ORIGINAL ARTICLE

Mental health status of healthcare workers at a third line tunisian hospital during COVID-19 pandemic

La santé mentale du personnel de santé d'un hôpital tunisien de troisième ligne durant la pandémie de COVID-19

Islam Mejri [1], Imen Youssfi [2], Tasnim Znegui [1], Nejla Mechergui [2], Hamdi El Kefi [3], Rim Hammami[4], Sarra Chenik [5], Ameni Ben Mansour [6], Soumaya Ben Saad [6], Zied Moatemri [1]

1. *Pneumology Department, Military Hospital of Tunis, Tunis, Tunisia / Faculty of Medicine of Tunis, University of Tunis El Manar, Tunis, Tunisia*
2. *Occupational Health Department, Charles Nicolle Hospital of Tunis, Tunis, Tunisia, / Faculty of Medicine of Tunis, University of Tunis El Manar, Tunis, Tunisia*
3. *Psychiatry Department, Military Hospital of Tunis, Tunis, Tunisia / Faculty of Medicine of Tunis, University of Tunis El Manar, Tunis, Tunisia*
4. *Emergency Department, Military Hospital of Tunis, Tunis, Tunisia / Faculty of Medicine of Tunis, University of Tunis El Manar, Tunis, Tunisia*
5. *Cardiology Department, Military Hospital of Tunis, Tunis, Tunisia / Faculty of Medicine of Tunis, University of Tunis El Manar, Tunis, Tunisia*
6. *Pneumology C Department, AbderrahmenMami Hospital of Ariana, Tunisia / Faculty of Medicine of Tunis, University of Tunis El Manar, Tunis, Tunisia*

Abstract

Introduction: During the COVID-19(coronavirus-19 disease) pandemic, health care workers (HCWs) faced the risk of infection and distressing work to meet health requirements. The aim of the present stud ywas to evaluate perceptions of HCWs of their security at work in COVID-19 units and their coping strategies, at the military hospital of Tunis, during the second wave of COVID-19.

Methods: A cross-sectional study was conducted via an auto-questionnaire on February 2021.HCWs of the military hospital of Tunis were included. Participants were asked about their perceived security at work in COVID-19 units and their coping behaviors. Mental disorders were assessed, via qualitative questionnaires.

Results:A total of 110 HCWs' responses were collected. Fifty-eight participants (52.7%) were females. The mean age was 33.7 years (SD 9.3). They were doctors at 45.5% and nurses at 39.1%. HCWs declared having worked in COVID-19 units in 81.8% of cases. The participants reported their fears about being infected in 58.2% and infecting family members in 85.5% of cases. Protective factors included information about the disease (80%), availability of personal protective equipment (PPE) (80.9%), support from colleagues(72.7%)or superiors at work (50.9%), and ability to communicate with others (63.6%). Depression, anxiety, and insomnia were found in respectively 25.5%, 30%, and 41.8% of HCWs. In multivariate analysis, suffering from a traumatic distress was significantly associated with anxiety and depression ($p<0.01$ and, $p<0.05$ respectively). In addition, insomnia severity was linked to age ($p=0.05$) and having colleagues infected with COVID-19 ($p<0.05$).

Conclusion: In the present study, HCWs of the military hospital of Tunis stated having high levels of insomnia, anxiety, and depression since the early outbreak of the COVID-19 pandemic. These mental disorders may have a negative impact on the quality of life of HCWs and should be enhanced by psychological support and preventive measures.

Keywords: COVID-19, Mental health, Healthcare workers, Military Hospital, Tunisia

Résumé

Introduction : Pendant la pandémie de COVID-19(coronavirus-19 disease), le personnel hospitalier était confronté au risque d'infection et il a assuré un travail pénible pour répondre aux exigences sanitaires.

Objectif : Décrire la perception du risque professionnel et les stratégies d'adaptation, chez les professionnels de santé de l'hôpital militaire de Tunis, durant la pandémie de COVID-19.

Méthodes : Il s'agissait d'une étude transversale, menée en février 2021, ayant inclus les professionnels de santé de l'hôpital militaire d'instruction de Tunis. Les participants ont répondu à un questionnaire évaluant leur perception des risques auxquels ils étaient confrontés dans les unités COVID-19 et leurs comportements d'adaptation. Les troubles mentaux ont été évalués via des questions qualitatives.

Résultats : Un total de 110 réponses des participantsa été recueilli. Cinquante-huit participants (52,7%) étaient des femmes. L'âge moyen était de 33,7 ans (ET 9,3). Ils étaient des médecins dans 45,5% et des infirmiers dans 39,1%. Le personnel hospitalier a déclaré avoir travaillé dans des unités COVID-19 dans 81,8% des cas. Les participants ont déclaré avoir peur d'être infectés dans 58,2% des cas et de contaminer leurs proches dans 85,5% des cas. Les facteurs de protection étaient : l'information sur la maladie (80%), la disponibilité des équipements de protection individuelle (80,9%), le soutien des collègues (72,7%) ou des supérieurs au travail (50,9%), et la capacité à communiquer avec les autres (63,6%). La dépression, l'anxiété et l'insomnie ont été constatées dans 25,5%, 30% et 41,8%, respectivement. L'étude multivariée a montré que le fait de vivre un stress traumatique était significativement associé à l'anxiété et la dépression ($p<0,01$ et $p<0,05$, respectivement). La sévérité de l'insomnie était liée à l'âge ($p=0,05$) et au fait d'avoir des collègues infectés par le COVID-19 ($p<0,05$).

Conclusion: Dans cette étude, le personnel de santé de l'hôpital militaire de Tunis a déclaré avoir des niveaux élevés d'insomnie, d'anxiété et de dépression depuis le début de la pandémie de COVID-19. Cet épuisement mental peut retentir sur la qualité de vie et nécessite un soutien psychologique et des mesures préventives précoces.

Mots clés : COVID-19, Santé mentale, Professionnels de santé, Hôpital militaire, Tunisie

Correspondance

Tasnim Znegui
Pneumology Department, Military Hospital of Tunis, Tunis, Tunisia / Faculty of Medicine of Tunis, University of Tunis El Manar, Tunis, Tunisia
Email: zneguitasnim@gmail.com

INTRODUCTION

The COVID-19 (coronavirus-19 disease) pandemic spread rapidly across the world and has created unprecedented challenges for health care providers. The current evidence suggests that people infected with COVID-19 could endure mental health problems so that a psychiatric pandemic is co-occurring with the COVID-19 pandemic (1). The epidemiological distribution of mental health problems is different in the general population compared with that in higher-risk groups such asCOVID-19 patients and health care workers (HCWs).

HCWs were faced suddenly with a stressful situation generated by the insufficient access to protective equipment, the extreme workload causing physical exhaustion, and social isolation, due to quarantine precautions. Indeed, on the second wave, the COVID-19 pandemic has taken a heavy toll on the Tunisian national health system. Understaffed hospitals struggled to cope with the resurgence of the virus including the third level of care (2). At the military hospital of Tunis, 100 to 150 patients with suspected COVID-19 consult in emergency department with an estimated hospitalization rate of 10 to 15 per day according to hospital statistics. This hospital operated at 100% occupancy including resuscitation beds.

HCWs were rapidly contaminated, which led to anxiety within the work teams. HCWs, first-line fighters at a high risk of contamination, may frequently present with mental health symptoms facing this continuous source of distress.

Little is known about how to cope with this distress and how to optimize the psychological resilience of HCWs. Recognizing sources of mental problems can help decision-makers in developing specific preventive strategies (3,4).

Most of the current COVID-19 research focused on physical health, but research data on mental health at the early outbreak of the COVID-19 pandemic are lacking (4).An evaluation of the psychological impactofCOVID-19amongHCWs is required to provide supportive data for the targeted interventions on their psychological health during this pandemic.

The aim of this study was to describe perceptions of HCWs, of their security at work in COVID-19 units, their coping strategies, and the frequency of their anxiety, depression, and insomnia, at the military hospital of Tunis, during the COVID-19 pandemic.

METHODS

Study Design

We performed a cross-sectional study in February 2021. We included HCWs of the military hospital of Tunis who responded to a self-administrated questionnaire. Standard precautions are used for all patients' care, in accordance with the recommendations (6) to prevent contamination and to improve infection control. The local committee for the protection of persons approved the questionnaire (N°14/2022/CLPP/Military Hospital of Tunis).

Inclusion/Exclusion Criteria and Procedure

Our study included active HCWs (doctors, nurses, and medical technicians) working in the medical departments on the frontline and non-front line staff working at the military hospital of Tunis. Incomplete responses to the questionnaire were excluded.

Responses were anonymously collected.

Study Survey

The study survey included two parts:

- First part : we collected socio-demographic and occupational data (age, sex, marital status, title, specialty, seniority, work unit). Then, we asked participants if they had worked in aCOVID-19unit. We also asked about quarantine after their shift.

- Second part: we developed four sections to assess clinical data, perception of contamination risk level, coping strategies, and psychological responses.

**Clinical data*

The first section consisted of four questions about clinical data and medical history. HCWs were asked about whether they have been tested positive for COVID-19 and whether they have had colleagues or family members contaminated or not.

**Perception of contamination risk level*

The second section examined the perception of contamination risk levels via 9 questions.

**Coping strategies*

The third section consisted of 20 questions designed to identify stress factors and coping strategies used by HCWs in response to the COVID-19 pandemic.

**Psychological responses*

We used the French versions of the Hospital Anxiety and Depression Scale (HAD) (7) to assess depression and anxiety and the Insomnia Severity Index (ISI) to assess insomnia among HCWs (7).

Data resources/Measurements

Anxious symptoms were assessed via the Hospital Anxiety and Depression Scale (HAD) including 14 items. Participants reported their symptoms using a Likert scale (ranging from 0to 3). High scores indicate severe anxiety and depression. A cut-off score of 10 indicates that depression or anxiety is certainly present.

Insomnia was assessed via a 7-item Insomnia Severity Index (ISI) (8).We used a 5-point Likert rating scale (0 = no problem; 4 = very severe problem). A total score of more than 10 indicates the presence of insomnia (9) .The sensitivity and specificity of this cutoff were validated in a previous study(10).

Statistical Analyses

Descriptive statistics were used to present the data collected during the survey. All continuous variables were expressed as mean ± SD (Standard Deviation) or median

(IQR: Q1; Q3), and categorical variables as percentages.

Univariate analysis was performed to explore independent influence, clinical and professional data on mental health dimensions, such as insomnia, anxiety and depression. The$\chi 2$ test was used for variables that follow the normal distribution. Mann-Whitney test was used for variables that did not follow the normal distribution. All hypotheses were tested at a significance level of 0.05.

Multiple analysis was performed for the variables that are significantly associated with the different mental health dimensions with their odds ratio (OR), 95% confidence interval (CI) and p-value. Data analyses were run via SPSS software, version 25.

RESULTS

Socio-demographic and occupational Characteristics

The socio-demographic and occupational Characteristics are summarized in Table1.

Table1. Socio-demographicandoccupationalcharacteristicsofhealthcare . during the COVID-19 pandemic at the military hospital of Tunis, in 2021

Variables	N (%)
Gender	
Male	52(47.3)
Female	58(52.7)
Marital stats	
Single	57(51.8)
Married	51(46.4)
Divorced	2(1.8)
Numberofchildren	
0	65(59.1)
1	17(15.5)
>=2	28(25.5)
Placeofresidence	
Alone	12(10.9)
Withfamily	85(77.3)
Withroommates	13(11.8)
Occupationalgrade	
Doctor	50(45.5)
Nurse	29(26.4)
Medicaltechnician	21(19.1)
Otherhospitalstaff	10(9)
Department	
Medicaldepartment	81(73.7)
Surgicaldepartment	17(15.4)
Emergency-Intensivecare	12(10.9)
Workunits	
COVID-19 Units	90(81.8)
InpatientsUnits	20(18.2)
Workhoursperday	
<8	42(38.2)
>8	68(61.8)

A total of 110 HCWs responded to the questionnaire. The sex ratio was 0.89. The mean age was 33.7±9.3 years [23; 60]. The percentage of married participants was 46.4% (n=51). A total of 41.9% (n=45) had at least one child. The participants declared that they live with their families in 77.3 % (n=85).They were doctors in 45.5% (n=50), nurses in 26.4% (n=29) and health technicians in 19.1% (n=21).The median professional seniority was 4years (IQR: 2; 17)[1; 37]. HCWs worked in medical services in 73.7% (n=81) and in COVID-19 units in 81.8%(n=90).Work hours were more than 8 hours per day in 61.8 %(n=68).

Medical data

Twenty-four (22.8%) of the participants declared having a medical history and three ofthem declared having at they have a psychiatric illness. A total of 30.9% (n=34) declared to have tested positive for COVID-19, of whom two declared not to work in COVID-19 units. HCW shave declared to have cases of contamination of work colleagues in 85.5% (n=94) and of family members or friends in 56.4% (n=62). They also reported having been exposed to potentially traumatic distress such as health problems, death, and family conflict in 33.6% (n=37) of cases.

Perception of contamination risk level

Table 2 indicates the frequency of positive (yes) responses to the questions assessing HCWs' perceptions concerning COVID-19 contamination risk level.

Sixty-five percent (n=72) of participants perceived that their jobs put them at a high risk of contamination. They reported that th eyfeltextrastressatworkduringtheCOVID-19outbreak in 73.6% (n=81) of cases. Our participants reported their concerns about being infected in 58.2% (n=64) and infecting others in 85.5% (n=94). They perceived that their families and friends were afraid of being contaminated by their contact in 71.8% (n=79).

Table2. Perceptions of COVID-19 contamination risk level at the military hospital of Tunis in 2021.

Questions	Positives responses, n (%)
I thought my work put meat agreat risk	72(65.5)
I felt extra stress at work	81(73.6)
I was afraid of being infected with COVID-19	64(58.2)
I felt I had little control over the situation at work	57(51.8)
I thought I probably wouldn't survive if I got infected with COVID-19	24(21.8)
I thought about quitting work because of COVID-19	14(12.7)
I was afraid to contaminate others	94(85.5)
My family and friends were afraid of being contaminated by my contact	79(71.8)
Many people have avoided seeing my family because of my work	53(48.2)

Coping strategies

Nineteen (17.3%) participants declared that they had to change their residence to protect their families. Learning about COVID-19, its prevention, and the mechanism of transmission were declared by 67(60.9%) of the participants.

Table 3 indicates the frequency of positive (yes) responses to the questions assessing coping strategies. Almost 37 % (n=40) of participants declared that their work was no longer important compared to their health (93.6%, n=103) and their family relationships (95.5%, n=105).

Table3. Coping strategies of professionals during the COVID-19 pandemic atthe military hospital of Tunis in 2021

Variables	N(%)
Changes in priorities	
Healthstatus	103(93.6)
Family relationships	105(95.5)
Friend relationships	91(82.7)
Colleagues relationships	83(75.5)
Work	70(63.6)
Spiritual beliefs	61(55.5)
Protective Factors	
Media Communication	62(56.4)
Country's Directives	35(31.8)
Information about the Disease	88(80.0)
Protective Measures At Work	89(80.9)
Support From Hospital Administration	38(34.5)
Support From Superiors At Work	56(50.9)
Support From Family	94(85.5)
Support From Colleagues	80(72.7)
Support From Friends	81(73.6)
Being Able To Talk About It With Someone	70(63.6)
Religious Beliefs	78(70.9)

Among protective factors that can reduce the stress of HCWs, we can point to information about the disease (80%, n=88), availability of personal protective equipment (PPE) (80.9%, n=89), support from colleagues (72.7%, n=80), and superiors at work (50.9%, n=56) and ability to communicate with others (63.6%, n=70).

Psychological responses

Table 4 presents the HAD and ISI questionnaires, the median score of each item, and the total scores.

Table 4. Results of Depression, Anxiety, and Insomnia questionnaires during COVID-19 pandemic among health care workers, at the military hospital of Tunis in 2021.

Questionnaires	Median (IQR)
Total HAD	16.5 (11 ;20)
Total depression scale	9 (6;11)
Total anxiety scale	8 (5;11)
Total ISI	8.5 (2;12.25)

Notes: HAD: Hospital anxiety and depression,IQR: Inter-quartile-range, ISI: Insomnia severity index.

The mean scores for anxiety and depression were 8.31(SD 4.27) and 8.43(SD 3.63), respectively. Anxiety and depression were found in 30% and 25.5% of HCWs. The mean score of ISI was 8.71(SD 7.64). Insomnia was found in 41.8% (n=46). This disorder was moderate and severe in respectively 6.4% (n=7)and 10%(n=11).

In the present study, anxiety, and depression were found in respectively 32.3% and 23.5% of the HCWs who tested COVID-19 positive (p=0.08). Insomnia was found in 32.5% (n=11) of the HCWs who tested COVID-19 positive (p=0.09)

Multivariable analysis

Anxiety and depression both varied significantly with suffering from traumatic distress (p=0.002) and (p=0.01), respectively. Insomnia severity was linked to age (p=0.05) and having colleagues infected with COVID-19 (p=0.04).

Table 5 shows the associations between baseline variables and mental health disorders.

Table5. Associations between baseline variables and mental health disorders among the health care workers at the military hospital of Tunis during COVID-19 pandemic, in 2021.

Variables	Anxiety(N=33)			Depression(N=28)			Insomnia(N=46)		
	OR	[CI95%]	p value	OR	[CI95%]	p value	OR	[CI95%]	p value
Age	1.12	[-2.47;5.67]	0.43	0.78	[-4.96;3.85]	0.8	**0.2**	**[-7.02;0.37]**	**0.05**
Gender	0.93	[0.41;2.11]	0.86	0.86	[0.36;2.03]	0.73	2.05	[0.94;4.46]	0.06
Military state-valuing hours	1.11	[0.48;2.52]	0.80	2.08	[0.87;4.97]	0.09	1.56	[0.72;3.35]	0.25
Working hours	0.92	[0.34;2.87]	0.86	0.63	[0.26;1.50]	0.29	0.79	[0.36;1.73]	0.56
WorkinginCOVID-19 units	1	[0.34;2.87]	1	0.75	[0.25;2.20]	0.60	1.09	[0.40;2.94]	0.85
Compensatory rest	1.04	[0.43;2.47]	0.92	1.19	[0.48;2.95]	0.69	0.58	[0.25;1.34]	0.20
Changing habits	1.09	[0.37;3.17]	0.86	1.05	[0.34;3.25]	0.92	0.77	[0.28;2.15]	0.62
Attending training session	0.82	[0.35;1.88]	0.63	0.44	[0.18;1.07]	0.06	1.16	[0.53;2.54]	0.69
COVID-19infection	1.17	[0.49;2.81]	0.71	0.86	[0.33;2.21]	0.75	1.62	[0.71;3.66]	0.24
Family's infection	1.33	[0.39;4.50]	0.63	1.04	[0.43;2.48]	0.92	0.86	[0.40;1.86]	0.71
Colleagues 'infection	0.9	[0.39;2.04]	0.80	1.02	[0.30;3.49]	0.96	**3.65**	**[0.97;13.66]**	**0.04**
Traumatic distress	**3.66**	**[1.55;8.64]**	**0.002**	**3.14**	**[1.29;7.65]**	**0.01**	2.12	[0.95;4.75]	0.06

Factors associated with mental health disorders were investigated using χ 2 test and Mann-Whitney tests and reported as OR and CI95 %. Significant values are shown in bold. CI: Confidence Interval. OR: Odds Ratio.

DISCUSSION

Overview of the epidemiology of mental health problems in COVID-19

During the COVID-19 pandemic, HCWs had high prevalence rates of severe insomnia, anxiety, and depression. They also had risk factors for developing these disorders. Therefore, these symptoms, in addition to the daily fighting against COVID-19, suggest that they must cope with psychological distress (11). In Tunisia, during the second wave of the COVID-19 pandemic, HCWs faced a particularly stressful situation, with a high risk of contamination and limited access to PPE, hence, the emergence of depression and anxiety symptoms(12).

Contamination risk level

We have found that almost a third of our participants declared to have tested positive forCOVID-19. They also declared contamination of their work colleagues in 85.5% and their family members or friends in 54.6%.This is in line with other studies reporting a high prevalence of infection among HCWs in the USA, China, and Italy (13–15). The contamination of HCWs could be explained by working without adequate PPE, which increases the fear of contracting the infection. Moreover, the psychological impact of COVID-19 among HCWs who tested positive is another global health concern (16).

In our study, anxiety, and depression were found in respectively 32.3% and 23.5% of the HCWs who tested COVID-19 positive (p=0.08). Insomnia was found in 32.5% of these HCWs. Previous studies suggested that infectious out breaks affected the mental health of the patients.

HCWs infected by COVID-19, like the other patients, may experience anxiety symptoms, fear, and a lack of hope regarding the uncertainties in treatment. In this vulnerable population, several factors influence their mental health, which may include isolation, prolonged hospitalization, and lack of social support (1).

Coping strategies

HCWs face the emergency not only at the physical level, as they are continuously engaged inpatient assistance and care, but they have to cope with a huge psychosocial burden. This requires adapting themselves to the increasing distress while trying to bring out an effective coping strategy (17). Coping behaviors are then used by HCWs as a resource for well-being. In our study, 17% of the HCWs reported finding themselves obliged to change their residence to protect their families. Kisely et al.(18) also reported in their review that HCWs may need alternative housing to reduce the risk of contamination of family members.

We have found that information about the disease, availability of PPE, support from colleagues or superiors at work, and the ability to communicate with others are protective factors that can reduce the stress of the HCWs. Similar findings are described by several studies.

HCWs used problem-focused coping strategies with initiating actions to reduce the risk of infection. One of these strategies is learning about COVID-19, its prevention, and the mechanism of transmission (19). In another study, support from family and friends during infectious disease, as well as a positive attitude, has previously been shown to reduce stress (20).

Psychological responses

Studies have shown that HCWs working as frontline workers had varying levels of psychosocial burden during this pandemic (1). The frequency of depression, anxiety, and insomnia in military HCWsin this study was high (30%, 25.5%, and 41.8%, respectively). It is worth noting that the frequency of mental health problems in this population was lower than that of HCWs in local hospitals from the study by Huang and Zhao which revealed a high frequency of depression and anxiety in 50.7% and44.7%, respectively (21).

According to our results, anxiety and depression varied significantly with suffering from traumatic distress (p=0.002) and (p=0.01), respectively. Insomnia severity was linked to age (p=0.05) and having colleagues infected with COVID-19 (p=0.04).

HCWs are directly involved in infected patients' management: their diagnosis, treatment and care, and even in the death process. They are more vulnerable to psychological disorders such as depression and anxiety (22).

The study by Pan et al. (23) also showed that more symptoms of anxiety and insomnia appeared in military HCWs with the increase in age. This result indicates that older military HCWs may experience more occupational exhaustion, insomnia, and other pressures.

In the study by Schmulson et al.(24), the presence of psychological distress and insomnia were more common among HCWs having a colleague diagnosed with COVID-19 versus not (64.6%vs. 38.5%, p=0.089).

Implications for future mental health research in COVID-19

Some practical suggestions could be useful to improve the mental health of military HCWs in public health emergencies. First, more attention should be paid to specific groups, such as first-line workers, with support provided via "psychological-social" interventions. Second, it is not advisable to check information about COVID-19 frequently. Finally, interventions to reduce stress in the workplace are needed.

Limitations

This is a short-term (one month) cross-sectional observational study with selective recruitment. In addition, it was a study conducted in a third line of health care services including a small group of population.

However, the psychological impact of COVID-19 may increase shortly, implying the need for future studies. This study has been of great help to us in dealing with this health crisis. A long-term evaluation of this intervention is needed.

CONCLUSION

In the present study, HCWs of the military hospital of Tunis stated having high levels of insomnia, anxiety, and depression since the early outbreak of the COVID-19 pandemic. The risk of infection appeared to increase the severity of insomnia. These mental disorders may have a negative impact on both the social and professional quality of life of HCWs. These consequences on mental health were predictable and should encourage further psychological support and preventive measures.

REFERENCES

1. Hossain MM, Tasnim S, Sultana A, Faizah F, Mazumder H, Zou L, et al. Epidemiology of mental health problems in COVID-19: a review. F1000Research. 2020;9:636.
2. Bunouh, Abdelala. The devastating impact of covid-19 on the health system in Tunisia. Moroccan Journal of Public Heath, [S.l.], v. 2, n. 1, p. 22-44, july 2021.
3. Cai H, Tu B, Ma J, Chen L, Fu L, Jiang Y, et al. Psychological impacts and coping strategies of front-line medical staff during COVID-19 outbreak in Hunan, China. Med Sci Monit. 2020;26.
4. Lee S-H, Juang Y-Y, Su Y-J, Lee H-L, Lin, Y-H, Chao C-C. Facing SARS: psychological impacts on SARS team nurses and psychiatric services in a Taiwan general hospital. Gen Hosp Psychiatry. 2005;27(5):352-8.
5. Qiu J-Y, Zhou D-S, Liu J, Yuan T-F. Mental wellness system for COVID-19. Brain Behav Immun. 2020;87:51-2.
6. The INEAS guides means of protection around the patient suspected of or suffering from COVID-19 [Online]. 2020. Available : https://www.ineas.tn/fr/actualite/synthese-du-guide-parcours-du-patient-suspect-ou-confirme-de-la-COVID-19-version-novembre.
7. Snaith RP. The hospital anxiety and depression scale. Health Qual Life Outcomes. 2003;1(1):29.
8. Gagnon C, Belanger L, Ivers H, Morin CM. Validation of the insomnia severity index in primary Care. J Am Board Fam Med. 2013;26(6):701-10.
9. Morin CM, Belleville G, Bélanger L, Ivers H. The insomnia severity index: psychometric indicators to detect insomnia cases and evaluate treatment response. Sleep. 2011;34(5):601-8.
10. Yu DSF. Insomnia Severity Index: psychometric properties with Chinese community-dwelling older people: Insomnia Severity Index. J Adv Nurs. 2010;66(10):2350-9.
11. Fava GA, McEwen BS, Guidi J, Gostoli S, Offidani E, Sonino N. Clinical characterization of allostatic overload. Psychoneuroendocrinology. 2019;108:94-101.
12. Slama H, El Kefi H, Taamallah K, Stambouli N, Baffoun A, Samoud W, et al. Immediate psychological responses, stress factors, and coping behaviors in military health-Care professionals during the COVID-19 pandemic in Tunisia. Front Psychiatry. 2021;12:622830.
13. Ehrlich H, McKenney M, Elkbuli A. Protecting our healthcare workers during the COVID-19 pandemic. Am J Emerg Med. 2020;38(7):1527-8.
14. Wang J, Zhou M, Liu F. Reasons for healthcare workers becoming infected with novel coronavirus disease 2019 (COVID-19) in China. J Hosp Infect. 2020;105(1):100-1.
15. Chirico F, Nucera G, Magnavita N. COVID-19: Protecting healthcare workers is a priority. Infect Control Hosp Epidemiol. 2020;41(9):1117-1117.
16. Zhou S-J, Zhang L-G, Wang L-L, Guo Z-C, Wang J-Q, Chen J-C, et al. Prevalence and socio-demographic correlates of psychological health problems in Chinese adolescents during the outbreak of COVID-19. Eur Child Adolesc Psychiatry. 2020;29(6):749-58.
17. Cerami C, Santi GC, Galandra C, Dodich A, Cappa SF, Vecchi T, et al. Covid-19 Outbreak in Italy: Are we ready for the psychosocial and the economic crisis? Baseline findings from the psyCovid study. Front Psychiatry. 2020;11:556.
18. Kisely S, Warren N, McMahon L, Dalais C, Henry I, Siskind D. Occurrence, prevention, and management of the psychological effects of emerging virus outbreaks on healthcare workers: rapid review and meta-analysis. BMJ. 2020;m1642.
19. George CE, Inbaraj LR, Rajukutty S, de Witte LP. Challenges, experience and coping of health professionals in delivering healthcare in an urban slum in India during the first 40 days of COVID-19 crisis: a mixed method study. BMJ Open. 2020;10(11):e042171.
20. Xiang Y-T, Yang Y, Li W, Zhang L, Zhang Q, Cheung T, et al. Timely mental health care for the 2019 novel coronavirus outbreak is urgently needed. Lancet Psychiat. 2020;7(3):228-9.
21. Huang Y, Zhao N. Generalized anxiety disorder, depressive symptoms and sleep quality during COVID-19 outbreak in China: a web-based cross-sectional survey. Psychiatry Res. 2020;288:112954.
22. Saadati Rad MT, Poorhosein Fookolaee S. Recommendations for improving the mental health of healthcare professionals during the COVID-19 pandemic. Iran J Psychiatry Behav Sci. 2020;14(2).
23. Pan X, Xiao Y, Ren D, Xu Z, Zhang Q, Yang L, et al. Prevalence of mental health problems and associated risk factors among military healthcare workers in specialized COVID-19 hospitals in Wuhan, China: A cross-sectional survey. Asia-Pac Psychiatry. 2022;14(1).
24. Schmulson M, Gudiño-Zayas M, Hani A. The impact of COVID-19 pandemic on neurogastroenterologists in Latin America: Results of an online survey. J Clin Gastroenterol. 2021;55(8):684-90.

between base line variablesandmentalhealthdisorders among the health care workers,at the military hospital of Tunis during COVID-19 pandemic, in2021.