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Research article

Perceived stigma among Tunisian healthcare workers during the COVID-19 pandemic

Stigmatisation sociale perçue par les professionnels de la santé tunisiens durant la pandémie COVID-19

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ABSTRACT

Background and objectives. – Stigma was a major issue during the COVID-19 pandemic. It posed a serious threat to the lives of healthcare workers (HCWs) who were expected to experience higher levels of stigma and increased psychological distress. This is the first survey to investigate forms and correlates of perceived stigma in Tunisian HCWs during the COVID-19 pandemic.

Methods. – A cross-sectional web-based survey was conducted between October 8th and November 10th 2020, among 250 Tunisian HCWs. Data were collected using an online questionnaire using the Google Forms® platform. We used a self-reported instrument measuring COVID-19-related stigma, and the Multidimensional Scale of Perceived Social Support (MSPSS) to measure the perceived adequacy of social support from three sources: family, friends, and significant other.

Results. – The mean stigma score was 18.6 ± 8 . Participants sometimes to often experienced stigma in their relationships with friends (22%), neighbors (27.2%), parents (22.4%), and in social activities (30.8%). This stigma was perceived mainly through avoidance (68.4%), and rarely through verbal (6%) or physical aggression (1.2%). The mean MSPSS total score was 5.26 ± 1.24 . In multivariate analysis, depression history ($P < 0.001$), long working experience ($P < 0.001$), having presented ageusia/anosmia ($P = 0.007$) and lower total social support scale ($P < 0.001$) were significantly associated with higher perceived stigma score.

Conclusion. – Our findings showed that HCWs perceived stigma in professional, societal and familial domains. Social support from family, friends and others seemed to protect against perceived stigma. Proper health education targeting the public appears to be an effective method to prevent social harassment of both HCWs and COVID-19 survivors.

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R É S U M É

Introduction et objectifs. – La stigmatisation est un problème majeur pendant la pandémie de COVID-19. En effet, de telles pandémies créent de la peur et de l'anxiété, ce qui peut entraîner une stigmatisation sociale envers certains groupes, y compris les personnes infectées, celles qui ont voyagé à l'étranger, ou même les personnes associées aux personnes atteintes de la maladie, comme les membres de la famille et les professionnels de la santé (PS). En fait, travailler avec des patients potentiellement très contagieux peut conduire à une stigmatisation considérable. La stigmatisation sociale avait ainsi constitué une menace sérieuse pour le bien-être des PS, pouvant être à l'origine d'une détresse psychologique accrue. Le but de cette étude était de décrire les manifestations de la stigmatisation sociale perçues par les PS tunisiens durant la pandémie COVID-19 et d'évaluer ses facteurs prédictifs.

Mots clés :

Stigmatisation sociale
Support social
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Population et méthodes. – Nous avons mené une étude transversale descriptive et analytique entre le 8 octobre et le 10 novembre 2020, auprès de 250 PS tunisiens, moyennant un questionnaire en ligne. Nous avons utilisé un auto-questionnaire mesurant la stigmatisation liée à la pandémie COVID-19, et l'échelle « Multidimensional Scale of Perceived Social Support » (MSPSS) mesurant le niveau de soutien social perçu à partir de trois sources différentes (famille, amis, autrui significatif). L'approbation éthique a été obtenue du « Comité de protection des personnes » de l'université de Sfax, en Tunisie. L'analyse statistique a été réalisée via le logiciel Statistical Package for the Social Sciences (SPSS). Une analyse multivariée a été réalisée pour dégager les facteurs indépendants de la stigmatisation.

Résultats. – Le score moyen de stigmatisation était de $18,6 \pm 8$. Les participants percevaient parfois à souvent la stigmatisation dans leurs relations avec les amis (22 %), les voisins (27,2 %), leurs parents (22,4 %) et les activités sociales (30,8 %). Cette stigmatisation était perçue principalement par l'évitement (68,4 %), et rarement par une agression verbale (6 %) ou physique (1,2 %). Le score total moyen du MSPSS était de $5,26 \pm 1,24$. L'analyse univariée a montré que les PS âgés de plus de 40 ans, ainsi que ceux ayant des enfants ont rapporté des scores de stigmatisation perçue significativement plus élevés ($p=0,032$ et $p=0,005$ respectivement). Les participants ayant des antécédents de dépression étaient significativement plus susceptibles de présenter des niveaux plus élevés de stigmatisation perçue ($p < 0,001$). Les PS exerçant depuis plus de 5 ans percevaient une stigmatisation sociale significativement plus importante ($p=0,001$). Ceux qui ont présenté une anosmie et/ou une agueusie, ainsi que ceux ayant été testés pour la COVID-19 ont signalé un score de stigmatisation plus élevé ($p=0,015$ et $p=0,037$ respectivement). Des sous-échelles de soutien social plus faibles (famille ; amis et proches) ainsi qu'un faible score total étaient associés à une stigmatisation perçue plus élevée ($p=0,002$; $p < 0,001$; $p=0,001$ et $p < 0,001$). En analyse multivariée, l'antécédent de trouble dépressif ($p < 0,001$) ; une longue carrière ($p < 0,001$) ; le fait de présenter une agueusie/anosmie ($p=0,007$) et un faible score total MSPSS ($p < 0,001$) étaient significativement associés à un score de stigmatisation perçue plus élevé.

Conclusion. – Nos résultats ont montré que les PS percevaient de la stigmatisation dans tous les domaines professionnels, sociétaux et familiaux. Le soutien social semble protéger contre la stigmatisation perçue. Une éducation sanitaire appropriée ciblant le public pourrait être une méthode efficace pour prévenir le harcèlement social des PS et des patients atteints de COVID-19.

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1. Introduction

Stigma is a social label that bans subjects from the full acceptance of the society in which they live [1]. It is defined as “an attribute that links a person to an undesirable stereotype, leading other people to reduce the bearer from a whole and usual person to a tainted and discounted one” [1]. According to the World Health Organization (WHO) [2], in the context of health, social stigma means a negative association between a person or a group of people who share certain characteristics and a specific disease. In an outbreak, this may mean that people are labelled, stereotyped, discriminated against, treated separately, and/or experience loss of status because of a perceived link with a disease [3].

In the past, the epidemic of infectious diseases has already been associated with the backlash of discrimination and xenophobia, and this was also seen during the severe acute respiratory syndrome (SARS) outbreak in 2003 [4–6], as well as during the current COVID-19 pandemic [7,8].

In fact, such pandemics create fear and anxiety, which can lead to social stigma toward certain groups, including infected people, those who have travelled abroad, people of Asian descent [9], or even individuals associated with those with the disease, such as family members and healthcare workers (HCWs) [9]. In fact, working with potentially highly infectious patients led to considerable stigmatization [10,11].

It is no surprise then, that stigma toward HCWs has been a topic of interest in the literature [12,13] and a greater focus than ever after the emergence of a novel form of COVID-19 [14].

In a March 18, 2020 statement, WHO also unveiled that “some HCWs may, unfortunately, experience avoidance by their family or community owing to stigma or fear. This can make an already challenging situation far more difficult.” [8].

Thus, stigma has been, and currently is, a major issue during the COVID-19 pandemic [7].

It poses a serious threat to the lives of HCWs [8], who are expected to experience higher levels of stigmatization and reported increased psychological distress [14]. Thus, the practical reason for exploring stigmatised attitudes and behaviours, and perceived stigma, is the negative effect stigma has on a person's self-concept, life satisfaction, and professional quality of life, stress, burnout, and self-engagement [14].

To the best of our knowledge, this study is the first nationwide survey of perceived stigma in Tunisian HCWs during the tumultuous time of the COVID-19 epidemic. It aimed to investigate forms and correlates of HCWs stigmatization in a Tunisian sample during the COVID-19 pandemic.

2. Methods

2.1. Sample and procedure

A cross-sectional web-based survey was conducted between October 8th and November 10th 2020 (during the second wave of the COVID-19 pandemic in Tunisia). It targeted at HCWs at different university hospitals, private and public health establishments in Tunisia. Data were collected using an online questionnaire spread, throughout social media (groups of healthcare workers on Facebook) and e-mail messages, using the Google Forms® platform. Such studies, based on an online questionnaire, create the opportunity to swiftly reach specific groups of individuals and ensure the safety of surveyed individuals under pandemic conditions, which is a recommended approach [15,16].

Before taking part in the study, potential respondents were informed about the study's procedures and objectives, its voluntary and fully anonymous character, as well as the confidentiality of the responses.

Responses of participants currently working outside Tunisia were excluded. In fact, working conditions and societal

perception of HCWs may differ between countries. This is why we only included those working in Tunisia, to have a homogeneous population. Besides, questionnaires not filled-in completely were also excluded.

A total of 256 individuals completed the questionnaire. Among these responses, 6 were excluded (five of them were working outside Tunisia, and one questionnaire was partially filled-in). Consequently, only 250 responses were included.

2.2. Ethical approval

Expedited ethics approval was obtained from the "Committee for the Protection of Persons" of the university of Sfax, Tunisia, and the study conformed to the principles embodied in the Declaration of Helsinki.

2.3. Data collection and measures

After informed consent, participants were invited to provide information on socio-demographic characteristics, and job-related variables. They reported whether they have chronic medical conditions suspected to increase the risk of death due to COVID-19 complications (i.e. cardiovascular and chronic respiratory diseases . . .). They were also asked about their physical health during the pandemic.

Then, participants completed the following measures.

2.3.1. Self-reported instrument measuring COVID-19-related stigma

It consisted of 12 questions, using a 4-point Likert scale (0: not applicable; 1: never; 2: rarely; 3: sometimes; and 4: often). Responses were summed to calculate a total score; higher scores indicated a higher level of stigma.

We referred to Do Duy et al. [17], who used a scale by analogy to Berger's HIV Stigma Scale for the wording of terms and phrasing of measurement items [18]. This scale has been validated by these authors in a population of HCWs, and it is used to explore the severity of the stigma experience in this population.

In our study, the Cronbach's alpha for internal consistency was 0.88.

2.3.2. The Multidimensional Scale of Perceived Social Support (MSPSS) [19]

The MSPSS is used to measure the perceived adequacy of social support from three sources: family, friends, and significant other. It consists of 12 items using a 7-point Likert scale (1 = very strongly disagree, 7 = strongly agree). Family Subscale is the sum across items 3, 4, 8, & 11, then divided by 4. Friends Subscale is the sum across items 6, 7, 9, & 12, then divided by 4. While significant Other Subscale is sum across items 1, 2, 5, & 10, then divide by 4.

The total Scale is calculated by sum across all 12 items, then divided by 12. Higher scores indicate higher levels of social support.

This scale was used in our study to measure types and levels of social support received by HCWs. The Cronbach's alpha for internal consistency was 0.94.

2.4. Statistical analysis

Statistical analysis was performed using Statistical Package for the Social Sciences (SPSS) 22.0 (IBM SPSS Statistics, New York, United States). The results of quantitative variables were presented as mean \pm standard deviation (SD) or median and interquartile range (IQR), according to the variable distribution. Those of qualitative variables were presented as numbers and percentages. Student *t*-test was used to compare two means. The Pearson correlation coefficient was used to determine the correlation between two

quantitative variables when they were normally distributed (*r*, *P*). Otherwise, Spearman correlation coefficient was performed (*Rho*, *P*). Then, all variables that had $P \leq 0.2$ in the univariate analysis were entered into a multivariate model using stepwise linear regression analysis to identify independent factors of stigmatization (standardized coefficients beta, standard error, *t*, *P*). Data were considered statistically significant when $P < 0.05$.

3. Results

3.1. Description of the study population

The average age of participants was 33.2 years \pm 8 years. More females (68.4%) than males participated in this study, such that a gender ratio (F/M) of 2.16 was obtained. Among the respondents, 101 (40.4%) were single, 145 (58%) were married, 3 (1.2%) were divorced and only one (0.4%) was widowed. One hundred and twenty participants (48%) had children.

Among the participants, 46 (18.4%) had somatic history: chronic respiratory diseases in 16 (6.4%) cases; High blood pressure in 8 (3.2%); autoimmune diseases in 13 (5.2%) and endocrine pathologies in 6 (2.4%) cases.

Psychiatric history was noted in 27 (10.8%) HCWs: depressive disorder in 12 (4.8%); anxiety disorder in 18 (7.2%) and sleep disturbances in 7 (2.8%) cases.

Among the respondents, 227 (90.8%) were doctors. The median of their seniority as healthcare workers was 4 years (IQR = [2; 8.25]). Among them, 219 (87.6%) worked in public health establishments. Ninety-three (37.2%) worked in emergency service; intensive care unit; pneumology or infectious diseases services. Previous participation in COVID-19 patients' management was reported by 161 (64.4%) participants.

Among HCWs, 165 (66%) reported a previous attendance to COVID-19 training.

Physical symptoms potentially related to the infection within the previous month were reported as follows: headache in 53 cases (21.2%), oropharyngeal irritation in 32 (12.8%), myalgia in 25 (10%), coughing in 19 (7.6%), breathing difficulty in 5 (2%), dizziness in 11 (4.4%), and a fever of 38 °C for at least one day in 5 (2%) cases. Anosmia and/or ageusia, pathognomonic symptoms of COVID infection, were reported by 8 (3.2%) participants.

Since the pandemic beginning, 113 (45.2%) participants had been tested for COVID-19 and the infection was confirmed in 23 (9.2%) cases. A family member was positive or died from COVID-19 respectively in 110 (44%) and 15 (6%) cases.

3.1.1. Perceived social stigma

The mean stigma score was 18.6 \pm 8 points.

Table 1 shows the rating of different perceived stigma items.

The stigma was perceived through verbal aggression in 15 (6%) cases, physical aggression in 3 (1.2%) or avoidance in 171 (68.4%) cases.

3.1.2. Social support

The mean MSPSS total score was 5.26 \pm 1.24. The mean scores of family, friends and significant other subscales were respectively 5.45 \pm 1.36; 5 \pm 1.44 and 5.34 \pm 1.47.

3.2. Factors associated with stigmatization: results of univariate and multivariate analysis

Univariate analysis (Table 2) showed that HCWs over 40 years of age and those with children reported significantly higher perceived stigma scores ($P = 0.032$ and $P = 0.005$ respectively).

People with depression history were significantly more likely to report higher levels of perceived stigma ($P < 0.001$).

Table 1
Perceived stigma areas.

Item	Not applicable n (%)	Never n (%)	Rarely n (%)	Sometimes n (%)	Often n (%)
Relationships with friends	15 (6%)	118 (47.2%)	62 (24.8%)	47 (18.8%)	8 (3.2%)
Relationships with neighbors	27 (10.8%)	94 (37.6%)	61 (24.4%)	50 (20%)	18 (7.2%)
Social life (leisure activities, events, wedding ceremonies, condolences)	21 (8.4%)	96 (38.4%)	56 (22.4%)	53 (21.2%)	24 (9.6%)
Shopping	18 (7.2%)	129 (51.6%)	60 (24%)	37 (14.8%)	6 (2.4%)
Carrying out administrative affairs (post office, bank, ...)	15 (6%)	135 (54%)	60 (24%)	27 (10.8%)	13 (5.2%)
Nurseries, schools, high schools to you (as a parent) or your children	70 (28%)	105 (42%)	43 (17.2%)	19 (7.6%)	13 (5.2%)
At work (from colleagues)	17 (6.8%)	117 (46.8%)	75 (30%)	32 (12.8%)	9 (3.6%)
Marital relationship	66 (26.4%)	126 (50.4%)	35 (14%)	11 (4.4%)	12 (4.8%)
Relationship with your children	101 (40.4%)	90 (36%)	39 (15.6%)	15 (6%)	5 (2%)
Relationship with parents	15 (6%)	110 (44%)	69 (27.6%)	36 (14.4%)	20 (8%)
Relationship with brothers, sisters, or their family members	12 (4.8%)	109 (43.6%)	69 (27.6%)	44 (17.6%)	16 (6.4%)
Relationship with other family members (cousins, aunts, uncles ...)	14 (5.6%)	97 (38.8%)	70 (28%)	45 (18%)	24 (9.6%)

Table 2
Factors associated with social stigma perceived by healthcare workers.

Variables	Category	Mean (SD)	P
Age (years)	20–40	18.14 (7.9)	0.032
	≥ 40	21 (8.7)	
Gender	Males	18.1 (8.1)	0.5
	Females	18.8 (7.9)	
Marital status	Married	19.3 (8.4)	0.08
	Single/divorced/widowed	17.5 (7.3)	
Having children	No	17.2 (7.1)	0.005
	Yes	20.1 (8.7)	
Somatic chronic diseases	No	18.5 (7.6)	0.9
	Yes	18.7 (9.4)	
History of psychiatric illness	No	18.3 (7.8)	0.07
	Yes	21.1 (9.2)	
History of anxiety	No	18.5 (8)	0.54
	Yes	19.7 (7.8)	
History of compulsory obsessive disorder	No	18.6 (8)	0.4
	Yes	12 (4)	
History of depression	No	18.1 (7.6)	<0.001
	Yes	28.2 (8.9)	
History of sleeping disorder	No	18.5 (7.9)	0.45
	Yes	20.8 (10.1)	
History of bipolar disorder	No	18.6 (8)	0.9
	Yes	18 (7)	
History of suicide attempt	No	18 (8)	0.76
	Yes	21 (7)	
Profession	Medical	18.4 (7.9)	0.34
	Paramedics	20.1 (9)	
Type of institution	Private	18.6 (9.1)	0.9
	Public	18.7 (7.8)	
Department	Emergency/infectious/respiratory diseases	19.3 (8.6)	0.26
	Other departments	18.2 (7.6)	
Working experience (years)	< 5	17.2 (7.1)	0.001
	≥ 5	20.8 (8.8)	
Previous attendance to COVID-19 training	No	18.7 (8.7)	0.86
	Yes	18.5 (7.6)	
Source of COVID-19 information	Social media	19.6 (7.6)	0.33
	Assistance to a training session	18.3 (7.6)	
Ageusia anosmia	No	18.4 (7.8)	0.015
	Yes	25.3 (10.1)	
Previous participation in COVID-19 patients' management	No	17.7 (7)	0.17
	Yes	19.1 (7.9)	
COVID-19 testing	No	17.6 (7.6)	0.037
	Yes	19.7 (8.3)	
COVID-19 status	Positive	22.9 (10.2)	0.09
	Negative	19.1 (7.7)	
Family member positive COVID-19	No	18.3 (8)	0.56
	Yes	18.9 (8)	
Family member hospitalized for COVID-19	No	18.2 (7.8)	0.1
	Yes	20.5 (8.8)	
Family member COVID-19 death	No	18.4 (7.9)	0.24
	Yes	20.9 (9.3)	
Total Social Support Scale	–	–0.24 ^a	<0.001^b
Friends SS scale	–	–0.19 ^a	0.002^b
Family SS scale	–	–0.24 ^a	<0.001^b
Other SS scale	–	–0.21 ^a	0.001^b

SD: standard deviation; in bold and italics : significant p value (<0.05).

^a r correlation coefficient.

^b Pearson correlation test.

Table 3
 Stepwise multiple linear regression analysis of stigmatization risk factors among healthcare professionals.

Independent variables	Standardized coefficients beta	Standard error	t	P
Depression	0.22	2.17	3.9	<0.001
Working experience	0.21	0.94	3.7	<0.001
Ageusia/anosmia	0.15	2.61	2.72	0.007
Total Social Support Scale	-0.23	0.37	-3.97	<0.001

In bold and italics : significant p value (<0.05).

HCWs working since more than 5 years perceived significantly greater stigma ($P=0.001$).

Those having presented anosmia and/or ageusia, as well as those tested for COVID-19 reported higher stigma scores ($P=0.015$ and $P=0.037$, respectively).

Lower social support subscales (family; friends and significant other) and total score were associated with higher perceived stigma ($P=0.002$; $P<0.001$; $P=0.001$ and $P<0.001$).

In multivariate analysis, depression history ($P<0.001$); long working experience ($P<0.001$), having presented ageusia/anosmia ($P=0.007$) as well as lower total social support scale ($P<0.001$) were significantly associated with higher perceived stigma score (Table 3).

4. Discussion

4.1. COVID-19-related stigma perceived by HCWs

In the past, stigma has been associated with serious disease outbreaks and resulted in discrimination against these patient groups, which caused negative individual and societal effects [20].

During the 2003 outbreak of SARS, in studies conducted in Taiwan and Hong Kong, 20–49% of HCWs involved in the care of SARS patients reported being shunned, avoided, or otherwise stigmatized by people in their community, for fear that HCWs were infected with the SARS coronavirus [21,22]. Even their families were subject to such discrimination [21].

During the current COVID-19 pandemic, several features of stigma have been also reported worldwide. Recent studies reported that people with current or past COVID-19 and their relatives, social minorities (people from Asian descent, immigrants...), those with recent travel history as well as HCWs deployed in COVID-19 services suffer from a range of stigma experiences and practices [23–27].

This may explain why participants having presented ageusia and/or anosmia, pathognomonic symptoms of COVID, and therefore a confirmed infection, were significantly more likely to perceive social stigma. Furthermore, those having been tested for COVID-19, and therefore suspected to be infected, perceived significantly further social stigma.

Surprisingly, while in several settings HCWs are praised as heroes, recent research suggests that those working in COVID-19 designated hospitals suffer from stigma from friends and family as they work in hospital environments, a high-risk area for COVID-19 contamination [22].

As it is actually a hot topic, WHO paid a specific attention to this type of stigma, which was pointed out through a recent document about mental health and psychosocial considerations during the COVID-19 pandemic [28].

This is why we were interested in studying this issue in Tunisian HCWs, all the more so since, to the best of our knowledge, no Tunisian studies have been published regarding this topic.

In the present study, HCWs reported perceived stigma in all professional, societal, and familial domains. In fact, they sometimes often experienced stigma in their relationships with friends (22%), with neighbors (27.2%), in social activities (30.8%), at work (16.4%),

when shopping (17.2%), with parents (22.4%) and with brothers and sisters (24%). This stigma was perceived mainly through avoidance (68.4%), and rarely through verbal (6%) or physical aggression (1.2%).

In fact, since HCWs come in the frontline among groups susceptible to infection, fears from communication with them have been reported [20]. A recent study [27], conducted among 3551 non-HCWs adults measuring stigmatizing attitudes towards HCWs during COVID-19, showed that more than a quarter of respondents believed that HCWs should have restrictions placed on their freedoms, such as not being allowed to go out in public, being isolated from the community, and being separated from their families. More than a third of respondents stated that they would avoid HCWs for fear of contracting COVID-19. Almost a third of respondents believed that HCWs are likely to have COVID-19 [27].

Thus, stigma takes various forms: stigmatized people are shunned, insulted, marginalized, and rejected in the domains of work, interpersonal relationships, use of services and schooling [7] and sometimes subjected to physical violence [29].

In many countries, incidents have been reported where taxi drivers refused to drive medical doctors, restaurants refused to deliver food to hospitals, and residents refused to have HCWs as neighbors [20].

In Tunisia, several forms of social stigma towards HCWs have been reported in social media. For example, notes were posted on some supermarkets, indicating the priority given to HCWs to make their purchases in order to quickly leave the shops. Furthermore, children of HCWs have been deprived of reaching their kindergartens in some parts of Tunisia. Thus, even their family members or friends can experience 'secondary' or 'associative' stigma [23]. This may explain why, in our study, participants with children experienced significantly higher stigma than those without children. Children would be an additional burden of greater stigma. Besides, older HCWs perceived also higher levels of stigma, may be because of their more responsibilities and social activities, and then higher risk of social stigma exposure. Besides, people with history of depression were more likely to perceive social stigma, and this association was also concluded in multivariate analysis. This finding is predictable, given that the link between mental illness and stigma has been well established. For depressed people, feelings of personal stigma are so pervasive that they are an inherent part of the experience [30]. Lower self-esteem and feelings of devaluation increase their susceptibility to social stigma perception.

In Mexico, doctors and nurses were found to use bicycles, as they were reportedly denied access to public transport and were subjected to physical assaults.

Similarly, in Malawi, HCWs were reportedly disallowed from using public transport, insulted in the street, and evicted from rented apartments.

In India, media reports revealed that doctors and medical staff faced substantial social ostracism; they were asked to vacate the rented homes, and were even attacked while carrying out their duties.

In the USA, HCWs have also faced harassment at public places, because they have been perceived as at higher risk of transmission. However, in the UK, there is no stigma around HCWs possibility

of catching COVID, and their neighbors truly appreciated the work they have been doing [8].

Although all these writings about stigma experienced by HCWs, and stigmatized attitudes by non-HCWs, this stands in marked contrast to the research on COVID-19, which shows that the typical HCW is highly unlikely to be infected with COVID-19. American data (collected from February–April, 2020) shows that the majority of reported COVID-19 cases (89%) were not HCWs [31]. Like non-HCWs, HCWs were most likely to be infected in the community rather than in hospital settings. Therefore, there is no sound basis for the attitudes of many of our participants, who believed that HCWs should be separated from their communities or families. Although HCWs working with COVID-19 patients (e.g., in intensive care units) are at greater risk of exposure to the virus, these workers are effectively protected by personal protective equipment (e.g., face masks, gloves, visors), which reduces the risk of infection to minimal levels [32].

4.2. Relationship between stigma and social support

One important aspect of social resources is the social support that one perceives as being available in one's life. Perceived social support refers to the beliefs or evaluations that one has about the relationships in one's life [33].

In the current study, the stigma score decreased significantly as the social support subscales (family, friends and others) increased. In multivariate analysis, only the total social support score was an independent factor associated with stigma.

Similar association was reported in previous studies conducted among people with mental illness [34], those with epilepsy [35,36], or those with Human Immunodeficiency Virus infection [37], showing that perceived social support is found to be inversely associated with perceived stigma.

Our findings add to the existing body of literature that suggests that social support buffers the negative effect of stress – and in this case – the stress associated with stigma [34]. In fact, social support theory hypothesizes that social support serves to protect individuals against the negative effects of stressors by leading them to interpret stressful occasions less negatively [38]. This theoretical perspective focuses on an individual's perception of the availability of support for a stressful situation [37].

Individuals with high levels of perceived social support describe themselves in more positive and less negative terms compared to others. These positive self-appraisals may in turn promote the development of more effective coping skills that can be utilized when confronting specific situations [33]. Another positive benefit of perceived social support is that it may allow individuals to deal more effectively with life stressors, because they may believe that others will be there to help them if necessary [33]. This sense that others are available to provide assistance can result in enhancing one's ability to cope with life challenges. This is why social support from family and friends can help in specific stigmatized situations [39].

4.3. Strengths and limitations

Our study is the first Tunisian study evaluating social stigma perceived by Tunisian HCWs. Nevertheless, our findings should be assessed in light of the study's limitations.

First, because of the web-based design, no response rate could be estimated as it was not possible to estimate how many persons were reached by social network advertisement. Besides, this design biased the sample towards populations with an access to digital resources and those who may be more socially connected, leading to selection bias. As a result, our conclusions were less generalizable to the entire HCWs.

Then, the current design was cross-sectional consisting in a short-term investigation few months into the pandemic, and so it is possible that the attitudes and perception of respondents may change over time. This, however, does not ensure a longitudinal vision, and thus precludes conclusions regarding causality.

Finally, we tested only the internal consistency of the instrument measuring COVID-19-related stigma, which is not a validated scale. Its validation will be interesting for a better relevance of the results.

5. Conclusion

Stigma has been, and currently is, a major issue during the COVID-19 pandemic. It poses a serious threat to the lives of potentially infected people, as well as individuals associated with those with the disease, such as family members and HCWs. To the best of our knowledge, this study is the first nationwide survey of perceived stigma in Tunisian HCWs during the tumultuous time of the COVID-19 epidemic.

Our findings showed that HCWs reported stigma perception in all professional, societal and familial domains: their relationships with friends, with neighbors, in social activities, at work, when shopping, and with family members. This stigma was perceived mainly through avoidance, and rarely through verbal or physical aggression.

Social support from family, friends and others seemed to be inversely associated with perceived stigma. Our findings were coherent with previous studies, suggesting that social support buffers the negative effect of stress – and in this case – the stress associated with stigma, and can help HCWs overcome these feelings.

To tackle social stigma derived from COVID-19, WHO suggested the creation of an environment where open discussion among people and HCWs is possible. How we communicate about COVID-19 is crucial to support people to take effective action to help combat the disease and to avoid fueling fear and stigma. Proper health education targeting the public seems to be an effective method to prevent social harassments of both HCWs and COVID-19 survivors, and to create a proper environment to work as a team to contain the pandemic.

Disclosure of interest

The authors declare that they have no competing interest.

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