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Mental health impact of work-related injuries: a cross-sectional study

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ABSTRACT

Background: work related injuries (WRIs) can range in severity from mild to possibly fatal. Compared to workers in other industries, many health care professionals are more likely to get hurt. Both the standard of treatment and the physical and emotional health of the personnel may be impacted by these injuries. The antecedent to post-traumatic stress disorder (PTSD) is a delayed response to a stressful event or situation, whether short-term or long-term, that is catastrophic or dangerous in nature. PTSD is likely to cause widespread discomfort. Some conditions, like stress and anxiety, are comorbid with PTSD. WRIs and mental health (MH) concerns may result in costs for organizations and society.

Aim: To identify the correlation between MH and WRIs among healthcare workers (HCWs).

Methods: This research was cross-sectional, and it was conducted on workers in hospitals during Sept.2025. The research used a survey that investigated the demographics, work injuries (WIs), PTSD, anxiety, and depression among the participants.

Results: A total of 183 participants were enrolled; 93 (50.8%) were females, and the major prevalent WI was musculoskeletal, 27 (14.8%). There were 83 (45.4%), 88 (48.1%), and 101 (55.2%) who had PTSD, moderate anxiety, and moderately severe to severe depression, respectively. There were significant correlations between PTSD and gender ($p < 0.001$), type of injury ($p < 0.001$), anxiety ($p < 0.001$), and depression ($p < 0.001$).

Conclusion: Work-related injuries have an adverse effect on the MH of HCWs, leading to elevated levels of PTSD, anxiety, and depression.

Keywords: WRIs, healthcare workers, prevalence, mental health, impact.

Introduction

Work injury (WI) is damage or a wound that occurs to the body resulting from intentional or unintentional acute exposure to different forms of energy or resulting from the absence of essential elements, such as oxygen or heat, that is caused by a specific incident or event within a single shift or workday [1]. In the hospital settings, work-related injuries (WRIs) describe the self-reported injuries from incidental incidents in the previous 6 months, including wounds, needle stick, contact with contaminated substances, falls, mechanical injuries, and other types [2]. Such injuries can range from minor ones, such as bruises and cuts, to potentially life-threatening injuries [3].

The health sector involves several employees who face a greater risk of injury compared to employees in other fields [4]. Workers in hospitals, especially healthcare workers (HCWs), face several health hazards and WIs at work, including physical, chemical, biological, and psychological hazards that affect almost 50% of them [5]. Such injuries include strains, cuts, sprains, fractures, and frequent trauma such as sharp injuries, violence, and patient handling activities [4].

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Such injuries can affect the workers by affecting their mental health (MH), physical health, and quality of healthcare services provided by the affected healthcare personnel [6,7]. MH term refers to "the state and variation of an individual's psychological well-being and distress" [8], with a complete state including healthy emotional, cognitive, and social functioning with psychological distress absence [9].

Post-traumatic stress disorder (PTSD) develops as a delayed response to a stressful condition or event, of along or brief duration of a catastrophic or threatening nature, which is probably to cause pervasive distress [10]. PTSD risk relies on the critical incident nature and the personality of the individual [11].

There is comorbidity between PTSD and some conditions, such as anxiety and stress [10]. Stress and anxiety are linked with reduced morale in HCWs, reduced quality of care, and job satisfaction [12]. The high rates of PTSD have been reported among HCWs, due to witnessing the suffering and death of patients, experiencing emotionally distressing work events, exposure to direct threats, and exposure to violence from patients [10]. However, no previous study reported the PTSD rate after exposure to WIs.

WRIs and MH impose potential costs for facilities and society, including lost productivity, diminished morale, recruitment, healthcare expenses, and workers' compensation [13]. Hence, it is necessary to identify the correlation between WRIs and MH and the mental issues prevalent among those with WIs. However, interest in this subject has been neglected in the literature [13], and no previous study has been reported on this subject. Additionally, researchers often face difficulty quantifying the correlation between WRIs and MH [14].

One study from Saudi Arabia conducted on HCWs in Dammam and Jeddah reported a prevalence of sharp injuries of 8.4%, with a lower rate of injuries among those with experience exceeding 15 years. However, the study didn't mention the mental impact of such injuries on the workers [15].

A study from the USA demonstrated that injured workers had a greater probability of seeking mental healthcare services compared to non-injured ones during the 6 months post-injury (OR 1.64). Such findings indicate that injured workers experienced mental issues that required mental healthcare [16]. One study included 90 healthcare professionals and revealed that 27.8% met PTSD diagnostic criteria. The elevated risk of PTSD was considerably linked with exposure to traumatic events, especially those related to armed conflict [17].

One study conducted on 7,556 subjects with a WI was compared with 28,901 individuals of the general population. The workplace category displayed non-significant values regarding anxiety (aRR 0.82, 95% CI 0.95-1.06) after injury [18]. On the other hand, workers who experienced great degrees of stress from the compensation procedure were reported to be at elevated risk of anxiety 6 years post injury [19].

One study discovered that workers with injuries experienced worse MH and physical health, well-being, and functional restrictions at a mean of 10 years post-injury [20]. One research study enrolled HCWs in Bangladesh, revealed that moderate work hazards resulted in a moderate degree of MH issues. Physical, biological, chemical, and psycho-social hazards have a potential influence on HCWs' MH issues. On the other hand, accidental hazards had a significant negative impact [6]. Additionally, previous research revealed that mental disorders elevated the risk of occupational injuries [21-23].

Methodology

Cross-sectional that was conducted on workers in hospitals during Sept.2025. The research investigate the demographics, WIs, PTSD, anxiety, and stress among the participants in Care hospitals.

A-Inclusion standards:

1-Both genders.

2-All workers in hospitals, including medical and non-medical professions.

3-The subjects providing informed consent.

B-Exclusion standards:

1-Workers outside hospitals.

2-Subjects refuse participation and/or provide informed consent.

The tool for data collection

A survey included five parts. The first investigated the demographics of the subjects, including age, profession, years of experience, gender, and marital status. The second part investigated information on WIs, including injury date, type, possible cause, and consequences of the injuries. The third part was the "PSD Checklist-Civilian version (PCL-C)" for evaluating PTSD, whereas the fourth part will be the "self-anxiety scale" for measuring anxiety [24], and the fifth part was the "perceived stress scale" to assess the levels of stress [25].

Statistical method

SPSS version 26 will be implemented for data analysis. Mean (±SD) and number (%) will be used for the representation of quantitative and qualitative data, respectively. The correlations will be identified through the Student T-test or chi-square, based on the data type. The significance of the p-value will be considered at ≤ 0.05.

Ethical consideration

Ethical approval was obtained from Care IRB committee before the initiation of the study with a number :

H-01-R-159. Each subject signed informed consent before being incorporated into the study.

Results

A total of 183 subjects were included; their demographics are displayed in Table 1. Female subjects represented 93 (50.8%), and those aged 36-50 years represented the largest proportion of the participants, 60 (32.8%). Also, the largest proportions of the subjects had either intermediate education 63 (34.4%) or university and above 52 (28.4%).

A total of nine injuries were reported; he major types of WIs included musculoskeletal 27 (14.8%), accidents 24 (13.1%), and brain injuries 24 (13.1%), Table 2.

The depression of the subjects was investigated using the PHQ-9 scale; the questions and the proportion of each answer of the participants are displayed in Table 3. The range of PHQ-score was 3-22, and the mean ± SD was 14.2 ± 3.9, indicating moderate depression.

Anxiety of the subjects was investigated using the GAD-7 scale; the questions and the answers of the subjects are shown in Table 4. The range of GAD-7 score was 4–16, whereas the mean ± SD of the scores was 10.6 ± 3.5, indicating a moderate level of anxiety.

PTSD of the participants was investigated by PCL-5 through 20 items; the details of the questions and the answers of the participants are revealed in Table 5. The range of PCL-5 score was 3-43, whereas the mean ± SD of PCL-5 score was 30.25 ± 9.7, indicating sub-threshold PTSD symptoms.

The overall MH of the HCWs showed that Less than one-half of the participants had PTSD 83 (45.4%), and moderate anxiety 88 (48.1%), whereas more than one-half of the subjects had moderately severe and severe depression 101 (55.2%).

Considerable correlations were found between PTSD prevalence and several factors (Table 4). Females considerably tended to experience PTSD compared to males ($p < 0.001$). Also, those with a university or above level of education tended to experience PTSD ($p < 0.001$). In terms of injury types, there was a significant relation between PTSD and brain injuries ($p < 0.001$).

Regarding other MH parameters, PTSD was significantly related to anxiety levels ($p < 0.001$) and depression levels ($p < 0.001$), Table 5.

Significant correlations were found between anxiety levels and demographics (Table 6). Anxiety levels were significantly related to gender ($p < 0.001$), age ($p < 0.001$), and the educational levels of the participants ($p < 0.001$).

Similarly, there were significant correlations between depression level and different demographics, including gender ($p < 0.001$), age ($p < 0.001$), and educational level ($p < 0.001$), Table 7.

Table 1. Demographic characteristics of injured workers.

		N = 183	%
Sex	Female	93	50.8%
	Male	90	49.2%
Age	18-25	30	16.4%
	26-35	48	26.2%
	36-50	60	32.8%
	>50	45	24.6%
Educational level	Intermediate	63	34.4%
	Primary	36	19.7%
	Secondary	32	17.5%
	University or above	52	28.4%

Table 2. *Types of WI.*

Type of injury	Accidents	24	13.1%
	Brain injuries	24	13.1%
	Burns	22	12.0%
	Electrical injury	21	11.5%
	Falls from heights	22	12.0%
	Improper lifting	10	5.5%
	Musculoskeletal	27	14.8%
	Sharps	12	6.6%
	Struck by a moving object	21	11.5%

Discussion

In the health sector, the HCWs face a greater risk of injury compared to employees in other fields [4]. Such injuries can affect the workers by affecting their MH [6,7]. Therefore, this study was conducted to assess the correlation between WRIs and the MH of HCWs.

WRIs include strains, cuts, sprains, fractures, and frequent trauma such as sharp injuries, violence, and patient handling activities [4]. In the current study, the most frequent injuries were musculoskeletal and brain injuries, as well as accidents, whereas sharp injuries represented only 6.6% of all WRIs. In a previous Saudi study, the overall prevalence of WRIs in secondary hospitals of the Ministry of Health in Jeddah was 52%, with back injuries being the most dominant injuries (32.6%), followed by eye/mouth splashes (20.4%) and needle stick injuries (19.9%) [26].

The current study revealed that the healthcare providers had sub-threshold PTDS symptoms, but moderate depression and anxiety. Based on the different levels of the assessed three aspects of MH, we found that less than one-half of the subjects had PTSD and moderate anxiety, whereas more than one-half

Table 3. PHQ-9 scale description.

Over the last 2 weeks, how often have you been bothered by any of the following issues?	Not at all		Several days		More than half the days		nearly everyday	
	n	%	*n*	%	*n*	%	*n*	%
Little interest in doing things	97	53.0%	15	8.2%	37	20.2%	34	18.6%
Feeling down, depressed, or hopeless	15	8.2%	52	28.4%	92	50.3%	24	13.1%
Trouble falling/staying asleep, sleeping too much.	22	12.0%	81	44.3%	71	38.8%	9	4.9%
Feeling tired or having little energy	21	11.5%	48	26.2%	72	39.3%	42	23.0%
Poor appetite or overeating.	27	14.8%	24	13.1%	89	48.6%	43	23.5%
Feeling bad about yourself, or have let yourself or your family down.	26	14.2%	15	8.2%	70	38.3%	72	39.3%
Trouble concentrating on things	59	32.2%	35	19.1%	65	35.5%	24	13.1%
Moving or speaking so slowly that other people could have noticed.	41	22.4%	41	22.4%	65	35.5%	36	19.7%
Thoughts that you would be better off dead or of hurting yourself in some way	38	20.8%	19	10.4%	82	44.8%	44	24.0%
PHQ9 score mean ±SD Range	14.2 ± 3.9 3-22							

Table 4. Relation of PTSD with socio-demographic and type of injury.

		PTSD				*p* value
		no		yes		
		n	%	*n*	%	
Sex	Female	31	33.3%	62	66.7%	<0.001
	Male	69	76.7%	21	23.3%	
Age	18-25	21	70.0%	9	30.0%	0.210
	26-35	24	50.0%	24	50.0%	
	36-50	34	56.7%	26	43.3%	
	>50	21	46.7%	24	53.3%	
Educational level	Intermediate	42	66.7%	21	33.3%	<0.001
	Primary	12	33.3%	24	66.7%	
	Secondary	32	100.0%	0	0.0%	
	University or above	14	26.9%	38	73.1%	
Type of injury	Accidents	11	45.8%	13	54.2%	<0.001
	Brain injuries	0	0.0%	24	100.0%	
	Burns	22	100.0%	0	0.0%	
	Electrical injury	12	57.1%	9	42.9%	
	Falls from heights	22	100.0%	0	0.0%	
	Improper lifting	10	100.0%	0	0.0%	
	Musculoskeletal	14	51.9%	13	48.1%	
	Sharps	0	0.0%	12	**100.0%**	
	Struck by a moving object	9	42.9%	12	**57.1%**	

Table 5. Relation of PTSD in relation to anxiety and depression.

		PTSD				*p* value
		No		Yes		
		Count	Row *N* %	Count	Row *N* %	
Anxiety	Mild anxiety	59	83.1%	12	16.9%	<0.001
	Moderate anxiety	41	46.6%	47	53.4%	
	Severe anxiety	0	0.0%	24	100.0%	
Depression	Mild depression	29	100.0%	0	0.0%	<0.001
	Moderate depression	32	60.4%	21	39.6%	
	Moderately severe &severe depression	39	38.6%	62	61.4%	

Table 6. Relation of anxiety of injured workers to demographic factors.

		Anxiety						*p* value
		Mild anxiety		Moderate anxiety		Severe anxiety		
		n	%	*n*	%	*n*	%	
Sex	Female	22	23.7%	47	50.5%	24	25.8%	<0.001
	Male	49	54.4%	41	45.6%	0	0.0%	
Age	18-25	9	30.0%	21	70.0%	0	0.0%	<0.001
	26-35	14	29.2%	22	45.8%	12	25.0%	
	36-50	15	25.0%	45	75.0%	0	0.0%	
	>50	33	73.3%	0	0.0%	12	26.7%	
Educational level	Intermediate	44	69.8%	19	30.2%	0	0.0%	<0.001
	Primary	12	33.3%	12	33.3%	12	33.3%	
	Secondary	1	3.1%	31	96.9%	0	0.0%	
	University or above	14	26.9%	26	50.0%	12	23.1%	

Table 7. Relation of depression of injured workers to demographic factors.

		Depression						*p* value
		Mild depression		Moderate depression		Moderately severe &severe depression		
		n	%	*n*	%	*n*	%	
Sex	Female	13	14.0%	12	12.9%	68	73.1%	<0.001
	Male	16	17.8%	41	45.6%	33	36.7%	
Age	18-25	0	0.0%	9	30.0%	21	70.0%	<0.001
	26-35	14	29.2%	22	45.8%	12	25.0%	
	36-50	15	25.0%	10	16.7%	35	58.3%	
	>50	0	0.0%	12	26.7%	33	73.3%	
Educational level	Intermediate	14	22.2%	19	30.2%	30	47.6%	<0.001
	Primary	0	0.0%	24	66.7%	12	33.3%	
	Secondary	1	3.1%	10	31.3%	21	65.6%	
	University or above	14	26.9%	0	0.0%	38	73.1%	

of the participants had moderate, severe, and severe depression. There are few studies that assessed PTSD among healthcare providers; furthermore, there is a lack of studies assessing MH related to WRIs among healthcare providers. A previous study from China conducted on 965 healthcare professionals revealed that the prevalence of PTSD symptoms was 25.6%, whereas the prevalence of depression and anxiety was 46.01% and 27.88%, respectively [24]. Such findings were better than ours; however, the study assessed these three aspects regarding work violence, and this may indicate a possible impact of the type of WRIs on the degree of MH.

PTSD risk is relying on the critical incident nature, and the personality of the individual [11], and the high rates of PTSD have been reported among HCWs, due to witnessing the suffering and death of patients, experiencing emotionally distressing work events, exposure to direct threats, and exposure to violence from patients [10]. In our study, we found that PTSD was impacted by the type of injury, education level, and gender. PTSD tended to be more prevalent for those who experienced brain injuries, indicating that PTSD may be more related to more severe injuries.

Additionally, we found that PTSD is more common among those with higher education levels of university and above, as well as among females. It was reported that the lifetime prevalence of PTSD in the USA is almost 10% for women and 5% for men, revealing a greater predisposition of women to experience PTSD [27,28]. Such findings, in combination with ours, may indicate that generally, women are more susceptible to experiencing PTSD compared to men, regardless of the profession.

A 10-year systematic review focused on PTSD in HCWs included 32 publications and revealed that greater years of service, older age, previous year exposure to violence, personality traits, history of mental disorders, and being non-graduates were found to be workers' pre-trauma factors predicting PTSD symptoms [29]. However, it seems that the studies involved in the review focused on exposure of HCWs to violence, but didn't mention or study the other WRIs.

There is comorbidity between PTSD and some conditions, such as anxiety and stress [10]. It was demonstrated that depression and PSD [30], or depression and anxiety [31], often occur as comorbid conditions following traumatic events. Furthermore, persons with depression were more prone to be diagnosed with concurrent PSD or anxiety [32,33]. PTSD could affect the normal emotional process of individuals; previous research suggested that PTSD symptoms acted as a predictor for the progression of depression [34]. PTSD can also cause anxiety, denial, and fear, and can further lead to depression progression [35]. This was in agreement with our findings, as we found that there were significant correlations between PTSD and both anxiety and depression. PTSD was significantly related to more severe degrees of anxiety and depression.

In a previous retrospective cohort study, it was discovered that the MH trajectory from the pre-injury to post-injury period was worse for individuals with a workplace injury compared with those injured outside the workplace, as assessed by depression and anxiety. Such findings suggest that there may be features unique to the workplace and/or injury claims and compensation processes that contribute to this pattern [18].

The research on MH related to WIs in the healthcare settings is rare; a previous analysis screened 8,590 records and selected 33 studies that focused on work-related exposures causing PTSD, revealing that the main occupation of the individuals was military [36]. Furthermore, a previous analysis published in 2011 and focused on the impact of work-related critical incidents in healthcare professionals on PTSD included eleven studies and found high heterogeneity among the studies. Additionally, there were no definite findings reported, but it was stated that the analysis supported the hypothesis that work-related critical incidents are positively related to PTSD, anxiety, and depression among healthcare professionals [37]. This explains the lack of comparison established in this study, as there is a lack of studies concerned with the current subject.

Conclusion

The MH of HCWs isn't optimal; significant proportions of HCWs experienced PTSD, anxiety, and depression. Additionally, PTSD was potentially related to the type of WI and linked with depression and anxiety, indicating that WRIs can adversely affect the MH of the HCWs, resulting in PTSD progression and consequently the progression of depression and anxiety, especially among female and highly educated workers.

Limitations, strengths, and recommendations

The limitations of this study include the small sample size and the lack of sufficient comparison with previous literature due to the lack of adequate previous studies focusing on the current subject. However, the strength point of this study is that it is the first Saudi study focusing on the current subject and reports three aspects of MH (PTSD, depression, and anxiety) in relation to WRIs. Therefore, further studies are highly recommended.

List of Abbreviations

HCWs	Healthcare workers
MH	Mental health
PTSD	Post-traumatic stress disorder
WI	Work injury

Conflict of interest

The authors declare that they have no conflict of interest regarding the publication of this article.

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None.

Consent to participate

Participants signed the consent form before filling in the questionnaire.

Ethical approval

Ethical approval was obtained from Care IRB committee before the initiation of the study with a number: H-01-R-159. Each subject signed informed consent before being incorporated into the study.

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