Original Research Article

Post-Traumatic Stress Disorder and Associated Factors Among Caregivers of Patients with COVID-19 in Saudi Arabia: A Cross-sectional Study

ABSTRACT

Background: One of psychological disorders caused by catastrophic life events or severe medical problems is the incidence of post-traumatic stress disorder among people. Different sociodemographic factors have been associated with the development of post-traumatic stress disorder (PTSD). Such research is lacking with COVID-19 especially in the Saudi context.

Aim: The purpose of this study was to determine factors associated with PTSD during the outbreak of COVID-19.

Materials and Methods: This cross-sectional study was conducted on a convenience sample of 92 Saudi citizens, living in Saudi Arabia, and had at least one relative who had been diagnosed with COVID-19. Data were collected using the impact of event scale (IES-R). SPSS was used to run a multiple linear regression analysis.

Results: The results revealed that participants suffered from a partial PTSD. The regression analysis showed a significant relationship between participants' characteristics and PTSD. The model explained 13.9% of the variance of PTSD ($F [5, 77] = 2.49$, $R^2 = .139$, $p < .05$). Two predictors of gender ($p<.01$) and level of education ($p<.05$) were statistically significant to the prediction. Male participants had higher PTSD scores than female participants (beta = -9.19, $t = -2.73$, $p < .01$). Also, those caregivers with low level of education had higher PTSD levels (beta = 3.279, $t = 2.30$, $p <.05$).

Conclusion: The current study demonstrated a strong association between participants' demographic characteristics (namely gender and level of education) and PTSD. A lack of information and the evolution of the COVID-19 outbreak may be important factors in increasing people's levels of PTSD. Therefore, future research aiming to find appropriate solutions to such issues is recommended.

Keywords: Post-traumatic stress disorder (PTSD), family, caregivers, psychological impact, COVID-19

INTRODUCTION

The coronavirus (COVID-19) pandemic is increasingly recognized as a serious, worldwide public health concern influencing aspects of daily life [1]. The number of cases has increased rapidly to include many countries, including Saudi Arabia. More than half a million people in the country have been diagnosed with COVID-19, according to the daily reports by the Ministry of Health. To confront the unprecedented risk of the spread of COVID-19 and decrease unexpected challenges especially in the economy and health aspects, the Saudi government has suspended or limited the presence of many operations in both public and private agencies. The government has also endeavored to enforce quarantine for people with suspected COVID-19 symptoms [2]. Further, different awareness campaigns have been initiated to inform the society about the importance of taking COVID-19 health precautions.

Multiple psychological disorders can arise as a result of the high number of COVID-19 death cases around the world. One of such disorders caused by COVID-1 is the incidence of post-traumatic stress disorder (PTSD) among individuals. PTSD is the development of specific symptoms after experiencing one or different catastrophic life events [3]. Such psychological issue can lead to negative effects on people's health and social well-being. The prevalence of PTSD was reported at approximately 32 % among adults aged 18–30 years in the United States [4]. The PTSD symptoms were also reported at about 5% in Wuhan, where COVID-19 was started [5]. Such disorder may lead to serious distress among people. Hospitalization and the death of loved ones due to life-threatening COVID-19 illness are risk factors for developing PTSD [6].

There is an association between caregivers' psychological problems and the health of their patients, which may aggravate patients' health conditions [7,8]. PTSD is also prevalent among family caregivers of patients admitted to critical care units both during and after their

stay [9]. Psychological stress associated with difficult cases can be a reason for the development of PTSD among caregivers. The role of family caregivers can be stressful, resulting in a variety of negative health consequences ranging from mild to severe psychological stress, as well as a higher chance of death [7]. Moreover, family caregivers' relationship with patients is an important factor associated with PTSD symptoms [10].

Different sociodemographic factors have been associated with the development of PTSD [11]. Other factors were also identified with prior epidemic crises such as Severe Acute Respiratory Syndrome [12]. Such research is lacking with COVID-19, especially in the Saudi context where there are traditional strong relationships between family members, thus effective and sufficient support to each is expected. Identifying risk factors associated with PTSD can be helpful in finding high-risk groups and providing recommendations for coping. Based on the previous findings, this study was conducted to determine factors associated with PTSD among Saudi family caregivers. It was hypothesized that PTSD level is influenced the education level of Saudi family caregivers.

MATERIALS AND METHODS

This study used a cross-sectional design, intended to provide information about PTSD during the COVID-19 health crisis. Data concerning PTSD were collected at a single point in time, using an anonymous online survey. The institutional review board approval (Ref#: KSU-HE-20-402) was received from a public university. Participation was completely voluntary and consent forms were obtained prior to data collection.

Inclusion criteria - In order to assess the public's immediate PTSD during the COVID-19 pandemic, a convenience sampling strategy was used. Saudi citizens living in one of the 13 regions of Saudi Arabia and lived with at least one relative who had been diagnosed with COVID-19 were eligible to participate in this study. They should also have a good English level in order to read and understand the questionnaire. exclusion criteria -

Individuals under the age of 18 were excluded, as such individuals may not have been able to understand the questions. Though Arabic is the Saudi Arabia's official language, the questionnaire was administered in English to avoid any misunderstandings about terminology whose meanings may change when translated into a language other than the original.

The G*Power tool (Heinrich-Heine-Universität, Düsseldorf, Germany) was used to determine the required sample size. Using a significance level of .05, power level of .80, effect size of .15, and five predictors, a minimum sample of 91 participants was determined in order to run the regression analysis.

Measures

The study participants completed a survey that includes demographic questions (age, gender, marital status, level of education, and employment status) along with another existing reliable instrument that measure the PTSD variable, which is the Impact of Event Scale–Revised (IES-R) [13]. This self-report scale consists of 22 items and three subscales. The subscales of the IES-R include: intrusion with 8 items (i.e., intrusive thoughts, nightmares, and intrusive feelings); 8 items for avoidance (i.e., numbing of responsiveness and avoidance of feelings); and 6 items for hyperarousal (i.e., anger and difficulty concentrating). Each item is rated on a 5-point Likert scale ranging from 0 (not at all) to 4 (extremely). Scores above 24 provide meaningful results [14]. Scores between 24 and 32 have partial PTSD, while those who score above 33 have a probable diagnosis of PTSD. This instrument can measure adults' subjective response to a particular event. The instrument has previously been demonstrated to show good internal consistency, reliability, and predictive validity [13]. In this study, the Cronbach's alpha was .83, indicating an acceptable reliability value.

Data Collection Procedures

Data collection was done using an anonymous questionnaire created on a secure online platform. The research team put the online questionnaire link on the most widely used

social media sites in Saudi Arabia, Twitter and Facebook, along with a recruitment statement. Due to the quarantine and COVID-19 restrictions, using the social sites was the only available and convenient option to recruit participants from all over the country. The recruitment statement provided details related to the study purpose, inclusion and exclusion criteria, risks, benefits, confidentiality, and contact information.

There were two screening questions to determine whether a person was a family member caring for a patient with COVID-19 and his or her relation to the patient. Another point to note is that there was no question about when a family caregiver began providing care for patients, as this question may appear to be related to the whole duration of providing care. To avoid misunderstandings, the research team decided not to ask about the time frame, though it can provide useful information. Once interested people read it, met the eligibility criteria and agreed to participate in the study, they could access the link and complete the survey form. The link was also sent to nurses working in some public healthcare centers to share it with interested and eligible people.

Ethical Considerations

The institutional review board approval was obtained prior to collecting primary data. Permission to use the instrument was also confirmed. Participants were given a recruitment statement explaining the purpose of the study, potential risk and/or benefits, anonymity, and confidentiality. Participants were also notified that their participation was completely voluntary and that collected data would be reported in aggregate form. Further, they were informed that there would not be any consequences for declining to participate in the study. This study was funded by the deanship of scientific research through the research center at the college of nursing, King Saud University. Lastly, there was no conflict of interests to declare.

Statistical Analysis

SPSS version 27 (IBM Corp.) was used to manage and analyze collected data. Participants' demographic characteristics were summarized using descriptive statistics. The descriptive statistics revealed that all variables had less than 5% missing values. Multiple linear regression was used to determine the relationship between participants' demographic characteristics and PTSD. The p-value of.05 was used as a significance criterion for statistical tests.

RESULTS

Table 1 displays the participants' characteristics. The sample consisted of 92 adults, whose ages ranged from 20 to 63 years (SD ± 7.2). Approximately 77.2 % of participants (n = 71) were male. More than two-thirds of participants (72.8%) were married. The majority of participants (76.1%) had a bachelor's degree or higher, and 62% were currently employed.

Table 1: Demographic Characteristics of Caregivers (N = 92)

Variable (Range)	n (%) or M±SD
Age (20-63 years)	M= 34.5 ± SD=7.2
Gender	
Male	71 (77.2)
Female	19 (20.7)
Marital status	
Married	67 (72.8)
Not Married	22 (23.9)
Employment status	
Employee	57 (62)
Not employee	34 (37)
Level of education	
≤High school	9 (9.8)
Diploma	11 (12)
Bachelor or higher education	70 (76.1)

Table 2 displays the descriptive statistics of all items and subscales. Some COVID-19 memories were still elicited by particular reminders, according to the majority of the participants (M=3.09, SD ± 1.19), followed by the item that participants have felt irritable and angry (M2.97, SD± 1.15). The overall score of the scale was 26; thus, the sample in this study were classified as having partial PTSD.

Table 2: Descriptive Statistics of PTSD Items/Subscales (N = 92)

Subscales/Items	M	(SD)	Degree
Intrusion	**2.62**	**(1.0)**	
Any reminder brought back feelings about it	3.09	(1.19)	
I had trouble staying asleep	2.38	(1.19)	
Other things kept making me think about it	2.65	(1.15)	
I thought about it when I didn't mean to	2.48	(1.0)	
Pictures about it popped into my mind	2.76	(1.11)	
I found myself acting or feeling like I was back at that time	2.49	(1.15)	
I had waves of strong feelings about it	2.59	(1.18)	
I had dreams about it	2.54	(1.26)	
Avoidance	**2.36**	**(1.21)**	
I avoided letting myself get upset when I thought about it or was reminded of it	2.83	(1.18)	
I felt as if it hadn't happened or wasn't real	2.78	(1.20)	
I stayed away from reminders of it	2.70	(1.28)	
I tried not to think about it	2.88	(1.31)	
I was aware that I still had a lot of feelings about it, but I didn't deal with them	2.74	(1.16)	
My feelings about it were kind of numb	2.30	(1.0)	
I tried to remove it from my memory	2.84	(1.47)	
I tried not to talk about it	2.20	(1.14)	
Hyperarousal	**2.82**	**(1.22)**	
I felt irritable and angry	2.97	(1.15)	
I was jumpy and easily startled	2.92	(1.16)	
I had trouble falling asleep	2.95	(1.23)	
I had trouble concentrating	2.88	(1.17)	
Reminders of it caused me to have physical reactions, such as sweating, trouble breathing, nausea, or a pounding heart	2.29	(1.39)	

I felt watchful and on-guard	2.92 (1.25)		
Total IES-R Score	**26.0**	**Partial PTSD**	

Table 3 displays the regression analysis of the relationship between participants' characteristics and PTSD. There was a significant relationship between participants' characteristics and overall PTSD score. The model explained 13.9% of variance in PTSD ($F[5, 77] = 2.49$, $P < .05$, $R^2 = .139$). Two predictors—gender ($P = .008$) and level of education ($P = .024$)—were statistically significant to the prediction of PTSD toward the incidence of COVID-19 among participants. Male participants had higher PTSD scores than female participants when all other variables were held constant ($\beta = -9.19$, $t = -2.73$, $P < .01$). Those with low levels of education also had higher PTSD scores when all other variables were held constant ($\beta = 3.279$, $t = 2.30$, $P < .05$; see Table 3).

Table 3: The Relationship Between Demographic Characteristics and PTSD (N = 92)

Independent Variables	**B-coefficients**	**Standardized *β***	***t***	***p***
Age	.155	.091	.786	.434
Gender [a]	-9.19	-.299	-2.73	.008
Level of education [a]	3.27	.271	2.30	.024
Marital Status	1.63	.055	.478	.634
Job	3.59	.142	1.18	.240
Model				.038

[a] Significant variable in the regression analysis model
Predictors: Age, Gender, Level of education, Marital Status, Job
Outcome: Total PTSD score

DISCUSSION

The objective of the present study was to assess caregivers' levels of PTSD during the COVID-19 outbreak. Overall, the findings show that participants had partial levels of PTSD which could be related to the dearth of information at the beginning of the crisis. The results of this study will now be compared to the findings of previous work. Since then, many studies have been conducted on PTSD among caregivers. Caillet et al. conducted a study aiming to determine the psychological impact of COVID-19 on 208 intensive care units'

caregivers [15]. The authors reported post-traumatic stress among a quarter of the sample. They attributed this percentage to the fact that being a caregiver during COVID-19 could cause some psychological stress problems. Similarly, Tan et al assessed the psychological impact of the COVID-19 pandemic on healthcare caregivers in Singapore [16]. The authors found PTSD to be prevalent among the sample. However, this study and the one by Caillet et al. focused on hospital healthcare caregivers, while the current study was performed on home caregivers. There may have been some environmental or social factors that limit the current study's findings to home caregivers. Therefore, more research is needed to compare PTSD levels among caregivers in various settings.

This study revealed that male participants had higher PTSD scores than female participants when controlling for all other variables. Contrary to these findings, another study examining the moderating role of caregiving on fear of COVID-19 and PTSD, indicated that women had higher PTSD than men [17]. The same was also reported by other authors who found female caregivers to be associated with PTSD [18]. The differences between the study findings may be related to women's lifestyles in Saudi Arabia. It is common that women tend to stay home after marriage and take care of family members, while men are responsible for everyday tasks and family spending. Further, men are generally less interested in forming emotional and supporting bonds with others [19]. Women are also more likely than men to provide attention to their health and feelings and to show their emotions. Such behaviors can lead to emotional self-regulation and minimize the effects of stressors [20].

Moreover, this study revealed that participants with lower levels of education had higher PTSD scores. Similar finding was reported by Andresen et al., who studied PTSD in family caregivers of intensive care unit patients [9]. This could be explained by the fact that higher education is associated with a more knowledge of health issues and better understanding of diseases [9-21]; thus, better mental and health control. A study also found

education level to be negatively associated with post-traumatic stress symptoms [22]. Though the focus of this finding was on the post-traumatic stress symptoms rather than PTSD itself, it can help researchers better understand the impacts of psychological stress. To clarify, post-traumatic stress symptoms can occur or disappear within 30 days [23], whereas PTSD is a more serious health disorder that influences everyday functioning and can also last longer than 30 days. Expanding PTSD-related knowledge from several aspects would help design research or awareness programs that contribute to improved awareness level of PTSD. People with higher levels of education also tend to analyze and synthesize evidence from the literature, rather than being impacted by news from unofficial sources [24].

When reviewing the literature, PTSD was found frequently studied among patients with severe medical conditions or their caregivers. For example, in the aforementioned study [22], the authors reviewed potential risk and protective factors for the development of PTSD in caregivers of adult patients affected by severe medical diseases. Prior studies were also conducted on PTSD in family caregivers of intensive care unit patients [25-9]. Further, factors associated with psychological problems among family caregivers of patients with chronic conditions were determined in other studies [26-27]. PTSD with other psychological issues were also studied in caregivers of children tested for COVID-19 in the acute phase of the Italian outbreak [28]. The massive global prevalence of PTSD [29], resulting from life circumstances and/or its confirmed associations with long-term neurobiological changes and comorbidities, as mentioned by Armenta et al. [30], may be the reasons for diverse PTSD research efforts. Therefore, conducting more comparative studies of PTSD and associated factors in different circumstances is suggested.

PTSD levels should be steadily decreasing as a result of the Saudi Ministry of Health's preventative actions. Therefore, there should be more awareness campaigns conducted by local health and/or educational institutions to teach appropriate PTSD coping

skills. There is also a scarcity of research on PTSD in Saudi family caregivers. Therefore, it is recommended to conduct more research that helps identify potential variables leading to the low prevalence of PTSD. Moreover, health services to reduce the severity of COVID-19 may be of poor to moderate quality due to a lack of supportive scientific resources. Therefore, the present findings can be used to provide improved therapeutic healthcare services. They can also be used to design psychosocial support interventions to help improve mental health in Saudi society.

Limitations

The first limitation is the inability to examine cause and effect in a cross-sectional study design compared to longitudinal and interventional study designs. Second, we were unable to determine the causality between the variables of interest due to the use of a self-report measure and a cross-sectional design. The sampling strategy used in the study may also be at risk of bias, which may make it difficult to generalize the findings. Future research that includes a homogenous sample from different regions of Saudi Arabia could provide in-depth results regarding PTSD levels in the Saudi community.

CONCLUSIONS

The current study demonstrated a strong association between participants' demographic characteristics (namely gender and level of education) and PTSD. The results of this study indicated that participants had partial levels of PTSD. A lack of information and the suddenness of the COVID-19 outbreak may be important factors in increasing people's levels of PTSD. Therefore, future research aiming to find appropriate solutions to such issues is recommended.

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