Poor Work Ability Is Associated with Workplace Violence in Nurses. A Longitudinal Study

Nicola Magnavita * and Igor Meraglia

Posted Date: 29 April 2024

doi: 10.20944/preprints202404.1864.v1

Keywords: ableism; ageism; disability management; health surveillance; health promotion; injury; occupational health; social support; psychosocial stress; bullying

 doi:10.20944/preprints202404.1864.v1

Article

Poor Work Ability Is Associated with Workplace Violence in Nurses. A Longitudinal Study

Nicola Magnavita [1,*] and Igor Meraglia [1]

School of Occupational Health, Department of Life Sciences and Public Health, Università Cattolica del Sacro Cuore, Roma, Italy

* Correspondence: nicolamagnavita@gmail.com

Abstract: Healthcare personnel must face two problems of growing importance: violence in the workplace and the loss of work ability due to ageing of the workforce. Studying the relationship between these two phenomena can help to prepare effective prevention measures. In a public health company, we asked nurses to self-assess their work ability using the Work Ability Index (WAI) and we analysed the relationship between this indicator and the violence experienced in the previous and following years. 321 out of 344 nurses (99.3%) participated. In a logistic regression model, the WAI score was a significant protective factor for violence experienced in the previous year (OR=0.94 CI95%=0.90; 0.98 p<0.01) and in the following year (OR=0.88 CI95%=0.84; 0.92 p<0.01). In a hierarchical logistic regression model, social support acted as a protective factor (OR = 0.87 CI95% = 0.79; 0.95 for violence experienced in the previous year), while occupational stress was a significant determinant of the risk of aggression (OR=3.65 CI95%=1.90; 7.03 in the previous year, OR=3.54 CI95%=1.801; 6.947 in the following year). The difficulties that nurses encounter in carrying out their growing work demands in an environment that is not promptly adapted to their changing physical and mental conditions can lead to an increased risk of violence. Prevention of workplace violence should include organizational and ergonomic measures that reduce stress and increase staff support and work ability.

Keywords: ableism; ageism; disability management; health surveillance; health promotion; injury; occupational health; social support; psychosocial stress; bullying.

1. Introduction

Workplace violence (WV) is a problem of considerable importance for healthcare workers (HCWs). Many studies have investigated this widespread phenomenon, its high prevalence in many occupational sectors, and the consequences endured by workers who are victims and witnesses of WV. Healthcare is the sector with the highest rate of non-fatal assaults. A meta-analysis of 253 studies involving a total of 331,544 participants that was performed before the COVID-19 pandemic, indicated that 61.9% of HCWs had been exposed to some form of WV, 42.5% reported exposure to non-physical WV, and 24.4% had experienced physical WV in the previous year [1]. In the United States, the pooled rate of WV against nurses increased from 30% between 2000 and 2004 to 43% between 2020 and 2022 [2], with higher prevalence rates in emergency departments [3,4] and psychiatric mental health settings [5]. The COVID-19 pandemic changed working conditions and consequently aggression rates. The prevalence of WV during the first pandemic wave was lower compared to the period prior to the pandemic, however it was still significant [6]: over 42% of HCWs had undergone violence [7]. The mid- to late-pandemic period witnessed an increase in physical and verbal violence prevalence, alongside a rise in legal litigation against HCWs [8]. While the verbal violence rate was equal in nurses and doctors, nurses were subjected to more than double the rate of physical violence than physicians [9,10]. Nurses are frequently victims of aggressive actions perpetrated by patients and visitors, but also by colleagues and superiors. Bullying against nurses takes on different forms in different cultures and occupational settings, but it is very widespread [11]. Inter-nurse horizontal violence is reported by over 33% of workers [12].

 doi:10.20944/preprints202404.1864.v1

Copious studies on the effects of WV have enabled us to obtain valid evidence. Longitudinal studies in HCWs indicate that WV is consistently associated with poorer mental health [13,14]. Nurses experiencing WV suffer high levels of stress [15] and have 2.13- and 2.25-fold higher odds of reporting post-traumatic stress disorder and burnout than their non-exposed colleagues [16]. Poor training is one of the factors that predispose nurses to experience violence in psychiatric settings [17]. It is important to observe that the relationship between WV and stress is reciprocal: workers who experience WV have increased work stress levels, and those who report high stress and low social support are prone to WV in subsequent years [18,19]. In more general terms, workers' experience of occupational stress may make them more vulnerable to third-party violence. In hospitals, the highest rates of WV can be observed in situations associated with the highest level of work-related stress; social support is a protective factor [20].

Absence due to illness may be a consequence of the violence experienced. The Literature indicates that WV exposure is associated with sickness leave [21]. In several studies, high rates of WV are associated with high absenteeism [22,23]. Lack of workplace social support is an independent risk factor for long-term absences associated with WV in Swedish and Danish cohort studies [24]. Once again, the relationship between WV and absenteeism is reciprocal. A meta-analysis showed that employees exposed to WV have a 26% higher risk of experiencing sickness absence, and that workers who have taken extended periods of sick leave have a greater possibility of subsequently encountering WV [25]. Social support reduces absenteeism in HCWs exposed to violent events [26]. On the contrary, lateral violence in nurses increases the risk of abandoning the profession [27].

Experiencing WV is also associated with work fatigue. Cross-sectional studies showed that nurses exposed to WV in emergency and first-aid services reported high levels of fatigue that impacted negatively on their personal lives, impaired patient care, and produced a toxic environment in the unit. In this degraded situation, lateral violence was both the source and the result of mental and emotional exhaustion [28]. Among workers from a psychiatric hospital, who reported regular exposure to social shaming and bullying by patients, WV was significantly associated with lower professional performance [29]. Emotions resulting from violence may influence the behaviour of HCWs; for example, exposure to verbal violence from patients increased the use of restraint and seclusion on the part of HCWs in a psychiatric hospital [30]. Moreover, the consequences of violence may trigger a spiral of violence.

Since exposure to WV can influence behaviour, work style, fatigue, stress, and sickness leave, it is important to study the relationship between violence and work capacity. Work ability (WA) is defined as a combination of occupational competence, the state of health needed to be competent, and the occupational skills needed to manage the work tasks in a reasonably safe environment [31]. Working capacity is closely linked to a person's age and this makes it important to control this variable in healthcare personnel who are subject to progressive ageing in all countries of the world [32–37]. The ageing process and seniority of nurses negatively affect their ability to work [38] and this has prompted health promotion programs to counteract the effects of ageing [39].

To measure work ability authors have generally adopted the Work Ability Index (WAI) [40], a questionnaire created by Finnish researchers in the late 1990s and used all over the world. Unfortunately, there are few longitudinal studies on the relationships between work ability and violence. The available studies, of a cross-sectional nature, indicate that the two variables are inversely associated, that is, increasing values of one variable correspond to decreasing values of the other variable. Most authors have interpreted the association observed in cross-sectional studies as evidence that violence reduces work capacity. For example, exposure to WV was considered responsible for the decline in the WAI of emergency physicians [41], social assistance workers [42], nurses [43,44], and mixed categories of HCWs [45].

Many researchers claim that cross-sectional studies do not allow us to infer causality, and this applies even more for a variable such as violence which has been shown to have reciprocal relationships with stress, absences, and fatigue, all factors linked to WA. Moreover, a careful examination of the characteristics of the WAI questionnaire suggests that these interpretations may be partial. The WAI is made up of seven dimensions that investigate chronic pathologies,

 doi:10.20944/preprints202404.1864.v1

occupational demands and individual resources [46] that contribute to compiling two main components, broadly described as "ill-health-related ability", and "subjectively estimated work ability" [47]. The first component collects information on illnesses diagnosed by a doctor, their impact on work capacity, absences due to illness and the future occupational outlook. The second factor contains a self-evaluation of current working capacity compared to maximum working-life capacity, and an evaluation of the worker's resources and their effectiveness compared to the physical and psychological demands of the job. It is plausible that many chronic pathologies pre-exist the act of violence and can be modified by WV to only a limited extent. Moreover, the reduction in work ability compared to the maximum possessed in life is considered an effect of ageing rather than of trauma. When evaluating the association between WV and WA in a cross-sectional study, the possibility that reduced working capacity pre-existed and may have favoured acts of violence, must not be overlooked.

To explore this possibility, using a short longitudinal design that measured exposure to violence over two successive years, we examined a sample of nurses from a public healthcare company to evaluate whether work ability can influence exposure to violence. In our study we tested the following hypotheses:

1. The WAI score is a significant predictor of the risk of aggression in nurses.
2. Social support is a protective factor against violence.
3. Occupational stress is a predisposing factor of aggression.

2. Materials and Methods

2.1. Population

In European countries, workers who are exposed to occupational risks are subjected to a health surveillance program that includes recurrent medical examinations in the workplace. Following these check-ups, and after taking occupational risks into consideration, the doctor decides about the worker's suitability for the job. One of the pieces of information that is routinely collected during these medical examinations is whether the worker has been exposed to violence in the previous year.

In an Italian public health company, nurses received an invitation to evaluate their work capacity by filling in a form prior to their routine medical examination. Participation was free, unincentivized, and unrelated to the determination of their fitness for the job. 321 of the 344 nurses who were invited to participate agreed to take part (participation rate 93.3%).

The research was conducted in accordance with the Helsinki Declaration. In compliance with occupational medicine confidentiality principles and the ICOH code of ethics [48], participants granted their informed consent by signing a personal health document, thereby authorizing analysis of their personal data, and agreeing to the dissemination of the results in an aggregate, anonymous form. The project was approved by the Catholic University Ethics Committee (ID 3008).

2.2. Questionnaire

Workers were invited to self-assess their working capacity using the Italian version [49] of the Work Ability Index WAI [40]. The WAI consists of a set of questions that consider the worker's resources, health, and the physical and mental demands of their job. Seven dimensions are used to grade the responses, resulting in a score ranging from 7 to 49. The WAI score can therefore be used as a continuous variable, with higher scores corresponding to greater work ability. Reliability of the questionnaire in this present study (Cronbach's alpha) was 0.690.

The experience of violence in the workplace is recorded every year using four questions taken from the Arnetz Violent Incident Form (VIF) [50]. One question was used to measure physical violence in the workplace: "Have you been the victim of a physical attack while at work in the last 12 months? When we refer to a physical assault, we mean any attack—with or without weapons—that has the potential to cause bodily harm". Similarly, questions with "yes" or "no" answers were used to investigate threats ("A threat refers to the intention of causing physical damage") or harassment

 doi:10.20944/preprints202404.1864.v1

("harassment is any annoying or unpleasant word, attitude or action that creates a hostile work environment,"). The fourth item involved indicating the perpetrator of the violence.

Workplace social support [51] was measured by means of six questions in the Italian version [52] of the demand-control-support questionnaire, based on Karasek's job strain model [53]. Each question (e.g., "There is a quiet and pleasant atmosphere at my place of work") had four possible answers rated on a score from 1 = "It's never like that, I don't agree at all" to 4 = "It's exactly like that, I completely agree". The final score varies from 6 to 24; higher values indicate greater social support. The reliability of the questionnaire in this study (Cronbach's alpha) was 0.785.

Work-related stress was measured with the questionnaire derived from the Italian version [54] of Siegrist's model [55]. The questionnaire is based on a 4-point Likert scale, and consists of three questions for the Effort scale ranging from 3 to 12, and seven questions for the Reward scale, ranging from 7 to 28. Stress, defined as the imbalance between effort and rewards (Effort/Reward Imbalance, ERI), is measured as the weighted ratio between the two variables. The alpha of the Effort scale was 0.748, while the alpha of the Reward scale was 0.608.

2.3. Statistics

We analysed the prevalence of workers who complained of having been exposed to different forms of violence in the two years of observation. We then studied the distribution of the variables of interest by using the Kolmogorov-Smirnov and Shapiro-Wilk tests.

Firstly, we verified that the variables of interest (gender, age, WAI, Support and ERI) were correlated with each other by examining the Pearson correlation coefficients for parametric variables and Spearman correlation coefficients for non-parametric variables.

We then built some logistic regression models by taking each of the forms of violence reported by the nurses as a dependent variable, the WAI score as an independent variable, and age and sex as covariates. Finally, we built a hierarchical logistic regression model for each type of WV, first introducing the Support variable, then the ERI variable as a covariate.

The IBM/SPSS Statistics for Windows, Version 28.0 (Armonk, NY, USA: IBM Corp), was used for these analyses.

3. Results

The study was conducted on 321 hospital nurses (72 male, 22.4%; 249 female workers, 77.6%). Mean age was 41.6±13.0 years.

The average score of the WAI questionnaire was 40.1± 5.7 points; median value 41. The distribution of scores was non-normal (Kolmogorov-Smirnov test 0.141, $p<0.001$; Shapiro-Wilk test 0.924, $p<0.001$). Female workers had a slightly worse WAI score than males. Mean values did not reveal significant gender difference (39.9±5.5 in female vs. 40.9±6.1 in male workers, Student's $t= 1.39$, $p=0.187$); however, the comparison of medians demonstrated that work ability in women was significantly lower than in men (Mann-Whitney U Test $p<0.05$). The WAI score was inversely correlated with age (Spearman's rho = -0.182 $p<0.001$).

At the baseline, there were 40 workers (12.5%) who reported having experienced at least one episode of physical aggression in the previous year. 57 nurses (17.8%) reported having been exposed to threats; 57 (17.8%) reported harassment. Overall, 96 people (29.9%) reported having been exposed to violence in the previous year. The main perpetrator of the assaults were patients (49.5%), visitors (26.8%), colleagues (22.7%) and in one case only, a person unrelated to the work environment. At follow-up, the percentage of nurses who reported experiencing physical aggression in the previous year was slightly lower (36, 11.2%), while 53 had been subjected to threats (16.5%) and 75 (23.4%) reported harassment. Overall, there were 86 victims of violence (26.8%).

We built logistic regression models, adjusted for age and sex, using the occurrence of the different forms of violence as the dependent variable and the WAI score as the predictor. In these models, the WAI score at the baseline was a significant protecting factor for threats, harassment and any type of violence experienced in the previous year (Table 1), and for WV experienced in the following year (Table 2).

 doi:10.20944/preprints202404.1864.v1

Table 1. Association of WAI score with exposure to workplace violence experienced in the previous year. Logistic regression analysis models adjusted for age and sex.

Type of violence	Odds Ratio	Confidence Intervals 95%	*p*
Physical	0.945	0.891; 1.003	0.062
Threats	0.943	0.899; 0.990	0.018
Harassment	0.941	0.896; 0.988	0.014
Any type of violence	0.942	0.903; 0.983	0.006

* Adjusted for age and sex.

Table 2. Association of WAI score with exposure to workplace violence in the following year. Logistic regression analysis models adjusted for age and sex.

Type of violence	Odds Ratio	Confidence Intervals 95%	*p*
Physical	0.890	0.840; 0.942	0.000
Threats	0.887	0.842; 0.933	0.000
Harassment	0.885	0.844; 0.929	0.000
Any type of violence	0.880	0.839; 0.923	0.000

* Adjusted for age and sex.

Using hierarchical logistic regression analyses we evaluated the impact of workplace social support and stress on WV. Support exerted a modest protective effect on harassment but did not have a significant relationship with physical violence. Occupational stress was significantly associated with violence in all models (Tables 3 and 4). The impact of work ability on the prevalence of different forms of violence in the following year remained significant even after the inclusion of social support and ERI in the hierarchical multivariate models.

Table 3. Association of WAI score, social support, and occupational stress with exposure to workplace violence in the previous year. Hierarchical logistic regression analysis.

Type of violence		Model I* OR (CI95%)	*p*	Model II** OR (CI95%)	*p*
Physical	WAI	0.952 (0.896; 1.012)	0.114	0.980 (0.917; 1.047)	0.551
	Support	0.944 (0.832; 1.070)	0.367	1.012 (0.876; 1.168)	0.875
	ERI	-	-	3.903 (1.719; 8.861)	0.001
Threats	WAI	0.950 (0.903; 1.000)	0.049	0.975 (0.923; 1.031)	0.373
	Support	0.951 (0.855; 1.059)	0.361	1.020 (0.904; 1.151)	0.743
	ERI	-	-	3.867 (1.914; 7.812)	0.000
Harassment	WAI	0.963 (0.914; 1.014)	0.151	0.994 (0.938; 1.053)	0.843
	Support	0.844 (0.757; 0.940)	0.002	0.899 (0.800; 1.012)	0.077
	ERI	-	-	4.739 (2.294; 9.790)	0.000
Any type of violence	WAI	0.960 (0.917; 1.004)	0.074	0.984 (0.937; 1.033)	0.512
	Support	0.868 (0.790; 0.953)	0.003	0.919 (0.831; 1.016)	0.097
	ERI	-	-	3.655 (1.900; 7.030)	0.000

* Adjusted for age, sex, and social support. ** Additionally adjusted for ERI.

 doi:10.20944/preprints202404.1864.v1

Table 4. Association of WAI score, social support, and occupational stress with exposure to workplace violence in the subsequent year. Hierarchical logistic regression analysis.

Type of violence		Model I* OR (CI95%)	*p*	Model II** OR (CI95%)	*p*
Physical	WAI	0.889 (0.837; 0.944)	0.000	0.902 (0.847; 0.961)	0.001
	Support	1.015 (0.889; 1.159)	0.828	1.068 (0.922; 1.237)	0.382
	ERI	-	-	2.495 (1.088; 5.724)	0.031
Threats	WAI	0.894 (0.847; 0.943)	0.000	0.908 (0.858; 0.961)	0.001
	Support	0.946 (0.845; 1.059)	0.336	1.008 (0.890; 1.143)	0.897
	ERI	-	-	3.296 (1.581; 6.873)	0.001
Harassment	WAI	0.895 (0.851; 0.941)	0.000	0.912 (0.865; 0.962)	0.001
	Support	0.917 (0.827; 1.016)	0.096	0.991 (0.884; 1.110)	0.872
	ERI	-	-	4.587 (2.261; 9.304)	0.000
Any type of violence	WAI	0.889 (0.846; 0.934)	0.000	0.904 (0.858; 0.952)	0.000
	Support	0.921 (0.834; 1.017)	0.104	0.982 (0.881; 1.094)	0.741
	ERI	-	-	3.537 (1.801; 6.947)	0.000

* Adjusted for age, sex, and social support. ** Additionally adjusted for ERI.

4. Discussion

This study confirms that violence is a problem that nurses are forced to deal with on a daily basis. In the two years observed in our study, approximately one in four workers experienced at least one episode of physical or verbal violence. By asking workers during their annual medical examination if they had been victims of violence in the previous year, some episodes emerged which would otherwise have been neither reported nor recorded, demonstrating that health surveillance of workers can provide a contribution to the assessment of a risk that would otherwise remain unacknowledged.

Knowing the extent of a phenomenon and its causes is the basic requirement for controlling and preventing it. For this reason, we used a longitudinal method to investigate the possibility that violence is at least partly determined by reduced work ability. This study demonstrated that work ability is a significant protective factor against aggression. This association may occur because workers at their full physical and mental capabilities are better able to manage situations that could lead to violent events. In this study, reduced work ability was associated with aggression experienced in the previous year and in an even more significant way with violence reported in the year following the WAI measurement. Although this observation, that was based on a limited sample, must be interpreted with caution, it might indicate that reduced working capacity gradually reveals its effect as a promoter of violence because difficulty in providing the services required by the work task may induce a negative emotional state in healthcare workers that impairs their availability towards the requests of patients and visitors and consequently triggers incivility. This could be one reason why workers with low WAI have an increased risk of violence.

The factors that reduce the self-assessment of work ability made with the WAI are mainly chronic diseases and ageing [56–59]. There is considerable evidence to suggest that disabled or elderly people are often particularly vulnerable to bullying and violence. Ableism (discrimination against disabled people) is an increasingly frequent occupational phenomenon [60] that directly affects the healthcare professions [61] and generates discrimination against HCWs [62,63]. Medical and nursing students are among the most frequent targets of discrimination [64]. A more modern approach in the medical field should allow for the inclusion of healthcare personnel with disabilities [65] but this does not always occur. Although policies and interventions have been developed to induce employers to manage disabilities correctly [66,67], these are still far from achieving their aims. A disabled person still undergoes stigma for being considered guilty of not carrying out his/her job. Perhaps this may explain why, when analysing cross-sectional studies in WA and WV, authors have not explored the possibility that reduced work capacity may be among the causes of aggression. It is feared that the

 doi:10.20944/preprints202404.1864.v1

victim of the attack could be considered guilty of the attack itself. But this stems mainly from the idea that disability is a fault and that the worker must adapt to the job, no matter how much effort it requires. On the contrary, it is the job that should be adapted to the worker, enhancing his/her residual work capabilities, but the Literature demonstrates how far we are from applying this principle. The findings from a 2014 census of the Canadian federal public service revealed that disability was significantly associated with increased odds of workplace harassment and discrimination [68]. Discriminatory phenomena and WV also emerged from the Panel Survey of Employment for the Disabled 2016-2018 in South Korea [69], as well as from the Household, Income, and Labour Dynamics in Australia ("HILDA") survey [70]. The same happens with ageing: older nurses are often the targets of incivility in the workplace. The health and well-being of older nurses, as well as their ability to continue practicing, may be impacted by prevalently negative opinions and beliefs about their ability and skill in their occupational environments [71]. Therefore, we can affirm that the association between WA and WV observed in various studies should be interpreted primarily as a tendency to violence in workers who are unable to satisfy work demands. To prevent ageism and ableism in the nursing profession, work environments must foster a positive attitude to ageing and disability by promoting meaningful relationships and an inclusive atmosphere.

Evidence of the effect of WA on WV must not lead us to forget that, arguably, the relationship between WA and WV could be a reciprocal relationship. A study conducted with the Nurses Work Functioning Questionnaire [72], a tool specifically designed to investigate the work ability of nurses, demonstrated that exposure to violence does not modify the sub-scales relating to cognitive aspects of task execution, errors causing incidents at work and avoidance behaviour, but is associated with conflicts with colleagues, impaired contact with patients and their families and lack of energy and motivation [73]. Therefore, violence does not affect cognitive abilities and professional skills, but profoundly disturbs work behaviour. Prolonged exposure to WV damages relationships between workers and increases occupational stress, which in the long term may also lead to a reduction in individual resources that sustain adequate work ability.

This study showed that good relationships with colleagues and superiors, i.e. workplace social support, can help reduce the risk of harassment but have little effect on physical aggression. Occupational stress is associated with manifestations of violence. There is a close reciprocal relationship between violence and stress, as well as between violence and social support [18,19]. The repetition of violent episodes induces chronic stress, reduces the perception of social support and this predisposes to new episodes of violence. Workplace support is of particular importance in moderating the effects of the interaction between work ability and violence. Nursing students attribute the vertical violence they experience during clinical work primarily to a lack of information and guidance [74], while, on the contrary, students exposed to intense clinical stress but with high social support from teachers obtain optimal results [75]. Verbal and psychological violence also has serious effects on nursing students who complain about high job strain, low social support, and low organizational justice [76] that produce a negative effect on their professional commitment [77]. Workplace violence in HCWs may be associated with burnout and the intention to quit [78], although this relationship can be mediated by work ability [79].

By showing how a reduction in work ability can favour exposure to violence, this study deserves credit for shedding light on a topic that has so far attracted little research. It does, however, have many limitations. The first is that it was conducted on a single healthcare company, thus restricting the possibility of extending our results to other work situations, even though there were no obvious differences between the nurses of the public company examined here and other nurses. Another limitation is the brevity of the prospective observation period. A cohort study conducted over a period of several years could help reveal the possible inverse relationship between violence and work ability. To date, the topic has only been addressed by cross-sectional studies that cannot infer the causality of the observed association. Finally, a further limitation is the reliance of the study on subjective data. Nevertheless, recording experiences of violent episodes during annual medical examination by the occupational health physician provides more sensitive data than an analysis of injury records which include only the worst episodes of physical violence. Moreover, it is much more

 doi:10.20944/preprints202404.1864.v1

accurate than the application of algorithms that have not been scientifically validated [80]. Better knowledge of the relationship between work ability and violence can be obtained with well-designed, long-term longitudinal studies.

5. Conclusions

Our study confirmed the three hypotheses underlying this research. Work ability is a protective factor towards violence at work. Social support at work can act as a protective factor, while occupational stress is a powerful determinant of violence. The prevention of violence in the workplace should not be separated from ergonomic and organizational interventions to improve work capacity and reduce occupational stress.

Author Contributions: Conceptualization, N.M.; methodology, N.M; data curation, N.M. and I.M.; writing—original draft preparation, N.M.; writing—review and editing, N.M. and I.M. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Institutional Review Board Statement: The study was conducted in accordance with the Declaration of Helsinki and approved by the Ethics Committee of Catholic University of the Sacred Hearth of Rome (protocol code 3008; date of approval 16 April 2020).

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

Data Availability Statement: Anonymized data can be obtained upon request.

Acknowledgments: We thank the workers who participated in the survey and E.A. Wright who revised the English language.

Conflicts of Interest: The authors declare no conflict of interest.

References

1. Liu, J.; Gan, Y.; Jiang, H.; Li, L.; Dwyer, R.; Lu, K.; Yan, S.; Sampson, O.; Xu, H.; Wang, C.; Zhu, Y.; Chang, Y.; Yang, Y.; Yang, T.; Chen, Y.; Song, F.; Lu, Z. Prevalence of workplace violence against healthcare workers: a systematic review and meta-analysis. *Occup Environ Med* **2019**, *76(12)*, 927-937. doi: 10.1136/oemed-2019-105849.
2. McLaughlin, L.; Khemthong, U. The Prevalence of Type II Workplace Violence in US Nurses 2000 to 2022: A Meta-Analysis. *West J Nurs Res* **2024**, *46(3)*, 248-255. doi: 10.1177/01939459231222449.
3. Aljohani, B.; Burkholder, J.; Tran, Q.K.; Chen, C.; Beisenova, K.; Pourmand, A. Workplace violence in the emergency department: a systematic review and meta-analysis. *Public Health* **2021**, *196*, 186-197. doi: 10.1016/j.puhe.2021.02.009.
4. Nikathil, S.; Olaussen, A.; Gocentas, R.A.; Symons, E.; Mitra, B. Review article: Workplace violence in the emergency department: A systematic review and meta analysis. *Emerg Med Australas* **2017**, *29(3)*, 265-275. doi: 10.1111/1742-6723.12761.
5. Li, L.; Zhang, Q.; Yang, H.; Undergraduate, S.L. Incidence and related influencing factors of workplace violence among psychiatric nurses in China: A systematic review and Meta-analysis. *Arch Psychiatr Nurs* **2022**, *40*, 68-76. doi: 10.1016/j.apnu.2022.04.005.
6. Hadavi, M.; Ghomian, Z.; Mohammadi, F.; Sahebi, A. Workplace violence against health care workers during the COVID-19 Pandemic: A systematic review and meta-analysis. *J Safety Res* **2023**, *85*, 1-7. doi: 10.1016/j.jsr.2023.01.001.
7. Saragih, I.D.; Tarihoran, D.E.T.A.U.; Rasool, A.; Saragih, I.S.; Tzeng, H.M.; Lin, C.J. Global prevalence of stigmatization and violence against healthcare workers during the COVID-19 pandemic: a systematic review and meta-analysis. *J Nurs Scholarsh* **2022**, *54(6)*, 762-771. doi: 10.1111/jnu.12794.
8. Magnavita, N.; Chirico, F.; Sacco, A. COVID-19: from hospitals to courts. *Lancet* **2021**, *397(10284)*, 1542. doi: 10.1016/S0140-6736(21)00472-4.
9. Zhang, S.; Zhao, Z.; Zhang, H.; Zhu, Y.; Xi, Z.; Xiang, K. Workplace violence against healthcare workers during the COVID-19 pandemic: a systematic review and meta-analysis. *Environ Sci Pollut Res Int* **2023**, *30(30)*, 74838-74852. doi: 10.1007/s11356-023-27317-2.

10. Ramzi, Z.S.; Fatah, P.W.; Dalvandi, A. Prevalence of Workplace Violence Against Healthcare Workers During the COVID-19 Pandemic: A Systematic Review and Meta-Analysis. *Front Psychol* **2022**, *13*, 896156. doi: 10.3389/fpsyg.2022.896156.
11. Lee, H.; Ryu, Y.M.; Yu, M.; Kim, H.; Oh, S. A Qualitative Meta-Synthesis of Studies on Workplace Bullying among Nurses. *Int J Environ Res Public Health* **2022**, *19(21)*, 14120. doi: 10.3390/ijerph192114120.
12. Zhang, Y.; Cai, J.; Yin, R.; Qin, S.; Wang, H.; Shi, X.; Mao, L. Prevalence of lateral violence in nurse workplace: a systematic review and meta-analysis. *BMJ Open* **2022**, *12(3)*, e054014. doi: 10.1136/bmjopen-2021-054014.
13. Nyberg, A.; Kecklund, G.; Hanson, L.M.; Rajaleid, K. Workplace violence and health in human service industries: a systematic review of prospective and longitudinal studies. *Occup Environ Med* **2021**, *78(2)*, 69-81. doi: 10.1136/oemed-2020-106450.
14. Rudkjoebing, L.A.; Bungum, A.B.; Flachs, E.M.; Eller, N.H.; Borritz, M.; Aust, B.; Rugulies, R.; Rod, N.H.; Biering, K.; Bonde, J.P. Work-related exposure to violence or threats and risk of mental disorders and symptoms: a systematic review and meta-analysis. *Scand J Work Environ Health* **2020**, *46(4)*, 339-349. doi: 10.5271/sjweh.3877
15. Schablon, A.; Wendeler, D.; Kozak, A.; Nienhaus, A.; Steinke, S. Prevalence and Consequences of Aggression and Violence towards Nursing and Care Staff in Germany-A Survey. *Int J Environ Res Public Health* **2018**, *15(6)*, 1274. doi: 10.3390/ijerph15061274.
16. Wang, J.; Zeng, Q.; Wang, Y.; Liao, X.; Xie, C.; Wang, G.; Zeng, Y. Workplace violence and the risk of post-traumatic stress disorder and burnout among nurses: A systematic review and meta-analysis. *J Nurs Manag* **2022**, *30(7)*, 2854-2868. doi: 10.1111/jonm.13809.
17. Hilton, N.Z.; Addison, S.; Ham, E.C.; Rodrigues, N.; Seto, M.C. Workplace violence and risk factors for PTSD among psychiatric nurses: Systematic review and directions for future research and practice. *J Psychiatr Ment Health Nurs* **2022**, *29(2)*, 186-203. doi: 10.1111/jpm.12781.
18. Magnavita, N. The exploding spark. Workplace violence in an infectious disease hospital - A longitudinal study. *Biomed Res Int* **2013**, 316358. doi: 10.1155/2013/316358.
19. Magnavita, N. Workplace violence and occupational stress in health care workers: a chicken and egg situation - Results of a 6-year follow-up study. *J Nurs Scholarsh* **2014**, *46:5*, 366–376. doi: 10.1111/jnu.12088.
20. Balducci, C.; Vignoli, M.; Dalla Rosa, G.; Consiglio, C. High strain and low social support at work as risk factors for being the target of third-party workplace violence among healthcare sector workers. *Med Lav* **2020**, *111(5)*, 388-398. doi: 10.23749/mdl.v111i5.9910.
21. Nielsen, M.B.; Indregard, A.M.; Øverland, S. Workplace bullying and sickness absence: a systematic review and meta-analysis of the research literature. *Scand J Work Environ Health* **2016**, *42(5)*, 359-70. doi: 10.5271/sjweh.3579.
22. Shahjalal, M.; Parvez Mosharaf, M.; Mahumud, R.A. Effect of workplace violence on health workers injuries and workplace absenteeism in Bangladesh. *Glob Health Res Policy* **2023**, *8(1)*, 33. doi: 10.1186/s41256-023-00316-z.
23. Lee, N.R.; Lee, K.J.; Lee, J.H. Who Hurt You at Work? Results From a Nationwide Survey of Association Between Absenteeism and Workplace Violence, Stratified by Perpetrator. *J Occup Environ Med* **2023**, *65(11)*, e682-e687. doi: 10.1097/JOM.0000000000002944.
24. Hoffmann, S.H.; Bjorner, J.B.; Xu, T.; Mortensen, J.; Török, E.; Westerlund, H.; Persson, V.; Aust, B.; Rod, N.H.; Clark, A.J. Workplace Violence and Long-term Sickness Absence: Assessment of the Potential Buffering Effect of Social Support in Two Occupational Cohort Studies. *J Occup Environ Med* **2020**, *62(10)*, 830-838. doi: 10.1097/JOM.0000000000001975.
25. Liao, X.; Wang, Y.; Zeng, Q.; Wang, J.; Yang, X.; Yan, W.; Wang, G.; Zeng, Y. Is there a bidirectional relationship between workplace bullying and the risk of sickness absence? Systematic review and meta-analysis of prospective studies. *Occup Environ Med* **2023**, *80(9)*, 529-537. doi: 10.1136/oemed-2023-108823.
26. Dale, M.T.G.; Nissen, A.; Berthelsen, M.; Gjessing, H.K.; Heir, T. Psychosocial work factors and sick leave risk after a terrorist bomb attack: a survey and registry-based longitudinal study of governmental employees in Norway. *BMJ Open* **2021**, *11(10)*, e052628. doi: 10.1136/bmjopen-2021-052628.
27. Zhang, Y.; Yin, R.; Lu, J.; Cai, J.; Wang, H.; Shi, X.; Mao, L. Association between horizontal violence and turnover intention in nurses: A systematic review and meta-analysis. *Front Public Health* **2022**, *10*, 964629. doi: 10.3389/fpubh.2022.964629.

28. Wolf, L.A.; Perhats, C.; Delao, A.M.; Clark, P.R. Workplace aggression as cause and effect: Emergency nurses' experiences of working fatigued. *Int Emerg Nurs* **2017**, *33*, 48-52. doi: 10.1016/j.ienj.2016.10.006.
29. Zaitsev Assuline, S.; Savitsky, B.; Wilf-Miron, R.; Kagan, I. Social shaming and bullying of mental health staff by patients: A survey in a mental health centre. *J Psychiatr Ment Health Nurs* **2023**, *30(2)*, 255-266. doi: 10.1111/jpm.12865.
30. Geoffrion, S.; Lamothe, J.; Fraser, S.; Lafortune, D.; Dumais, A. Worker and perceived team climate factors influence the use of restraint and seclusion in youth residential treatment centers: Results from a mixed-method longitudinal study. *Child Abuse Negl* **2021**, *111*, 104825. doi: 10.1016/j.chiabu.2020.104825.
31. Tengland, P.A. The concept of work ability. *J Occup Rehabil* **2011**, *21(2)*, 275-85. doi: 10.1007/s10926-010-9269-x.
32. Graham, E.M.; Duffield, C. An ageing nursing workforce. *Aust Health Rev* **2010**, *34(1)*, 44-8. doi: 10.1071/AH09684.
33. Sherman, R.O.; Chiang-Hanisko, L.; Koszalinski, R. The ageing nursing workforce: a global challenge. *J Nurs Manag* **2013**, *21(7)*, 899-902. doi: 10.1111/jonm.12188.
34. Ryan, C.; Bergin, M.; White, M.; Wells, J.S.G. Ageing in the nursing workforce - a global challenge in an Irish context. *Int Nurs Rev* **2019**, *66(2)*, 157-164. doi: 10.1111/inr.12482.
35. Callander, E.; Sidebotham, M.; Lindsay, D.; Gamble, J. The future of the Australian midwifery workforce - impacts of ageing and workforce exit on the number of registered midwives. *Women Birth* **2021**, *34(1)*, 56-60. doi: 10.1016/j.wombi.2020.02.023.
36. Drew, S.J.; Halpern, L.R. The Aging Surgeon Cohort: Their Impact on the Future of the Specialty. *Oral Maxillofac Surg Clin North Am* **2022**, *34(4)*, 593-601. doi: 10.1016/j.coms.2022.02.005.
37. Lillis, S.; Milligan, E. Ageing doctors. *Australas J Ageing* **2017**, *36(1)*, 14-18. doi: 10.1111/ajag.12371.
38. Rypicz, Ł.; Witczak, I.; Rosińczuk, J.; Karniej, P.; Kołcz, A. Factors affecting work ability index among polish nurses working in hospitals - A prospective observational survey. *J Nurs Manag* **2021**, *29(3)*, 468-476. doi: 10.1111/jonm.13192.
39. Fadel, M.; Roquelaure, Y.; Descatha, A. Interventions on Well-being, Occupational Health, and Aging of Healthcare Workers: A Scoping Review of Systematic Reviews. *Saf Health Work* **2023**, *14(1)*, 135-140. doi: 10.1016/j.shaw.2022.12.003.
40. Tuomi, K.; Ilmarinen, J.; Jahkola, A.; Katajarinne, L.; Tulkki, A. *Work Ability Index*, 2nd ed.; Finnish Institute of Occupational Health: Helsinki, Finland, 1998.
41. Nikolić, D.; Višnjić A. Mobbing and Violence at Work as Hidden Stressors and Work Ability Among Emergency Medical Doctors in Serbia. *Medicina (Kaunas)* **2020**, *56(1)*, 31. doi: 10.3390/medicina56010031.
42. Roncoleta, L.M.; Pereira Jorge, I.M.; Maríngolo, L.P.; Justino, M.F.; Martins Silva-E-Dutra, F.C. Psychosocial and environmental factors: influence on work ability among social assistance workers. *Rev Bras Med Trab* **2020**, *17(3)*, 335-345. doi: 10.5327/Z1679443520190408.
43. Fischer, F.M.; Martinez, M.C. Individual features, working conditions and work injuries are associated with work ability among nursing professionals. *Work* **2013**, *45(4)*, 509-17. doi: 10.3233/WOR-131637.
44. Bordignon, M.; Marziale, M.H.P.; Sutherland, M.A.; Monteiro, I. Factors related to work ability among nursing professionals from urgent and emergency care units: A cross-sectional study. *Work* **2023**, *74(2)*, 673-683. doi: 10.3233/WOR-211300.
45. Wang, P.X.; Wang, M.Z.; Hu, G.X.; Wang, Z.M. Study on the relationship between workplace violence and work ability among health care professionals in Shangqiu City. *Wei Sheng Yan Jiu* **2006**, *35(4)*, 472-4.
46. Ilmarinen, J. The Work Ability Index (WAI). *Occupational Medicine* **2007**, *57*, 2:160 doi.org/10.1093/occmed/kqm008
47. Mateo Rodríguez, I.; Knox, E.C.L.; Oliver Hernández, C.; Daponte Codina, A.; The esTAR Group. Psychometric Properties of the Work Ability Index in Health Centre Workers in Spain. *Int J Environ Res Public Health* **2021**, *18*, 12988. doi: 10.3390/ijerph182412988.
48. International Commission on Occupational Health. Code of ethics. Available online: https://www.icohweb.org/site/code-of-ethics.asp. Accessed January 24, 2024.
49. Converso, D.; Sottimano, I.; Garzaro, G.; Guidetti, G.; Pira, E.; Viotti, S. Contribution to validation of the Italian version of work ability personal radar. *Med Lav* **2022**, *113*, e2022051. doi: 10.23749/mdl.v113i6.13470.
50. Arnetz, J. E. The Violent Incident Form (VIF): A practical instrument for the registration of violent incidents in the health care workplace. *Work & Stress* **1998**, *12*, 17–28.

51. Johnson, J.V.; Hall, E.M.; Job strain, work place support, and cardiovascular disease. A cross sectional study of a random sample of the Swedish working population. *Am J Public Health* **1988**, *78*, 1336
52. Magnavita, N. Two Tools for Health Surveillance of Job Stress: The Karasek Job Content Questionnaire and the Siegrist Effort Reward Imbalance Questionnaire. *G. Ital. Med. Lav. Ergon* **2007**, *29*, 667–670.
53. Karasek, R.; Brisson, C.; Kawakami, N.; Houtman, I.; Bongers, P.; Amick, B. The Job Content Questionnaire (JCQ): an instrument for internationally comparative assessments of psychosocial job characteristics. *J Occup Health Psychol* **1998,** *3(4)*, 322-55.
54. Magnavita, N.; Garbarino, S.; Siegrist, J. The use of parsimonious questionnaires in occupational health surveillance. Psychometric properties of the short Italian version of the Effort/Reward Imbalance questionnaire. *TSWJ Sci World J* **2012**, *372852*. doi: 10.1100/2012/372852.
55. Siegrist, J.; Wege, N.; Puhlhofer, F.; Wahrendorf, M. A short generic measure of work stress in the era of globalization: effort-reward imbalance. *Int Arch Occup Environ Health* **2009**, *82(8)*, 1005-13
56. van den Berg, T.I.; Elders, L.A.; de Zwart, B.C.; Burdorf, A. The effects of work-related and individual factors on the Work Ability Index: a systematic review. *Occup Environ Med* **2009**, *66(4)*, 211-20. doi: 10.1136/oem.2008.039883
57. Gajewski, P.D.; Rieker, J.A.; Athanassiou, G.; Bröde, P.; Claus, M.; Golka, K.; Hengstler, J.G.; Kleinsorge, T.; Nitsche, M.A.; Reinders, J.; Tisch, A.; Watzl, C.; Wascher, E.; Getzmann, S. A Systematic Analysis of Biological, Sociodemographic, Psychosocial, and Lifestyle Factors Contributing to Work Ability Across the Working Life Span: Cross-sectional Study. *JMIR Form Res* **2023**, *7*, e40818. doi: 10.2196/40818.
58. Suorsa, K.; Mattila, V.M.; Leskinen, T.; Heinonen, O.J.; Pentti, J.; Vahtera, J.; Stenholm, S. Work ability and physical fitness among aging workers: the Finnish Retirement and Aging Study. *Eur J Ageing* **2022**, *19(4)*, 1301-1310. doi: 10.1007/s10433-022-00714-1.
59. Rostamabadi, A.; Zamanian, Z.; Sedaghat, Z. Factors associated with work ability index (WAI) among intensive care units' (ICUs') nurses. *J Occup Health* **2017**,*59(2)*, 147-155. doi: 10.1539/joh.16-0060-OA.
60. Lindsay, S.; Fuentes, K.; Tomas, V.; Hsu, S. Ableism and Workplace Discrimination Among Youth and Young Adults with Disabilities: A Systematic Review. *J Occup Rehabil* **2023**, *33(1)*, 20-36. doi: 10.1007/s10926-022-10049-4.
61. Neilson, S. Ableism in the medical profession. *CMAJ* **2020**, *192(15)*, E411-E412. doi: 10.1503/cmaj.191597.
62. Kakara, M.; Venkataramani, A.S. Earnings of US Physicians With and Without Disabilities. *JAMA Health Forum* **2023**, *4(12)*, e233954. doi: 10.1001/jamahealthforum.2023.3954.
63. Lindsay, S.; Fuentes, K.; Ragunathan, S.; Lamaj, L.; Dyson, J. Ableism within health care professions: a systematic review of the experiences and impact of discrimination against health care providers with disabilities. *Disabil Rehabil* **2023**, 45(17), 2715-2731. doi: 10.1080/09638288.2022.2107086.
64. Griffin, L.; Baverstock, A. Medical student perceptions and experiences of incivility: a qualitative study. *BMC Med Educ* **2023**, *23(1)*, 404. doi: 10.1186/s12909-023-04354-6.
65. McAdams, R.M.; Sesto, M.; Kling, P.J. Modernizing Medical Culture: Time to Embrace Healthcare Workers with Disabilities. *Am J Med* **2022**, *135(7)*, 806-807. doi: 10.1016/j.amjmed.2021.12.021.
66. Derbyshire, D.W.; Jeanes, E.; Khedmati Morasae, E.; Reh, S.; Rogers, M. Employer-focused interventions targeting disability employment: A systematic review. *Soc Sci Med* **2024**, *347*, 116742. doi: 10.1016/j.socscimed.2024.116742.
67. Smith, D.L.; Atmatzidis, K.; Capogreco, M.; Lloyd-Randolfi, D.; Seman, V. Evidence-Based Interventions for Increasing Work Participation for Persons With Various Disabilities. *OTJR (Thorofare N J)* **2017**, *37(2_suppl)*, 3S-13S. doi: 10.1177/1539449216681276.
68. Jones, A.M.; Finkelstein, R.; Koehoorn, M. Disability and workplace harassment and discrimination among Canadian federal public service employees. *Can J Public Health* **2018**, *109(1)*, 79-88. doi: 10.17269/s41997-018-0022-0.
69. Lee, H.J.; Jeong, W.; Chon, D.; Kim, J.H.; Moon, J.Y. The Association between Perceived Discrimination and Mental Health of Wage Workers with Disabilities: Findings from the Panel Survey of Employment for the Disabled 2016-2018. *Int J Environ Res Public Health* **2022**, *19(14)*, 8541. doi: 10.3390/ijerph19148541.
70. Keramat, S.A.; Alam, K.; Rana, R.H.; Shuvo, S.D.; Gow, J.; Biddle, S.J.H.; Keating, B. Age and gender differences in the relationship between obesity and disability with self-perceived employment discrimination: Results from a retrospective study of an Australian national sample. *SSM Popul Health* **2021**, *16*, 100923. doi: 10.1016/j.ssmph.2021.100923.

71. Chen, C.; Shannon, K.; Napier, S.; Neville, S.; Montayre, J. Ageism directed at older nurses in their workplace: A systematic review. *J Clin Nurs* **2024**. *Epub ahead of print.* doi: 10.1111/jocn.17088.
72. Magnavita, N.; Chiorri, C. Nurses Work Functioning Questionnaire (NWFQ): refinement and validation of the Italian version. *Med Lav* **2017**, *108(6)*, 466-476. doi: 10.23749/mdl.v108i6.6454.
73. Magnavita, N.; Heponiemi, T.; Chirico, F. Workplace Violence Is Associated With Impaired Work Functioning in Nurses: An Italian Cross-Sectional Study. *J Nurs Scholarsh* **2020**, *52(3)*, 281-291. doi: 10.1111/jnu.12549. Epub 2020 Mar 25.
74. Xu, W.; Feng, L.; Huang, H.; Liu, S.; Ye, M.; Tang, F.; Chuang, Y.C.; Cai, F. Evaluation and improvement of workplace vertical violence of nursing interns based on the Importance-Performance Analysis method. *Front Med (Lausanne)* **2023**, *10*, 1210872. doi: 10.3389/fmed.2023.1210872.
75. Magnavita, N.; Chiorri, C. Academic stress and active learning of nursing students: A cross-sectional study. *Nurse Educ Today* **2018**, *68*, 128-133. doi: 10.1016/j.nedt.2018.06.003
76. Magnavita, N.; Heponiemi, T.; Chirico, F. Workplace Violence Is Associated With Impaired Work Functioning in Nurses: An Italian Cross-Sectional Study. *J Nurs Scholarsh* **2020**, *52(3)*, 281-291. doi: 10.1111/jnu.12549.
77. Yu, Z.; Kong, D.; Li, Y.; Zhang, J.; Guo, A.; Xie, Q.; Gao, F.; Luan, X.; Zhuang, X.; Du, C.; Liu, J. Psychological workplace violence and its influence on professional commitment among nursing interns in China: A multicenter cross-sectional study. *Front Public Health* **2023**, *11*, 1148105. doi: 10.3389/fpubh.2023.1148105.
78. Gedik, Ö.; Ülke Şimdi, R.; Kıbrıs, Ş.; Sivuk, D.K. The relationship between workplace violence, emotional exhaustion, job satisfaction and turnover intention among nurses during the COVID-19 pandemic. *J Res Nurs* **2023**, *28(6-7)*, 448-466. doi: 10.1177/17449871231182837
79. Converso, D.; Sottimano, I.; Balducci, C. Violence exposure and burnout in healthcare sector: mediating role of work ability. *Med Lav* **2021**, *112(1)*, 58-67. doi: 10.23749/mdl.v112i1.9906.
80. Magnavita, N.; Larese Filon, F.; Giorgi, G.; Meraglia, I.; Chirico, F. Assessing Workplace Violence: Methodological Considerations. *Med Lav* **2024**, *115(1)*, e2024003. doi: 10.23749/mdl.v115i1.15186.