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Original Research Article

Short-Term Psychological Impact of the 2019 Coronavirus Disease (COVID-19) Pandemic on Healthcare Workers of a Cancer Treatment Center: A Cross-Sectional Study

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Abstract: ***Background*:** The sudden emergence of the novel and severe 2019 Coronavirus disease (COVID-19) would be expected to impact the mental health of healthcare workers and thus represent a challenge to psychological resilience. In order to reduce psychological impacts, more research data are needed to help develop evidence-based strategies. We conducted a single center, cross-sectional study, with the aim of assessing the immediate psychological impact of COVID-19 pandemic on medical and paramedical staff in a cancer treatment center providing continuous health care during the pandemic. ***Methods*:** From April 19th to May 5th, 2020, medical and nursing staff from Oncology and Hematology Center of Mohammed VI University Teaching Hospital was invited to participate with a self-report questionnaire. We used Impact of Event Scale-Revised (IES-R), Hospital Anxiety and Depression scale (HADS), and Insomnia Severity Index (ISI) to evaluate stress, anxiety, depression, and insomnia, respectively. Additional information on demographic characteristics, medical history, exposure to COVID-19, and accessed mental health services were included in the questionnaire. ***Results*:** We received 93 completed questionnaires. Among all healthcare workers included in this study, 30.1% reported stress, 32.3% had anxiety, 30.1% reported depression, and 31.2% had insomnia symptoms. Occupation, female gender, concomitant chronic diseases, history of mental disorders, and history of contact with suspected or confirmed patients were risk factors for psychological disturbances, whereas care provided by hospital decision-makers, and full coverage of all departments with protective measures were protective factors. ***Conclusion*:** During the initial phase of COVID-19 outbreak in Morocco, about one-third of the respondents reported moderate to severe psychological impact, and more than half rated their anxiety, depression symptoms, and insomnia as moderate to severe. Our findings emphasize the importance of being prepared to support medical staff in all facilities through mental health interventions at times of widespread crisis.

Keywords: COVID19, Mental health, Anxiety, Depression, Stress, Healthcare workers, Oncology center.

1. INTRODUCTION

In December 2019, a novel viral pneumonia caused by Sars-Cov-2 (Severe Acute Respiratory Syndrome Coronavirus 2) emerged in Wuhan city-China. The disease rapidly spread throughout China and elsewhere and within weeks of the initial outbreak the total number of cases and deaths increased dramatically. Due to the rapid escalation of "Corona Virus Disease 2019" (COVID-19) pandemic, World Health Organization (WHO) declared on January 30, 2020, the novel Coronavirus a "Public Health Emergency of International Concern" (PHEIC). As May 1st, 2020, COVID-19 infected more than 3,325,620 people all over the world and killing 234,496 individuals. The pandemic not only brought high mortality rates from the

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viral infection but also impacted the mental health of the general population.

In 2003, the world faced a similar, but less sever, situation with the sudden emergence of severe acute respiratory syndrome (SARS). At the time numerous studies have assessed immediate and long-term psychological and occupational effects of providing hospital healthcare during SARS outbreak. The results showed a progressive appearance of psychological distress among healthcare workers (HWs): fear and anxiety represented the immediate response and decreased in the early stages of the epidemic. Long-term effects were: posttraumatic stress symptoms, depression, and psycho-physiological symptoms that lasted for a long time, resulting in more profound impacts [1, 2].

According to these studies, the factors responsible for mental health deterioration among medical and nursing staff were: exhaustion, isolation and lack of contact with family, social discrimination working in high-risk positions and exposure to high risk of infection, and sometimes inadequate equipment for safety from contagion [2, 3]. These same factors may have impacted health workers during the novel COVID-19 outbreak, leading to similar mental health problems reported during SARS epidemic. Therefore effective support and training is highly recommended.

The Moroccan government has made colossal efforts in order to reduce the pressure on health workers, such as reducing work intensity by an equitable distribution of human resources, providing adequate equipment for safety, adopting strict infection control, and offering practical guidance. Khalid *et al*., [4] reported that such measures helped protect medical staff mental health during the "Middle East respiratory syndrome (MERS)" outbreak. At the same time, national television channels, radio stations, and social media are diffusing information about strategies for psychological self-help. Nonetheless, evidence-based mental health services are preferable, and help assess the quality of support services and programs [5].

In addition, on a local scale, the department of psychiatry of Mohammed VI University Teaching Hospital (UTH) of Marrakesh set up a helpline to provide telephone guidance for medical and nursing staff in order to reduce the psychological impact of COVID-19. The medical, paramedical, and nursing staff of the Oncology and Hematology Center (OHC) of Mohammed VI UTH, even if not in direct contact with COVID-19 patients, may also be impacted by this pandemic, since they must provide continuous care for cancer patients during such unprecedented circumstances.

There is a paucity of studies assessing the immediate psychological impact of COVID-19 on health workers this far. With this study we aimed to assess the immediate psychological impact, by examining the psychological distress, anxiety, stress, depression, and insomnia, experienced by the staff of the OHC in the midst of the COVID-19 outbreak, to Identify risk factors involved in psychological distress, and to evaluate the efficiency of the provided psychological protective measures.

2. METHODS

2.1. Study design and participants

We adopted a single-center, cross sectional survey design. All medical doctors, nurses, and clinical technicians from all departments of the OHC, who were actually on service during the outbreak, were invited to participate. Our study was conducted between April 19th and May 5th, 2020, one month after the Moroccan authorities announced national lockdown. Data were collected through "Google forms" with an anonymous, self-rated questionnaire that was distributed to all OHC staff via "WhatsApp" or "Gmail", and some questionnaires were done using paper-and pencil method. One response only to the questionnaire per participant was permitted.

2.2. Questionnaire

The structured questionnaire consisted of five parts: basic socio-demographic data, direct and indirect exposure experience (contact history with COVID-19), access to mental healthcare services, mental health assessment status, and self-perceived health status compared to that before the COVID-19 pandemic.

2.2.1. Demographic data:

Basic demographic data include age (year), gender (female/male), occupation (doctor, nurse, clinical technician, and biomedical engineer), department, and marital status (married, unmarried, or divorced).

2.2.2. Exposure to COVID-19

In order to determine the exposure to COVID-19, OHC health workers were asked the following questions:

Have you been diagnosed with COVID-19?
Do you manage confirmed COVID-19 patients?
Do you have a close relative been diagnosed with COVID-19?
Do you have a friend or neighbors diagnosed with COVID-19?
Then, participants were asked whether there was anyone living with them with suspected symptoms.
The answer to each question was "yes" or "no".

2.2.3. Accessed mental healthcare services

To determine which psychological services OCH medical staff had received, we used the following question: Did you have access to the following services: psychological materials (brochures, leaflets, or books), psychological assistance methods and techniques (through TV, Radio, Social media, or various online

platforms), and psychotherapy or counseling (individual or group therapy)?

2.2.4 Mental health assessment

We used three scales to assess the psychological impact of COVID-19, and mental health status of medical and nursing staff. The 22-item Impact of Event Scale-Revised (IESR), the 14-item Hospital Anxiety and Depression scale (HADS), and the 7-item Insomnia Severity Index (ISI) were used to evaluate distress, anxiety + depression, and insomnia respectively.

Impact of Event Scale-Revised (IES-R) is a self-report measure applied to assess subjective distress caused by a specific traumatic and stressful event. The event used for our questionnaire was the COVID-19 outbreak. The IES-R has 22 items, each with a rating scale from 0 to 4 (0 = Not at all; 1 = A little bit; 2 = moderately; 3 = Quite a bit; 4 = extremely), the scale is composed of three subscales (hyperarousal, intrusion and avoidance) [6]. The total IES-R score was categorized as follows: subclinical (0–8), mild distress (9–25), moderate distress (26–43), and severe distress (44–88) (Daniel and Weiss, 2007) [7]. *Hospital Anxiety and Depression scale (HADS) is a self-rated scale used to identify* anxiety and depressive disorders. It includes 14 items; questions 2, 4, 6, 8, 10, 12, and 14 formed the depression subscale; questions 1, 3, 5, 7, 9, 11, and 13 formed the anxiety subscale. Each question can be answered with a Likert rating scale from 0 to 3. Scores ranged from 0 to 21 for depression, and 0 to 21 for anxiety. A total score of 0 to 7 (for either subscale) indicates the absence of symptomatology, a score of 8 to 10 is suggestive of the presence of the respective state, and a score higher than 11 indicates the presence of the mood disorder [8]. *Insomnia Severity Index (ISI)* is a brief self-report instrument measuring the patient's perception of both nocturnal and diurnal symptoms of insomnia. The ISI comprises seven items assessing the precieved severity of difficulties initiating sleep, and staying asleep; satisfaction with current sleep pattern; early morning awakenings; noticeability of impairment attributed to the sleep problems; interference with daily functioning; and degree of distress concern caused by the sleep problem. Total score categories are: 0 to 7 = No clinically significant insomnia; 8 to 14 = Subthreshold insomnia; 15 to 21 = Clinical insomnia (moderate severity); 22 to 28 = Clinical insomnia (severe) [9].

2.2.5. Self-perceived health status:

The participants were asked to compare their health status before and during the COVID-19 pandemic. The answer options were: much worse, worse, almost unchanged, or getting better.

2.3. Statistical analysis

Data analysis was performed using IBM SPSS Statistics for Windows (Version 23.0). Descriptive analysis was used to describe the general data and currently accessed psychological services. For count data, frequencies and percentages were used.

3. RESULTS

3.1. Demographic characteristics of respondents

Of the 102 health workers eligible for the study, 93 filled the questionnaire (response rate, 91%). No questionnaire was excluded from the study due to incomplete data. Of the 93 successfully completed questionnaires, 24 (26%) were done using paper-and pencil method and 69 (74%) through the internet. The successful respondents comprised 62 (66.7%) women and 31 (33.3%) men, with a mean age of 30.4 years (range 23-47 years), most participants are in the age interval of 28-32 (62.4%). Of all the respondents, 71% are doctors (n= 66); 20.4% are nurses (n=19), the rest were other professionals such as biomedical engineer, and medical technicians. Half of the participants are single (53.8%), and 50.5% are living with their families (25.8% with their parents; 24.7% with their partner). Seventeen participants have a medical history, including 6 (6.5%) with a psychiatric history. During the study period, eight respondents (8.6%) had been in contact with a Covid-19+ friend, while the rest were not sure (50.5%) or had not been exposed (40.9%), Table 1.

Table 1: Demographic characteristics

Variables	Number	Percentage (%)
Total	93	100
Gender		
Male	31	33.3
Female	62	66.7
Age		
23 - 27	16	17.2
28 - 32	58	62.4
33 - 37	13	14
38 - 42	3	3.2
≥ 43	3	3.3
Marital status		
Married	40	43
Unmarried, divorced, or widower	53	57

Variables	Number	Percentage (%)
Occupation		
Medical doctor	66	70.9
Nurse	19	20.4
Medical technician	7	7.5
Department		
Ordinary	93	100
High risk	0	0
Medical History		
Mental health disorders	6	6.5
Others	17	18.3

3.2. Accessed mental healthcare services

Of all OHC health workers included in our study, 35.5% received mental healthcare services: 25.8% benefited from psychological counseling or psychiatric consultation, 10.8% had access to psychological resources available through internet and media, and only 1.1% received psychological materials such as leaflet s, brochures and pocket guides, as shown in Table 2.

Table 2: Resources of mental healthcare services

Variables		Number	Percentage (%)
Psychological counseling or psychiatric consultation	Yes	24	25.8
	No	76	74.2
psychological resources available through internet and media	Yes	10	10.8
	No	83	89.2
psychological materials	Yes	1	1.1
	No	92	98.9

3.3. Mental health assessment

3.3.1. Impact of Event Scale-Revised (IES-R) outcomes:

The IES-R scale, used to measure the psychological impact of COVID-19 outbreak, revealed a sample mean score of 33.23. Of all participants, 34 (36.6%) reported minimal psychological impact (score < 23); 14 (15.1%) rated mild psychological impact (scores 24–32); and 45 (48.4%) reported a moderate or severe psychological impact (score > 33), as shown in Table 3.

Table 3: IES-R outcomes

IES-R outcomes			
Scale scores		**Number**	**Percentage (%)**
0 - 23	Minimal psychological impact	34	36.6 %
24 - 32	Mild psychological impact	31	33.3 %
33 - 88	Moderate / severe psychological impact	28	30.1 %

3.3.2 Hospital Anxiety and Depression scale (HADS) outcomes:

Respondents' anxiety and depression levels, measured using the HAD scale, revealed a sample mean score of 17.33.

For the depression subscale, 34 (36.6%) were considered to have a normal score (score: 0-7); 31 (33.3%) were considered to have doubtful symptoms of depression (score: 8-10); and 28 (30.1%) were considered to have symptoms of depression (score: 11-21). For the anxiety subscale, 40 (43%) were considered to have a normal score (score: 0-7); 23 (24.7%) were considered to have doubtful symptoms of anxiety (score: 8-10); and 30 (32.3%) were considered to have symptoms of depression (score: 11-21), as shown in Table 4.

Table 4: HADS outcomes

Depression				Anxiety			
Scale scores		**Number**	**Percentage (%)**	**Scale scores**		**Number**	**Percentage (%)**
0 - 7	**Non-cases**	34	36.6 %	**0 - 7**	**Non-cases**	40	43 %
8 - 10	**Doubtful cases**	31	33.3 %	**8 - 10**	**Doubtful cases**	23	24.7 %
11 - 21	**Cases**	28	30.1 %	**11 - 21**	**Cases**	30	32.3 %

3.3.3. Insomnia Severity Index (ISI) outcomes:

The ISI, used to measure the patient's perception of both nocturnal and diurnal symptoms of insomnia during the COVID-19 outbreak, revealed a sample mean score of 10.59. Of all respondents, 34 (36.6%) reported no clinically significant insomnia (score < 7); 30 (32.3%) had subthershold insomnia (scores 8–14); 20 (21.5%) presented moderate clinical insomnia (scores 15–21); and 9 (9.7%) reported severe clinical insomnia (score > 22), as shown in Table 5.

Table 5: ISI outcomes

Insomnia			
Scale scores		**Number**	**Percentage (%)**
0 - 7	No clinically significant insomnia	34	36.6 %
8 - 14	Subthershold insomnia	30	32.3 %
15 - 21	Moderate clinical insomnia	20	21.5 %
22 - 28	Severe clinical insomnia	9	9.7 %

3.4. Association between different variables and the psychological impact

3.4.1. Sociodemographic variables and psychological impact

Female gender was associated with higher scores in the IES-R, HAD depression subscale, and HAD anxiety subscale, but lower scores in the ISI. Concomitant chronic illness and history of mental disorders were associated with higher scores in the HAD depression and anxiety subscales, therefore considered two risk factors of depression and anxiety. Living alone, or in isolation was associated with lower scores in the IES-R, and HAD anxiety subscale, consequently, considered a protective factor of stress, and anxiety symptoms. Occupation was considered a risk factor of stress, anxiety, depression, and insomnia, as residents and nurses had significant higher scores in the IES-R, HAD, and ISI scales. Other socio-demographic characteristics including age, geographic origin, and marital status, were not associated with IES-R, ISI, and HAD subscale scores

3.4.2. Contact history and psychological impact

Among all respondents, 7.3% had been in contact with an individual with suspected COVID-19; 3.22% reported indirect contact with an individual with confirmed COVID-19; and 1.07% reported close contact with an individual with confirmed COVID-19. Contact with an individual with suspected or confirmed COVID-19 were two risk factors of stress and anxiety, and were associated with higher scores in the IES-R, and HAD anxiety subscale.

3.4.3. Concerns about COVID-19 and psychological impact

Participant's high levels of concern about getting COVID-19 were associated with higher IES-R, HAD anxiety subscale, and ISI scores. Similarly, high levels of concern about a family member getting infected were associated with higher IES-R scores, HAD anxiety and depression subscale scores.

3.4.4. Work environment and precautionary measures and psychological Impact

Working with vulnerable cancer patients, was significantly associated with higher levels of stress, therefore considered as a risk factor of stress. Contrarily, full coverage of all OHC departments with protective measures; comfortable accommodations arranged by OHC administration; and reasonable work shift arrangement, were protective factors against stress, depression, and anxiety.

4. DISCUSSION

In December, 2019, a novel Coronavirus outbreak of pneumonia emerged in Wuhan - China, two months later it was officially named by WHO as COVID-19, and has ,since, garnered attention around the globe. The pandemic not only caused the infection of millions of people around the world, and high mortality rate, but also impacted the mental health of the general population. During the COVID-19 outbreak, the medical healthcare workers are facing enormous physical and psychological pressure, and are vulnerable to both high risk of infection and mental health problems, such as stress, depressive symptoms, anxiety, insomnia, fear, and denial. The unremitting stress healthcare workers is experiencing, not only effect their understanding, attention, and decision making ability, but could also have a lasting detrimental effect on their overall wellbeing. Therefore protecting the mental health of medical staff is important for an optimal control of the epidemic and their own long-term mental health. Historically, when a population is struck by large-scale, and deadly disasters of various type, consequent mental health problems that arise differ across different periods [10]. We therefore chose to survey health care providers in a cancer treatment facility, in the discrete window of time soon after the initiation of the outbreak of Coronavirus disease. In order to conduct a comprehensive analysis, we used different scales to assess the mental health of medical staff. Our observational study was conducted in unusual circumstances, in that there were restrictions on movement, and most activities, and person-to-person close contacts were reduced to the minimum for fear of the spread of the infection. Therefore conducting interviews was difficult, hence the use of the internet survey.

Our single-center, survey showed that 28 (30.1%), 30 (32.3%), 28 (30.1%), and 29 (31.2%)

healthcare workers reported stress, anxiety, depression, and insomnia symptoms. Recently, a study conducted at Tongi Hospital in Wuhan-China, with the aim to assess the immediate psychological impact of COVID-19 on 5062 Health Workers, showed 29.8% of medical staff reported high stress levels, 13.5% reported depression, and 24.1% reported anxiety symptoms [11]. In another survey conducted among 994 medical and nursing staff working in Wuhan, using PHQ-9, GAD-7, ISI, and IES-R scores, 36.9% of participants had subthreshold mental health disturbances, 34.4% reported mild disturbances, 22.4% had moderate disturbances, and 6.2% reported severe disturbance in the initial phase of the viral pandemic [12]. In 2003, a study during Taiwan's SARS outbreak, including 1257 HWs, 74.2 % of participants reported depression, and 77.4% reported anxiety and worrying. As well, during the Hong Kong SARS outbreak in 2003, a study involving 652 frontline medical staff showed that 57% were found to have experienced psychological distress, and 68% of participants reported high levels of job-related stress. We note that our results are relatively similar to those reported in studies conducted in Wuhan during the initial phase of the COVID-19 pandemic. On the contrary, the morbidity of anxiety, depression, and stress of HWs in our study is relatively lower, compared to the results of previous studies during SARS outbreak [13-15], which may be related to early protective measures implemented by OHC's administrators in response to COVID-19 in the early stage, to the fact that medical staff of OHC are working in low risk departments, and the use of different measurements in the studies conducted in the initial phase of SARS epidemic.

In line with the results of recent studies conducted during COVID-19 pandemic [11, 16], among the sociodemographic characteristics, the common risk factors for anxiety, depression symptoms, and acute stress, were female gender, concomitant chronic illness, and history of mental disorders. These two risk factors have already been widely discussed, and a considerable number of studies have suggested that women and people with concomitant physiological or psychological diseases have higher risk of depression, anxiety, and psychological stress [17-19]. Moreover the majority of HWs in different studies are female (63% in our study), and since numerous studies have confirmed the plight of working women [17], priority consideration should be given to female HWs. Meanwhile, our study showed that occupation is a significant risk factor of stress, anxiety, depression symptoms, and insomnia, as residents and nurses presented high rates of psychological disturbances than other participants. Our results are consistent with those reported in the study of Zhou et al. in Wuhan [11]. Previous studies in SARS-affected and H1N1 influenza-affected hospitals confirmed this finding [20]. The more plausible explanation is that nurses and residents have more and close contact with patients [20, 21].

Our study was conducted in a cancer treatment center, and despite the unprecedented circumstances of COVID-19 outbreak, medical staff still provide continuous care for cancer patients under strict protective measures for nosocomial infection. Therefore, no participant in our survey was diagnosed with COVID-19, 7.3% had contact with an individual with suspected COVID-19; 3.22% reported indirect contact with an individual with confirmed COVID-19; and 1.07% reported close contact with an individual with confirmed COVID-19. The results of the Chinese study showed that medical staff in Tongji Hospital in Wuhan had significant high risk of depression once infected with COVID-19, and increased risks of stress, anxiety, and depression, once one of their family members or relatives were infected with COVID-19 [11]. Consistent results are reported in our study, as contact with an individual with suspected or confirmed COVID-19 were two risk factors of stress and anxiety, and significantly associated with higher scores in the IES-R, and HAD anxiety subscale.

Since the very beginning of COVID-19 outbreak, the Moroccan authorities declared national lockdown and took drastic protective measures to prevent the spread of the infection. On a local scale, decisions-makers of Mohammed VI University Teaching Hospital of Marrakesh were alert to the mental health disturbances that HWs might encounter in the initial phase of COVID-19, and therefore implemented various psychological protective measures. Hence, 68.3% of our participants were satisfied with the full coverage of all OHC departments with protective measures; comfortable accommodations arranged by OHC administration; and reasonable work shift arrangement. All these measures were protective factors against stress, depression, and anxiety. Consistent results were reported in Zhu Zhou et al., as 83.6% of HWs expressed their satisfaction with sufficient logistical support and comfortable accommodations provided by Tongji Hospital, 79.5% were satisfied with the full coverage of all departments with protective measures for nosocomial infection, and 91% had received hospital-based, department-based, and ward-based care provided by hospital administrators and department leaders. Furthermore, 83 % of medical staff had reasonable work shift arrangement, which was an independent protective factor for depression symptoms, and acute stress [11].

The hospital's psychiatric department is trying to support staff, by setting up a help-line. However, only 25.8% of our participants sought psychological help. Our results are in accordance with findings reported by Zhu Zhou et al. as only 5% percent of HWs joined an online group offering relaxation techniques made available by the hospital's psychiatric team. Researchers previously explained these findings, by identifying some factors that inhibit individuals from

seeking professional psychological help, such as the desire to avoid experiencing painful feeling [22], the desire to avoid discussing personal information [23-25]. However, the most cited reason is the stigma of seeking treatment [26, 27].

Finally, our center experience suggests that psychological impact on healthcare workers can be alleviated by timely implementation of proper psychological protective measures. Therefore, a detailed psychological crisis intervention plan should be developed by offering psychological assistance for medical workers to express their psychological concerns with trained team of mental health practitioners, and by providing online courses to help raise awareness of psychological impact of COVID-19 pandemic, as a stressful event, in order to guide medical staff. Moreover, regular visits to medical workers by psychological counselors in order to provide support, seems to be a better option, since most participants in our study didn't seek psychological counseling. In this same regard, and in addition to psychological support, hospitals should provide reasonable work shift arrangement, and comfortable accommodations, which were significant protective factors for stress, anxiety, and depression symptoms.

Our study, a single-center, cross-sectional survey has some limitations. First, it was conducted in unusual circumstances, where person-to-person contacts were reduced to the minimum. It was thus difficult to conduct interviews. Second, the study was conducted early in the outbreak and only in a cancer treatment center treating non COVID-19 patients, which may limit the generalization of the findings.

5. CONCLUSIONS

During the initial phase of COVID-19 outbreak in Morocco, about one-third of the respondents reported moderate to severe psychological impact, and more than half rated their anxiety, depression symptoms, and insomnia as moderate to severe. Female gender, history of chronic illness, residents and nurses, history of contact with suspected or confirmed COVID-19 patients, were associated with higher levels of stress, depression, anxiety, insomnia, and greater psychological impact of the outbreak. Another promising finding was that specific up-to-date and accurate health information and certain precautionary measures were associated with a lower psychological impact of the outbreak and lower levels of stress, anxiety, and depression. Epidemiological data on psychological impact, and mental health consequences with the advent of COVID-19 and their management, and prevention has yet to be explored in future studies to respond to these challenges.

Competing Interests: The authors declare no competing interest.

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