19 disease and should not be confused with the SARS virus that caused concern in 2003.

#### **Mental health:**

Mental health is defined as “a relatively enduring emotional-mental state of feeling that all is well, being pleased with oneself and others, feeling satisfied, secure and mentally healthy, with a positive outlook on life and a sense of activity, strength and well-being”. Operationally, it is defined as the scores obtained by members of the study sample reflecting the impact of the COVID-19 pandemic on their mental health, as measured by the research tool prepared by the researchers, which includes the

following dimensions: Anxiety about family and fear of infection transmission, Reduced morale at work, Depression and guilt, Fatigue, exhaustion, and Professional and psychological stress.

#### **7-Previous studies:**

##### **1 -Study by Guezzou and Aghmine (2021):**

This study aimed to reveal the mental health of nurses working during the COVID-19 pandemic and to determine the extent to which the variables of social status and years of experience create differences in their level of mental health. The two researchers used the descriptive method and a questionnaire distributed to a sample of 30 nurses working at the Mother and Child Hospital in Guelma. The results of the study showed that there is a high level of mental health among the nurses working in the COVID-19 department, and that there are no statistically significant differences in the level of mental health in relation to the variables of social status and years of experience.

##### **2- Study by Fadhloun and Sahel (2021):**

The study aimed to determine the extent to which professional conditions contribute to the generation of work stress among nurses at the Mohammed Boudiaf hospital in the state of Oum El Bouaghi during the Corona pandemic. The analytical descriptive approach was used and a questionnaire containing 29 statements was administered to a sample of 30 nurses. The study found that professional conditions contributed significantly to the generation of work stress among nurses during the Corona pandemic.

##### **3-Study by Zakarya and Kherabach (2021):**

The study aimed to identify the risk factors of the COVID-19 pandemic on the mental and psychological health of doctors and nurses working in the health sector in Algeria, according to the personal variables: gender, age, type of scientific practice and professional advancement. The descriptive method was chosen and the researchers used the Mental Health Scale (Abu Hein 1992) to collect data, which was applied to a sample of (70) doctors and nurses from some Algerian states: Sétif, Bordj Bou Arreridj and Tizi Ouzou. The results showed that health workers, both doctors and nurses, of both sexes, showed various psychological disturbances during the coronavirus pandemic.

##### **4- Study by Hireche and Brahimi (2022):**

The study aimed to determine the level of burnout and its relationship with depression among nurses during the COVID-19 pandemic. The study used the descriptive-correlational approach and applied two instruments: the Maslach Burnout Inventory and the Beck Depression Inventory, on a sample of (102) nurses from the Mohamed Boudiaf Hospital in Medea, of different ages, after verifying the psychometric properties of the instruments. The study found different levels of burnout among the nurses and a significant correlation between burnout and depression among them, with no differences in the levels of burnout and depression according to the gender variable.

#### **Foreign studies:**

##### **1- Study by Lasalvia. A et al. (2020):**

The aim of the study was to determine the level of mental health risk among doctors and nurses during the COVID-19 pandemic in the Veneto hospital in northeastern Italy, in terms of post-traumatic stress symptoms, anxiety and depression according to personal demographic variables. The descriptive method was used and the study sample included (2195) healthcare workers who completed the Impact of Event Scale-Revised (IES-R), the Self-Rating Anxiety Scale (SAS) and the Patient Health Questionnaire-9 (PHQ-9). In general, the results showed that 63.2% of participants reported painful work-related coronavirus experiences and 53.8% reported post-traumatic stress symptoms. In addition, 50.1% had clinically relevant anxiety symptoms and 26.6% had at least moderate depressive symptoms. According to personal variables, multiple regression analysis showed that women, nurses in direct contact with COVID-19 patients and those with pre-existing mental health problems were more susceptible to the pathological psychological consequences of the pandemic.

##### **2- Study (Fatma Çölkesen, Fatih Çölkesen, 2021):**

The aim of the study was to determine the impact of the COVID-19 pandemic on the mental health of health care workers in the city of Konya, Turkey. For this purpose, anxiety and depression scales were administered to a sample of (435) doctors, nurses and nursing assistants who responded to the electronic questionnaires. After data collection and analysis, the scores of the sample were compared according to the variables of profession and years of experience. The study found that 25.7% of the sample received psychological and professional support, and 18% received professional psychological

treatment for the first time in their lives due to the psychological effects of the COVID-19 pandemic. The study also found that 43.4% suffered from anxiety and 65.1% from depression. In addition, less than 50% of healthcare workers with mental disorders were working on the front lines of the pandemic.

**3- The study by Johannes H. De Kock et al (2021)** :aimed to identify the factors that threatened the mental health of healthcare workers during the COVID-19 pandemic. Through a careful review of the literature of previous studies, following the guidelines of the World Health Organization and the Cochrane Organisation, the researchers searched 14 databases for studies that explained the negative effects of the COVID-19 pandemic. The search was conducted at two different times and 24 studies were reviewed, 18 of which were conducted in China and most of the sample participants were from urban hospitals. The study found that anxiety, depression and psychological stress were the top threats to the mental health of healthcare workers, and that nurses were more susceptible to these disorders than doctors. There were also differences in the factors that threatened the mental health of doctors and nurses according to COVID-19, which were attributed to the gender variable, favouring women, especially with regard to family concerns, fear of infection, lack of personal protective equipment, lack of psychological and social support, and lack of adequate experience. The studies recommended the need for flexibility in the workplace and cooperation to avoid the negative consequences of the COVID-19 pandemic on the mental health of doctors and nurses.

**4- Study: “Tamires et al. (Tamires P, S, & Al, 2022)**

Tamires et al. (Tamires P, S, & Al, 2022) conducted an analytical review of 25 studies published in 2021 on the psychological impact of the COVID-19 pandemic on nurses in 12 countries. They found that 94% of the participants in these studies experienced high levels of anxiety, depression, frustration and psychological distress due to the sense of obligation to work, increased workload and the possibility of contracting the pandemic as they were on the front line.

**5- Study by Hany El Gindi et al. (Hany El Gindi & Al, 2022)**

The aim of this study was to investigate the impact of the COVID-19 pandemic on the mental health of physicians, nurses and allied health professionals in Alberta, Canada, in terms of work-related stress, anxiety and depressive disorders. The study used self-report measures, a perceived stress scale and a generalised anxiety disorder scale. The results showed that healthcare workers were able to cope with work-related stress (n = 840, 81.2%), which led to high levels of anxiety (n = 369, 38.6%) and depression (n = 317, 32.7%). There were also differences between doctors and nurses in terms of stress, anxiety and depression, with nurses showing higher levels. The younger age group (under 30 years) also had higher levels of psychological symptoms, and female participants had more obvious psychiatric disorders than their male counterparts.

**8- Methodological procedures:**

**8-1 Study methodology:**

The researchers used the descriptive methodology as it is appropriate to the nature of the subject under study. The descriptive methodology is defined as “a method of describing the subject to be studied through a correct scientific methodology and presenting the results obtained in expressive numerical forms that can be interpreted” (Obaidat et al., 1999, p.64).

**8-2 Study sample:**

The study included a randomly selected sample of 295 resident doctors working in the public sector in the desert environment of regions 1-2-3. The personal details of the sample are shown in Table 1.

**Table 1: Personal data of the study sample**

<b>Gender</b>			<b>Work Institution</b>		
<b>Category</b>	<b>Frequency</b>	<b>Percentage</b>	<b>Category</b>	<b>Frequency</b>	<b>Percentage</b>
<b>Male</b>	<b>164</b>	<b>55.6%</b>	<b>Public</b>	<b>204</b>	<b>69.2%</b>
<b>Female</b>	<b>131</b>	<b>44.4%</b>	<b>Private</b>	<b>91</b>	<b>30.8%</b>
<b>Total</b>	<b>295</b>	<b>100.0%</b>	<b>Total</b>	<b>295</b>	<b>100%</b>
<b>Age</b>			<b>Seniority in Work</b>		
<b>Category</b>	<b>Frequency</b>	<b>Percentage</b>	<b>Category</b>	<b>Frequency</b>	<b>Percentage</b>

21 - 31 years	183	62.0%	1 - 10 years	245	83.1%
32 - 42 years	91	30.8%	11 - 21 years	40	13.6%
43 - 53 years	19	6.4%	22 - 33 years	9	3.1%
54 - 64 years	2	0.7%	33 - 44 years	1	0.3%
<b>Total</b>	<b>295</b>	<b>100.0%</b>	<b>Total</b>	<b>295</b>	<b>100.0%</b>
<b>Marital Status</b>			<b>Nature of Work</b>		
<b>Category</b>	<b>Frequency</b>	<b>Percentage</b>	<b>Category</b>	<b>Frequency</b>	<b>Percentage</b>
Single	140	47.5%	Day Shift	202	68.5%
Married	149	50.5%	Night Shift	93	31.5%
Divorced	5	1.7%	<b>Total</b>	<b>295</b>	<b>100%</b>
Widowed	1	0.3%	<b>Job</b>		
<b>Total</b>	<b>295</b>	<b>100%</b>	<b>Category</b>	<b>Frequency</b>	<b>Percentage</b>
<b>Workplace (Geographical Area)</b>			Specialist Doctor: Epidemiology	15	5.1%
<b>Category</b>	<b>Frequency</b>	<b>Percentage</b>	Specialist Doctor: Respiratory Diseases	23	7.8%
Area 1	70	23.7%	Specialist Doctor: Anesthesia and Intensive	27	9.2%
Area 2	63	21.4%	Specialist Doctor: Other Diseases	15	5.1%
Area 3	90	30.5%	General Practitioner	66	22.4%
Greater South	72	24.4%	Chief Physician	17	5.8%
<b>Total</b>	<b>295</b>	<b>100.0%</b>	Resident Doctor	97	32.0%
			Assistant Doctor	35	11.9%
			<b>Total</b>	<b>295</b>	<b>100%</b>

Table (01) shows that the distribution of the research sample in terms of gender was close between males and females, as indicated by the percentage of 55.6% for males and 44.4% for females. The distribution was also close between single people with 47.5% and married people with 50.5% according to the marital status variable. In terms of age, the majority of the sample was young, aged between 21 and 31 years, as indicated by the percentage of 62%. In terms of place of work, the research covered the Saharan regions of Algeria, including the High Plateaus, Region 1, Region 2, Region 3 and the Grand Sahara (Adrar, Tamanrasset, Bordj Badji Mokhtar, Tindouf), with percentages close to 21-30%. In terms of work institution, the majority of the sample, 62.20%, worked in a public institution, and the sample's work experience ranged from 1 to 10 years, as indicated by the percentage of 83.10%. As for the professional variable, the sample consisted of doctors.

### 8-3 Study instruments:

The study was conducted in the southern provinces of the country, represented by the job variable (geographical region).

After reviewing the literature and previous studies related to the topic, and after conducting some interviews with a number of doctors and the experiences gained during the pandemic, the researchers proceeded to design an electronic questionnaire to achieve the objectives of the study. The questionnaire consisted of (42) items divided into (5) dimensions:

The first dimension: Concern for family and fear of infection transmission (11 items).

The second dimension: Decreased morale at work (7 items).

The third dimension: Depression and guilt (5 items).

The fourth dimension: Tiredness and exhaustion (8 items).

The fifth dimension: Psychological/occupational stress (11 items).

**8-4 Psychometric characteristics of the instrument:**

After designing the study tool, the researchers distributed it electronically to a sample of (60) doctors to examine the psychometric characteristics, namely validity and reliability. The results were as follows:

**Validity:** Validity is defined as the ability of the measure to measure what it was designed to measure. The researchers used discriminant validity, which is the ability of the measure to discriminate between the two ends of the trait, as shown in Table (02).

**Table (02): Discriminant validity of the study tool**

Discrimination	Number	Mean	Standard Deviation	“T” Value	Statistical Significance	Level of Significance
Low	20	117.20	3.01	61.39	0.00	Significant at 0.01
High	20	65.00	2.24			

From Table (2) we can see that the value reached 61.39, which is statistically significant at the 0.01 level of significance. Therefore, we can say that the study tool, represented by the electronic questionnaire designed by the researchers, is able to discriminate between the two ends of the trait, thus measuring what it was designed to measure.

**Reliability:** Reliability is known as the ability of the scale to give the same results when applied again to the same sample under similar conditions. Researchers used two methods: Cronbach’s alpha and split-half, as shown in Table (3).

**Table (3) Reliability Coefficient of the Study Instrument Using Cronbach’s Alpha and Split-Half Methods**

Number of Statements	Sample	Reliability Coefficient:	
		Split-half Reliability	Cronbach’s Alpha
42	60	0.76	0.93

From Table (3) we can see that the reliability coefficient of the study tool is high using both methods, as we can see that the reliability coefficient using the split-half method reached (0.76) and using the Cronbach’s alpha method reached (0.93). This expresses the high reliability of the questionnaire, indicating that it is capable of measuring the level of impact of the Covid-19 pandemic on the mental health of doctors, and therefore the results can be generalised to the study population.

**9- Presentation and discussion of the results in the light of the hypotheses:**

After verifying the psychometric properties of the instrument and distributing it electronically to a sample of (295) doctors in the southern states, and after collecting and statistically analysing the data, the researchers proceeded to present, analyse and discuss the results according to the research hypotheses as follows:

**9-1 Presentation and analysis of the results of the first hypothesis:**

We expect a moderate level of impact of the Covid-19 pandemic on the mental health of doctors.

In order to know this, the arithmetic means and standard deviations of the questionnaire dimensions were calculated according to the following criterion:

Since the answer alternatives of the questionnaire items are (3): (Strong=3, Moderate=2, Weak=1), we calculate the range between the highest and lowest scores and divide the result by 3:  $(3-1)/3 = 0.66$ .

We add the result (0.66) to the lowest score:

$1 + 0.66 = 1.66$ , so the dimension whose arithmetic mean is in the range  $]1-1.66[$  means that the effect of the coronavirus in this dimension is at a weak level.

$1.67 + 0.66 = 2.33$ , so the dimension whose arithmetic mean falls in the range  $]1.67-2.33[$  means that the impact of the coronavirus in this dimension is at a moderate level.

$2.34 + 0.66 = 3.00$ , so the dimension whose arithmetic mean falls in the range  $]2.34-3.00[$  means that the impact of the coronavirus in this dimension is at a high level.

Table (04) illustrates this.

**Table (04): Arithmetic means and standard deviations of the level of impact of the Covid-19 pandemic on doctors' mental health**

Dimension	Number of statements	Mean	Standard deviation
Family Concern and Fear of Infection Transmission	11	2.29	0.73
Depression and Feeling of Guilt	5	2.18	0.72
Decreased Work Morale	07	2.12	0.77
Psychological/Professional Stress	11	2.01	0.79
Fatigue and Exhaustion	08	1.91	0.76
Overall Mean Score	/	2.10	0.75

From Table (04) we can see that the COVID-19 pandemic is affecting the mental health of doctors, as evidenced by the arithmetic means of the mental health dimensions and the overall arithmetic mean, which are in the range  $[1.67 - 2.33]$ , with standard deviations between 0.72 and 0.79 respectively.

This result is in line with the findings of the studies by Fadloun and Sahel (2021), who found that anxiety, depression and psychological stress are at the forefront of the mental disorders threatening the mental health of health workers at the Mohamed Boudiaf Hospital in the state of Oum El Bouaghi, Algeria. It also agrees with the study by "Tamires" et al. (Tamires P, S, & Al, 2022), which found that 94% of the sample in these studies had experienced advanced cases of anxiety, depression, frustration and psychological stress due to the sense of commitment to work and its excessive burden, and the possibility of being infected by the pandemic, considering that they are on the front line.

It also agrees with the study by Hany El Gindi et al. (Hany El Gindi & Al, 2022), which found that health workers in Alberta, Canada have the ability to withstand work stress ( $n = 840, 81.2\%$ ), which resulted in high levels of anxiety ( $n = 369, 38.6\%$ ) and depression ( $n = 317, 32.7\%$ ).

Dhahir (2020) pointed out that those working on the frontlines of the emerging coronavirus (COVID-19) in the various health care settings in Qatar are suffering from fear of infection and contagion, fear of an unknown fate that is not without the possibility of death, fear of infecting a family member, physical fatigue due to long and intense working hours, and pain of being away from their children due to self-isolation to protect the family and a sense of loneliness. These are just some of the feelings experienced by any doctor/nurse working on the frontline of health care (i.e. in emergency departments and patient care units) during the current COVID-19 pandemic. It is also noteworthy that the doctors themselves tend to hide these feelings and experiences, firstly because they do not find the time to deal with them during their intensive work, and secondly because they feel guilty if they express them, seeing their work as an obligatory duty with no time to complain.

The question arises: What is our social responsibility towards them, whether in the current difficult times and/or in the period after the pandemic has been overcome, i.e. the recovery period?

### **9-2 Analysis and presentation of results for the second hypothesis:**

We expect to find statistically significant differences among the study sample in the level of impact of the COVID-19 pandemic on mental health, attributed to personal variables (gender, age, seniority at work, marital status, occupation, type of work, work institution, and work location).

-To determine this, appropriate statistical methods were used for each of the personal data variables, as follows:

-There are differences between the study sample in the level of impact of the COVID-19 pandemic on mental health attributed to the variables of gender, type of work and work institution.

-To determine this, the statistical method of t-test was used, as shown in Tables (05) and (06).

**Table (05) shows the difference between the study samples in the level of impact of the COVID-19 pandemic on the mental health of doctors, attributed to the gender variable.**

Dimension	Social gender	Number	Mean	Standard deviation	T-value	Statistical significance	Level of significance
Concern for Family and Fear of Infection Transmission	Male	164	24.01	4.799	4.40	0.00	Significant at 0.01
	Female	131	26.55	5.069		0.00	
Decreased Moral Spirit at Work	Male	164	13.60	3.579	5.57	0.00	Significant at 0.01
	Female	131	15.93	3.451			
Depression and Feeling of Guilt	Male	164	11.28	2.532	0.96	0.33	Not significant at 0.05
	Female	131	11.56	2.383			
Fatigue and Exhaustion	Male	164	14.41	3.810	4.30	0.00	Significant at 0.01
	Female	131	16.33	3.773		0.00	Significant at 0.01
Psychological/Professional Pressure	Male	164	20.95	5.150	1.17	0.00	Significant at 0.01
	Female	131	23.45	5.072		0.00	Significant at 0.01
Total Score	Male	164	84.26	14.989	5.34	0.00	Significant at 0.01
	Female	131	93.82	15.501			

From Table (05) it can be seen that there are statistically significant differences between the members of the study sample in terms of fear of family and transmission of infection, reduced morale at work, fatigue and exhaustion and psychological workload, as well as in the overall scale score, which are attributable to the gender variable and in favour of women. The t values for these dimensions were significant at the 0.01 level. However, there are no differences in depression and guilt among the sample members attributed to the gender variable, as the t-value of 0.96 was not significant at the 0.05 level of significance.

This result is consistent with the findings of the study by Hany El Gindi et al. (2022), where the levels of psychological disorder symptoms were more pronounced in females compared to males among physicians, nurses and allied health professionals in Alberta, Canada. It is also consistent with the study by Johannes H. De Kock et al. (2021) who, through a thorough literature review of previous studies following the guidelines of the World Health Organisation and the Cochrane Organisation, found differences in the factors threatening the mental health of doctors and nurses due to COVID-19, attributed to the gender variable in favour of females, especially regarding family anxiety, fear of infection, lack of personal protective equipment, lack of psychological and social support, and lack of sufficient experience.

The results are also in line with the study by Lasalvia. A et al. (2020), who showed through multiple regression analysis that, according to personal variables, female doctors and nurses directly involved with COVID-19 patients and suffering from pre-existing mental health problems were more susceptible to the pathological psychological consequences of the pandemic in a hospital in Veneto, Italy (north-east Italy).

**Table (06) shows the difference between the members of the study sample in the degree of impact of the COVID-19 pandemic on mental health, attributed to the variables type of work and work institution.**

Variable	Category	Number	Mean	Standard deviation	t-value	Statistical significance	Level of significance
Nature of work	Daily performance	202	87.58	16.554	1.51	0.12	Not significant at 0.05 level
	Night shift	93	90.49	14.332			
Work institution	Public sector	204	87.61	16.475	1.51	0.13	Not significant at 0.05 level
	Private sector	91	90.49	14.489			

From Table (06) we can see that there are no statistically significant differences between the individuals in the study sample in the degree of impact of the COVID-19 pandemic on mental health that can be attributed to the variable of type of work. This is evidenced by the non-significant t-values for the total mental health score at the 0.05 level of significance. In addition, we can see from Table (06) that the t-values for the total score of mental health are not significant at the 0.05 level of significance, and therefore we can conclude that there are no differences between the individuals in the study sample in the degree of impact of the COVID-19 pandemic on the mental health of doctors that can be attributed to the variable of workplace institution.

This study agrees with the findings of a previous study that there are statistically significant differences between the individuals in the study sample in the level of impact of the COVID-19 pandemic on mental health that can be attributed to the variables: age, seniority in the workplace, marital status, job and workplace location (desert region).

To do this, a multivariate analysis of variance (MANOVA) was used, which examines the independent effect of several categories on two or more quantitative variables. The results of this analysis are presented in Table (07).

**Table (07) shows the differences between individuals in the study sample in the level of impact of the COVID-19 pandemic on mental health attributed to the variables: age, seniority in the workplace, marital status, job and workplace location (desert region).**

Variable	Impact dimensions of the COVID-19 pandemic on mental health	Sum of squares	Degrees of freedom	Mean square	F-value	Statistical significance
Age	Anxiety about family and fear of infection transmission	126.71	3	42.24	1.53	0.20
	Decreased morale at work	119.56	3	39.85	2.96	0.12
	Depression and feelings of guilt	6.09	3	2.03	0.33	0.80
	Fatigue and exhaustion	93.67	3	31.22	2.07	0.10
	Psychological/professional stress	126.71	3	42.24	1.57	0.20
	Total score	1869.64	3	2.49	2.49	0.06
Seniority at work	Anxiety about family and fear of infection transmission	129.58	3	43.19	1.57	0.19
	Decreased morale at work	435.67	3	145.22	.570	0.63
	Depression and feelings of guilt	4.56	3	1.521	.240	0.86
	Fatigue and exhaustion	29.80	3	9.935	.640	0.58
	Psychological/professional stress	129.58	3	43.19	1.57	0.19
	Total score	435.67	3	145.22	.570	0.63
Marital	Anxiety about family and	126.40	3	42.13	1.53	0.20

<b>status</b>	fear of infection transmission					
	Decreased morale at work	2814.57	3	938.19	3.80	0.11
	Depression and feelings of guilt	23.62	3	7.87	1.29	0.27
	Fatigue and exhaustion	42.90	3	14.30	.930	0.42
	Psychological/professional stress	126.40	3	42.13	1.53	0.20
	Total score	2814.57	3	938.19	3.80	0.25
<b>Job position</b>	Anxiety about family and fear of infection transmission	431.76	7	61.68	2.30	0.02
	Decreased morale at work	6868.42	7	981.20	4.16	0.00
	Depression and feelings of guilt	100.86	7	14.40	2.45	0.01
	Fatigue and exhaustion	317.75	7	45.39	3.12	0.00
	Psychological/professional stress	431.76	7	61.68	2.30	0.02
	Total score	6868.42	7	981.20	4.16	0.00
<b>Workplace location (desert area)</b>	Anxiety about family and fear of infection transmission	5208.34	3	1736.11	173.34	0.00
	Decreased morale at work	66187.20	3	22062.40	770.67	0.00
	Depression and feelings of guilt	563.508	3	187.83	44.60	0.00
	Fatigue and exhaustion	2938.30	3	979.43	184.46	0.00
	Psychological/professional stress	5208.34	3	1736.11	173.34	0.00
	Total score	66187.20	3	22062.40	770.67	0.00

From Table (07) we can see that there are no statistically significant differences between the individuals in the study sample in terms of the impact of the COVID-19 pandemic on the mental health of doctors, which can be attributed to the variables of age, marital status and seniority at work. This is indicated by the non-significant 'F' values for the dimensions and overall mental health score for the variables of age, seniority and marital status, which were not significant at the 0.05 level of significance.

However, "Mashref" and "Al-Jishi" (2020) consider that married health workers have a higher level of anxiety about the spread of diseases than their unmarried or divorced counterparts, which is related to their sense of responsibility towards their families. These workers, including those in A&E, have been observed to divide their feelings between their family concerns and their professional obligations. These concerns about personal and family health are more prevalent among workers who live with children or the elderly.

This finding is consistent with the study by "Qazqouz" and "Aghmeen" (2021), which found no statistically significant differences in the level of mental health among nurses working at the Maternity and Child Hospital in the state of Guelma during the COVID-19 pandemic, according to the variables of social status and years of experience.

Doctors, regardless of personal variables (seniority, marital status, age, etc.), who have worked and continue to work in hospitals in China, Italy and other places, indicate that the psychological effects of work are added to the daily physical pain, which in turn increases the severity of psychological stress and pain. These physical effects include acute pain in the upper and lower back, neck, shoulders and legs. Skin lesions sometimes occur due to the constant separation of the skin from the air. (Dhafir, 2020).

All studies address the long-term effects on them, as many of them suffer from severe depression, post-traumatic stress disorder (PTSD) and psychosomatic illnesses that affect their mental and physical health. What characterises this type of disorder is that it appears within a month or several

years after the trauma and negatively affects all aspects of life, whether social and/or professional. This impact can be so great that the person is unable to lead a normal life as before. There are four main signs of this type of disorder: first, the sudden appearance of difficult memories of the event, sometimes in the form of nightmares with a difficult emotional and physical reaction. Second, avoidance of talking about what happened and avoidance of places and people that remind them of it. Third, negative thoughts about the self and the world, despair, difficulty maintaining relationships with family members and friends, lack of interest in activities that were enjoyable before the event, and difficulty expressing positive emotions. Fourth, sudden changes in daily habits, such as difficulty sleeping, concentrating, anger and nervous behaviour, among others.

Meanwhile, there are statistically significant differences between the sample individuals in the dimensions of the impact of the COVID-19 pandemic and the total score on the mental health of doctors attributed to the variables of job and workplace (the desert region), as indicated by the “F” values for these two variables, which were significant at the level of 0.01 and 0.05.

Therefore, it is necessary to know which category of the variables of job and workplace for doctors is most affected by the COVID-19 pandemic on their mental health, and to know this, the statistical method (Scheffé) was used for the post-hoc comparisons, as shown in Tables (08) and (09).

**Table (08): Results of Scheffé’s test for post-hoc comparisons between mean differences for the categories of the job variable**

Job position	General practitioner	Resident doctor	Senior doctor	Assistant doctor	Specialist in resuscitation and anesthesia	Specialist in respiratory diseases	Specialist in infectious diseases	Specialist in other diseases
General practitioner		1.13	0.37	*14.24	0.71	1.05	1.48	1.08
Resident doctor			0.77	0.69	0.43	0.08	0.35	0.05
Senior doctor				10.48	0.34	0.68	1.12	0.72
Assistant doctor					**14.96	5.42	8.44	7.50
Specialist in resuscitation and anesthesia						9.53	6.52	7.45
Specialist in respiratory diseases							3.01	2.08
Specialist in infectious diseases								0.93
Specialist in other diseases								

\* The difference between the means of the two groups was statistically significant at the 0.01 level of significance.

\*\*The difference between the means of the two groups was statistically significant at the 0.05 level of significance.

From Table (09) we can see that the results of the Scheffé test showed that the COVID-19 pandemic had a particularly strong and significant effect on the mental health of the functional categories of general practitioners and anaesthetists and intensive care physicians, where the difference between the means of the two groups was 14.96, which is statistically significant at the 0.05 level of significance. This was followed by the difference between residents and general practitioners, where the difference between the means of the two groups was 14.24, which is statistically significant at the 0.01 level of significance. Therefore, we can say that the COVID-19 pandemic had a greater impact on the mental health of residents, anaesthetists and intensivists, and general practitioners than on the other functional categories.

In this context, Kunz et al. (2021) believe that nurses suffer more from depression, anxiety and symptoms of post-traumatic stress disorder than physicians because they have shouldered a heavy burden in the challenge of controlling the virus due to their commitment to working, in some cases without interruption, and being on the frontline and in direct confrontation with the pandemic, which makes them in need of accurate clinical attention and access to psychological consultation and treatment as appropriate, as well as the organisation of working hours and the establishment of clear work protocols that allow them to perform their work comfortably and protect them from transmission of infection. This finding is consistent with the study by Johannes H. De Kock et al. (2021), which found that anxiety, depression and psychological stress were at the forefront of mental health threats to health care workers, and that the category of epidemiologists and respiratory specialists were more susceptible to these disorders than other physicians because of their direct involvement with the pandemic. This is supported by Moshreff and Elgaish (2020), who suggest that the likelihood of stress may increase for staff with direct patient contact responsibilities. For example, physicians and nurses are more likely to report high levels of stress than any other healthcare professional. Nurses were also more likely to develop post-traumatic stress disorder than other hospital staff.

**Table (09): Results of Scheffé’s test for post hoc comparisons of mean differences for the categories of the workplace variable (the desert region)**

Geographical area	Area 1	Area 2	Area 3	The Southern area
Area 1		<b>*14.91</b>	<b>*25.33</b>	<b>*41.85</b>
Area 2			<b>*10.41</b>	<b>*26.94</b>
Area 3				<b>*16.52</b>
The Southern area				

**\* The difference between the means of the two groups is significant at the 0.01 level of significance.**

From Table (10) we can see that the results of the Scheffé test show that the COVID-19 pandemic has affected the mental health of doctors in all desert regions of the country according to the variable of place of work (geographical region), as evidenced by the significant differences between the group means, all of which are significant at the 0.01 level of significance.

This result indicates that the COVID-19 pandemic has had an impact on the mental health of doctors in all desert regions without exception, particularly in terms of concern for their families and fear of infection transmission, decreased morale at work, depression and guilt, fatigue and exhaustion, and professional and psychological stress. This is not experienced by the rest of society, “the remaining members of society who stay at home with their families in their private safe zones”. Unfortunately, society often, intentionally or unintentionally, ignores what these heroes are going through in their fight against an invisible virus that has paralysed the entire world. It is also noteworthy that the professionals themselves tend to hide these feelings and experiences because, firstly, they do not have time to deal with them during their intense work and, secondly, they feel guilty if they express them because they see their work as an obligatory duty with no time to complain. ( Dhafir,2020)

#### **10- General Conclusion:**

The COVID-19 pandemic has lasted for almost two years and has had serious consequences at all levels - social, economic and political - in all countries of the world. In the health sector, it has exposed structural weaknesses and shortcomings in the management organisation of the health sector,

such as the haphazard distribution and shortage of medicines in Algeria, in addition to the blatant shortage of medical care and doctors, which has led to an increase in complications and deaths. In fact, a high percentage of the human losses due to the pandemic have come from the medical staff themselves, given their daily presence in hospitals. This had a negative impact on the mental health of specialist and general practitioners in all southern states across the country, particularly in terms of concern for their families and fear of transmission among them. This has led to a decline in work morale due to the successive psychological pressures of each shift, in addition to feelings of depression, self-blame, fatigue, exhaustion and professional pressure that have weighed heavily on the entire health sector. Their psychological suffering has affected their personal lives and family relationships, draining them both mentally and physically.

This has created in us a greater capacity to deal with crises in the future and to pay more attention to prevention programmes, commitment to them and their implementation in order to combat the spread of disease on the one hand, and to raise awareness of the COVID-19 disease and the pandemic in all segments of society on the other.

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