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ORIGINAL RESEARCH

Exploring Secondary Traumatic Stress as a Post-Pandemic Challenge for Healthcare Workers Practicing in Saudi Arabia

Heba Ashi[1], Marwah A Afeef [2], Faris M Almutairi[3], Razin H Subahi[4], Emad A Aljohani[5], Zuhair S Natto [1]

[1]Department of Dental Public Health, Faculty of Dentistry, King Abdulaziz University, Jeddah, Kingdom of Saudi Arabia; [2]Department of Research & Studies, Al-Thagher Hospital, Jeddah, Kingdom of Saudi Arabia; [3]Department of Respiratory Therapy, Al-Thagher Hospital, Jeddah, Kingdom of Saudi Arabia; [4]Specialty Dental Centre. Al-Thagher Hospital, Jeddah, Kingdom of Saudi Arabia; [5]Department of Health Services and Hospital Management, Al-Thagher Hospital, Jeddah, Kingdom of Saudi Arabia

Correspondence: Marwah A Afeef, Al-Thagher Hospital, Jeddah, Kingdom of Saudi Arabia, Tel +966535732762, Email mafeef@moh.gov.sa

Objective: In this study, we aim to determine post-pandemic level of secondary traumatic stress and the associated factors among healthcare workers practicing in the Western province of Saudi Arabia.

Methods: Healthcare workers practicing at public health sector of the Western province of Saudi Arabia. Received Web-based Self-administered questionnaire, assessing post-pandemic Secondary Traumatic Stress (STS), using Secondary Traumatic Stress Scale (STSS).

Results: A total of 380 responses received. Logistic regression analysis identified significant predictors of secondary traumatic stress (STS). Females had a significantly higher likelihood of experiencing STS (OR=2.425, $p<0.001$). Doctors were significantly more likely to experience STS compared to other specialties (OR=2.863, $p=0.016$). Participants sleeping 7 hours were associated with a lower likelihood of STS (OR=0.427, $p=0.016$), while sleeping 6 hours showed a trend towards lower STS but was not statistically significant ($p=0.068$). Participants aged 50 and above were significantly less likely to experience STS (OR=0.275, $p=0.021$). Lastly, Saudi nationals were significantly more likely to experience STS compared to non-Saudis (OR=2.717, $p=0.014$).

Conclusion: Female healthcare workers, doctors, and those younger than 50 years old were all found to be at a significantly higher risk of STS. Interestingly, sleep duration emerged as a potential protective factor, with those sleeping 7 hours exhibiting a lower risk of STS. Finally, the analysis revealed a higher prevalence of STS among Saudi nationals compared to non-Saudis.

Keywords: secondary traumatic stress, post-pandemic, healthcare workers, Saudi Arabia, public sector

Introduction

Empathy-based stress is the negative psychological and physical impact of experiencing the trauma of others at work combined with empathetic engagement.[1] In literature, empathy-based stress differentiated into three different types of strain constructs including compassion fatigue, secondary traumatic stress, and vicarious traumatization.[1] Vicarious traumatization considered as a negative reaction to witnessing or observing others suffering over time. As a result of this experience, individuals transform from within and may create different views about the world.[1] In addition, secondary traumatic stress is defined as "the stress deriving from helping others who are suffering or who have been traumatized".[2] According to literature, post-traumatic stress disorder and secondary traumatic stress disorder are sharing the same negative impact in cognition and mood.[3] On the other hand, compassion fatigue is a high level of stress where individuals feel the same pain and suffer of the original trauma victim.[1] Secondary traumatic stress disorder considered as occupational hazard,[4,5] as day-to-day tasks of healthcare workers include, listening or witnessing the suffer, pain, and fear of others. Consequently, such engagement involves absorbing and re-living the traumatizing events impacting the workers ability to provide quality of care.[5,6]

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The growing literature revealed that healthcare workers to experience high level of work-related stress and psychological distress.[7,8] It has been documented that nurses caring for patients with trauma to experience the same stress experienced by their patients.[9] Moreover, a study revealed that caring for survivors of traumatic events may negatively impact the physical and mental health of the professionals.[3]

In Poland, a study conducted to assess the secondary traumatic stress among a group of medical professionals concluded that paramedics and nurses to be at high risk of indirect traumatic stress disorder.[6] In Germany, a study examined the frequency of reporting secondary traumatic stress among nurses. It has been found that high rates of self-reported secondary traumatic stress disorder in nurses. Moreover, those with secondary traumatic stress disorder showed symptoms of depression and anxiety, higher job strain, and lower workability.[8]

In Saudi Arabia, multiple studies conducted to assess the impact of work-related stressors on the health and wellbeing of the healthcare workers. A study revealed that the frequent exposure to complicated situations by nurses of critical care units make them more prone to burn out and secondary traumatic stress.[10,11] Moreover, a study assessed the level of secondary traumatic stress among healthcare workers in critical care revealed that emergency healthcare workers suffer high level of secondary traumatic stress disorder.[12]

In this study, we aim to determine post-pandemic level of secondary traumatic stress disorder and the associated factors among healthcare workers practicing in the Western province of Saudi Arabia.

Methods

It is a cross-sectional study took place in August 2023. The study focused on healthcare workers employed in the public health sector of Jeddah City, located in the Western Province of Saudi Arabia. Only hospitals and primary care centers within their network and operated by the Saudi Arabian Ministry of Health and located in Jeddah city of the Western Province of Saudi Arabia were included. Out of thirteen public hospitals in Jeddah city of Saudi Arabia, five hospitals expressed interest in participating in our study. Of these hospitals, three have a bed capacity of 400 to 700 beds, while the other two have a bed capacity of 100 to 300 beds. They distributed the survey to their employees through internal communication channels. These workers received a web-based, self-administered questionnaire assessing post-pandemic Secondary Traumatic Stress (STS) using the Secondary Traumatic Stress Scale (STSS).

The study has been granted an exemption from requiring written informed consent since it is a web-based questionnaire. The need for written informed consent was waived by the Institutional Review Board holding the National Registration number with NCBE-KACST, KSA: (H-02-J-002) based at Jeddah Health Affairs. IRB Log No (A01671) 05/07/2023. Those who responded to the questionnaire assumed agree to take part in the study.

Sample

The required sample size was calculated using the Raosoft website (http://www.raosoft.com/samplesize.html; 5% margin of error and 95% CI) based on healthcare workers (HCWs) numbers practicing in Saudi Arabia. Based on these calculations, a sufficient sample size was found to be 377 participants. As such, the final sample consisted of 377 total HCWs, with a response rate of 50%.[13]

Data Collection Tool

Web-based Self-administered questionnaires have been sent to HCW official emails through the Internal Communication department in the targeted hospitals. Section 1 collected personal and occupational data. Section 2 assesses the Secondary Traumatic Stress (STS), using Secondary Traumatic Stress Scale (STSS), a self-administered 17-item questionnaire that has been established as a valid and reliable instrument for measuring the frequency of STS symptoms.[12] Participants were asked to express how frequently they have experienced the STS symptoms in the past year post-pandemic. The total scores got calculated by summing the item scores, (0=Never, 1=Rarely, 2=A few times, 3=Somewhat often, 4=Often, and 5=Very often). A higher score indicating a higher frequency of symptoms. A score below 28 means little or no STS. A score between 28 and 37 meant mild STS. A score between 38 and 43 meant moderate STS. A score between 44 and 48 meant high STS, and score of 49 or more means severe STS.

Statistical Analysis

All statistical analyses were conducted using IBM SPSS Statistics for Windows, Version 29.0. Descriptive statistics were used to summarize the demographic characteristics of the study participants, including age, gender, nationality, marital status, professional specialization, department, years of experience, and sleep hours.

To analyze the predictors of secondary traumatic stress (STS), we performed a binary logistic regression. For this purpose, we combined the STS levels into a binary outcome variable: no/little STS versus others STS. The forward stepwise method was utilized for model building to identify the most significant predictors of STS.

The logistic regression model included the following independent variables: age group, gender, nationality, marital status, professional specialization, department, years of experience, and sleep hours. The forward stepwise approach allowed us to add variables to the model one at a time based on their statistical significance in predicting STS. The final model retained only those variables that were significant predictors at the $p<0.05$ level.

The results of the logistic regression analysis are presented as odds ratios (ORs) with corresponding 95% confidence intervals (CIs) and p-values. This approach ensured that only the most relevant predictors were included in the final model, providing a clear understanding of the factors associated with higher levels of STS among healthcare professionals.

Results

Three hundred eighty responses have been received. The study sample consisted of a diverse group of healthcare professionals with varying demographic characteristics. The age distribution revealed that the largest age group was 30–39 years, representing 47.4% of the sample, followed by the 40–49 age group at 31.6%. Participants aged 20–29 years and those aged 50 and above constituted 11.1% and 10.0%, respectively. Gender distribution indicated that 60.5% of the participants were male, while 39.5% were female. A significant majority of the participants were Saudi nationals (87.4%), with non-Saudis making up 12.6%. Marital status data showed that most participants were married (72.9%), with unmarried individuals accounting for 27.1% (Table 1).

In terms of professional specialization, the largest group within specialties was nurses (27.1%), followed by doctors (24.5%), and non-doctor specialists (19.2%). Pharmacists, administrative staff, and others comprised 6.3%, 10.0%, and 12.9% of the sample, respectively. Department-wise, outpatient and emergency departments had the highest representation at 21.3% and 20.3%, respectively. Other departments included ICU (11.1%), primary care (9.7%), surgical (6.8%),

Table 1 Frequency and Percentage of Demographic Characteristics of the Study Sample

Variables	Total N=380N (%)
Age	
20–29	42 (11.1)
30–39	180 (47.4)
40–49	120 (31.6)
50 and above	38 (10.0)
Gender	
Male	230 (60.5)
Female	150 (39.5)
Nationality	
Saudi	332 (87.4)
Non-Saudi	48 (12.6)
Marital status	
Married	277 (72.9)
Un married	103 (27.1)

(*Continued*)

Table 1 (Continued).

Variables	Total N=380N (%)
Speciality	
Doctor	93 (24.5)
Non doctor specialist	73 (19.2)
Nurses	103 (27.1)
Pharma	24 (6.3)
Admin	38 (10.0)
Others	49 (12.9)
Department	
ER	77 (20.3)
Outpatient	81 (21.3)
ICU	42 (11.1)
Primary care	37 (9.7)
Surgical	26 (6.8)
Inpatient	31 (8.2)
Others	86 (22.6)
Year of experience	
< 5 years	57 (15.0)
5–10	99 (26.1)
11–15	107 (28.2)
16–20	55 (14.5)
More than 20	62 (16.3)
Sleep hours	
5 or less	86 (22.6)
6	123 (32.4)
7	100 (26.3)
8 and more	71 (18.7)

Abbreviations: ER, emergency department; ICU, intensive care unit.

inpatient (8.2%), and other departments (22.6%). Participants' years of experience varied, with the largest group having 11–15 years of experience (28.2%), followed by those with 5–10 years (26.1%), less than 5 years (15.0%), 16–20 years (14.5%), and more than 20 years (16.3%). Regarding sleep hours, the most common sleep duration was 6 hours (32.4%), followed by 7 hours (26.3%), 5 or fewer hours (22.6%), and 8 or more hours (18.7%) (Table 1).

When stratifying the sample by secondary traumatic stress (STS) levels, it was observed that younger age groups (20–39) tended to have a higher percentage in the severe STS category compared to older age groups, although this difference was not statistically significant (p=0.082) (Table 2). Gender analysis revealed that females were more likely to experience higher levels of STS compared to males, with a significant p-value (<0.001). Nationality-wise, Saudi nationals were more represented in the severe STS category, though this difference was not statistically significant (p=0.308). Marital status indicated that married individuals tended to have lower STS levels compared to unmarried individuals, but this was not statistically significant (p=0.103). Within specialties, doctors and nurses had higher STS levels compared to other specialties, with a significant p-value (0.007). No significant difference in STS levels was observed across different departments (p=0.333). Years of experience did not significantly impact STS levels (p=0.486). Participants sleeping 5 hours or less showed higher levels of STS, with a significant p-value (<0.001) (Table 2).

Logistic regression analysis identified significant predictors of secondary traumatic stress (STS). Females had a significantly higher likelihood of experiencing STS (OR=2.425, p<0.001) (Table 3). Doctors were significantly more likely to experience STS compared to other specialties (OR=2.863, p=0.016). Participants sleeping 7 hours were associated with a lower likelihood of STS (OR=0.427, p=0.016), while sleeping 6 hours showed a trend towards lower STS but was not statistically significant (p=0.068). Participants aged 50 and above were significantly less likely

Table 2 Frequency and Percentage of Demographic Characteristics of the Study Sample Stratified by Secondary Traumatic Stress (STS)

Variables	Little to no n=213 n (%)	Mild n=60 n (%)	Moderate n=38 n (%)	High n=23 n (%)	Severe n= 46 n (%)	P value
Age						0.082
20–29	23 (10.8)	7 (11.7)	6 (15.8)	0 (0.0)	6 (13.0)	
30–39	92 (43.2)	32 (53.3)	18 (47.4)	11 (47.8)	27 (58.7)	
40–49	68 (31.9)	16 (26.7)	14 (36.8)	11 (47.8)	11 (23.9)	
50 and above	30 (14.1)	5 (8.3)	0 (0.0)	1 (4.3)	2 (4.3)	
Gender						<0.001*
Male	148 (69.5)	26 (43.3)	21 (55.3)	10 (43.5)	25 (54.3)	
Female	65 (30.5)	34 (56.7)	17 (44.7)	13 (56.5)	21 (45.7)	
Nationality						0.308
Saudi	183 (85.9)	54 (90.0)	31 (81.6)	20 (87.0)	44 (95.7)	
Non-Saudi	30 (14.1)	6 (10.0)	7 (18.4)	3 (13.0)	2 (4.3)	
Marital status						0.103
Married	166 (77.9)	41 (68.3)	23 (60.5)	17 (73.9)	30 (65.2)	
Un married	47 (22.1)	19 (31.7)	15 (39.5)	6 (26.1)	16 (34.8)	
Speciality						0.007*
Doctor	44 (20.7)	17 (28.3)	12 (31.6)	9 (39.1)	11 (23.9)	
Non doctor specialist	35 (16.4)	9 (15.0)	10 (26.3)	8 (34.8)	8 (17.4)	
Nurses	55 (25.8)	20 (33.3)	13 (34.2)	3 (13.0)	12 (26.1)	
Pharma	18 (8.5)	1 (1.7)	1 (2.6)	3 (13.0)	1 (2.2)	
Admin	30 (14.1)	5 (8.3)	1 (2.6)	0 (0.0)	2 (4.3)	
Others	31 (14.6)	8 (13.3)	1 (2.6)	0 (0.0)	9 (19.6)	
Department						0.333
ER	43 (20.2)	16 (26.7)	6 (15.8)	5 (21.7)	7 (15.2)	
Outpatient	47 (22.1)	11 (18.3)	6 (15.8)	6 (26.1)	11 (23.9)	
ICU	21 (9.9)	4 (6.7)	8 (21.1)	1 (4.3)	8 (17.4)	
Primary care	18 (8.5)	7 (11.7)	6 (15.8)	2 (8.7)	4 (8.7)	
Surgical	16 (7.5)	1 (1.7)	5 (13.2)	1 (4.3)	3 (6.5)	
Inpatient	13 (6.1)	6 (10.0)	3 (7.9)	4 (17.4)	5 (10.9)	
Others	55 (25.8)	15 (25.0)	4 (10.5)	4 (17.4)	8 (17.4)	
Year of experience						0.486
< 5 years	29 (13.6)	11 (18.3)	8 (21.1)	0 (0.0)	9 (19.6)	
5–10	50 (23.5)	18 (30.0)	11 (28.9)	9 (39.1)	11 (23.9)	
11–15	61 (28.6)	18 (30.0)	8 (21.1)	5 (21.7)	15 (32.6)	
16–20	31 (14.6)	8 (13.3)	6 (15.8)	5 (21.7)	5 (10.9)	
More than 20	42 (19.7)	5 (8.3)	5 (13.2)	4 (17.4)	62 (13.0)	
Sleep hours						<0.001*
5 or less	31 (14.6)	14 (23.3)	18 (47.4)	9 (39.1)	14 (30.4)	
6	75 (35.2)	22 (36.7)	7 (18.4)	5 (21.7)	14 (30.4)	
7	68 (31.9)	12 (20.0)	8 (21.1)	6 (26.1)	6 (13.0)	
8 and more	39 (18.3)	12 (20.0)	5 (13.2)	3 (13.0)	12 (26.1)	

Notes: *P value < 0.05. All P value obtained by chi square or Fisher exact test.
Abbreviations: ER, emergency department; ICU, intensive care unit.

to experience STS (OR=0.275, *p*=0.021). Lastly, Saudi nationals were significantly more likely to experience STS compared to non-Saudis (OR=2.717, *p*=0.014) (Table 3).

Discussion

Our study investigated the secondary traumatic stress (STS) among healthcare workers in Jeddah city of Saudi Arabia. The results of our study found that females to be more vulnerable to STS. Our results agree with multiple studies that

Table 3 Logistic Regression Analysis of Predictors of Secondary Traumatic Stress (STS)

Variables	B	S.E.	Wald	Sig.	OR (95 CI)
Gender					
Female	0.886	0.262	11.396	**<0.001**	**2.425 (1.450, 4.055)**
Male					Ref
Specialty					
Doctor	1.052	0.435	5.840	**0.016**	**2.863 (1.220, 6.718)**
Non doctor specialist	0.680	0.405	2.817	0.093	1.974 (0.892, 4.369)
Nurses	−0.022	0.403	0.003	0.957	0.978 (0.444, 2.156)
Pharma	−0.372	0.587	0.401	0.527	0.690 (0.218, 2.179)
Admin	−0.641	0.527	1.482	0.223	0.527 (0.188,1.479)
Other					Ref
Sleep hours					
5 or less	0.547	0.361	2.292	0.130	1.727 (0.851, 3.506)
6	−0.615	0.337	3.327	0.068	0.541 (0.279,1.047)
7	−0.850	0.351	5.851	**0.016**	**0.427 (0.215, 0.851)**
8 and more					Ref
Age					
30–39	0.149	0.380	0.153	0.696	1.160 (0.551, 2.443)
40–49	0.031	0.398	0.006	0.937	1.032 (0.473, 2.252)
50 and above	−1.289	0.559	5.319	**0.021**	**0.275 (0.092, 0.824)**
20–29					Ref
Nationality					
Saudi	1.000	0.408	6.005	**0.014**	**2.717 (1.222, 6.044)**
Non-Saudi					Ref

Notes: Outcome is Secondary Traumatic Stress (STS) little or no versus all other categories combined; the p value for Hosmer and Lemeshow test is 0.949. **Bold indicate *P* value < 0.05**. All *P* value obtained by multivariable logistic regression model.

found a significant association of STS among female HCW when compared to their counterparts.[14,15] In addition, our results found that younger HCW to report higher level of STS when compared to older HCW. It is suggested that older HCW to be more experienced to deal with work related stressors.[16] Our results also found that doctors and nurses to exhibit higher STS levels compared to other specialties. Ou results are in agreement with multiple studies confirmed that profession to be a risk factor of STS.[17,18] It has been suggested that the demanding nature of their work likely exposes them to more patients experiencing trauma. Support systems and stress management techniques tailored to these professions could be beneficial.

In addition, our findings revealed a significant link between insufficient sleep (5 hours or less) and higher STS underscores the importance of promoting healthy sleep among healthcare workers. It has been suggested that workload and work related stress to be contributing factors to sleep deprivation.[19] Work schedules and workload management strategies that prioritize adequate rest should be considered.

Moreover, Saudi nationals reported a higher prevalence of STS compared to non-Saudis. Saudi Arabian culture may have unique aspects that influence how individuals experience and express trauma.[15] It has been confirmed that societal expectations, religious beliefs, and familial dynamics can impact coping mechanisms and the development of post-traumatic stress symptoms (STS).[20]

Our study has number of limitations. This study was limited to Jeddah city of the Western province of Saudi Arabia according to the local IRB jurisdiction. So, our results cannot be generalized to all healthcare workers practicing in Saudi Arabia. Our study got conducted in public health sector, more studies needed to investigate this problem in private sector. Finally, it is a self-reported data so bias may influence some responses.

Conclusion and Future Directions

Female healthcare workers, doctors, and individuals under 50 years of age were significantly more likely to experience post-traumatic stress symptoms (STS). Interestingly, sleeping for 7 hours was associated with a lower risk of STS. Additionally, Saudi nationals reported a higher prevalence of STS compared to non-Saudis. Our research offers a valuable foundation for understanding the level of STS among healthcare workers in Saudi Arabia following the pandemic. Future studies could benefit from longitudinal designs to track participants over time and explore how work experiences and personal factors influence STS development. Qualitative research, such as in-depth interviews with healthcare workers, could provide valuable insights into their specific challenges and coping mechanisms. Furthermore, examining how cultural aspects of healthcare delivery and social support systems might impact STS risk in Saudi Arabia would be beneficial.

Data Sharing Statement

All data generated or analyzed during this study are included in this article. Further enquiries can be directed to the corresponding author.

Statement of Ethics

This study protocol was reviewed and approved. The study has been granted an exemption from requiring written informed consent since it is a web-based questionnaire. The need for written informed consent was waived by the Institutional Review Board holding the National Registration number with NCBE-KACST, KSA: (H-02-J-002) based at Jeddah Health Affairs. IRB Log No (A01672) 05/07/2023. Those who responded to the questionnaire assumed agree to take part in the study.

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Disclosure

The authors have no conflict of interest to declare.

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