Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

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Original article

Assessment of COVID-19 trauma responses. Who has been more traumatized during the pandemic?

Qui a été le plus traumatisé pendant la pandémie ? Évaluation des réponses aux traumatismes liés au COVID-19

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ABSTRACT

Background and Objective. – To evaluate the effect of cognitive and sociodemographic characteristics of healthcare and non-healthcare workers on their traumatic responses to the COVID-19 pandemic.
Methods. – Data were collected using an online survey between August-September 2020. The survey included the following scales: Beck Anxiety Inventory (BAI), Anxiety Sensitivity Index (ASI), and Impact of Event Scale-Revised (IES-R). Traumatic responses were categorized into three types: avoidance (IES-R_A), intrusion (IES-R_I), and hyperarousal (IES-R_H).
Results. – The study included a total of 672 participants, comprised of 399 (59.4%) men, and 273 (40.6%) women with a mean age of 39.25 ± 933 years. The results indicated that women had higher IES-R_I (r = .5.78, $p < 0.001$), IES-R_A (r = 4.47, $p < 0.001$), and IES-R_H (r = .5.20, $p < 0.001$) scores compared to men. Patients with a history of psychiatric diseases had significantly higher IES-R_I (r = −3.82, $p < 0.001$), IES-R_A (r = −2.00, $p < 0.05$), and IES-R_H (r = −4.06, $p < 0.001$) scores compared to patients with no history of psychiatric diseases. Non-healthcare workers had significantly higher IES-R_A (r = −2.69, $p < 0.01$) scores compared to healthcare workers.
Conclusion. – Female gender and a positive history of psychiatric diseases were found to lead to an increase in the frequency of all three traumatic responses to COVID-19. Contrary to expectation, being a healthcare worker was not found as a factor facilitating trauma response formation in our study.

Mots clés :
COVID-19
Échelle d'évaluation
Évaluation
Traumatisme
Pandémie
Professionnel de santé

RÉSUMÉ

Contexte et objectif. – Évaluer l'effet des caractéristiques cognitives et sociodémographiques des travailleurs de la santé et des travailleurs non médicaux sur leurs réponses traumatiques à la pandémie de COVID-19.
Méthodes. – Les données ont été recueillies à l'aide d'une enquête en ligne entre août et septembre 2020. L'enquête comprenait les échelles suivantes : Inventaire d'anxiété de Beck (BAI), Indice de sensibilité à l'anxiété (ASI) et Échelle d'impact de l'événement - révisée (IES-R). Les réponses traumatiques ont été classées en trois types : évitement (IES-R_A), intrusion (IES-R_I) et hyperexcitation (IES-R_H).
Résultats. – L'étude a inclus un total de 672 participants, composés de 399 (59,4 %) hommes et 273 (40,6 %) femmes avec un âge moyen de 39,25 ± 933 ans. Les résultats ont indiqué que les femmes avaient des scores IES-R_I (r = 5,78, $p < 0,001$), IES-R_A (r = 4,47, $p < 0,001$) et IES-R_H (r = 5,20, $p < 0,001$) plus élevés que les hommes. Les patients ayant des antécédents de maladies psychiatriques présentaient des

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scores IES-R_I ($r = -3{,}82$, $p < 0{,}001$), IES-R_A ($r = -2{,}00$, $p < 0{,}05$) et IES-R_H ($r = -4{,}06$, $p < 0{,}001$) significativement plus élevés que les patients n'ayant aucun antécédent de maladies psychiatriques. Les travailleurs non médicaux avaient des scores IES-R_A ($r = -2{,}69$, $p < 0{,}01$) nettement plus élevés que les travailleurs de la santé.

Conclusion. – On a constaté une augmentation de la fréquence de trois réponses traumatiques à la COVID-19 chez les femmes et celles ayant des antécédents positifs de maladies psychiatriques. Contrairement aux attentes, le fait d'être un travailleur de la santé ne s'est pas avéré être un facteur facilitant la formation de réponses traumatiques dans notre étude.

1. Introduction

Coronavirus disease 2019 (COVID-19) originated from Wuhan, China in late December, 2019 and afterwards became a global pandemic [1]. Following the COVID-19 outbreak, individuals around the world faced many undesirable situations, including death, loss of relatives, separation, job loss, and a sense of insecurity. Additionally, numerous strict measures were imposed in many countries around the world, such as the closure of schools and strict social isolation. Due to these stress factors, psychological problems became unavoidable during the COVID-19 pandemic.

Traumatic experiences can cause psychological difficulties in affected individuals. The incidence of psychological reactions such as anxiety, fear, frustration, loneliness, anger, boredom, and stress increased remarkably during the pandemic. One of the psychiatric conditions that can occur during the pandemic is posttraumatic stress reaction [2].

Posttraumatic Stress Disorder (PTSD) emerges as an outcome of exposure to severe stressors such as wars, natural disasters, and other events like the pandemic [3]. Following exposure, these individuals may react differently to survive and reduce their existing stress. These reactions can be in the form of intrusion, avoidance, or hyperarousal [4].

For many individuals – after or during trauma – the psychological symptoms are subclinical and resolve spontaneously with no need for psychological intervention. For some other individuals, however, the psychological symptoms may progress and become permanent [5]. Traumatic responses are predictive of the risk of development and severity of PTSD as well as post-traumatic quality of life [6].

The aim of our study was to evaluate the effect of cognitive and sociodemographic characteristics of healthcare and non-healthcare workers on their traumatic responses to the COVID-19 pandemic. Our hypothesis was that sociodemographic factors may have an impact on posttraumatic responses. These factors (such as working as a healthcare worker or having a history of chronic diseases) and psychological features (anxiety sensitivity, history of psychiatric diseases), could both be risk factors for the development of PTSD. Our findings might help health authorities to recognize the increased risk of PTSD during the COVID-19 pandemic and to provide early, effective measures to reduce such traumatic effects.

The studies evaluating the PTSD relationship of the COVİD-19 pandemic have focused on whether the individual meets the diagnosis of PSTD and PTSD symptoms during the evaluation [7]. Responses to trauma have been ignored in many studies. In our study, trauma responses that could be predictive for psychiatric diseases like PTSD were evaluated. In addition, our study is the only study conducted in terms of comparative evaluation of trauma responses of healthcare workers and non-healthcare worker individuals.

2. Material and Methods

This descriptive, quantitative, cross-sectional study was designed to explore the factors associated with the COVID-19 trauma. The study was initiated after obtaining an approval from the local and national ethics committees (Approval No: 243/2020). The study protocol was conducted in accordance with the Helsinki Declaration.

Due to the ongoing national lockdown in Turkey and the increased risk of infection associated with face-to-face interactions, data were collected using an online survey between August 17 and September 1, 2020. Inclusion criteria included voluntary participation, being 18–65 years of age, and having at least primary education. Exclusion criteria included those who were below the age of 18 and over 65 years, with active psychotic symptoms, and presence of organic diseases that may affect judgment and decision making (e.g., dementia, frequent epilepsy, acute cerebrovascular event).

Individuals who were and who were not healthcare professionals were evaluated in the study. The voluntary group of individuals who were healthcare workers formed the healthcare professionals actively working at Dicle University Faculty of Medicine. The healthcare professionals participating in the study were asked to invite individuals they knew, who met the inclusion criteria, who did not have blood relation, and who were not healthcare workers. The volunteer group compromised of non-healthcare workers was determined in this way.

Online questionnaires were sent to 928 people via email and WhatsApp messaging. The questionnaires of 124 volunteers due to non-compliance with the inclusion criteria and 232 volunteers for not completing the scales were not evaluated.

The survey included the following scales and questionnaires: sociodemographic data form, Beck Anxiety Inventory (BAI), Anxiety Sensitivity Index (ASI), and Impact of Event Scale-Revised (IES-R).

2.1. Sociodemographic data form

This included items probing for participants' age, gender, marital status, occupation, personal and family history of psychiatric diseases, and personal and family history of chronic diseases (chronic heart disease, diabetes, asthma, chronic obstructive pulmonary disease).

2.2. Beck Anxiety Inventory (BAI)

The scale consists of 21 multiple-choice Likert-type items, each scored on a scale value of 0 (not at all) to 3 (severely). The Turkish reliability and validity study of BAI was conducted by Ulusoy et al. (1998) [8].

Table 1
Sociodemographic characteristics.

Parameter	Variable	*n*	%
Marital status	Married	493	73.4
	Unmarried	144	21.4
	Divorced	35	5.2
Educational level	Literate	11	1.6
	Primary school	14	2.1
	Secondary school	15	2.2
	High school	84	12.5
	Pre-bachelor	80	11.9
	Bachelor	315	46.9
	Master&x27s	85	12.6
	PhD	68	10.1
Personal history of psychiatric diseases	Yes	61	9.1
	No	602	89.6
Family history of psychiatric diseases	Yes	81	12.1
	No	581	86.5
Personal history of chronic diseases	Yes	115	17.1
	No	557	82.9
Family history of chronic diseases	Yes	275	40.9
	No	397	59.1

Values are given as numbers (*n*) and percentages (%).

2.3. Anxiety Sensitivity Index (ASI)

The scale includes three subscales: physical (ASI_P), cognitive (ASI_C), and social (ASI_S), each of which consists of six Likert-type items [9]. The Turkish reliability and validity study of BAI was conducted by Mantar et al. [10].

2.4. Impact of Event Scale-Revised (IES-R)

IES-R is a 22-item self-report measure used for assessing subjective distress caused by traumatic events. IES-R consists of three subscales:

- avoidance (IES-R_A);
- intrusion (IES-R_I), and;
- hyperarousal (IES-R_H).

The Turkish reliability and validity study of IES-R was conducted by Çorapçıoğlu et al. [6].

2.5. Statistical analysis

Data were analyzed using SPSS for Windows version 22.0 (Armonk, NY: IBM Corp.). Relationship between gender and BAI, ASI, and IES-R scores was analyzed using Independent Samples *t*-Test. The effect of occupational status (healthcare worker vs. non-healthcare worker) and sociodemographic characteristics (personal and family history of psychiatric and chronic diseases) on IES-R scores was analyzed using Independent Samples *t*-Test. The effect of marital status on IES-R scores was analyzed using One-Way ANOVA Test. Correlations among BAI, ASI, and IES-R scores were determined using Pearson' 933 (range, 21–63). The participants included 180 (26.78%) healthcare workers, most of whom were physicians and nurses, and 492 (73.22%) non-healthcare workers (Table 1).

3.1. Effect of sociodemographic characteristics on trauma response

Women had higher BAI ($r = 7.65$, $p < 0.001$), ASI total (ASI_Tot) ($r = 2.11$, $p < 0.05$), ASI_C ($r = 2.86$, $p < 0.01$), IES-R_I ($r = 5.78$, $p < 0.001$), IES-R_A ($r = 4.47$, $p < 0.001$), and IES-R_H ($r = 5.20$, $p < 0.001$) scores compared to men (Table 2).

Patients with a history of psychiatric diseases had significantly higher BAI ($r = -7.44$, $p < 0.001$), ASI_Tot ($r = -3.95$, $p < 0.001$), ASI_P ($r = -3.41$, $p < 0.001$), ASI_C ($r = 5.03$, $p < 0.001$), IES-R_I ($r = -3.82$, $p < 0.001$), IES-R_A ($r = -2.00$, $p < 0.05$), and IES-R_H ($r = -4.06$, $p < 0.001$) scores compared to patients with no history of psychiatric diseases (Table 3).

Table 2
Effect of gender on trauma response.

Gender	Female (*n* = 273) Mean ± SD	Male (*n* = 401) Mean ± SD	t (df = 672)
1.BAI	8.67 ± 6.84	5.05 ± 5.41	7.65***
2.ASI-Tot	37.63 ± 13.07	35.52 ± 12.50	2.11*
3.ASI_P	13.07 ± 5.46	12.29 ± 4.90	1.93
4. ASI_C	14.29 ± 5.21	13.18 ± 4.74	2.86**
5. ASI_S	10.27 ± 4.40	10.05 ± 4.36	0.66
6. IES-R_I	9.24 ± 5.72	6.87 ± 4.87	5.78***
7. IES-R_A	10.04 ± 5.08	8.24 ± 5.15	4.47***
8. IES-R_H	6.02 ± 4.29	4.43 ± 3.60	5.20***

Values are given as mean ± standard deviation (SD). BAI: Beck Anxiety Inventory score, ASI_Tot: Anxiety Sensitivity Index total score, ASI_P: Anxiety Sensitivity Index physical subscale score, ASI_C: Anxiety Sensitivity Index cognitive subscale score, ASI_S: Anxiety Sensitivity Index social subscale score, IES-R_I: Impact of Event Scale-Revised intrusion subscale score, IES-R_A: Impact of Event Scale-Revised avoidance subscale score, IES-R_H: Impact of Event Scale-Revised hyperarousal subscale score, SD: Standard deviation.
* $P < 0.05$.
** $P < 0.01$.
*** $P < 0.001$.

3.2. Effect of occupational status on traumatic responses

Healthcare workers had significantly higher BAI scores compared to non-healthcare workers ($r = 3.96$, $p < 0.001$). However, non-healthcare workers had significantly higher ASI_Tot ($r = -2.38$, $p < 0.05$), ASI_P ($r = -3.79$, $p < 0.001$), and IES-R_A ($r = -2.69$, $p < 0.01$) scores compared to healthcare workers (Table 4).

4. Discussion

The present study evaluated the effect of sociodemographic features and cognitive processes (e.g., anxiety sensitivity) on traumatic responses to COVID-19 pandemic. Traumatic responses were categorized into three types: intrusion, avoidance, and hyperarousal.

Avoidance refers to persistent avoidance of internal and external stimuli associated with the traumatic event(s). Moreover, excessive avoidance behavior is associated with the person' fear and anxiety level [11]. During the COVID-19 pandemic, it is recommended to avoid social environments and possible transmission routes to prevent the spread of the infection. However, the

Table 3
Effect of personal history of psychiatric diseases on traumatic responses.

History of psychiatric diseases	Yes (*n* = 61) Mean ± SD	No (*n* = 604) Mean ± SD	t (df = 663)
1.BAI	12.01 ± 7.92	5.95 ± 5.84	−7.44***
2. ASI-Tot	42.23 ± 13.97	35.59 ± 12.37	−3.95***
3. ASI_P	14.62 ± 6.20	12.31 ± 4.92	−3.41***
4. ASI_C	16.57 ± 5.88	13.28 ± 4.76	−5.03***
5. ASI_S	11.03 ± 4.40	9.99 ± 4.33	−1.78
6. IES-R_I	10.30 ± 6.74	7.58 ± 5.12	−3.82***
7. IES-R_A	10.23 ± 5.16	8.84 ± 5.18	−2.00*
8. IES-R_H	7.03 ± 4.34	4.89 ± 3.88	−4.06***

Values are given as mean ± standard deviation (SD). BAI: Beck Anxiety Inventory score, ASI_Tot: Anxiety Sensitivity Index total score, ASI_P: Anxiety Sensitivity Index physical subscale score, ASI_C: Anxiety Sensitivity Index cognitive subscale score, ASI_S: Anxiety Sensitivity Index social subscale score, IES-R_I: Impact of Event Scale-Revised intrusion subscale score, IES-R_A: Impact of Event Scale-Revised avoidance subscale score, IES-R_H: Impact of Event Scale-Revised hyperarousal subscale score, SD: Standard deviation.
* $P < 0.05$.
*** $P < 0.001$.

Table 4
Effect of occupational status on traumatic responses.

Occupational status	Healthcare worker ($n=180$) Mean ± SD	Non-healthcare worker ($n=492$) Mean ± SD	t (df = 670)
1.BAI	8.09 ± 7.21	5.95 ± 5.81	3.96***
2. ASI-Tot	34.43 ± 12.99	37.08 ± 12.64	−2.38*
3. ASI_P	11.37 ± 4.98	13.06 ± 5.14	−3.79***
4. ASI_C	13.37 ± 5.04	13.71 ± 4.94	−0.78
5. ASI_S	9.69 ± 4.52	10.31 ± 4.32	−1.63
6. IES-R_I	7.31 ± 5.08	8.01 ± 5.43	−1.52
7. IES-R_A	8.06 ± 5.22	9.27 ± 5.13	−2.69**
8. IES-R_H	4.93 ± 3.95	5.11 ± 3.96	-0.51

Values are given as mean ± standard deviation (SD). BAI: Beck Anxiety Inventory score, ASI_Tot: Anxiety Sensitivity Index total score, ASI_P: Anxiety Sensitivity Index physical subscale score, ASI_C: Anxiety Sensitivity Index cognitive subscale score, ASI_S: Anxiety Sensitivity Index social subscale score, IES-R_I: Impact of Event Scale-Revised intrusion subscale score, IES-R_A: Impact of Event Scale-Revised avoidance subscale score, IES-R_H: Impact of Event Scale-Revised hyperarousal subscale score, SD: Standard deviation.
* $P<0.05$.
** $P<0.01$.
*** $P<0.001$.

avoidance behavior of individuals, such as avoiding places that do not need to be avoided and avoiding behaviors that have no risk of infection, may be at the level of maladaptive fear and affect the functionality of the individuals.

Intrusion is the most typical symptom of PTSD and occurs when a person involuntarily and vividly relives the traumatic event in the form of nightmares and repetitive and distressing images or physical sensations. The symptoms of intrusion are thought to indicate the severity of PTSD [12].

Hyperarousal, on the other hand, may manifest as sleep problems, anger, and attention and concentration difficulties [13]. It is associated with hyperactive amygdala response [14]. The symptoms of overstimulation can cause numbness symptoms. In turn, the symptoms of both overstimulation and numbness can have serious negative effects on physical health and quality of life [15].

The results indicated that female gender and a positive history of psychiatric diseases led to an increase in the frequency of all three traumatic responses. Contrary to expectations, being a healthcare worker was not found as a factor facilitating trauma response formation in our study.

The severity and comorbidity of trauma-related problems are greater in women than in men [16]. This phenomenon is associated with several factors related to women, including increased risk of trauma, effect of sex hormones, and sociocultural background [17,18]. Studies investigating gender and PTSD predisposition have also reported that women are at an increased risk of PTSD development [19]. In our study, women had significantly different traumatic responses when compared to men ($p < 0.001$).

In our study, a positive history of psychiatric diseases was another factor leading to an increase in the frequency of all three traumatic responses. In a previous meta-analysis, Brewin et al. indicated that a positive history of psychiatric diseases was reported as a risk factor for PTSD development [20]. It has also been reported that previous psychiatric diseases facilitate subsequent PTSD episodes. Not only does PTSD history pose a risk for PTSD development, but so too does depressive episode history [21].

Healthcare workers constitute the occupational group most affected by the pandemic. To illustrate, a previous study investigated the psychological impact of the Severe Acute Respiratory Syndrome (SARS) epidemic on hospital employees and reported that 10% of the employees showed clinical signs of PTSD [22].

In our study, participants were divided into two groups as healthcare and non-healthcare workers. The results indicated that the anxiety levels (BAI scores) of healthcare workers were significantly higher than those of non-healthcare workers ($p < 0.001$). In traumatic responses, however, the frequency of avoidant behavior was higher in non-healthcare workers than in healthcare workers ($p < 0.01$), while no significant difference was found in terms of other traumatic responses ($p > 0.05$). These findings could be attributed to the fact that healthcare workers necessarily need to reduce their avoidance behavior significantly due to their responsibility to fulfill their obligations. Therefore, the frequency of avoidant behavior is likely to be higher in non-healthcare workers than in healthcare workers.

5. Limitation

One of the limitations of the survey application was its online format, which nearly all of the non-healthcare-worker volunteers were not accustomed to. This was resolved by leaving out the incomplete scales in the study.

6. Conclusion

Our hypothesis was that sociodemographic factors and psychological features that could be risk factors for the development of PTSD and could increase the risk of development and severity of infection may have an impact on posttraumatic responses. This hypothesis was supported by the findings that indicated that female gender, increased anxiety sensitivity, and a positive history of psychiatric diseases were risk factors for PTSD development and led to an increase in the frequency of all three traumatic responses. Nevertheless, contrary to expectations, there were no significant differences found for traumatic responses in healthcare workers, who have the highest risk of COVID-19 infection, compared to non-healthcare workers.

Ethics Committee Approval

The study protocol was approved by local ethics committee (Approval No: 243/2020).

Consent of The Participants

Informed consents were obtained from all paticipants included in the study.

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Disclosure of interest

The authors declare that they have no competing interest.

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