



## Article

# Common Occupational Trauma: Is There a Relationship with Workers' Mental Health?

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**Abstract:** Exposure to major trauma can have significant consequences for workers' mental health, but common trauma may also result in poor mental health outcomes. This cross-sectional study retrospectively investigated the occurrence of common physical or psychological workplace trauma in 901 health, social service, and trading company workers and studied these experiences in relation to occupational stress, anxiety, and depression. Stress was measured with the effort/reward imbalance (ERI) model while anxiety and depression were evaluated with the Goldberg Anxiety and Depression Scale (GADS). Healthcare workers reported a high frequency of trauma and significantly higher levels of stress, anxiety, and depression than other workers. Even in the entire population of workers of the various professional categories, verbal violence (harassment and threats), traffic accidents, home injuries, and family bereavement were significantly associated with high levels of stress, anxiety, and depression. Major trauma survivors are known to be at increased risk of mental disorders and require support in the workplace, however, even minor repeated emotional trauma and injuries can affect mental health. During mandatory health surveillance, the occupational physician should systematically collect information on minor trauma and mental health outcomes when assessing the occupational fitness of the workers assigned to him.

**Keywords:** anxiety; depression; distress; workplace violence; harassment; healthcare; occupational health; social care; trade



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## 1. Introduction

Mental health issues contribute considerably to the burden of disease and disability worldwide. Globally, they account for one-third (32.4%) of world years lived with disability and a yearly loss of nearly 12 billion working days [1,2]. Currently, throughout the world, 970 million people are affected by mental disorders and this number is expected to rise significantly over the next 20 years. Overall, more than 50% of the general population in middle- and high-income countries will suffer from at least one mental disorder at some point in their lives [3]. Mental health problems have a direct impact on employers and businesses due to increased absenteeism, loss of productivity and profits, as well as through an increase in costs incurred in order to deal with the issue [4]. Depression and anxiety are the most common mental disorders among the world population. According to a 2017 WHO report, 4.4% of the global population suffers from depressive disorder and 3.6% from an anxiety disorder. Mental disorders, that may occur in people of all ages, including those of working age, lead to considerable losses in health and difficulties in the provision of public health [5].

Survivors of major life trauma are at a heightened risk of developing mental health conditions in the years after their injury [6,7]. Workers who suffer sudden extreme trauma

in the workplace report varying degrees of psychological consequences that range up to post-traumatic stress disorder (PTSD) [8]. A meta-analysis indicates that employees exposed to major trauma have an increased risk of PTSD and depression [9].

However, minor trauma in the workplace can also be associated with poor mental health. Common forms of incivility and verbal harassment are associated with high stress and symptoms of anxiety and depression in various groups of workers, such as those employed in health and social care companies [10–13], or in other occupational categories [14]. More generally, all occupational stressors can lead to anxiety or depression in the long run [15,16]. Psychosocial work factors may increase the likelihood of developing stress as well as mental disorders in vulnerable individuals, who, by virtue of genetic predisposition or chronic illness or other reasons, are more susceptible to stressors [17–19]. In many countries, the employer is obliged to prevent psychosocial risks in the workplace [20] and should consequently assess the incidence of minor trauma and its relationship with health.

The frequency of traumatic events is not the same in the different categories of workers. Violence and bullying constitute a serious issue in all workplaces, and especially for healthcare workers [21–23]. Injuries at work are also common in health care workers, who are particularly prone to needle sticks and biological injuries [24,25]. Although social care activities and paperwork and retail trade are not free from these problems [26], the expected frequency of these traumatic events in these sectors is lower than in healthcare.

The purpose of this study was: (1) To evaluate the frequency of common occupational trauma in a convenience sample of health, social service and office and trade workers, and (2) to study the association of these events with work-related stress, anxiety, and depression.

## 2. Materials and Methods

### 2.1. Study Design and Participants

This cross-sectional survey was conducted in 2019 on workers employed in healthcare, social services, and office and retail trade workers of commercial companies located in the Latium Region (Central Italy). In accordance with European and Italian legislation, workers exposed to occupational risks are subjected to periodic medical examinations in the workplace. On that occasion, they were invited to participate by the occupational doctor. All workers exposed to occupational hazards, who had been working for at least one year in the same company, were asked to answer a self-administered questionnaire during their periodic medical examination for the assessment of suitability for work. The questionnaire was accepted by 901 out of 945 workers (participation rate 95.3%).

The study was conducted in compliance with the Helsinki Declaration (as revised in Brazil, 2013) and was authorized by the University Ethical Committee (ID 2896). Prior to participation, all participants gave their written informed consent.

### 2.2. Questionnaire

The frequency of violent events in the workplace was measured with four items of the Arnetz's Violent Incident Form (VIF), a checklist proposed by Arnetz for the registration of violent incidents in the workplace [27] and previously used in other Italian studies [10,11,28–32]. The participants were asked to give a yes or no response to whether they had experienced any of the following: Physical violence (an attack, with or without weapons, that could cause or not cause physical harm), threats (the intention of causing physical harm), harassment (any actions, words, attitudes, that were annoying or unpleasant, or which created a hostile work environment), and continuous exposure to harassment, including stalking (a behavior characterized by willfully and repeatedly harassing, inducing annoyance, worry, or fear in the workplace).

The frequency of other traumas (accidents at work, road accidents, domestic injuries, family deaths) was investigated in the questionnaire by means of a binary question (no/yes).

Occupational stress was measured using a short Italian version of the Effort/Reward Imbalance Questionnaire [33] based on Siegrist's model [34], implicating that stressful features of the work result from failed reciprocity between (high) efforts spent and (low) rewards received. The short version of the questionnaire includes three questions for the Effort variable, and seven for the Reward variable. All items have graded responses on a 4-point Likert scale, so the resulting sub-scales are respectively between 3 and 12 (Effort) and between 7 and 28 (Reward). The weighted relationship between the two variables, effort/reward imbalance (ERI) indicates a state of distress if it has values greater than one. The test score reliability coefficient (Cronbach's alpha) for the Effort sub-scale of the ERI in our sample was 0.854. Cronbach's alpha for the sub-scale Reward was 0.716.

Anxiety and depression were assessed using the Goldberg Anxiety and Depression Scale (GADS). This questionnaire consists of nine binary questions, to which a point is assigned for each affirmative answer. A score of 5 or more on the anxiety subscale, or 2 or more on the depression scale, suggests suspected clinically evident anxiety or depression [35]. The reliability of the Anxiety sub-scale of GSDS in this study was 0.852, for Depression, it was 0.793.

### 2.3. Data Analysis

The frequency of traumatic phenomena was calculated in the different sectors and the chi-square test and Fisher's exact test were used to ascertain whether the frequency of such events was homogeneous in the different working sectors. The mean values of the variables indicating stress and mental health were compared by ANOVA and post-hoc comparison with Bonferroni test. The influence of aggression and injuries on stress, anxiety, and depression was assessed using linear regression models. The association of traumatic events with the clinical condition of anxiety or depression, corresponding to values exceeding the GADS cut-off, was studied by logistic regression.

The statistics were conducted using the IBM SPSS Statistics for Windows, Version 26.0 package (IBM Corp., Armonk, NY, USA).

## 3. Results

The population consisted of 901 workers (age  $45.9 \pm 11.4$ ; male 36.5%) belonging to healthcare ( $n = 564$ ; male: 31.4%; age  $48.6 \pm 11.13$ ), social care ( $n = 102$ ; male: 27.5%; age  $45.10 \pm 10.95$ ), and trading companies ( $n = 235$ ; male 52.8%; age  $39.61 \pm 9.48$ ).

The incidence of traumas was found to vary in the different work sectors (Table 1). Violent events were significantly more frequent in healthcare than in other sectors, in particular, healthcare workers were more exposed to threats and harassment than workers in other sectors. However, the most serious form of violence, such as persistent and petulant harassment (stalking), was equally distributed in the different sectors. The various forms of violence were more frequent in the female gender (124 women, 21.7%, reported having suffered at least one type of aggression) than in males (51, 15.5%; chi-square  $p = 0.024$ ).

The mean levels of stress, anxiety, and depression were significantly different in the three subgroups of the sample examined (Table 2). In healthcare workers, there were high levels of Effort and low Rewards, with resultant average work stress (ERI) significantly higher than in the other groups, and on average  $>1$ , which means that most workers were in a state of distress. Levels of anxiety and depression were also higher in healthcare than in social care and trading company workers. Again, the average values in healthcare were close to the cut-off for anxiety and even higher than the cut-off for depression, indicating that a high proportion of workers were anxious or depressed.

The different types of events were variably associated with stress, anxiety, and depression. In a multiple linear regression model adjusted for age and gender, threats, harassment, and stalking were significantly associated with stress (ERI). Workplace harassment, threats, driving accidents, home injury, and mourning were associated with anxiety and depression (Table 3).

**Table 1.** One-year incidence of common traumas in some occupational sectors.

Type of Trauma	Healthcare (N; %)	Social Care (N; %)	Office Trade (N; %)	Total (N; %)	Chi-Square # p-Value	Fisher’s Exact Test §
Physical Assault	36 (6.4%)	5 (4.9%)	5 (2.1%)	46 (5.1%)	0.045 *	0.028 *
Threats	92 (16.3%)	5 (4.9%)	7 (3.0%)	104 (11.5%)	0.000 ***	0.000 ***
Harassment	72 (12.8%)	2 (2.0%)	18 (7.7%)	92 (10.2%)	0.001 ***	0.001 ***
Stalking	17 (3.0%)	2 (2.0%)	7 (3.0%)	26 (2.9%)	0.839	0.839
Any form of violence	140 (24.8%)	10 (9.8%)	25 (10.6%)	175 (19.4%)	0.000 ***	0.000 ***
Work injury	35 (6.2%)	3 (2.9%)	5 (0.9%)	40 (4.4%)	0.003 **	0.001 **
Driving accident	39 (6.9%)	2 (2.0%)	7 (5.5%)	54 (6.0%)	0.143	0.148
Home injury	65 (11.5%)	2 (2.0%)	7 (6.0%)	81 (9.0%)	0.001 ***	0.000 ***
Family mourning	153 (27.1%)	28 (27.5%)	18 (18.7%)	225 (25.0%)	0.036 *	0.056

\*  $p < 0.05$  \*\*  $p < 0.01$  \*\*\*  $p < 0.001$  # comparison between healthcare, social care and office and trade workers; § comparison between healthcare and other workers.

**Table 2.** Average values of the variables related to stress and mental health.

Variable	Healthcare (x; sd)	Social Care (x; sd)	Trade (x; sd)	Total(x; sd)	ANOVA p-Value
Effort (range 3–12)	8.11 ± 2.42	6.33 ± 2.18	6.68 ± 2.47	7.53 ± 2.52	0.000
Reward (range 7–28)	18.49 ± 3.63	19.98 ± 3.60	19.73 ± 4.16	18.99 ± 3.82	0.000
ERI	1.10 ± 0.51	0.80 ± 0.44	0.87 ± 0.52	1.00 ± 0.52	0.000
Anxiety (range 0–9)	4.27 ± 3.03	2.36 ± 2.60	3.24 ± 2.74	3.78 ± 2.98	0.000
Depression (range 0–9)	2.76 ± 2.42	1.38 ± 1.94	2.23 ± 2.16	2.47 ± 2.45	0.000

**Table 3.** Association of traumatic events with occupational stress (ERI), anxiety, and depression. Multiple linear regression models adjusted for age and gender.

Type of Trauma	ERI			Anxiety *			Depression *		
	Beta	t	p	Beta	T	p	Beta	t	p
Physical aggression	0.046	1.322	0.187	0.056	1.699	0.090	0.051	1.514	0.130
Threat	0.101	2.801	0.005	0.088	2.554	0.011	0.077	2.198	0.028
Harassment	0.166	4.790	0.000	0.129	3.917	0.000	0.129	3.809	0.000
Stalking	0.091	2.708	0.007	0.021	0.671	0.502	0.041	1.264	0.207
Work injury	0.052	1.619	0.106	0.048	1.587	0.113	0.004	0.121	0.904
Driving accident	0.059	1.852	0.064	0.098	3.252	0.001	0.075	2.436	0.015
Home injury	0.082	2.581	0.010	0.151	5.012	0.000	0.176	5.705	0.000
Mourning	0.063	1.933	0.054	0.205	6.594	0.000	0.164	5.130	0.000
Adjusted R <sup>2</sup>		0.119			0.197			0.157	

\* GADS score, range 0–9.

A multivariate logistic regression model indicated that the risk of being anxious is significantly increased by harassment or threats at work, traffic accidents, injuries, and bereavement. Similarly, the risk of depression was increased by harassment or threats at work, home injuries, and bereavement (Table 4).

**Table 4.** Association of traumatic events with cases of anxiety and depression. Logistic regression models adjusted for age and gender.

Type of Trauma	Anxious			Depressed		
	OR	CI 95%	<i>p</i>	OR	CI 95%	<i>p</i>
Physical aggression	1.426	0.675, 3.014	0.353	1.513	0.674, 3.397	0.316
Threat	2.029	1.199, 3.432	0.008	2.139	1.214, 3.770	0.009
Harassment	3.308	1.880, 5.821	0.000	2.515	1.376, 4.594	0.003
Stalking	0.910	0.349, 2.376	0.848	1.140	0.401, 3.238	0.805
Work injury	1.179	0.585, 2.376	0.646	0.773	0.384, 1.557	0.472
Driving accident	2.369	1.273, 4.408	0.006	1.758	0.929, 3.326	0.083
Home injury	2.778	1.644, 4.692	0.000	2.680	1.521, 4.721	0.001
Mourning	2.227	1.590, 3.120	0.000	2.103	1.483, 2.981	0.000
Nagelkerke's R <sup>2</sup>		0.206			0.152	

#### 4. Discussion

Our study showed that there is a higher incidence of traumatic events in the healthcare sector than in sectors involving social care and trading. Healthcare workers also reported the highest levels of stress, anxiety, and depression. A clinical evaluation would have classified a large proportion of these workers as “anxious” and “depressed”. Importantly, our observations were conducted in 2019, before the healthcare sector was challenged by the Covid-19 pandemic. Therefore, the reported levels of mental health were not affected by the pandemic but derive from the numerous stressors commonly present in work activities. Among these, trauma could play an important role.

Common traumas occurring in the workplace (violence, injuries, driving accidents), as well as home injuries and family mourning events, were associated with occupational stress and with poor mental health in workers.

Our findings are consistent with previous studies showing that workplace violence (WV) can have significant consequences on both the physical and mental health of the victims [13]. Occupational moral injury is consistently associated with mental health [36]. Many participants in this study experienced distress. This concurs with related findings that stress is one of the most significant outcomes of workplace violence [37,38]. Participants also experienced depressive and anxious symptomatology that is in line with previous research stating that WV often results in depression and anxiety disorders [39–42]. In workers exposed to WV, sleep is often the first altered parameter [43]. Impaired sleep promotes the harmful effects of stress on physical and mental health [44,45]. Furthermore, WV reduces work ability [32] and therefore makes workers more exposed to mistreatment since it interferes with their ability to effectively cope with dangerous situations [46]. Longitudinal studies have demonstrated that the relationship between WV and stress is of a circular nature: Exposure to violence causes stress, but distressed workers are more exposed to WV than other workers [12,13].

Verbal violence had a closer relationship with mental health than physical violence. This result supports previous findings provided from population-based studies [47–49]. Experience of verbal violence may cause a reduction in self-confidence and self-esteem [50] and increase the risk of anxiety and depression [51].

In our study, other common traumatic events were also associated with poor mental health. This result is not surprising. Work-related injuries and driving accidents are predictors of depression, as demonstrated by longitudinal [52–55] and meta-analytic studies [56]. However, our cross-sectional study is unable to suggest the direction of the observed associations. The observed associations might also express reverse causality. For example, even if it is likely that those who have suffered a car accident will experience stress, anxiety, and depression, the opposite is also probable. Prospective studies in the literature indicate an increased risk of injuries and driving accidents in patients with depression [52–57]. A higher risk of injuries was observed in symptomatic subjects as well as in those taking

psychoactive medication [58,59]. Sleepiness and impaired cognitive and psychomotor ability resulting from mental diseases and many antidepressant and anxiolytic drugs may explain the increased risk of injuries and driving accidents [60,61]. Furthermore, chronic psychiatric illness can alter cognitive processes and therefore increase the risk of accidents, as can other chronic diseases, such as obstructive sleep apnea (OSAS) [62,63].

Family bereavement and home injuries were also associated with poor mental health. There is consolidated evidence that life stressors are associated with anxiety and depression [64]. For example, bereaved mothers and fathers of cancer patients are vulnerable to prolonged grief and psychological symptoms up to five years after the death of their child [65].

Previous studies have reported that work-related injuries showed a stronger association with mental health disorder than injuries outside of work, due to several factors, such as a combination of the financial burden of the injury, the difficulty involved in pursuing workers' compensation claims, chronic pain, and the fact that occupational injuries are typically more severe and involve a longer recovery period than non-occupational injuries [54,66]. Conversely, in our study, only non-occupational injuries were significantly associated with psychological health. A possible explanation for this inconsistency is that we only investigated the occurrence of the accident and not its severity. In health services, injuries such as needle pricks are frequent, and, if they do not have infectious consequences, they do not affect mental health in any way.

Possible development of this study could be the collection of a greater number of observations coming from different working sectors. In a subsequent study, it might be useful to collect and analyze variables that have not been considered here, such as the role of seniority as a moderating factor in the relationship between trauma and mental health, or the different perception in genders, which could affect the reporting of trauma [67].

Our study is a preliminary investigation into the association between common trauma and mental health and has several limitations. Since the survey was conducted in the workplace by the doctor in charge of supervising workers exposed to occupational risks, the main limitation was due to a lack of random sampling. This limit was partially balanced by having obtained a very high participation rate and a large number of cases. However, the results cannot be extrapolated to other situations, although the conditions of workers in the companies investigated are probably not substantially different from those in other companies. Our results must be considered with caution and only the repetition of this experiment in other work situations will be able to confirm or deny what was observed.

Another limitation is the cross-sectional nature of the study, which did not allow us to ascertain the direction of the observed associations. Subsequent longitudinal studies could help understand the mechanisms linking trauma and mental health. Furthermore, information on the trauma suffered was obtained retrospectively, and might therefore be influenced by recall bias typical of this type of study, although by carrying out a medical examination concomitantly with the compilation of the questionnaire, we were able to verify the information provided and help the workers to clarify their memories.

## 5. Conclusions

Many common everyday traumas are associated with high occupational stress and symptoms of anxiety and depression. The doctor who is responsible for monitoring the health of workers exposed to occupational risks should investigate the occurrence of these traumas during routine medical examinations. Collecting information on traumatic events is simpler than administering and evaluating a psycho-diagnostic questionnaire (which the doctor does not normally use) and can provide an immediate indication of the mental health conditions of the worker being examined. Companies should provide support and counseling services for workers who undergo these traumas because the state of poor mental health of workers negatively affects their ability to work and therefore, the quality of their service.

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**Informed Consent Statement:** Informed consent was obtained from all subjects involved in the study.

**Data Availability Statement:** The data that support the findings of this study are available in Zenodo repository: doi:10.5281/zenodo.4648083.

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