Psychological Impact of a Sanitary Crisis on Health Care Workers in Tunisia: The COVID-19 as an Example

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Abstract

Background: The massive spread of the COVID-19 being relatively deadly, leads to psychological pressures dominated by an atmosphere of panic and worries mainly among Health Care Workers (HCWs). Only few studies have evaluated this impact on HCWs mental health in Tunisia.

Aim: We aimed at determining the prevalence of COVID-19 fear and its associated factors among HCWs at a University Hospital in Tunisia.

Methods: We conducted a cross sectional study among HCWs staff in the University Hospital Tahar Sfar Mahdia which is located in the Central-East part of Tunisia in December 2020. The fear of corona virus disease was assessed using the valid French version of the Fear of Covid-19 Scale (FCV-7).

Results: A total of 173 professionals were recruited with a mean age of 35.3 ± 9.4 years. Among them, 66% were women. One third of participants (33.3%) were medical professionals. Almost, 68% have experienced a high level of fear.

Our survey showed a significantly higher level of fear among females 70.1% and elderly people 60.8%. It was positively associated ($p < 0.05$) with anxiety and depression, high risk perception and the responsibility degree of being a virus vector for their loved ones.

Anxiety and depression disorders (standardized $\beta = 3.118$, CI = 0.545-5.832, $p = 0.018$), high risk perception ($\beta = 3.321$, CI = 0.097-6.545, $p = 0.044$), knowledge about Covid-19 transmission ($\beta = 2.586$, CI = 0.439-4.734, $p = 0.019$), degree of responsibility ($\beta = 3.130$, CI = 0.373-5.887, $p = 0.026$), being a doctor ($\beta = -6.475$, CI = -8.785- -4.165, $p = 0.001$) and Perceived Vulnerability to Disease ($\beta = 0.26$, CI = 0.157-0.363, $p < 001$) were found to be predictive factors of corona virus fear in the linear regression model (Adjusted $R^2 = 0.374$).

Conclusion: Authorities should introduce a preventive strategy based on psychological intervention for HCWs to overcome their fear and worries.

Keywords: Fear; Health Care Workers; Covid-19; Pandemic; Tunisia

Introduction

Corona viruses are a group of associated viruses that can cause infectious diseases, including the common cold, Severe Acute Respiratory Syndrome (SARS), and Middle East Respiratory Syndrome (MERS) [1,2]. A novel and emerging type of Coronavirus was discovered and it was identified as a cause of the spread of a respiratory tract infection that began in Wuhan, the most populous city, in China in December 2019. The virus is now known as Severe Acute Respiratory Syndrome Coronavirus-2 (SARS Cov-2). The resulting disease is called Coronavirus Disease 2019 (COVID-19) [3]. COVID-19 hasquickly turned into a global public health emergency affecting many countries of the world. In March 2020, the World Health Organization announced that it had classified COronaVIrus Disease 2019 (COVID-19) as a pandemic [4,5].

There is no doubt that the emergence of coronavirus pandemic constitutes an unprecedented public health emergency in recent years that imposes serious challenges in all areas mainly medical and economic crises [6]. Tunisia like all other countries has introduced barrier measures to limit the spread of this virus. The lockdown and social distancing were the main strategies adopted [7]. These control strategies are an unpleasant experience causing numerous psychological distress such as anxiety, depression, panic among those who undergo it [8,9].

The rapid and massive spread of the coronavirus and the fear of this pandemic due to its being extremely enemy and relatively deadly, leads to psychological pressures dominated by an atmosphere of anxiety, darkness, depression and worries. In fact, it has been described as the fear of the unknown future. Fear is spreading faster than an epidemic [10]. Fear is one of the main emotional responses experienced from the outbreak of the pandemic. It has been defined as a negative valenced emotion, with a high level of arousal [11]. In addition, it can be described as a response by which the organism adapts to imminent danger also as a defense reaction to ensure the chance of survival [12]. Thus, Contamination fear is defined like "an intense and persisting feeling of having been polluted, dirtied, orinfected, or endangered as a result of contact, direct or indirect, with an item/place/person perceived to be soiled, impure, dirty, infectious, or harmful" [13].

While, the emerging literature was largely interested in the impact of coronavirus on physical health, its impact on mental health cannot be ignored. Therefore, many studies have proved that the world wasnot aware of the coronavirus hazards on the psychological health [14]. This is why the health authoritiesworldwide should not have as objective only the reduction of the transmission, but also the work on individual fears to ensure a society totally free of covid-19 [15].

As previously mentioned, as the covid-19 pandemic is ongoing a wave of fear, anxiety and worrieswas manifested in the society. It has also caused the reorganization of the health care facilities worldwide. The HCWs were facing patients, physical exhaustion, significant risk of viral contamination and psychological impact [16].

Many previous studies focused on infectious diseases such as AIDS have demonstrated that HCWs were significantly worried about the great contagiousness of viruses [17]. In fact, they developed fear for several reasons, mainly for fear of getting infected, fear of being a potential virus vector for their loved ones, fear of being stigmatized and fear of not providing adequate care for infected patients [18].

Only few studies have evaluated the impact of this epidemic on the mental wellbeing of the Tunisian population. In fact, considering the role of fear as a central emotional response during this pandemic in psychological health our study aims to estimate the prevalence of the fear of the COVID-19 and to analyze its determinant factors among HCWs at a university hospital.

Methods
Participants and procedure

We performed a cross sectional study among HCW staff in the university hospital of Mahdia which is located in the Central-East part of Tunisia in December 2020 using an anonymous self-administered and standardized brief Questionnaire. There were no exclusionary criteria for participation. A member of the study team distributed the questionnaires and explained the study's purpose to each participant.

Measures

COVID-19 Fear Scale: is a 7-item scale assessing fear of COVID-19 among the general population and will also be effective in appeasing Covid-19 fear among individuals [15]. We have used The French version of the Fear of COVID-19 Scale 2020 which is a reliable and valid tool for evaluating and characterizing the severity of the fear of COVID-19 [9]. In fact, It's a brief questionnaire with robust psychometric properties and an acceptable internal consistency (Cronbach's alpha = .87, 95% CI = [.85, .89])). Participants indicate their level of agreement with the statements using a five-point Likert scale. The answers included "strongly disagree", "disagree", "neutral", "agree" and stronglyagree. The minimum score possible for each question is 1, and the maximum is 5. A total score couldbe calculated by adding up each item score (ranged from 7 to 35). The higher the score, the greater thefear of COVID-19 was [15].

The Generalized Anxiety Disorders Scale (GAD-7): Consisting in 7item scale which was developed asa rapid screening tool for the presence of a clinically significant anxiety disorder. Additionally, it has been used to measure the severity of general anxiety symptoms among individuals and populations [19]. It's calculated by assigning scores of 0, 1, 2, and 3 to the response categories, respectively, of "not at all," "several days," "more than half the days," and "nearly every day". GAD-7 total score for the seven items ranges from 0 to 21.Those with a score above 15 have severe anxiety.

The QSP-9 is a subscale of the full version of the Patient Health Questionnaire (PHQ-9) which has shown good psychometric properties [20]. It is a brief reliable and valid questionnaire consisting of nine items measuring the severity of depressive Symptoms. Each item is scored on a four-point Likert-scale (0–3) with scores ranging from 0 to 27. Thus; higher scores correspond to greater depression severity.

The Perceived Vulnerability to Disease Scale (PVDS) is a brief questionnaire with 15 items which was used to assess participant's perceived vulnerability to infectious disease, consisting of two subscales: perceived infectability (seven-item subscale) and germ aversion (eight-item subscale).Participants indicate their level of agreement with the statements using a seven-point Likert scale (from strongly disagree = 1 to strongly agree = 7) with seven items reverse-scored. A higher score reveals a severe form of perceived vulnerability to disease. Additionally, It has Cronbach's α of 0.70, 0.72, and 0.70 for perceived infectability, germ aversion, and PVDS overall score respectively [21].

Statistical analysis

Data was analyzed using the Statistical Package for the Social Sciences (IBM SPSS 21.0). For the qualitative data, the variables were described with frequencies and percentages, means with standard deviations for the quantitative data. Univariate and multivariate models were built to characterize the fear of Covid-19. We set the statistical significance threshold p value at 0.05. Student's t-test was used to analyze FCV scores among deferent demographic and exposure groups. All significant variables from the univariate analysis (p < = 0.2) were included as independent variables and the perceived fear was the dependent variable in the multivariate model.

Results

A total of 173 professionals were recruited with a mean age of 35.3 ± 9.4 years. Among them, 66%were women (sex-ratio = 0.51). One third of participants 33.3% were medical professionals.Approximately, half of the sample 51.5% had experience of less than 5 years. Almost, two thirds 68%have experienced a high level of fear. The majority 75.3% mentioned that they lived with the elderly (Table 1).

The overall FCV-7 means score was 17.95 ± 6.6. The group with the highest fear score was the oneexperienced anxiety and depressive disorder (31.7 ± 9.3) followed by older personnel (30.6 ± 8.1).

Univariate analyses

The results of the student's t-test investigating the categorical predictors of the FCV-S7 are summarized in Table 2. As can be seen, except for the knowledge level which had a p-value of 0.2, the other categorical predictors (Age, job categories, Anxiety and depressive disorder, psychological preparation, the degree of responsibility, risk perception and experience) were significantly associated with increased fear of Covid-19 (p-value ranging from 0.04 to 0.0001).

Table 1: Demographic characteristics of the study sample (N = 173 professionals).

	n	%
Age (mean ± SD) (years)	35.3 ± 9.4	
Gender		
Female	112	66
Male	58	34
Marital status		
Single	56	32.9
Married	109	64.1
Separated or widowed	5	3
Job categories		
Nursing personnel	89	52.1
Medical personnel	57	33.3
Administrative personnel	25	14.6
Work experience		
Less than 5 years	87	51.5
5-20 years	65	38.5
More than 20 years	17	10
Departments		
Covid-19 units	47	27.2
Other departments	126	72.8
Living with elderly		
Yes	128	75.3
No	42	24.3
Pre-existing chronic diseases		
Yes	36	21.3
No	169	78.7

Fear of Covid-19	Mean (± SD)	p-value
Age (years)		
Young adult <35	25.7 ± 8.6	
Adult 35-65	30.6 ± 8.1	< 0.001
Gender		
Male	17.13 ± 6.51	0.223
Female	18.43 ± 6.61	
Job categories		
Medical professionals	22.3 ± 6.1	
Allied health professionals	30.5 ± 8.7	< 0.001
Marital status		
Single/Unmarried	24.1 ± 7.7	< 0.001
Married	29.9 ± 8.6	
Work experience		
≥ 5 years	25.9 ± 8.5	0.04
< 5 years	29.8 ± 8.5	
Anxiety symptoms		
Yes	20.45 ± 6.91	0.001
No	16.71 ± 6.05	
Depressive symptoms		
Yes	21.27 ± 6.64	<0.001
No	16.08 ± 5.81	
Anxiety and depressive disorder		
Yes	31.7 ± 9.3	0.001
No	26.6 ± 8.3	
Knowledge about Covid-19 transmission		
Inadequate	26.8 ± 8.5	0.2
Adequate	28.4 ± 8.8	
Perceived risk of Covid-19 infection		
High perceived risk	28.7 ± 8.8	0.01
Low perceived risk	22.1 ± 6	
Degree of responsibility for being a virus vector		
Feeling responsible	28.7 ± 9	0.001
Feeling not responsible	24 ± 6.3	
Having a history of Covid-19 infection		
Yes	28.7 ± 6.4	0.003
No	22.8 ± 6.9	
Psychological preparedness for caring of Covid-19 patients		
Feeling psychologically prepared	26.25 ± 4.2	0.008
Feeling psychologically unprepared	29.86 ± 5	

Table 2: Links between socio-demographics and work-related characteristics and the fear of Covid-19 among healthcare workers: Univariate analysis (N = 173).

Pearson's correlation coefficient r was used to investigate the relation-ship between the FSV-S7score and the perceived vulnerability to disease overall score. Thus, it was the strongest predictor of fear of Covid-19 with (p-value = 2.10^{-5} and r = 0.4).

Multivariate analyses

To investigate which predictors uniquely explained the variation in the fear of coronavirus, all significant continuous and categorical predictors ($p \leq 0.2$) were entered into a linear logistic regression model. The linearity of the quantitative variables was verified by the scatter plot method. This model explained 37.4% of the fear of the Covid-19 (Adjusted R^2 = 0.374). In fact, the perceived vulnerability to disease overall score and job categories (not being a doctor) were the strongest predictive factors with respectively p-values = 2.10^{-5}, 10^{-4}, followed respectively by anxiety and depressive disorder (p = 0.018), knowledge level (p = 0.019), degree of responsibility (p = 0.026) and risk perception (p = 0.044).

Table 3 shows the standardized regression coefficients of the predictors in the linear logistic regression model.

Table 3: Predictors of the fear of the coronavirus in a linear logistic regression analysis.

Variable	β	CI 95%	p-value
Inadequate knowledge about COVID-19 transmission	2.586	[0.439; 4.734]	0.019
Anxiety and depressive disorder	3.188	[0.545; 5.832]	0.018
High perceived risk of Covid-19 infection	3.321	[0.097; 6.545]	0.044
Degree of responsibility for being a virus vector	3.130	[0.373; 5.887]	0.026
Perceived Vulnerability to Disease (overall score)	0.260	[0.157; 0.363]	<0.001
Being a physician	-6.475	[-8.785; - 4.165]	<0.001

Discussion

In total 173 HCWs were included in our study. The mean age of the respondents was 35.35 ± 9.4 years. Females outnumbered males (sex ratio = 0.51). One third of participants were medical professionals 33.3%. Almost, two thirds 68% have experienced a high level of fear. Globally, the fear of corona virus disease was positively associated (p < 0.05) with anxiety and depressive disorder, risk perception and the degree of responsibility and negatively associated with experience, psychological preparation and test result. However, After multivariate linear logistic regression analyses, we found that most significant fear's risk factors to consider were knowledge score, anxiety and depressive disorder, risk perception, degree of responsibility and Perceived Vulnerability to Disease overall score.

As the COVID-19 pandemic is ongoing, it remains, at the time of writing, the most significant public health problem worldwide. The emerging literature has mainly focused on the preventive measures,the therapeutic strategies and the impact of corona virus on physical health. On the other hand, few studies have evaluated the psychological effects of corona virus disease on mental health [14]. In the current study our aim was to investigate the predictor factors of a high level of the fear of Covid-19 among HCWs. To achieve our goals, a rigorous methodology was used, based on valid and reliable tools such as the FCVs7 which has been translated and validated in several languages and has been used by numerous scientists in many countries such as Iran, France, Turkey, Italy, Saudi Arabia, Russia, Israel, Paraguay, Bangladesh and Peru [9,14,15,22-28].

Numerous previous studies suggested that increased fear-related symptoms were observed during the spread of a highly contagious and relatively deadly infectious disease. In addition, this wave of fear and worry that has invaded the societies have already been reported in previous epidemics such as those caused by SARS and MERS-COV [29].

The prevalence of fear of coronavirus disease was significantly higher among females than among males. This aligns with other studies which have revealed that women experienced greater psychological vulnerability compared to men during this pandemic [3,5]. Additionally, In Italy, similar results were reported and have shown a greater women's psychological vulnerability related to COVID-19 [30]. A Tunisian study conducted by (Sediri., *et al*.) [31] has demonstrated the sameassociation consisting in the high prevalence of distress symptoms among Tunisian women during the lockdown. Despite this association between the gender and the fear of corona virus in our study, being female is not a predictor of high levels of fear of Covid-19, contrary to what has been reported by (Broche-Pérez., *et al*.) [32]. These results might be explained by biological origin, such as differencesin personality traits and physical strengths [33] or by genetic and hormonal factors [31].

Significant associations between experience, age and the fear of corona virus have also been found respectively. Thus, the older HCWs, as well as, those with the least experience, presented a high fear perception. Previous studies have documented similar results revealing great age differences in COVID-19 fear perception, which was higher in the elderly. These findings were consistent with prior studies which suggest that older people may have greater psychological vulnerability related to their high level ofrisk perception due to a decline in their immune systems [34]. On the other hand, a Chinese study conducted by Huang and Zao (2020) have shown that younger people aged under than 35 years old experienced more fear of corona virus disease [35]. However, according to our results many hypothesesmight be suggested including more frequent pre-existing chronic diseases than younger HCWs, and fragile psychology in the elderly.

In this study, another major factor of the fear of the COVID-19 was the perceived risk of getting the infection (p = 0.044). However, the increase of risk-perception had the advantage of promoting preventive measures [32,36,37]. In fact, This risk perception is mainly manifested by an atmosphere of panic and worry, but also by compliance with barrier measures. This fact is aligned with priorresearches which suggest that people experience fear through an affective and experiential way [38].

A significant association between the degree of responsibility and the fear of coronavirus disease was also found in our study (p = 0.026). In fact, the feeling of being a potential source of contamination increases the fear of being a virus vector for their loved ones [39]. Additionally, This was proven by Mayer., *et al*. [40], who developed and validated the Fear of COVID-19 Familial Infection Scale (FCFI) consisting of two subscales "Fear of infecting others", and" Perception of Others' fear of being infected by me». Thus, the authors demonstrated a high correlation between the FIO subscale and the Fear of the COVID-19 scale score. These findings might be explained by the lack of personalprotective equipment (PPE) in our establishment thing proved by other studies such as Roya., *et al*. [41].

Our study has also revealed that anxiety and depressive disorder is an important predictor factor of Covid-19 fear perception (p = 0.018) Thus, this association, we observed between the fear of COVID-19 and depression aligns with numerous previous studies [15,23] also, between fear of COVID-19 and anxiety [15,42]. Moreover, Ahorsu., *et al*. [15] have revealed a high correlation between the FCV scale and hospital anxiety depression scale (HAD).

Those results might be explained by the fear of the unknown future which influences negatively the mental health [8,31]. This emotional response has been reported in previous epidemics. Additionally, a study conducted by Chong., *et al*. [43], has shown that during the SARS virus outbreak in Taiwan, HCWs felt extreme anxiety and depression which were the major mental expression of their vulnerabilities.

In our study, the last and most important factor correlated with fear was the Perceived Vulnerability to disease (p < 0.001) which was elucidated by the perceived vulnerability to disease overall score PVDS, the more vulnerable the HCWs felt to diseases, the more he was afraid. Ahorsu., *et al*. [15] haveproven the same findings, the higher the score of the fear of coronavirus the higher PVDS was.

Based on what was quoted above, we recommend that health care authorities should provide HCWs with the personal protective equipment PPE essential to protect themselves against the Coronavirus contagion. Additionally, professionals must periodically attend training on barrier measures to ensure good hygienic practices. Finally, we recommended a program of psychological intervention for HCWsto overcome their fear and worries.

The present study has also some limitations. First, this is a cross-sectional study so it is difficult to concretely identify cause-effect conclusions, further longitudinal studies on this topic are essential in the future. Second, data were self-reported and might be subject to information bias. Third, weconsider that the sample is relatively small but our study was carried out during the pandemic's secondwave in which the number of personnel was significantly reduced since they have worked with a guardsystem.

Conclusion

To our knowledge, this is the first study that asses the prevalence of corona-virus's fear and its predictor factors among Tunisian HCWs. Despite limitations, it provides considerable information about the role of vulnerability, anxiety and depressive disorder, risk perception and others factors on the Covid-19 risk perception that can complement the clinical efforts in treating COVID-19 cases. Therefore, based on what we have found in the present study, authorities could introduce a program of psychological training for HCWs to overcome their worries and vulnerabilities. Such programs could be used in a situation of health crisis.

Author's Contribution

All authors contributed to this article and approved its publication. The authors declare that they have no conflict of interest.

Ethical Approval

All procedures performed in this study involving human participants were approved by the Ethical Committee. Informed consent was obtained from each participant.

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