Universidade de Aveiro
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EMELDA CONCEIÇÃO RODRIGUES LOUREIRO PACHECO

IMPACTO DA VIOLÊNCIA NO TRABALHO NA CAPACIDADE PARA O TRABALHO: A FUNÇÃO MEDIADORA DO MEDO, ANSIEDADE E CLIMA DE PREVENÇÃO

IMPACT OF WORKPLACE VIOLENCE ON WORK ABILITY: THE MEDIATING ROLE OF FEAR, ANXIETY, AND PREVENTION CLIMATE

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Tese apresentada à Universidade de Aveiro para cumprimento dos requisitos necessários à obtenção do grau de Doutor em Psicologia, realizada sob a orientação científica do Senhor Professor Carlos Fernandes da Silva, Professor Catedrático da Universidade de Aveiro e da Senhora Professora Anabela Maria Sousa Pereira, Professora Associada com Agregação da Universidade de Aveiro.

Com amor, para Inês e Rita, minhas filhas

o júri

presidente

Doutor João Manuel da Costa e Araújo Pereira Coutinho
Professor Catedrático, Universidade de Aveiro

vogais

Doutora Anabela Maria Sousa Pereira (Coorientadora)
Professora Associada com Agregação, Universidade de Aveiro

Doutora Teresa Margarida Crato Patrone de Abreu Cotrim
Professora Auxiliar, Universidade de Lisboa

Doutor Samuel Silvestre Antunes
Professor Auxiliar, Instituto Universitário de Ciências Psicológicas, Sociais e da Vida (ISPA)

Doutora Elisabeth de Jesus Oliveira Brito
Professora Adjunta, Universidade de Aveiro

Doutora Cláudia Joana da Silva Fernandes
Técnica Superior, Catim-Centro de Apoio Tecnológico à Indústria Metalomecânica

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palavras-chave

agressão psicológica, ansiedade, capacidade para o trabalho, clima de prevenção da violência, medo, trabalho, violência física, violência vicariante

resumo

A violência no trabalho é um fenómeno que tem vindo a aumentar e é hoje uma questão de direitos humanos e saúde pública. Os seus efeitos negativos, imediatos e a longo prazo, na saúde e bem-estar dos indivíduos determinam a adoção, pelas organizações, de medidas que previnam a sua exposição e minimizem as suas consequências. Neste contexto, os principais objetivos da presente investigação foram: (i) avaliar o impacto da violência no trabalho na capacidade para o trabalho; e (ii) examinar como o medo, a ansiedade e o clima de prevenção da violência podem influenciar o efeito da violência física, agressão psicológica e violência vicariante na capacidade para o trabalho. Foram realizados quatro estudos: um estudo de revisão dos efeitos da agressão psicológica nos trabalhadores, um estudo de validação de uma medida que avalia o clima organizacional de prevenção da violência física e psicológica e dois estudos que testam modelos de mediação procurando melhor compreender como a violência no trabalho afeta a capacidade para o trabalho dos indivíduos. Os dados dos estudos empíricos foram recolhidos a partir de uma amostra constituída por enfermeiros portugueses que responderam a um questionário disponibilizado online. Da análise dos resultados destacam-se os seguintes contributos para a investigação e a prática: Primeiro, a revisão sistemática veio colocar na agenda, pelos efeitos nefastos a que está associada, a necessidade de prevenir uma das formas mais frequentes de violência no trabalho, a agressão psicológica. Com base na evidência são ainda sugeridas estratégias conducentes à sua prevenção. Segundo, com o estudo das propriedades psicométricas da versão portuguesa da *Violence Prevention Climate Scale* (Kessler et al., 2008) é validado um instrumento para a população portuguesa capaz de medir políticas, procedimentos e práticas implementadas na organização conducentes à prevenção da violência no trabalho. Terceiro, os resultados dos modelos de mediação mostraram a existência de um efeito indireto entre violência no trabalho e capacidade para o trabalho já que mediado pelo medo, ansiedade e clima de prevenção. Esta evidência é importante para o desenvolvimento de programas e intervenções destinadas a prevenir e a reduzir os efeitos da violência no trabalho.

keywords anxiety, fear, physical violence, psychological aggression, violence prevention climate, vicarious violence, work, work ability

abstract Violence at work is a phenomenon that has been increasing and is today a human rights and public health issue. Its immediate and long-term negative effects on individuals' health and well-being determine organizations' adoption of measures to prevent their exposure to it and minimize its consequences. In this context, the main aims of this research were to: (i) assess the impact of workplace violence on work ability; and (ii) examine how fear, anxiety and a violence prevention climate can influence the effect of physical violence, psychological aggression and vicarious violence on work ability. Four studies were carried out: a study reviewing the effects of psychological aggression on workers, a study validating a measure to assess the organizational climate of physical and psychological violence prevention and two studies testing measurement models seeking better understanding of how violence at work affects individuals' work ability. The data for the empirical studies were gathered from a sample of Portuguese nurses who answered an online questionnaire. Analysis of the results highlights the following contributions to research and practice: First, the systematic review brings to the fore, due to the associated harmful effects, the need to prevent one of the most frequent forms of violence at work, psychological aggression. Based on the evidence, strategies leading to its prevention are also suggested. Secondly, with the study of the psychometric properties of the Portuguese version of the *Violence Prevention Climate Scale* (Kessler et al., 2008) is validated an instrument for the Portuguese population able to measure policies, procedures and practices implemented in organizations that lead to preventing violence at work. Thirdly, the results of the mediation models showed the existence of an indirect effect between workplace violence and work ability, as it is mediated by fear, anxiety and prevention climate. This evidence is important for the development of programs and interventions aimed to prevent and reduce the effects of workplace violence.

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LIST OF ABBREVIATIONS

AET	Affective Events Theory
APA	American Psychological Association
AVE	Average Variance Extracted
BLS	Bureau of Labor Statistics
CFA	Confirmatory Factor Analysis
CFI	Comparative Fit Index
CI	Confidence Interval
ECVI	Expected Cross-Validation Index
ESENER	European Survey of Enterprises on New and Emerging Risks
EU-OSHA	European Agency for Safety and Health at Work
Eurofound	European Foundation for the Improvement of Living and Working Conditions
EWCS	European Working Conditions Survey
ILO	International Labour Organization
NHS	National Health Service
NIHR HTA	National Institute for Health Research Health Technology Assessment
OSH	Occupational Safety and Health
PRISMA	Preferred Reporting Items for Systematic Reviews and Meta-Analyses
PT VPCS-12	Portuguese version of the 12-item Violence Prevention Climate Scale
RMSEA	Root Mean Square Error of Approximation
SEM	Structural Equation Modeling
SRMR	Standardized Root Mean Square Residual
STROBE	Strengthening the Reporting of Observational studies in Epidemiology
VPC	Violence Prevention Climate
VPCS	Violence Prevention Climate Scale
WAI	Work Ability Index
WHO	World Health Organization

INTRODUCTORY NOTE

Workplace violence remains a growing problem. It is defined by the International Labour Organization [ILO] (2019) as a "range of unacceptable behaviors and practices, or threats thereof, whether a single occurrence or repeated, that aim at, result in, or are likely to result in physical, psychological, sexual or economic harm, and includes gender-based violence and harassment". The concept encompasses a range of unacceptable behaviors, practices or threats that occur at work, including physical attacks, being yelled at, slander, ridicule, aggressive behavior through information and communication technologies, unwanted sexual comments (International Labour Organization [ILO], 2020).

As a complex and global phenomenon, workplace violence affects all countries and occupations and is a violation of human rights. It is underreported to a great extent (Arnetz et al., 2015). Differences in definitions and methodological approaches, and the level of awareness, for example, make it difficult to compare data and have a global picture of its prevalence and incidence (ILO, 2020).

Exposure to verbal abuse is the most frequent type of harmful behavior experienced by workers in many countries and regions in the world (European Foundation for the Improvement of Living and Working Conditions [Eurofound] & International Labour Organization [ILO], 2019). Non-fatal intentional injury caused by other people was reported by 20,790 American workers in 2018 (U.S. Bureau of Labor Statistics [BLS], 2020). In Europe, the findings of the European Working Conditions Survey [EWCS] showed that 5% of respondents reported experiencing bullying/harassment in the 12 months prior to the study, 2% reported having experienced physical violence, and 1% sexual harassment (Eurofound & ILO, 2019). In addition, the main findings of the European Survey of Enterprises on New and Emerging Risks [ESENER-3] 2019 showed that 61% of establishments in EU28 reported having to deal with difficult patients, customers and pupils (European Agency for Safety and Health at Work [EU-OSHA], 2019).

Workplace violence has been an area of concern for researchers. The overall aim of this doctoral dissertation (hereafter dissertation) focuses on the impact of workplace violence on individuals. Understanding and preventing violence directed against workers is critical to promote their health and well-being.

Four specific yet related studies of the issue of violence at work were conducted: (i) one systematic review focusing on the personal outcomes of psychological aggression. Key variables that would moderate the negative impact of psychological aggression were also identified. (ii) One study aiming to test the psychometric properties of the Portuguese version of the 12-item Violence Prevention Climate Scale, and (iii) two studies examining the mechanisms presumed to underlie the relationship between workplace violence and work ability.

This dissertation is structured as follows. It starts by looking at the concept of workplace violence, including types of violent behaviors experienced at work and related outcomes (Chapter 1). Second, it lists the aims of this dissertation, describes the techniques used to collect information, including measures, and the statistical procedures used to analyze the data (Chapter 2). Third, it includes the studies published or submitted that constitute the core of this research: one systematic review, a validation study and two empirical studies using mediation analysis (Chapter 3). Finally, an integrative conclusion of the research is made (Chapter 4).

CHAPTER I

General Background

WORKPLACE VIOLENCE

Recognized as a serious problem that should be prevented and eliminated, violence at work is addressed more and more in national legislation, as well in occupational safety and health (OSH) regulatory frameworks (ILO, 2020). For the first time, an international agreement on this subject was reached, the ILO Violence and Harassment Convention, 2019 (No.190), and accompanying Recommendation (No. 206). However, a review by Chirico et al. (2019) shows that workplace violence is not a subject dealt with in the law of most countries. A number of EU countries have a specific regulation on workplace violence. For example, in Finland, occupational violence is specifically addressed. In Portugal, workplace violence is covered under the general duties of employers, who are obliged to assess psychosocial risks, including workplace violence. A similar approach was found in other developed countries, such as Switzerland and Canada. Surprisingly, Chirico et al. (2019) found no provision with regard to workplace violence in Australia, New Zealand and the USA. Furthermore, there are marked differences in the regulation of workplace violence among developing and transition countries of America, Africa and Asia. Workplace violence is prohibited in many countries only if it includes an attack on sexual or religious customs.

Workplace violence is not a function of a country, a work setting or an occupational group. Even labor inspectors, who undertake workplace inspections to assess compliance with legal obligations experience high levels of violence at work (ILO, 2020; Pacheco, 2016).

No single definition of workplace violence exists in legislation or in the literature. More consensual is the classification of workplace violence based on the relationship between the perpetrator and the target in four broad categories: Type 1 – no legitimate relationship exists: e.g., criminal intent by strangers; Type 2 – a legitimate relationship exists with the organization: violence perpetrated by members of the public (customers/clients/patients and family); Type 3 – a present or past work relationship exists: worker on worker violence; Type 4 – a personal relationship exists: domestic violence that spills over to the workplace (Merchant & Lundell, 2001; e.g., Barling et al., 2009; Kessler et al., 2008). This dissertation will examine Type 2 workplace violence from the perspective of the target (i.e., those who experience violence, directly or vicariously).

EU-OSHA's 2019 European Survey of Enterprises on New and Emerging Risks (ESENER-3) shows that 59.7% of establishments in EU27 reported having to deal with difficult patients, customers and pupils, with the highest percentages registered in human health and social work activities (83.5%). In Portugal, the percentage ranges from 75% for all establishments to 94.1% in the human health and social work activity sector. Compared to 2014, ESENER-3 shows an increase in reporting difficult patients, customers and pupils in education, human health and social work activities in EU27 (2014, 74.9%; 2019, 79.9%) including in Portugal (2014, 79.04%; 2019, 89.76%) (European Agency for Safety and Health at Work [EU-OSHA], n.d.). Data from the National Health Service (NHS) Staff Survey 2020, show that, in the UK, 14.5% of NHS staff experienced at least one incident of physical violence in the last 12 months from patients / service users, their relatives or other members of the public (National Health Service [NHS], 2021). Li et al. (2020) found that, in the world, one in five healthcare professionals experience physical violence perpetrated by patients or visitors annually. Evidence of the prevalence of exposure to physical violence varied according to health care facility, with the highest percentage being found in nursing homes (30.33%). The review also shows that nurses are significantly more exposed to physical violence from patients or visitors than physicians (22.9% *vs* 14.6%).

Workplace violence: definition and dimensions

During their working hours, individuals may experience different forms of violent and aggressive behaviors perpetrated by customers (including patients, relatives). Physical violence at work is associated with the most severe negative behaviors toward employees and others with whom they work. All violent behaviors are aggressive in nature but not all aggressive behaviors are violent (Barling, 1996; Schat & Kelloway, 2005).

In this dissertation, the term *workplace violence* includes enacted physically violent and psychologically aggressive behaviors with the intent to harm, adopting the definition proposed by Schat and Kelloway (2005): “behavior that is enacted by an individual(s) within or outside an organization, intended to physically or psychologically harm a worker or workers, and occurs in a work-related context”.

Although interrelated, physically violent and psychologically aggressive behaviors represent different dimensions of the phenomenon. Schat and Kelloway (2003) compared a common factor *vs* a three-factor oblique solution and found empirical support for the conceptualization of workplace violence in three distinct dimensions: physical violence, psychological aggression, and vicarious violence (i.e., violent behaviors experienced indirectly).

Physical violence at work

Physical violence at work is associated with non-fatal forms of human aggression, that is, physically injurious behaviors involving direct physical assaults, attacks (e.g., pushing, shoving), and direct threats of assault (Barling, 1996; Neuman & Baron, 1998).

Consistent with Rogers and Kelloway (1997), in this dissertation, physical violence at work includes physical attacks directed toward individuals (e.g., hitting, kicking, grabbing, shoving, pushing, biting, throwing an object) or their property, and the threat of physical attack. Acts such as terrorism, domestic violence, armed robberies, murder, and sexual violence are excluded (Barling, 1996; Neuman & Baron, 1998).

Psychological aggression at work

Psychological aggression at work occurs more frequently than physical violence. In a review, 66.9% of nurses worldwide reported being exposed to non-physical violence *vs* 36.4% who experienced physical violence (Spector et al., 2014). The literature also suggests that psychologically aggressive behaviors might escalate into physically violent behaviors (Barling, 1996). The longitudinal study by Gadegaard et al. (2019) showed that occasional and frequent conflicts at work (mostly perpetrated by customers) were significantly associated with increased threats and physical violence. The authors also found that threats mediate the relationship between conflicts and physical violence, suggesting an escalating mechanism.

The literature and research have demonstrated the existence of meaningful, theoretical and measurement differences between constructs such as abusive supervision, incivility, bullying/mobbing, harassment, victimization, interpersonal deviance, emotional

abuse, ostracism and social undermining. However, often, we found those constructs under the label of terms such as workplace psychological aggression / workplace abuse / workplace victimization / workplace mistreatment (e.g., Aquino & Thau, 2009; Hershcovis, 2011; Nielsen & Einarsen, 2018).

This dissertation examines aggressive psychological behaviors that are by nature overt and direct behaviors such as being "yelled at", "shouted at", "sworn at" and "glared at", experienced one or more times, and perpetrated at work by one or more individuals, mostly by customers. The terminology applied is psychological aggression at work/workplace psychological aggression because some of the psychologically harmful behaviors may not necessarily be verbalized (e.g., being glared at, Rogers & Kelloway, 1997; Schat & Kelloway, 2000, 2003). In fact, other terms such as verbal aggression, verbal violence and non-physical violence are used in research to represent these behaviors (e.g., Barling et al., 2001; Schat & Frone, 2011; Spector et al., 2014).

Vicarious violence at work

Violent behaviors at work can also be experienced indirectly, as a result of seeing or hearing about co-workers/managers being exposed to violence at work. It is important to examine these behaviors, because they have an impact on employees' perceptions, fears and expectations (Barling, 1996). The literature contains various terms such as "observers /observed," "witnesses," "bystanders," for the same experience (Milczarek & EU-OSHA, 2010; Eurofound, 2015; ILO, 2020; Vranjes et al., *in press*; Zhou et al., 2017).

In the current dissertation, it is used the term "vicarious violence at work", in line with Kelloway and colleagues' research (Dupré et al., 2014; Rogers & Kelloway, 1997; Schat & Kelloway, 2000). Vicarious violence at work refers to a range of violent behaviors such as seeing or hearing of others (co-workers/managers/friends/relatives) experiencing violent events or being threatened with physical violence at work.

Empirical research has shown that physical violence, psychological aggression and vicarious violence have an extremely negative impact on individuals and organizations. Despite this, there is little research examining the link between these three dimensions of workplace violence and its impact on individuals' work ability. It is important to identify this relationship and examine how this relationship occurs. This dissertation attempts to

address the process by which nurses' experience of workplace violence affects their own work ability.

Workplace violence: outcomes

Workplace violence caused by another person to healthcare workers is a growing concern. The rate of injuries related to non-fatal workplace violence has increased from 6.4 per 10.000 full-time workers in 2011 to 10.4 in 2018. Compared to workers overall, healthcare workers experience the highest rates of incidence of workplace violence (2.1 *vs* 10.4), and are 5 times more likely to suffer an injury through workplace violence (U.S. Bureau of Labor Statistics, 2020).

An overview of existing systematic reviews (e.g., Hills & Joyce, 2013; Lanctôt & Guay, 2014; Mento et al. 2020; Pariona-Cabrera et al., 2020) and meta-analyses (Herschovis & Barling, 2010) related to the consequences of workplace violence revealed a gap in examining the impact of workplace violence on work ability.

Based on the models proposed by Barling and colleagues (Barling, 1996; Kessler et al., 2008; Schat & Kelloway, 2005; Weiss & Cropanzano, 1996), this research posits that fear, anxiety and violence prevention climate are mediators of the effect of workplace violence on work ability. The model is shown in Figure 1.

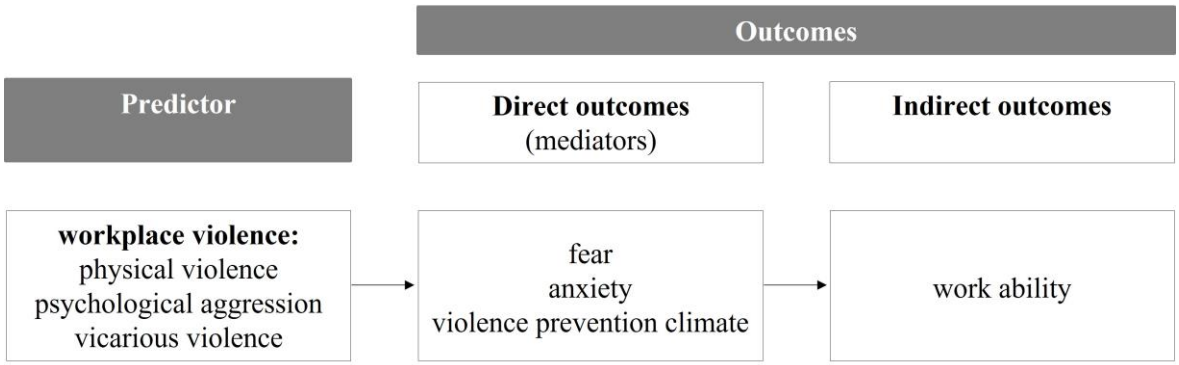

Figure 1. Proposed model of the research linking violence at work to the outcomes variables.

Workplace violence and work ability

As an occupational stressor, exposure to physical and aggressive behaviors at work reflects job demands that influence employees' work ability (Eskelinen et al., 1991). To date, limited attention has been given to the impact of the subjective experience of violent and aggressive behaviors at work on work ability (Cadiz et al., 2019; Converso et al., 2021). Examining this link will enable us to understand fully the nature and causes of this relationship in order to prevent or minimize the consequences. Both workplace violence and work ability are associated with health-related (e.g., depression) and organizational (e.g., commitment) strains, which in turn have an impact on work-related decisions such as turnover intention or early retirement (Brady et al., 2020; ILO, 2020).

From the perspective of occupational health (Ilmarinen, 2019), here, work ability is defined as a person's ability to meet the demands of their job. Work ability is a function of one's health and mental resources and the requirements of the job (Cadiz et al., 2019), which is aligned with the construct of the Work Ability Index (Tuomi et al., 1991).

Work ability can be assessed in an objective (e.g., from the social insurance perspective) or subjective (self-evaluation) way (Lederer et al., 2014). In this research, work ability will be examined from the perspective of the subject, nurses' self-reporting of their own work ability, and a conservative approach is adopted. That is, an overall assessment considering both objective (health conditions) and subjective (e.g., perceptual rating of current work ability compared with lifetime best) components of work ability, as is done with the Work Ability Index (Brady et al., 2020).

Workplace violence and fear of future violent events at work

Employees who fear future violence at work experience the same negative adverse outcomes as those who are directly or vicariously exposed to it (Rogers & Kelloway, 1997). The growth of research in the field of occupational health psychology aiming to understand the link between the subjective experience of workplace violence and fear of future violence at work has coincided with the model of workplace violence proposed by Barling (1996). Subsequent empirical research has demonstrated a significant statistical correlation between workplace violence, fear and other outcomes: turnover intentions,

mental health, physical symptoms (Rogers & Kelloway, 1997), irritability (Muller & Tschan, 2011), somatic health, job-related affect, neglect (Schat & Kelloway, 2000, 2003), anger, job engagement (Ford et al., 2016), job satisfaction, autonomy (Pacheco, 2016), emotional exhaustion, and cynicism (Portoghese et al. 2017).

To our knowledge, the role of affective reactions, emotions such as anger, fear, sadness or joy (Weiss & Cropanzano, 1996), as proximal causes of work ability, has not received enough attention. Tuomi and colleagues (1997) suggested that fear of failure and mistakes (as a mental demand) is related to reduced work ability. The association between workplace violence, fear of future violent events and work ability has not been examined. Understanding how emotions influence the relationship between negative demands at work such as workplace violence and work ability is important in designing interventions aimed to promote and improve employees' work ability.

Workplace violence and anxiety

People experience and respond to violent and aggressive behaviors differently (Barling, 1996). Consistent with the stress framework, certain events (stressors), perceived as a threat to individuals' own well-being, affect them through a psychological stress process (i.e., not directly). In response to job stressors such as workplace violence, workers also experience emotional strains such as feelings of anxiousness (Brady et al. 2020; Chang et al., 2012; Ganster & Rosen, 2013). Empirical research showed that workplace violence is strongly associated with strains in the form of anxiety (e.g., Lanctôt & Guay, 2014; Pacheco et al., 2021a; Pariona-Cabrera et al., 2020).

In this research, based on the State-Trait Anxiety Inventory (Spielberger et al., 1983), anxiety will also be examined as an indicator of nurses' emotional strain, reflecting, at the present, general feelings of tension, apprehension and nervousness ("I feel nervous").

Workplace violence and violence prevention climate

Workplace violence can be prevented and managed. The nature of the organizational climate could play an important role in preventing violence at work. A good

climate is related to people's safety and well-being. When employees perceive that their organization has policies and procedures, and promotes practices to deal with workplace violence, this influences the way they experience those harmful behaviors directed toward them or a colleague, and the way they respond to a violent event (Spector et al., 2007). Violence prevention climate is defined as employees' perceptions of organizational policies, practices and procedures regarding the control and elimination of physical violence and psychological aggression (Kessler et al., 2008). Having policies and procedures to deal with workplace violence is useful but not sufficient. When it is a question of physical violence, direct management action and practices are also required (Kessler et al., 2008). Chang et al. (2012) noted that violence prevention climate perceptions and exposure to workplace violence predict strains (e.g., anxiety) and prevention motivation both of which predict prevention performance (e.g., prevention participation). These results show that a violence prevention climate and exposure to workplace violence are associated not only with strains but also influence employees' behaviors targeted at preventing violence at work. Once again, the results suggested that managers' actions play an important role in prevention.

Specifically in nursing, violence prevention climate predicts several outcomes, including anger, anxiety, depression, emotional exhaustion, physical symptoms and turnover intention (Spector et al., 2007; Spector et al., 2015; Yang & Caughlin, 2017). In this research, based on the literature (Cadiz et al., 2019) on safety climate showing a link between a poor safety climate and reduced physical and mental work ability after 2 years (Brandt et al., 2021), it is proposed that violence prevention climate affects nurses' work ability.

CHAPTER II

Objectives and General Method

This chapter includes sub-sections with a brief description of the Research project and design; Research question, and general and specific aims; Data collection and sample; Description of instruments used; Data analysis, and Ethical considerations. More detailed information is provided in Chapter 3.

Research project and design

This dissertation focuses on the relationship between workplace violence and outcomes. Quantitative, descriptive and correlational research was carried out, structured around one systematic review and three cross-sectional studies. An overview of the studies conducted is presented in Figure 1.

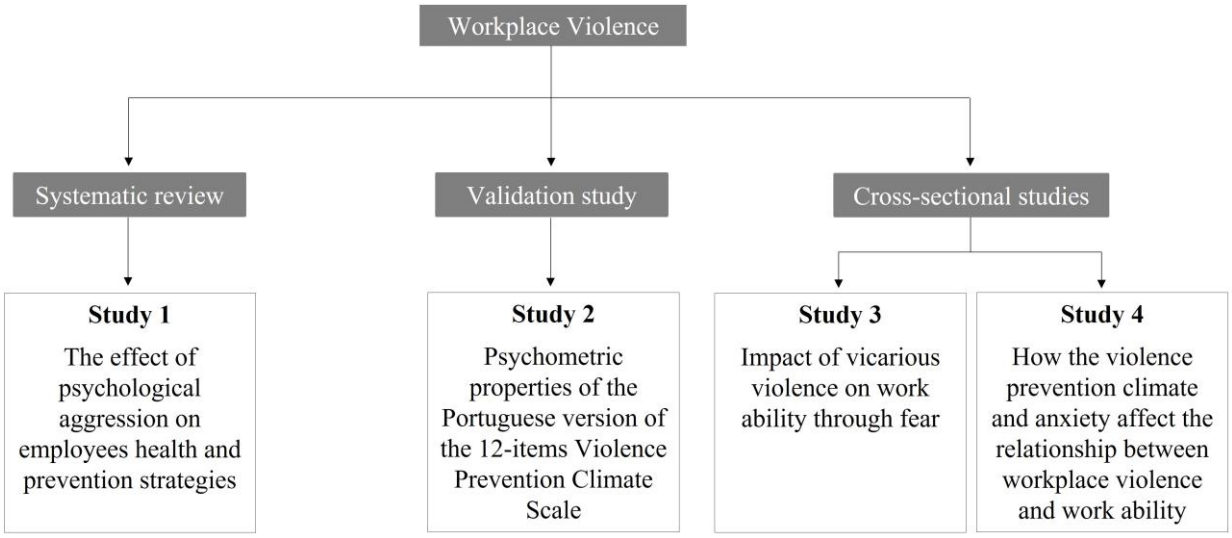

Figure 1. Overview of the studies that constitute the core of this dissertation.

Aims

The main aim of this research was for better understanding how workplace violence influences work ability by examining the mediating role of fear, anxiety and violence prevention climate. The specific aims were related to the main purposes of each study:

Study: systematic review

- To identify the relationship between workplace psychological aggression perpetrated by different sources and personal outcomes;
- To synthesize third-variables that influence workplace psychological aggression and its outcomes.

Study: psychometric properties analysis

- To validate the European Portuguese version of the 12-item Violence Prevention Climate Scale (VPCS) by providing evidence of its factor structure, internal consistency and convergent and discriminant validity.

Study: simple mediation analysis

- To examine the impact of workplace vicarious violence on nurses' work ability through fear of future violent events at work.

Study: serial multiple mediation analysis

- To investigate the mechanism through which violence prevention climate and anxiety affect the relationship between workplace violence and work ability.

Data and sample

Before starting the systematic review, a protocol was prepared, describing the rationale, aims and methods of the review. The protocol was then available and registered on PROSPERO (CRD42017064400), an international database of prospectively registered systematic reviews (https://www.crd.york.ac.uk/prospero/). The sample (30 studies) was obtained via PubMed, Scopus, ProQuest and Web of Science.

Cross-sectional data was based on a self-report questionnaire formed of socio-demographic information, and validated scales measuring workplace violence, fear, anxiety, violence prevention climate and work ability. To gather data, an online survey was conducted through the online survey tool provided by The Information and Communication Technologies Services of the University of Aveiro. The invitation to participate in the online survey was made by email and the website of the Portuguese Order of Nurses. The survey was available online between November 23, 2018 and February 17, 2019. The data used in this research were obtained from a sample of 474 nurses who completed data on all of the variables. Considering the aims and methods of

each of the three cross-sectional studies, the sample was randomly split into three samples: sample of 120 participants for the validation study; a sample of 154 participants for the simple mediation analysis, and a sample of 200 participants for the multiple mediation analysis. Participants' characteristics are described in each study (Chapter 3).

Measures

The psychometric properties of the self-report measures used in the current investigation have been established and all of them have been widely applied in research. A brief description of each measure is presented below. Detailed information is provided in the methods section of each study.

Based on Kelloway and colleagues (e.g., Rogers & Kelloway, 1997; Schat & Kelloway, 2000) studies, three scales were used to measure the occurrence and frequency of violence at work during the past year. The items describe violent, aggressive events that may occur from many sources at work. Here, workplace violence perpetrated by customers (clients, patients, relatives) was measured.

Predictor Variables

Construct: physical violence at work
Study: serial multiple mediation analysis
Measure: *Physical Violence at Work* has eight items to assess how often participants have experienced physical violent events at work or threats of these, such as "Have you been hit, kicked, grabbed, shoved or pushed while you've been at work?" or "Have you had an object thrown at you while you've been at work?" The scale reliability reported in previous studies showed a Cronbach's coefficient alpha of .65 (Rogers & Kelloway, 1997), .63 (Mueller & Tschan, 2011), .68 (Pacheco et al., 2016), for example.

Construct: psychological aggression at work
Study: serial multiple mediation analysis
Measure*: Psychological Aggression at Work* was designed to assess how often participants have experienced direct, non-physical violent events at work. The scale is formed of three

items, such as “Have you been yelled at or shouted at while you’ve been at work?” Scale reliability (α) reported in previous studies was .91 (LeBlanc & Kelloway, 2002), .87 (Schat & Kelloway, 2003).

Construct: vicarious violence at work
Study: simple mediation analysis and serial multiple mediation analysis
Measure: *Vicarious Violence at Work*, consisting of five items, asked whether participants had heard about or seen violent events or threats of these toward co-workers, supervisors or friends/relatives at work. An example item is “Have you seen any co-workers/managers being threatened with physical violence at work?” In previous studies, the internal consistency (α) of the scale was .88 (Rogers & Kelloway, 1997; Schat & Kelloway, 2003), and .73 (Pacheco et al., 2016), for example.

Outcomes Variables

The stressor-stress-strain framework specifies a mediating process (see Figure 1, Chapter 1) providing more understanding of how workplace violence and work ability are related. This research used three mediating variables: fear, anxiety and violence prevention climate.

Construct: fear
Study: simple mediation analysis
Measure: In *Fear of Future Violent Events at Work,* participants indicate the degree to which they are afraid of experiencing violence at work or a threat of this during the next year. The items match those of the Physical Violence at Work scale. The scale has shown Cronbach’s alpha coefficients of .91 (LeBlanc & Kelloway, 2002), .87 (Schat & Kelloway, 2003), and .97 (Fu et al., 2021).

Construct: anxiety
Study: serial multiple mediation analysis

Measure: Spielberger et al. (1983) 20-item state scale was used to assess participants' present feelings. The items were widely used in previous studies showing excellent internal consistency (α = .94, Thomas & Cassady, 2021).

Construct: violence prevention climate
Study: psychometric properties analysis and serial multiple mediation analysis
Measure: The 12-item scale version of the Violence Prevention Climate Scale (Kessler et al., 2008) measures three dimensions of climate: (i) policies and procedures, and (ii) practices and response, both concerning the control of physical violence and psychological aggression at work, and (iii) pressure for unsafe practices, which is related to avoiding such policies and practices. The Violence Prevention Climate Scale has shown coefficients alpha of .87 (Gazica & Spector, 2016) and .91 (Yang & Caughlin, 2017).

Construct: work ability
Study: simple mediation analysis and serial multiple mediation analysis
Measure: The Work Ability Index (Tuomi et al., 1994) measures both objective (diseases, injuries, and illnesses) and subjective (e.g., perceived work ability in relation to mental job demands) components of work ability. The Index has shown acceptable reliability (Brady et al., 2020; Cadiz et al., 2019).

Data analysis

The systematic review was conducted using the PRISMA approach in order to identify, select, appraise and synthesize the studies, in a structured and accurate way. Data from 30 empirical studies included were summarized based on measures of association, such as correlations, odds ratios and regression coefficients provided in each study.

Statistical analyses of the cross-sectional data were carried out with SPSS version 25.0, including AMOS, a Structural Equation Modeling (SEM) software. The mean, standard deviation, scale reliability and intercorrelations (Pearson's correlation) of study variables were estimated. To evaluate the psychometric properties of the Portuguese version of the 12-item violence prevention climate scale, confirmatory factor analysis (CFA) was conducted, and for better understanding of how workplace violence relates to

work ability, a simple (one mediator) and a multiple (two mediators) mediation analysis was performed, based on maximum likelihood estimation, and bootstrap to infer about indirect effects.

Ethical considerations

This research was conducted in accordance with the protocol reviewed and approved by the Ethics and Deontology Council of the University of Aveiro (32-CED/2018, 06/06/2018), considering the ethical standards of the Institution and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards.

According to international ethical principles (e.g., APA Ethical Principles), empirical studies included in this dissertation were published as original data.

The data on which the studies are based are available, upon reasonable request and for scientific purposes, from the Department of Psychology and Education of the University of Aveiro, for at least 5 years after the date of publication in the online repository of the University of Aveiro.

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CHAPTER III

Systematic review and Empirical studies

STUDY 1

Impact of Psychological Aggression at the Workplace on Employees' Health: A Systematic Review of Personal Outcomes and Prevention Strategies

Publication

Pacheco, E., Bártolo, A., Rodrigues, F., Pereira, A., Duarte, J., Carlos, F.S. (2021). Impact of psychological aggression at the workplace on employees' health: A systematic review of personal outcomes and prevention strategies. *Psychological Reports*, 124(3), 929-976. https://dx.doi.org/10.1177/0033294119875598.

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Abstract

Psychological aggression perpetrated by customers, coworkers, and supervisors is a behavior frequently experienced in the workplace with negative consequences for an individual's health. The aim of this systematic review was to examine the personal outcomes of overt workplace psychological aggression and summarize empirical evidence on how to prevent and reduce its effects. A search on PubMed, Scopus, ProQuest, and Web of Science electronic databases was made. Data were obtained from 30 studies (26 cross-sectional, 3 longitudinal, 1 quasi-experimental) representing 20,683 employees. Longitudinal studies indicated that workplace psychological aggression is significantly associated with musculoskeletal injury and psychological strains (anxiety, depression, anger) over time. Research also suggests that psychological aggression at work predicts fear, emotional exhaustion, depersonalization, personal accomplishment, and physical symptoms, for example. Additionally, the information collected suggested that support from coworkers, supervisors, and management; informational support; political skills; job resources; and confidence to prevent and respond to aggression moderate significantly the impact of workplace psychological aggression on personal and organizational outcomes. Perceptions of a violence prevention climate, aggression-preventive supervisor behavior, and aggression preventive employee effort are also significantly associated with a reduction in psychological aggression at work and strains. In conclusion, this review allows us to understand the effects of the psychological aggression by identifying the preventive strategies that could be adopted by managers, supervisors, or leaders to deal with it and promote individual's health in the workplace.

Keywords: health education, mental disorders, prevention, psychological aggression, workplace

Introduction

Subjacent to this review are the importance of work and its central role in the lives of the general population and its potential to promote and sustain mental health. Interest in work and work transitions across the lifespan has grown, in part explained by the evidence that is positively associated with behavioral, emotional, and physical aspects of an individual's health and their impact on other domains of people's lives (American Psychological Association [APA], 2016; Blustein, 2008, 2013; see also Duffy, Blustein, Diemer, & Autin, 2016).

In this systematic review, our focus is the relationship between workers' experience of psychological aggression and strains, and resources to prevent and minimize their effects.

There has been a wide debate in research on conceptual and operational issues of various forms of human aggression that occur at work, and we can find a diversity of definitions and related terms (e.g., Aquino & Thau, 2009; Barling, Dupré, & Kelloway, 2009; Bowling & Beehr, 2006; Bowling, Camus, & Blackmore, 2015; European Agency for Safety and Health at Work [EU-OSHA], 2010; International Labour Organization [ILO], 2013). In this respect, the aggression and organizational literature also recognizes distinctive constructs, with theoretical differences. For example, bullying, workplace aggression (physical and psychological aggression), incivility, and abusive supervision differ in terms of intensity and intent to harm (Nielsen, Matthiesen, & Einarsen, 2010; Schat & Kelloway, 2005; Tepper & Henle, 2011; Yang, Caughlin, Gazica, Truxillo, & Spector, 2014; see also Nielsen & Einarsen, 2018). The World Health Organization (WHO, 2019) argues that workplace violence involves both physical and nonphysical violence in work-related circumstances, but it does not clearly distinguish the different constructs mentioned above (see also ILO, 2013).

Thus, in this study, we offer an examination of workplace psychological aggression. Different terminology (as we find in other specific constructs—cf. Tepper, Simon, & Park, 2017) has been used by researchers to designate this form of workplace aggression, such as nonphysical aggression (e.g., Yang et al., 2014), verbal aggression (e.g., Kessler, Spector, Chang, & Parr, 2008), psychological aggression (e.g., Dionisi, Barling, & Dupré, 2012; Schat & Frone, 2011), and nonphysical violence (e.g., Spector,

Zhou, & Che, 2014). In this review, we apply the term workplace psychological aggression, employed by Kelloway and colleagues (e.g., Barling et al., 2009; Schat & Kelloway, 2003), in line with the distinction between verbal aggression and psychological aggression made by Straus, Hamby, Boney-McCoy, and Sugarman (1996). We adopt Schat and Kelloway's (2005) perspective and definition of workplace aggression as "a behavior that is enacted by an individual(s) within or outside an organization, intended to physically or psychologically harm a worker or workers, and occurs in a work-related context." (p. 191). This is consistent with our aims for the following reasons.

First, it is difficult to examine the effects of physical violence independently of psychological aggression because those who experience physical violence also experience psychological aggression. Only a few employees reported physical violence without experiencing psychologically aggressive behaviors. There is also consensus that not all aggressive behaviors are violent (Schat & Frone, 2011; Schat & Kelloway, 2005). Physically violent and psychologically aggressive behaviors experienced at work such as being hit and yelled at can co-occur, but they are different forms of aggression if we consider their immediate effects: physical and psychological harm (Schat & Frone, 2011). Evidence shows that although related, physical violence and psychological aggression are different constructs and empirically distinguishable. This approach is important because it leads us to focus on a range of psychological aggressive behaviors toward employees (e.g., yelling) that occur more frequently than physical violence and tend to be less visible (Barling et al., 2009; Schat & Frone, 2011).

Second, as stated by Schat and Kelloway (2005), this definition differs from other related constructs when we consider the following: (i) the frequency or duration of aggressive behaviors. The experience of negative acts is not necessarily repeated and prolonged in time as we found in definitions of bullying or harassment (cf. Nielsen, Glasø, & Einarsen, 2017; Nielsen et al., 2010; see also Nielsen & Einarsen, 2018); (ii) the target is a worker or workers. This feature distinguishes this form of aggressive behavior from organizational counterproductive behaviors such as theft, sabotage; (iii) the source of aggression can be from within (colleague) or outside (customers) the organization. The perpetrator is not limited to any one source, as we found in abusive supervision (i.e., supervisors; Tepper et al., 2017), for example.

In addition, contrary to what we found in other related constructs, such as discrimination or sexual harassment, acts of aggressive behaviors toward employees are not necessarily motivated by race or gender (Hershcovis & Barling, 2010a).

Third, the perspective of Schat and Kelloway (2005) goes further by considering experience of vicarious events. Evidence suggests that one need not experience aggressive behaviors directly to be affected (Barling, 1996). In fact, like direct aggression, workplace vicarious aggression is also associated with negative outcomes (Dupré, Dawe, & Barling, 2014; Schat & Kelloway, 2003).

Consistent with previous research, the individual's perceptions of aggressive behaviors can lead to psychological stress, which in turn generates psychological and physical strains (Barling, 1996; Schat & Kelloway, 2005). Supported by the traditional work stress framework (stressor →stress →strain) and Bandura's (1977) social learning theory, this model has been widely used by researchers to examine the negative impact of workplace aggression on personal and organizational outcomes. For example, direct and vicarious workplace aggression by customers affects the perceived risk of aggression, which in turn influences physical health, mental health, affective commitment, and turnover intentions (Dupré et al., 2014). The negative consequences of the experience of workplace aggression can go further and affect other domains of an individual's life. Coworker workplace aggression is linked to psychological detachment, which in turn is associated with work–family conflict (Demsky, Ellis, & Fritz, 2014).

Other outcomes were demonstrated in Hershcovis and Barling's (2010b) meta-analyses. Combining a variety of constructs (e.g., incivility, bullying, mistreatment) into a broad aggression category, the study showed that (i) supervisor aggression has stronger negative effects than coworker aggression on organizational outcomes (e.g., turnover intentions); (ii) coworker aggression has stronger negative effects than outsider aggression on organizational outcomes (e.g., job satisfaction, commitment); and (iii) there was no significant difference between supervisor, coworker, and outsider aggression in relation to emotional exhaustion and depression.

Workplace aggression is also associated, for example, with shame, low self-esteem, frustration, job stress, posttraumatic stress, and somatic symptoms (Aquino & Thau, 2009; Bowling et al., 2015).

Another critical issue in this area has been to identify specific ways to prevent workplace aggression. Research on the nature of workplace aggression antecedents has found that organizational and contextual factors (e.g., role ambiguity, organizational injustice) are associated with workplace aggression, so eliminating them is crucial for organizations (Dupré et al., 2014). On the other hand, research focus on the consequences of workplace aggression is particularly interesting regarding moderator variables, such as perceived control and social support, that may reduce the effect of workplace aggression on outcomes (Barling, 1996; Schat & Kelloway, 2005).

This review is pertinent due to the prevalence of psychological aggression in the workplace compared to other distinct constructs related with aggressive behaviors at work (Nielsen et al., 2010; Tepper et al., 2017). The review by Spector et al. (2014) of the literature on violence toward nurses shows that rates of exposure to nonphysical violence were significantly higher than those of bullying, physical violence, and sexual harassment (i.e., 66.9%, 39.7%, 36.4%, and 25%, respectively). According to these authors, patients and family/friends perpetrated most nonphysical violence, with 53.9% and 47.3%, respectively.

Unlike past reviews, the novelty of our study lies in examining workplace psychological aggression as a specific construct. The workplace aggression variable used by Yang et al. (2014) includes overt physical and nonphysical behaviors. Hershcovis and Barling (2010b) include in one broad workplace aggression variable measures of bullying, incivility, mobbing, and petty tyranny, for example. Dudenhoffer and Dormann's (2015) and Tepper's reviews (Tepper, 2007; Tepper et al., 2017) are based on one focal construct and instrument: customer-related social stressors (Dormann & Zapf, 2004) and abusive supervision (Tepper, 2000), respectively. In line with Nielsen and Einarsen (2018), we also believe that workplace psychological aggression should be considered from another angle for greater understanding of this phenomenon, in order to develop better programs and guidelines to prevent it.

Aims

Our aims are to examine the personal outcomes of workplace psychological aggression and identify a set of variables that buffer those outcomes. Specifically, we focus

on targets' perceptions of overt psychologically aggressive behaviours with the intent of inflicting harm, perpetrated by customers, coworkers, and supervisors and experienced directly (i.e., employees being yelled, shouted or sworn at) or vicariously (i.e., employees that have seen or heard about a colleague being yelled or shouted at), rather than ambiguous behaviours (e.g., incivility or social undermining) or employees' aggressive behaviours toward individuals or the organization (perpetrator perspective). We examine the effects of this experience on personal outcomes. That is not to say that our construct is not associated with negative organizational outcomes, but these strains are not our primary interest here. In addition, we summarize direct associations and moderating effects of organizational and individual third variables (MacKinnon, 2011) that will potentially modify positively the relation between psychological aggression and personal outcomes. In doing so, we believe that effective ways to design future preventive interventions are identified.

Methods

Protocol and registration

Details of the protocol for this systematic review were registered on PROSPERO (CRD42017064400) and is available in full on the NIHR HTA program website (http://www.crd.york.ac.uk/PROSPERO).

Eligibility criteria

Based on the literature on workplace aggression (e.g., Barling, 1996; Schat & Kelloway, 2005), inclusion criteria were applied to ensure transparency and similar interpretation in the studies selected.

Empirical records in English, published between 2000 and 2017, were retrieved: (i) where workplace psychological aggression is defined; (ii) analyzing workplace psychological aggression from the target perspective; and (iii) reporting association between workplace psychological aggression and personal outcome variables. Adult (18

years or older), full- or part-time employees, whatever the occupation and the work setting, were included.

All studies selected for inclusion in this systematic review were published in peer-review journals, so reviewed by experts according to rigorous standards of scientific research.

Literature search

A search of the literature was made between April and May 2017. First, we searched the electronic bibliographic databases PubMed, Scopus, ProQuest, and Web of Science (Science and Social Science Citation Index). The search terms used to identify relevant studies included, for example, "workplace"/"work"/"occupational" AND "psychological aggression"/"verbal aggression"/"verbal violence"/"nonphysical aggression"/"nonphysical violence." Second, a search of APA and affiliated journals was carried out on Google Scholar. Finally, we also performed a manual search of the reference list included in meta-analysis and review articles. Any personal outcome associated with workplace psychological aggression was considered.

The selection process was conducted in accordance with a four-phase Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) flow diagram (Moher, Liberati, Tetzlaff, & Altman, 2009). Based on the title and/or abstract information, two researchers independently identified records through database searching, removed duplicate records, screened, and excluded records. Two reviewers assessed full-text articles for eligibility with those not meeting the criteria being excluded. A third reviewer checked a random sample of included articles to verify if the criteria were being met consistently.

Those studies selected for inclusion also were subject to critical appraisal by two reviewers independently based on the Joanna Briggs Institute tools (Moola et al., 2017). Disagreements related to quality assessment were successively resolved by discussion in the review team. The results of this appraisal highlight that 15 out of 30 studies reported exposure measure reliability and 19 out of 30 studies identified both demographic characteristics (e.g., gender, age) and work-related factors (e.g., tenure, hours worked, work site) as control variables and strategies to deal with them. None of the studies was excluded.

Data items

Relevant information for each sample was gathered within the following criteria: (i) exposure measure is identified as in the original study; (ii) tenure (years) was not reported due to insufficient data; (iii) source of aggression was categorized as customer (e.g., client, user), coworker (e.g., colleagues), supervisor (e.g., superiors); (iv) online survey data collection includes questionnaires distributed by e-mail; (v) outcome measures are identified by their authors; (vi) personal outcomes are reported regardless of their statistical significance; and (vii) significant third variables (individual or organizational) related with resources and strategies to prevent workplace psychological aggression are reported.

Results

Study selection

A flow diagram (see Figure 1) shows the numbers of records screened, removed, assessed for eligibility, and included in this review.

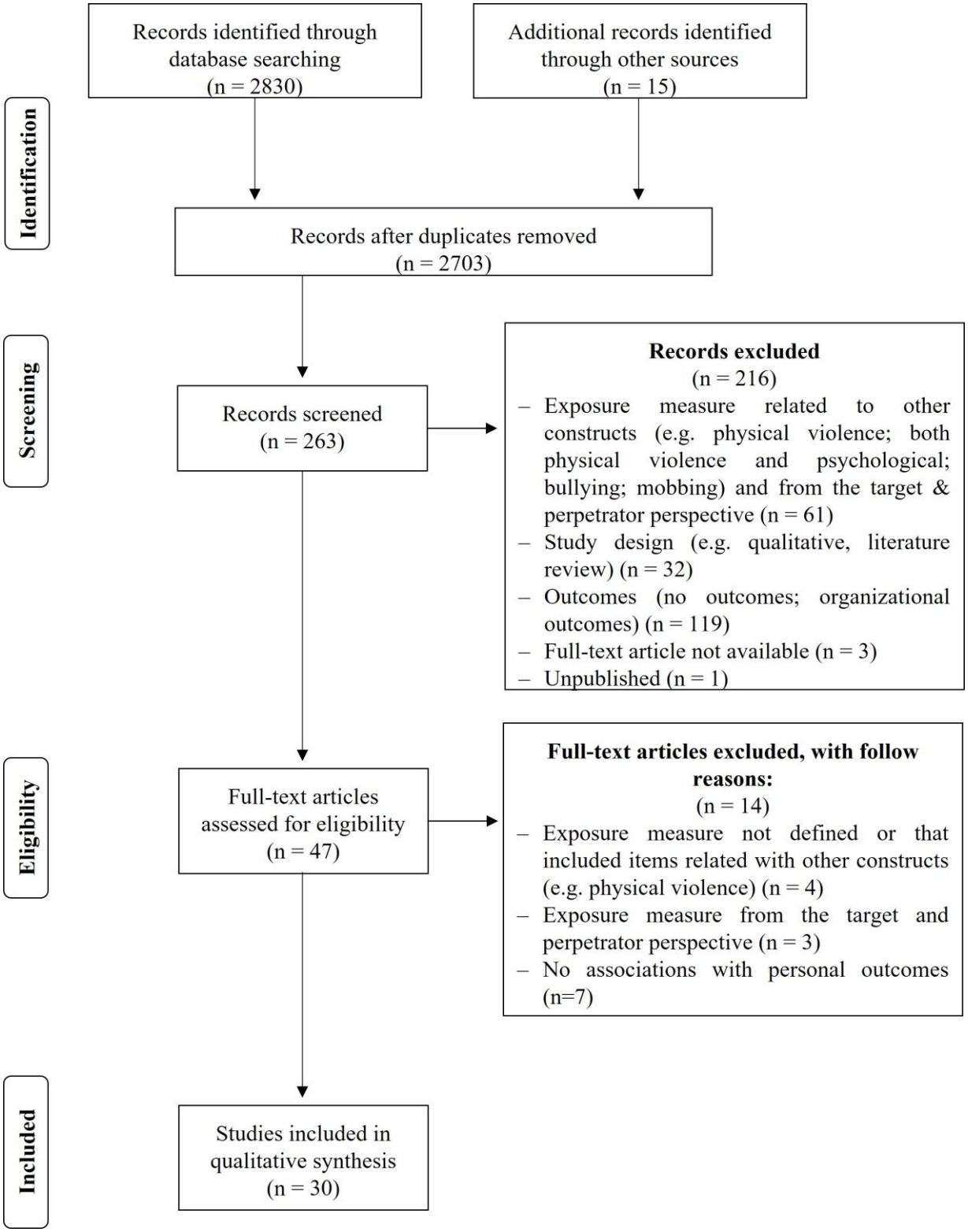

Figure 1. Studies screened, assessed for eligibility, and included in this review, with reasons for exclusions at each stage.
Source: Adapted from Moher et al. (2009).

A total of 2,845 records were identified, 263 were screened. Of these, 216 were excluded, for the following reasons: (i) 28% of studies focus on other constructs (e.g., bullying—Balducci, Cecchin, Fraccaroli, & Schaufeli, 2012; physical violence—Mueller & Tschan, 2011) (ii) or examine the exposure measure from both the target and perpetrator perspective (e.g., interpersonal conflict—Demsky et al., 2014; interpersonal and organizational counterproductive work behavior—Meier & Spector, 2013), and (iii) 55% did not report associations between workplace psychological aggression and personal outcomes. Of the 47 full texts assessed for eligibility, 14 were excluded due to (i) exposure measure (n = 7), for example, Dupré et al. (2014) assessed direct and vicarious workplace aggression of a psychological and physical nature by customers, but all items of measurement were averaged to form one index; Nixon and Spector's (2015) measure included verbal aggression, intimidation, social exclusion, undermining, rude behavior, interpersonal conflict, and physical aggression; (ii) no report of associations between workplace psychological aggression and outcomes (n = 7). Thus, 30 studies were included in this systematic review.

Demographic and study characteristics

More than half the studies (n = 16) were conducted in America, eight in Europe, four in Asia, and one in Africa. One study did not report the country (Dionisi et al., 2012).

Sample size varied from 118 (Itzhaki et al., 2015) to 3,471 participants (Dhaini et al., 2015). Of the total number of 20,683 participants, 10,579 worked in health care in a variety of work settings.

Twenty-six studies have a cross-sectional design, and one has a quasi-experimental design. Three studies are longitudinal. Different data collection techniques were used: traditional paper-and-pencil (n = 17), online method (n = 8), telephone survey (n = 2), telephone survey and online (n = 1), and hardcopy and online technique (n = 2).

Exposure measure

Great heterogeneity was found in the measures used to assess workplace psychological aggression. Frequency of workplace psychological aggression was measured

by (i) a single item (e.g., Itzhaki et al., 2015), (ii) items adapted from other measures (e.g., Da Silva et al., 2015), (iii) continuous measures that aggregated specific workplace psychological aggression indicators (e.g., Pacheco, Cunha, & Duarte, 2016), or (iv) newly developed instruments (e.g., Dormann & Zapf, 2004; Table 1).

The content of the exposure measures is focused on overt psychological behaviors such as "been threatened," "yelled at," "a door abruptly shut," "insulted," "something spiteful was said," "treated rudely/with disrespect," "interrupted while you were speaking/working," "judged or criticized unfairly," "address me defiantly," "customers always complaining," and "argue all the time" (e.g., Barling, Rogers, & Kelloway, 2001; Chang, Eatough, Spector, & Kessler, 2012; Chang & Lyons, 2012; Dionisi et al., 2012; Dormann & Zapf, 2004; Grandey, Kern, & Frone, 2007; Hanson, Perrin, Moss, Laharnar, & Glass, 2015; Kessler et al., 2008; LeBlanc & Kelloway, 2002; Llor-Esteban, Sánchez-Muñoz, Ruiz-Hernández, & Jiménez-Barbero, 2017). Other studies reported the content of the exposure measure broadly as verbal aggression and insults (Da Silva et al., 2015; Dhaini et al., 2015; Itzhaki et al., 2015; Jaradat et al., 2016; Jung et al., 2015; Magnavita, 2013).

Of the included studies, 15 provide exposure measure reliability, showing adequate internal consistency (coefficient alpha) with values ranging from $\alpha = .72$ (e.g., Dormann & Zapf, 2004) to $\alpha = .93$ (Pacheco et al., 2016).

Concerning the source of psychological aggression at work: (i) nine studies did not identify the source (e.g., Schat & Frone, 2011); (ii) in three studies, although the source is mentioned, subsequent analyses do not specify it (e.g., Spector, Yang, & Zhou, 2015); (iii) 13 studies addressed workplace psychological aggression perpetrated by customers; and (iv) one study (Dionisi et al., 2012) examined supervisor psychological aggression and another (Yang & Caughlin, 2017) coworker psychological aggression.

Three studies (Chang & Lyons, 2012; Grandey et al., 2007; LeBlanc & Kelloway, 2002) distinguished different sources of workplace psychological aggression. In doing so, differences associated with outcomes were also examined.

A specific period in which workplace psychological aggression occurred was reported in 22 studies varying considerably from 1 day (Grandey, Dickter, & Sin, 2004) to the past year/entire career (Itzhaki et al., 2015).

Table 1. Study characteristics and workplace psychological aggression measures.

Authors (year)	Country	Sample size (*n*)	Gender		Age	Occupations	Work setting	Measure	Reliability (α =)	Source of aggression	Timeframe
			Male	Female	Mean (SD)						
Barling et al. (2001)	Canada	292	0	292	-	Various occupations (e.g. nurses)	Clients' own homes	Greenberg & Barling (1999)	-	-	6 months
Chang et al. (2012)	United States	172	34	138	24 (6.8)	Various occupations	Variety of organizations (e.g. retail/service)	Workplace Aggression Research Questionnaire (Neuman & Keashly, 2004)	.76	-	12 months
Chang & Lyons (2012)	United States	446	98	348	27 (5.7)	Various occupations	Variety of organizations (e.g. school)	Workplace Aggression Research Questionnaire (Neuman & Keashly 2004)	.72	Supervisor Coworker Customer Other (separately)[1]	12 months
Da Silva et al. (2015)	Brazil	2940	279	2661	36.7 (9.6)	Healthcare workers (e.g. nurses)	Primary care	WHO VAW (Schraiber et al. 2010)	-	-	12 months
Dhaini et al. (2015)	Switz.	3471[2]	264	3192	-	Nurses and auxiliary nurses	Nursing homes	Ryden Aggression Scale (Oh, Eom, & Kwon, 2004)	-	Customer	1 month
Dionisi et al. (2012)	-	467	0	467	39.89 (10.6)	-	-	Conflict Tactics Scales (Straus 1979; Straus et al. 1996)	Not Provided[3]	Supervisor	12 months
Dormann & Zapf (2004)	Germany	591	130	461	32.13 (9.52)	Various occupations (e.g. flight attendants)	Variety of settings	Customer-related social stressors measure was developed	.72	Customer	-
Grandey et al. (2004)	United States	198	79	119	-	Call center employees (voice-to-voice service)	Call center	"Think about the last time a caller was upset about his or her bill and became very angry and verbally attacked you."	-	Customer	Daily

(continued)

Table 1. *Continued*

Authors (year)	Country	Sample size (*n*)	Gender		Age	Occupations	Work setting	Measure	Reliability (α =)	Source of aggression	Timeframe
			Male	Female	Mean (SD)						
Grandey et al. (2007)	United States	*Study1* 2446	1296	1150	39 (11.8)	Various occupations	Variety of organizations (e.g. office)	"During the past 12 months, how often have you experienced any kind of verbal abuse, such as being yelled at, threatened, insulted, or sworn at …?"	-	Supervisor Coworker Customer (separately)[1]	12 months
Hanson et al. (2015)	United States	1214	0	1214	47.3 (13.8)	Homecare workers (activities e.g. shopping)	Client's own home	Barling et al. (2001)	-	Customer	12 months
Itzhaki et al. (2015)	Israel	118[2]	42	74	48.75 (8.73)	Nurses	Hospital[4]	"Have you been exposed to verbal violence from a patient and/or a patient's family during the past year / during your work as a nurse?"	-	Customer	Past year / entire career
Jaradat et al. (2016)	Palestina	343	131	212	37.4 (8.0)	Nurses	Hospitals / primary care	(WHO 2003)	-	-	12 months
Jung et al. (2015)	Korea	161	161	0	53 (-)	Drivers	"Road"	-	-	Customer	12 months
Karatepe & Nkendong (2014)	Cameroon	136	79	57	-	Various occupations (e.g. bartenders)	Hotel industry	Dormann & Zapf (2004)	.90	Customer	-
Karatepe et al. (2009)	Cyprus	204	137	67	-	Various occupations (e.g. concierges)	Hotel industry	Dormann & Zapf (2004)	.88	Customer	-
Kessler et al. (2008)	United States	216	40	176	23.9 (6.3)	Various occupations (e.g. customer service/sales)	Variety of settings (e.g. industries)	Workplace Aggression Research Questionnaire (Neuman & Keashly 2004)	.78	-	-

(continued)

Table 1. *Continued*

Authors (year)	Country	Sample size (*n*)	Gender		Age	Occupations	Work setting	Measure	Reliability (α =)	Source of aggression	Timeframe
			Male	Female	Mean (SD)						
LeBlanc & Kelloway (2002)	Canada	254[2]	104	149	38.68 (11.80)	Various occupations	Variety of settings (e.g. hospitals)	Barling et al. (2001)	Coworker aggression (α = .82) Public aggression (α = .91)	Coworker / customer (separately)[1]	-
Li & Zhou (2013)	China	800	168	632	-	Call center employees (voice-to-voice service)	Call center	A customer verbal aggression scale was developed	.91	Customer	-
Llor-Esteban, et al. (2017)	Spain	518[2]	70	442	41.3 (9.57)	Nurses /auxiliary nursing	Hospital	Healthcare-workers Aggressive Behavior Scale-Users (Waschgler, Ruiz-Hernández, Llor-Esteban, & García-Izquierdo, 2012)	.84	Customer	12 months
Magnavita (2013)	Italy	627	268	359	37.5 (10.4)	Healthcare workers (e.g. physicians)	Hospital[5]	Violent Incident Form (Arnetz, 1998)	-	-	12 months
Pacheco et al. (2016)	Portugal	131	42	89	41.89 (7.49)	Labor inspectors	Variety of settings (e.g. employer's own industry)	Workplace Aggression Questionnaire (Schat, Desmarais, & Kelloway, 2006)	.93	Customer	12 months
Schat & Frone (2011)	United States	2376	1259	1117	39 (-)	Various occupations	Variety of settings	McFarlin, Fals-Stewart, Major, & Justice (2001)	.79	-	12 months
Schat & Kelloway (2003)	Canada	225	29	196	40.9 (9.8)	Various occupations (e.g. nurses)	Healthcare settings	Barling et al. (2001)	.87	-	12 months
Spector et al. (2007)	United States	198	0	198	-	Nurses	Hospital[6]	"Have you been verbally assaulted in your workplace in the last 12 months."	-	Customer / coworker / supervisor	12 months
Spector et al. (2015)	United States	126	-	-	26.1 (6.9)	Nurses	Variety of settings (hospital)	"Were you been verbally assaulted at work since graduating from nursing school?"	-	Customer / coworker	6 and 12 months

(continued)

Table 1. *Continued*

Authors (year)	Country	Sample size (*n*)	Gender		Age	Occupations	Work setting	Measure	Reliability (α =)	Source of aggression	Timeframe
			Male	Female	Mean (SD)						
Viotti et al. (2015)	Italy	630	114	516	37.97 (8.76)	Nurses and auxiliary nurses	Hospital	Customer-related Social Stressors (Dormann & Zapf 2004)	.92	Customer	-
Winstanley & Whittington (2002)	England	375	-	-	37.9 (-)	Healthcare workers (e.g. doctors)	Hospital	"How frequently do you experience verbal aggression from patients or their relatives/friends?"	-	Customer	-
Yang & Caughlin (2017)	United States	*Sample 1* 237 *Sample 2* 337	- -	- -	*Sample 1* 47.64 (10.55) *Sample 2* 41.82 (11.72)	Nurses	Hospital/acute care facilities Healthcare organization	Chang et al. (2012)	*Sample 1* .84 *Sample 2* .85	Coworker	6 months
Yang et al. (2016)	United States	*Study 1* 273	-	-	-	Nurses	Healthcare organization	Chang et al. (2012)	.87	-	12 months
Zhou et al. (2015)	United States	161	-	-	-	Nurses	Variety of settings (e.g. hospital)	"Have you been verbally assaulted while at work since you graduated from nursing school?" to the sixth month and "Have you been verbally assaulted while at work in the past six months?" to the twelfth month	-	Customer / coworker / other	6 and 12 months

[1]The authors have distinguished different sources.
[2] Gender: cases with missing data were deleted
[3]Dionisi et al. (2012) – Authors note: "…no internal consistency data are provided."
[4]Itzhaki et al. (2015) – Mental Health Hospital
[5]Magnavita (2013) – Infectious Diseases Hospital
[6]Spector et al. (2007) – Veteran's Health Administration Hospital

Note: All the items with the symbol (-) were not reported

Outcomes

Consistent with our aim regarding the personal outcomes of workplace psychological aggression, a variety of outcomes were taken from studies. We found a lack of consistency in their measurement; for example, anxiety was examined in nine studies through measures such as Emotional Strain Scale, Brief Symptom Inventory 18, General Health Questionnaire, and Mood Scale.

In addition, this review has examined significant variables associated with prevention and reduction of those outcomes. Of the total of 30 studies, 14 examined a set of related individual and organizational variables. Of these studies, 10/14 studies were conducted in the USA. Moderating variables in the research design were included in 5/14 and 9/14 studies examined associations between third variables and workplace psychological aggression and strains.

Main findings

Workplace psychological aggression outcomes

In this review, the correlation between workplace psychological aggression and the outcome was retained. For example, Dormann and Zapf's (2004) exposure measure (customer-related social stressors) has four dimensions. For our purposes, only the association between the factor of "customer verbal aggression" (as it reflects psychological aggression by customers) and the outcome was considered.

Three longitudinal studies conducted in the health-care sector show that exposure to psychological aggression at work is related with mental and physical complaints over time. Workplace psychological aggression affects anxiety and depression in baseline assessment after 12 months of exposure (Magnavita, 2013) and is significantly correlated with anger and depression 6 months and 12 months after nurses begin work (Spector et al., 2015). Zhou, Yang, and Spector (2015) found that workplace psychological aggression is a significant predictor of anger and musculoskeletal injury 12 months after nurses begin work (Table 2).

Customer psychological aggression is significantly associated with emotional exhaustion, depersonalization and personal accomplishment (Dhaini et al., 2015; Dormann & Zapf, 2004; Grandey et al., 2004; Karatepe & Nkendong, 2014; Karatepe, Yorganci, & Haktanir, 2009; Li & Zhou, 2013; Llor-Esteban et al., 2017; Viotti, Gilardi, Guglielmetti, & Converso, 2015; Winstanley & Whittington, 2002), fear, diminished psychological well-being, physical symptoms (LeBlanc & Kelloway, 2002; Pacheco et al., 2016), back pain and joint pain (Dhaini et al., 2015) poor life satisfaction (Itzhaki et al., 2015), social dysfunction (Llor-Esteban et al., 2017), sleep problems, and stress (Hanson et al., 2015).

A few studies explored workplace psychological aggression perpetrated by supervisors and coworkers. The experience of supervisor psychological aggression is negatively associated with psychological well-being (Dionisi et al., 2012), and coworker psychological aggression is positively correlated with emotional exhaustion and physical symptoms (Yang & Caughlin, 2017).

Differences associated with psychological aggression perpetrated from different sources and outcomes were examined. Chang and Lyons (2012) discriminated four types of sources and compared associations between psychological aggression from those different perpetrators and outcomes. Their results suggested that psychological aggression by all four perpetrators (customer, coworkers, supervisor, and significant others) is positively associated with increased anger, anxiety, and depression. Grandey et al. (2007) found that all three perpetrators of psychological aggression, inside (coworkers and supervisor) and outside (customer), were significant predictors of job-related emotional exhaustion. LeBlanc and Kelloway (2002) examined employees' experience of psychological aggression from two sources. The results suggested that customer and coworker psychological aggression are differently associated with personal outcomes, while coworker psychological aggression has no effects on fear.

Table 2. Correlations and regression coefficients between workplace psychological aggression and personal outcomes.

Authors (year)	Study design	Collection	Outcomes	Measure		Findings
				Authors (year)	Reliability (α =)	
Barling et al. (2001)	Cross-sectional	Online survey	Anger	Nowlis (1965)	.84	[psychological] aggression – anger (*r* = .20***)
			Anxiety		.79	[psychological] aggression – anxiety (*r* = .24***)
			Sadness		.91	[psychological] aggression – sadness (*r* = .11)
Chang et al. (2012)	Cross-sectional	Online survey	Anger	Derogatis (2003)	.87	Verbal aggression – anger (*r* = .41***)
			Anxiety		.71	Verbal aggression – anxiety (*r* = .21**)
			Depression		.75	Verbal aggression – depression (*r* = .35***)
Chang & Lyons (2012)	Quasi-experimental	Online survey	Anger	Derogatis (2003)	.87	Verbal aggression – anger (supervisor *r* = .49***; coworker *r* = .26**; customer *r* = .35***; other *r* = .34***)
			Anxiety		.71	Verbal aggression – anxiety (supervisor *r* = .36***; coworker *r* = .16*; customer *r* = .19*; other *r* = .32**)
			Depression		.75	Verbal aggression – depression (supervisor *r* = .40***; coworker *r* = .24**; customer *r* = .26**; other *r* = .23**)
Da Silva et al. (2015)	Cross-sectional	Online survey	Depression	Santos et al. (2013)	-	Exposure to insult – depression OR = 2.55; 95% CI [1.79, 3.62]*** Exposure to insult – probable major depression OR = 6.28; 95% CI [4.11, 9.61]*** Exposure to threats – depression OR = 1.44; 95% CI [0.84, 2.49] Exposure to threats – probable major depression OR = 1.48; 95% CI [0.83, 2.66]*
Dhaini et al. (2015)	Cross-sectional	Paper-and-pencil survey	Back pain	Swiss Health Survey (Federal Statistical Office, 2012)	-	Customer verbal aggression – back pain OR = 1.36; 95% CI [1.06, 1.74]*
			Joint pain		-	Customer verbal aggression – joint pain OR = 1.50; 95% CI [1.12, 2.02]**
			Needle stick injuries	Schubert et al. (2009)	-	Customer verbal aggression – needle stick injuries OR = 0.99; 95% CI [0.48, 2.08]
			Allergies	One-item measure[1]	-	Customer verbal aggression – allergies OR = 2.17; 95% CI [0.94, 5.0]
			Tiredness	Swiss Health Survey (Federal Statistical Office, 2012)	-	Customer verbal aggression – tiredness OR = 1.03; 95% CI [0.77, 1.37]
			Sleeplessness		-	Customer verbal aggression – sleeplessness OR = 1.27; 95% CI [0.94, 1.72]

(continued)

Table 2. *Continued*

Authors (year)	Study design	Collection	Outcomes	Measure		Findings
				Authors (year)	Reliability (α =)	
			Headache		-	Customer verbal aggression – headache OR = 0.98; 95% CI [0.67, 1.37]
			Emotional exhaustion	Maslach, Schaufeli, & Leiter (2001)	-	Customer verbal aggression – emotional exhaustion OR = 1.24; 95% CI [0.97, 1.60]
Dionisi et al. (2012)	Cross-sectional	Online survey	Psychological well-being	Goldberg (1972)	.91	Supervisor psychological aggression – psychological well-being (*r* = -.25***)
Dormann & Zapf (2004)	Cross-sectional	Paper-and-pencil survey	Emotional exhaustion	Bussing & Perrar (1992); Maslach, Jackson, & Leiter (1996)	.85	Customer verbal aggression – emotional exhaustion (β = .14**)
			Depersonalization		.77	Customer verbal aggression – depersonalization (β = .30**)
			Personal accomplishment		.78	Customer verbal aggression – personal accomplishment (β = -.33**)
Grandey et al. (2004)	Cross-sectional	Paper-and-pencil survey	Emotional exhaustion	Wharton (1993)	.82	Customer verbal aggression – emotional exhaustion (*r* = .30*)
			Stress appraisal	One-item measure[1]	-	Customer verbal aggression – stress appraisal (*r* = .25*)
Grandey et al. (2007)	Cross-sectional	Telephone survey	Emotional exhaustion	One-item measure[1]	-	Customer / coworker / supervisor verbal aggression – emotional exhaustion (B = .11*** / .20*** / .18***)
Hanson et al. (2015)	Cross-sectional	Online and telephone survey	Stress	Pejtersen, Kristensen, Borg, & Bjorner (2010)	.90	Customer verbal aggression – stress (B = 14.5***)
			Sleep problems		.90	Customer verbal aggression – sleep problems (B = 14.4***)
			Depression		.80	Customer verbal aggression – depression (B = 8.4***)
			Burnout	Borritz et al. (2006)	.90	Customer verbal aggression – burnout (B = 18.7***)
Itzhaki et al. (2015)	Cross-sectional	Paper-and-pencil survey	Life satisfaction	Diener, Emmons, Larsen, & Griffin (1985)	.81	Customer verbal violence – life satisfaction (*r* = -.22*)
			Post-traumatic growth	Cann et al. (2010)	.83	Customer verbal violence – post-traumatic growth (r = .03)

(continued)

Table 2. *Continued*

Authors (year)	Study design	Collection	Outcomes	Measure		Findings
				Authors (year)	Reliability (α =)	
Jaradat et al. (2016)	Cross-sectional	Paper-and-pencil survey	Psychological distress	El-Rufaie & Daradkeh (1996); Golberg (1978)	.90	Verbal aggression – psychological distress (2.9 units; p = 0.04; 95% CI [0.2, 5.6]
Jung et al. (2015)	Cross-sectional	Paper-and-pencil survey	Depression	Cho & Kim (1993)	-	Customer verbal abuse – depression OR = 2.84; 95% CI [1.11, 7.30][2]
Karatepe & Nkendong (2014)	Cross-sectional	Paper-and-pencil survey	Emotional exhaustion	Maslach & Jackson (1981)	.89	Customer verbal aggression – emotional exhaustion (r = .65***)
Karatepe et al. (2009)	Cross-sectional	Paper-and-pencil survey	Emotional exhaustion	Maslach & Jackson (1981)	.87	Customer verbal aggression – emotional exhaustion (β = .25***)
Kessler et al. (2008)	Cross-sectional	Online survey	Anger	Derogatis (2003)	.84	Verbal aggression – anger (β = .38***)
			Anxiety		.72	Verbal aggression – anxiety (β = .24**)
			Depression		.88	Verbal aggression – depression (β = .24**)
			Physical symptoms	Spector & Jex (1998)	.87	Verbal aggression – physical symptoms (β = .26***)
LeBlanc & Kelloway (2002)	Cross-sectional	Paper-and-pencil survey	Fear of future violent events at work	Rogers & Kelloway (1997)	.95	Public nonphysical aggression – fear (r = .48**) Coworker nonphysical aggression – fear (r = .11)
			Emotional well-being	Banks et al. (1980)	.88	Public nonphysical aggression – emotional well-being (r = -.20**) Coworker nonphysical aggression – emotional well-being (r = -.32**)
			Psychosomatic well-being	Spence, Helmreich, & Pred (1987)	.84	Public nonphysical aggression – psychosomatic well-being (r = -.26**) Coworker nonphysical aggression – psychosomatic well-being (r = -.39**).
Li and Zhou (2013)	Cross-sectional	Paper-and-pencil survey	Emotional exhaustion	Maslach et al. (1996)	.88	Customer verbal aggression – emotional exhaustion (β = .53***)

(continued)

Table 2. *Continued*

Authors (year)	Study design	Collection	Outcomes	Measure		Findings
				Authors (year)	Reliability (α =)	
Llor-Esteban et al. (2017)	Cross-sectional	Paper-and-pencil survey	Emotional exhaustion	Gil-Monte (2002);	.87	Non-physical customer violence – emotional exhaustion (*r* = .26**)
			Professional efficacy		.86	Non-physical customer violence – professional efficacy (*r* = -.18*)
			Cynicism		.73	Non-physical customer – cynicism (*r* = .13)
			Social dysfunction		.69	Non-physical customer violence – social dysfunction (*r* = .16*)
			Depressive symptomatology	Lobo, Pérez-Echeverria, & Artal (1986); Goldberg & Hillier (1979)	.87	Non-physical customer violence – depressive symptomatology (*r* = .24**)
			Anxiety /insomnia		.90	Non-physical customer violence – anxiety/insomnia (*r* = .16*)
			Somatic symptoms		.85	Non-physical customer violence – somatic symptoms (*r* = .28**)
Magnavita (2013)	Longitudinal	Paper-and-pencil survey	Anxiety	Magnavita (2007); Golberg, Bridges, Duncan-Jones, & Grayson (1988)	.82	Verbal aggression – anxiety in baseline assessment OR = 1.11; 95% CI [1.01, 1.22]* and after 12 months OR = 2.61; 95% CI [1.60, 4.30]***
			Depression		.78	Verbal aggression – depression in baseline assessment OR = 1.19; 95% CI [1.05, 1.35]** and after 12 months: OR = 2.66; 95% CI [1.61, 4.39]***
Pacheco et al (2016)	Cross-sectional	Online survey	Fear of future violent events at work	Rogers & Kelloway (1997)	.96	Customer psychological aggression – fear (B = .5955***)
			Psychological well-being	McIntyre et al. (2003); Goldberg (1972)	.91	Customer psychological aggression – psychological well-being (B = .0788)
			Physical symptoms	Spector & Jex (1998)	.97	Customer psychological aggression – physical symptoms (B = .2804***)
Schat & Frone (2011)	Cross-sectional	Telephone survey	Overall health	Four-itens measure[1]	.77	Psychological aggression – overall health (*r* = - .09***)

(continued)

Table 2. *Continued*

Authors (year)	Study design	Collection	Outcomes	Measure		Findings
				Authors (year)	Reliability (α =)	
Schat & Kelloway (2003)	Cross-sectional	Paper-and-pencil survey	Fear of future violence at work	Rogers & Kelloway (1997)	.97	Psychological aggression – fear (*r* = .57***)
			Emotional well-being	Banks et al. (1980)	.90	Psychological aggression – emotional well-being (*r* = -.09)
			Somatic health	Spence et al. (1987)	.86	Psychological aggression – somatic health (*r* = -.19**)
Spector et al. (2007)	Cross-sectional	Paper-and-pencil survey	Anxiety	Derogatis (2003)	.87	Verbal aggression – anxiety (β = .15)
			Depression		.88	Verbal aggression – depression (β = .20*)
			Physical symptoms	Spector & Jex (1998)	.83	Verbal aggression – physical symptoms (β = .24*)
Spector et al. (2015)	Longitudinal	Paper-and-pencil and online survey	Anger	Caplan et al. (1980)	.85 / .91 (6 / 12 months)	Verbal abuse – anger 6 months (*r* = .24*) and 12 months after graduation (*r* = .30*)
			Anxiety		.72 / .74 (6 / 12 months)	Verbal abuse – anxiety 6 months (*r* = .08) and 12 months after graduation (*r* = .17)
			Depression	Bohannon, Maljanian, & Goethe (2003)	.69 / .75 (6 / 12 months)	Verbal abuse – depression 6 months (*r* = .19*) and 12 months after graduation (*r* = .18*)
			Physical sym ptoms	Spector & Jex (1998)	.80 (6 / 12 months)	Verbal abuse – physical symptoms 6 months (*r* = .19*) and 12 months after graduation (*r* = .17)
Viotti et al. (2015)	Cross-sectional	Paper-and-pencil survey	Emotional exhaustion	Sirigatti & Stefanile (1993); Maslach & Jackson (1986)	.82	Customer verbal aggression – emotional exhaustion (*r* = .41**)
			Depersonalization		.77	Customer verbal aggression – depersonalization (*r* = .43**)
Winstanley & Whittington (2002)	Cross-sectional	Online survey	Emotional exhaustion	Maslach & Jackson (1986)	.90	Customer verbal aggression – emotional exhaustion (*r* = .25***)
			Depersonalization		.79	Customer verbal aggression – depersonalization (*r* = .32***)

(continued)

Table 2. *Continued*

Authors (year)	Study design	Collection	Outcomes	Measure		Findings
				Authors (year)	Reliability (α =)	
Yang & Caughlin (2017)	Cross-sectional	Paper-and-pencil and online survey	*Sample 2* Emotional exhaustion	Shirom & Melamed (2006)	.90	Coworker psychological aggression – emotional exhaustion (*r* = .16*)
			Sample 1 Physical symptoms	Spector & Jex (1998)	.86	Coworker psychological aggression – physical symptoms (*r* = .31**)
			Sample 2 Physical symptoms		.83	Coworker psychological aggression – physical symptoms (*r* = .29**)
Yang et al. (2016)	Cross-sectional	Paper-and-pencil survey	Anxiety	Caplan et al. (1980)	.81	Psychological aggression – anxiety (*r* = .17**)
			Irritation		.92	Psychological aggression – irritation (*r* = .27**)
			Depressive mood	Bohannon, Maljanian, & Goethe (2003)	.78	Psychological aggression – depressive mood (*r* = .18**)
			Physical symptoms	Spector & Jex (1998)	.83	Psychological aggression – physical symptoms (*r* = .26**)
Zhou et al. (2015)	Longitudinal	Paper-and-pencil survey	Anger	Caplan et al. (1980)	.88 / .91 (6 / 12 months)	Psychological aggression – anger 12 months after nurse's graduation, controlling for 6 months' strains (*β* = .17*)
			Musculoskeletal injury	Kuorinka et al. (1987)	-	Psychological aggression – musculoskeletal injury 12 months after nurse's graduation controlling for 6 months' strains (*β* = .29***)

OR: odds ratio; CI: confidence interval.
Items with the symbol (-) were not reported in the original study.
aItems developed by study authors.
bLevel of significance not reported.
*p<.05. **p<.01. ***p<.001.

Further studies show a positive relationship between workplace psychological aggression and irritation and depressive mood (Yang, Liu, Nauta, Caughlin, & Spector, 2016) and a negative association with overall health (Schat & Frone, 2011).

No significant associations were found between workplace psychological aggression and sadness, cynicism, needle stick injuries, allergies, tiredness, sleeplessness, and headache or the positive outcome of posttraumatic growth.

Workplace psychological aggression prevention strategies

Only 14 out of 30 studies examined means of preventing or buffering the consequences of workplace psychological aggression, and very few of them explicitly considered moderating variables (Table 3).

Of those 14 studies, just 5 examined moderating effects. One study (Zhou et al., 2015) focused on employees' political skills (i.e. ability to influence others' perceptions and behaviors). Political skills are a significant variable that could buffer the impact of workplace psychological aggression on anger, job satisfaction, career commitment, and injury. Three studies suggested that confidence to prevent and respond to workplace psychological aggression (Hanson et al., 2015), job resources (Viotti et al., 2015), and perceived organizational support (Li & Zhou, 2013) moderates the impact of customer psychological aggression on burnout. Support is also suggested by Schat and Kelloway (2003) as a significant moderating variable. Their results demonstrated that instrumental support moderates the effects of psychological aggression at work on emotional well-being, somatic health, and job-related affect. Informational support has moderating effects on emotional well-being.

Five studies identified a perceived violence-prevention climate (i.e. organizational policies, practices, and procedures to prevent physical and verbal aggression; Kessler et al., 2008) as a key variable with a significant correlation with the experience of direct and vicarious aggressive behaviors and strains. More specifically, a violence-prevention climate is significantly associated with psychological aggression, anger, anxiety, depression, physical symptoms, turnover intentions and emotional exhaustion (Chang et al., 2012; Kessler et al., 2008; Spector, Coulter, Stockwell, & Matz, 2007; Spector et al.,

2015; Yang & Caughlin, 2017), management satisfaction, job satisfaction, and perceived danger (Kessler et al., 2008; Spector et al., 2007; Yang & Caughlin, 2017). In this context,

Table 3. Correlations and moderators effects of individual and organizational variables related with positively strategies and resources to deal with psychological aggression.

Authors (year)	Individual and organizational variables	Findings
Chang et al. (2012)	Violence-Prevention Climate (policies and procedures; practices; pressure for unsafe practices)	Policies – verbal aggression (r = -.13*) Practices – verbal aggression (r = -.13*) Pressure – verbal aggression (r = -.23**)
	Prevention motivation	Prevention motivation – verbal aggression (r = -.13*)
	Prevention behaviors (compliance; participation)	Prevention compliance – verbal aggression (r = -.17*) Prevention participation – verbal aggression (r = -.16*)
	Employee morale (job satisfaction; commitment)	Job satisfaction – verbal aggression (r = -.24***) Affective commitment – verbal aggression (r = -.12**)
Chang & Lyons (2012)	Leader-member exchange Perceived organizational support	Leader-member exchange – verbal aggression (r = -.14**) Perceived organizational support – verbal aggression (r = -.16***)
Dormann & Zapf (2004)	Supervisor support	Supervisor support – customer verbal aggression (r = -.15***)
Grandey et al. (2004)	Autonomy	Autonomy – customer verbal aggression (r = -.22*)
Hanson et al. (2015)	Confidence to prevent and respond to violence and harassment	Confidence moderate significantly the impact of customer verbal aggression on burnout (B = -5.6*)
Kessler et al. (2008)	Violence Climate (policies and procedures; practices; pressure for unsafe practices)	Policies – verbal aggression (β = -.25**) Practices – verbal aggression (β = .04) Pressure – verbal aggression (β = -.19*)
Li & Zhou (2013)	Perceived organizational support (emotional)	Emotional perceived organizational support moderate significantly the impact of customer verbal aggression on emotional exhaustion (β = -.22**)
Schat & Frone (2011)	Job attitude (job satisfaction, affective commitment)	Job attitude – workplace psychological aggression (r = -.21***)
Schat & Kelloway (2003)	Organizational support (instrumental; informational)	Instrumental support moderate the impact of workplace psychological aggression on emotional well-being (β = .22***); somatic health (β = .17**) and job-related affect (β = .21***) Informational support moderate the impact of workplace psychological aggression on emotional well-being (β = .21*)
Spector et al. (2007)	Perceived Violence Climate (policies and procedures, management attitudes and support)	Violence climate – verbal aggression (r = -.28*)

(continued)

Table 3. *Continued*

Authors (year)	Individual and organizational variables	Findings
Spector et al. (2015)	Violence-Prevention Climate (policies and procedures; practices; and pressure for unsafe practices)	Violence-prevention climate six months after graduation significantly predict verbal abuse 12 months after graduation (β = -.27*), controlling prior verbal abuse exposure
Viotti et al. (2015)	Job resources (job content, social and organizational levels)	Meaning of the work and skill discretion moderated the impact of customer verbal aggression nurses experience on emotional exhaustion (β = -.11* / β = -.11*) and depersonalization (β = -.19*** / β = -.15**). Support from superior and fairness moderated the impact of customer verbal aggression nurses experience on emotional exhaustion (β = -.12** / β = -.11*). Role clarity moderate the impact of customer verbal aggression nurses experience on depersonalization (β = -.12*) Support from superior, support from colleagues, fairness and organizational support moderated the impact of customer verbal aggression auxiliary nurse's experience on emotional exhaustion and on depersonalization (β = -.19* / β = -.26** / β = -.33** / β = -.27**, respectively) Organizational social utility moderated the impact of customer verbal aggression auxiliary nurse's experience on depersonalization (β = -.28**)
Yang & Caughlin (2017)	Aggression-Preventive Supervisor Behavior (declarative, active and proactive leadership behavior) Violence-Prevention Climate (policies and procedures; practices and responses and pressure for unsafe practices) Aggression-prevention effort (motivation, compliance, participation)	*Sample 1* Aggression-Preventive Supervisor Behavior – coworker psychological aggression (r = -.16*) *Sample 1* Violence-Prevention Climate – coworker psychological aggression (r = -.34**) *Sample 2* Violence-Prevention Climate – coworker psychological aggression (r = -.28**) *Sample 2* Prevention motivation – coworker psychological aggression (r = -.16*)
Zhou et al. (2015)	Political skill (social astuteness, interpersonal influence, networking ability, apparent sincerity)	At 12 months after controlling for 6 months' strains interpersonal influence moderate the impact of workplace psychological aggression on anger (β = -.06*); job satisfaction (β = .12**); career commitment (β = .19**) and injury (β = -.02*)

(continued)

Table 3. *Continued*

Authors (year)	Individual and organizational variables	Findings
Zhou et al. (2015)	Political skill (social astuteness, interpersonal influence, networking ability, apparent sincerity)	At 12 months after controlling for 6 months' strains network ability moderate the impact of workplace psychological aggression on anger (β = -.04**); job satisfaction (β = .06**) and career commitment (β = .11***) At 12 months after controlling for 6 months' strains apparent sincerity moderate the impact of workplace psychological aggression on anger (β = -.10**); job satisfaction (β = .18**) and career commitment (β = .24**) and injury (β = -.04**)

*p< .05.; **p< .01.; ***p< .001.

aggression-preventive supervisor behaviour and aggression preventive employee effort have a significant correlation with psychological aggression and emotional exhaustion, anger, anxiety depression, turnover intentions, job management, and job satisfaction (Chang et al., 2012; Yang & Caughlin, 2017).

Two other studies also examined organizational support as an important resource to deal with psychological aggression. Support received from supervisors is negatively associated with customer psychological aggression, emotional exhaustion, and depersonalization and positively associated with personal accomplishment (Dormann & Zapf, 2004). A low-quality relationship between supervisor and subordinates (i.e., Leader–member exchange) and perceived organizational support are associated with psychological aggression (Chang & Lyons, 2012).

Chang and Lyons (2012) and Schat and Frone (2011) also suggested that organizations that implement strategies to promote job satisfaction and affective commitment will reduce psychological aggression and strains.

Autonomy is another organizational resource that is negatively associated with psychological aggression, emotional exhaustion, and stress appraisal resulting from customer aggression (Grandey et al., 2004).

Discussion

Workplace psychological aggression is a serious problem for employees and organizations and occurs frequently (ILO, 2013; Spector et al., 2014).

Based on current empirical data, we summarized the impact of workplace psychological aggression on employees' health. This review goes further by providing significant findings related to resources and strategies to prevent and buffer the negative effects of psychological aggression at work. We examined workplace psychological aggression as a specific construct (cf. Nielsen & Einarsen, 2018), not psychological aggression at work as broad concept that encompass constructs as bullying or incivility. From the target's perspective, we considered behaviors such as being yelled, shouted, or sworn at, which are perpetrated, directly or vicariously, by customers, supervisors, and coworkers toward employees.

Two decades have passed since the early investigations of Barling and colleagues (e.g., Barling, 1996), but critical limitations in the scientific research on workplace aggression persist, namely, the definition of the construct under investigation and the use and reporting of valid and reliable measures of exposure, making statistical comparisons and meta-analyses difficult. These methodological concerns are also found in other reviews (e.g., Spector et al., 2014).

It would be important, therefore, for future research on workplace aggression to define the form of aggression that is examined, identify the measure and the authors, clarify the behaviors nested, and, if the instrument has one item, report the item and specify other information such the source and time frame.

Workplace psychological aggression outcomes

According to the traditional model of work stress, workplace psychological aggression is a psychosocial stressor that affects employees through a psychological stress process, as opposed to a directly physical association (Barling, 1996; Ganster & Rosen, 2013; Schat & Kelloway, 2005). A widely used procedure to examine the consequences of workplace aggression is mediation analysis (e.g., Barling et al., 2001) which is extensively recommended in research (e.g., Hayes, 2017; Hayes & Rockwood, 2017; MacKinnon, 2011; Preacher, 2015).

Our systematic review only reported direct relationships between workplace psychological aggression and personal strains, not direct and indirect outcomes (mediating effects).

Our findings show that participants from a great variety of occupations, working in different settings, who have experienced psychological aggression also reported a multiplicity of negative outcomes.

Longitudinal associations show that employees experiencing psychological aggression have reported anger, depression, anxiety, and musculoskeletal injury during the study period (12 months). However, more prospective studies are required to examine how serious those outcomes became. In fact, Spector et al. (2015), when comparing strains over time for those exposed versus not exposed, found that those exposed to psychological aggression did not show an increase in strains.

Other results also demonstrated that overt psychological aggressive behaviors predict affective (fear) psychological (e.g., emotional exhaustion, depersonalization) and psychosomatic (physical symptoms) outcomes.

Our findings agree with Dudenhoffer and Dormann's (2015) meta-analytic results concerning the consequences of customer-related social stressors. The authors found that the associations between verbal aggression by customers and emotional exhaustion and depersonalization are mainly invariant across service jobs.

When the source of psychological aggression is considered, we do not know the differences in the impact of psychological aggression perpetrated by different sources on personal outcomes over time, and only three studies compared differences related with the experience of psychological aggression from different sources and outcomes. As provided by Spector et al. (2014), various sources accounted for workplace psychological aggression (e.g., nurses, 21.8%; physicians, 28.5%; staff, 39.2%). Depending on the source, workplace psychological aggression is associated with different outcomes and differences in the impact on those outcomes (see LeBlanc & Kelloway, 2002). Therefore, a deeper examination of the target and perpetrator relationship will enable us to refine our strategies to minimize the impact of workplace psychological aggression on personal and organizational outcomes (Hershcovis & Barling, 2007).

None of the studies included addressed the consequences of vicarious psychological aggression. This is not surprising since traditionally research has examined

the consequences of vicarious physical violence (Barling, 1996; Schat & Kelloway, 2005; see also Dupre´ et al., 2014). More research is needed taking this perspective into account to assist organizations in developing guidelines to prevent and minimize its effects (cf., for example, International Labor Office/International Council of Nurses/World Health Organization/Public Services International, 2002 or Occupational Safety and Health Administration, 2016 guidelines).

Of the studies included, few examined direct and indirect outcomes of workplace psychological aggression. Additionally, considering the reasons given by Hayes (2017), MacKinnon (2011), and Preacher (2015), we would encourage future research to include mediation variables in studies on workplace aggression outcomes.

Workplace psychological aggression: prevention and reduction of effects

The consequences of workplace psychological aggression are also influenced by individual responses and situational and individual factors that could prevent or minimize its effects (Barling, 1996; Schat & Kelloway, 2005). The second purpose of this review was to summarize empirically based evidence that can be relevant when designing preventive programs. Of the total of 30 studies, 14 studies provided the required information from different statistical approaches and supported by different theoretical models, for example, the conservation of resources theory (Li & Zhou, 2013).

There is little empirical research analyzing effective ways to moderate the relationship between workplace psychological aggression and outcomes. Nevertheless, the findings are promising, and relevant individual and organizational resources are advanced. More specifically, political skills, confidence to prevent workplace psychological aggression, job resources, and organizational support moderate the effect of workplace psychological aggression on outcomes. Individuals who develop interpersonal resources—interpersonal influence, networking ability, apparent sincerity—tend to experience lower levels of anger and injury after experiencing psychological aggression at work (Zhou et al., 2015). Strategies that increase employees' confidence to prevent and respond to aggressive psychological behaviors may help workers to deal with those negative acts and decrease the effect of psychological aggression on burnout (Hanson et al., 2015). The development of strategies that increase resources at the job content level (work meaning, skill discretion,

role clarity); at the social level (support from supervisors and colleagues); and at the organizational level (organizational support, fairness, social utility) have a significant impact on reducing emotional exhaustion and depersonalization (Viotti et al., 2015).

The role played by support from the organization, supervisor, and coworkers, at the individual and unit level, in preventing workplace psychological aggression and reducing its effects has been also demonstrated. Actions that indicate that organizations care about employees' well-being and value their contributions (emotional, instrumental, and informational support) have a significant moderated effect on the negative consequences of psychological aggression (Li & Zhou, 2013; Schat & Kelloway, 2003).

Other strategies and resources include violence-prevention climate, prevention behaviors, support, employee morale, and autonomy. Spector and colleagues focused on employees' perceptions of violence-prevention climate at the individual and at the unit level. Respectively, both policies (e.g., formal rules) and practices (e.g., management attitudes and support) encourage employees to focus attention on how their preventive behavior may influence the behavior of others (coworkers and patients). Organizations that promote a good violence-prevention climate enhance employees' knowledge and help them to recognize precursors of violent and aggressive behaviors and take actions to avoid them. In addition, interventions aiming to promote a good perceived violence-prevention climate are associated with a decrease in individual (anger, anxiety) and organizational (turnover intentions) strains. Supervisors' daily procedures and practices and employee prevention motivation and behaviors are also crucial for successful prevention and reduction of the effects of workplace psychological aggression. Aggression-preventive supervisor behavior (helping–serving, monitoring–controlling, instructing–guiding); motivation (e.g., being motivated to try to stop violent incidents at work); compliance (e.g., following the correct violence prevention procedures); and participation (e.g., offers to help others by teaching them necessary knowledge or skills related to violence and aggression prevention) are significantly associated with a reduction of psychological aggression and outcomes (Chang et al., 2012; Yang & Caughlin, 2017).

Dormann and Zapf (2004) and Chang and Lyons (2012) also found evidence of the direct effect of social support on workplace psychological aggression and outcomes. The development of interventions related with different types of support provided by organizations and with promoting high-quality relationships between subordinates and

their supervisors should be considered when designing programs to prevent and minimize the effects of workplace psychological aggression.

High levels of management satisfaction, job satisfaction, affective commitment, and autonomy are also suggested as positive organizational resources related with health promotion and prevention of workplace psychological aggression (Chang & Lyons, 2012; Grandey et al., 2004; Schat & Frone, 2011).

Limitations

Several limitations are considered. Our first limitation is due with critical appraisal of the evidence of the included studies that was not rated. With few exceptions (e.g., Nielsen, Indregard, & Øverland, 2016), this lack of information is usual in reviews (e.g., Tepper et al., 2017) or meta-analytical reviews (Spector et al., 2014) in the scientific research related with aggressive behaviors at work. The review team adapted a checklist (Checklist for Analytical Cross-Sectional Studies) from The Joanna Briggs Institute to ensure some consistency during the process of analyzing the studies (Moola et al., 2017). However, this tool, as well as assessing the quality of evidence, made it possible to make an overall evaluation of each study, based on certain criteria (e.g., existence or not of well-defined inclusion criteria, the existence or not of a description of the participants), ensuring their inclusion in this review.

Second, a lack of conceptual explanation and the heterogeneity of measuring instruments make it difficult to identify the content of psychological aggression measures, which may lead to bias regarding the content measured (see, for example, Bowling et al., 2015).

Third, although some studies tested direct and indirect predictive effects, those pathways were not analyzed due to the characteristics and length limitation of this systematic review, meaning that important patterns may not have been discussed. For example, in Schat and Kelloway's (2003) study, the moderating effect of organizational support was stronger on secondary (e.g., emotional well-being) than on primary (fear) outcomes.

An additional limitation is that our findings are mainly from cross-sectional self-report studies, leaving uncertain the direction of causality in the predictions. This is a

limitation commonly pointed out in research on aggression at work (see Nielsen et al., 2017; Tepper, 2007). However, research on the predictors of workplace aggression link, for example, negative affect (sadness, anxiety) and trait anger to aggressive behaviors at work (Barling et al., 2009; see also Barling, 1996; Douglas & Martinko, 2001).

Conclusion

A systematic review on workplace psychological aggression was conducted, and PRISMA guidelines (Moher et al., 2009) were followed to report the data in the manuscript. Focusing on empirical studies, our aim was to identify personal outcomes and ways to reduce and minimize its impact on employee well-being. The challenges faced when investigating workplace aggression are to clearly define our construct, use valid and reliable measures, and explore strains and moderators with valid and reliable instruments within a statistical analysis framework that provides us with better knowledge and understanding of this phenomenon. These issues should be interpreted with some reservations, bearing in mind, for example, the scientific discussion in this field related with formative and reflective measures (e.g., Dionisi et al., 2012; MacKenzie, Podsakoff, & Podsakoff, 2011; Tepper & Henle, 2011) or single-item measures (e.g., Gilbert & Kelloway, 2014). Regarding the severe outcomes of workplace psychological aggression, negative associations were found with personal outcomes across samples.

Little is known about how and when the variability of its effects occurs at the supervisory, coworker, and customer level, and more longitudinal associations are needed to conclude about causality.

Programs to prevent workplace psychological aggression should develop strategies related, for example, with aggression-preventive supervisor and employee behavior, political skills, job resources, or organizational support. This is in line with the APA's (2014) recommendations "that preventive programs be selected based on a careful review of empirical evidence in order to choose programs that are empirically supported for their specific contexts and specified goals" (p. 287).

Practical implications

The findings of this systematic review emphasized workplace psychological aggression as a severe problem for individuals showing that those who experience psychological aggression at work also experience significant negative physical and psychological outcomes.

Importantly, this review also has implications for organizations by providing evidence that there are ways to moderate the impact of psychological aggression on personal outcomes and organizational strains. For example, (i) enhance organizational support through programs to assist those that experience psychological aggression, improve leadership skills, and provide stress management training, (ii) the development of programs aimed to create a positive violence-prevention climate through training, having practices that respond quickly to aggression and provide relevant information on workplace psychological aggression, or (iii) develop political skills through mentoring relationships (e.g., Chang & Lyons, 2012; Chang et al., 2012; Schat & Frone, 2011; Zhou et al., 2015).

In doing so, organizations will promote individuals' well-being, life satisfaction, and career commitment. As a result, workers will be more able to interact with other members of the public, relatives, coworkers, supervisors and influence their behaviors positively (Spector et al., 2007). Based on existent evidence, this systematic review indicated several directions for future interventions, programs, and guidelines.

If our findings are relevant for occupational services, preventive interventions, and health promotion at work, they are also relevant for the general area of occupational psychology and professional psychology practices (psychotherapy, assessments, and psychological interventions). Following APA (2016) recommendations for practice, clinical interventions related to work and career should be implemented to promote employees' health and quality of life. In fact, work plays a critical role in terms of time engagement and psychological meaning, is associated with satisfaction in other domains of life, and may have a protective function for adverse life events.

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STUDY 2

Portuguese Version of the 12-Item Violence Prevention Climate Scale: Test of Psychometric Properties

Publication

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Abstract

Background and Purpose: A violence prevention climate is critical for nurses' well-being but also for nursing practice and the quality of care. This study examined the reliability and factor validity of the European Portuguese version of the 12-item Violence Prevention Climate Scale (VPCS).

Methods: Data came from a sample of 120 nurses providing care in Portugal. Confirmatory factor analysis was used to test the structural theory of the scale.

Results: First and second-order confirmatory factor analysis models showed identical goodness-of-fit suggesting the adequacy of the models to the sample data. Our results also provide evidence of composite reliability, and convergent and discriminant validity.

Conclusions: Consistent with previous studies, data from this study showed that the Portuguese version of the 12-item VPCS is a reliable and valid scale to evaluate nurses' perceptions of violence prevention climate.

Keywords: nonphysical violence, nursing organizational climate, physical violence, validation research, violence prevention, workplace

Violence in health sector occupations is a serious problem. In fact, the rate of violence towards nurses is high throughout the world. The quantitative review by Spector et al. (2014) shows that 36.4% of nurses reported physical violence, 66.9% nonphysical violence, 39.7% experienced bullying, and 25% sexual harassment. In this context, violence prevention at work remains a challenge for organizations (International Labour Organization, 2019). The 12-item Violence Prevention Climate Scale (VPCS) (Kessler et al., 2008) is a widely used measure in the context of violence prevention at work in nursing.

The aim of this study is to assess the reliability and structural validity of the factor model of the European Portuguese version of the shorter form of the VPCS using confirmatory factor analysis (CFA). We explored two models: (a) a first-order model representing three intercorrelated subscales and (b) a higher order model with a second-order factor representing the total score and the three first-order factors.

The link between the experience of violence at work and negative effects at the individual, organizational, and societal level, including patient safety, quality of care, and nurses' career commitment, has been recognized by several organizations (e.g., International Council of Nurses, 2017; International Labour Office/International Council of Nurses/World Health Organization/Public Services International, 2002; Occupational Safety and Health Administration, 2016). Research has also provided much evidence of the impact of experiencing various forms of aggressive behaviors at work. For example, bullying and incivility are positively associated with depression, lack of commitment, turnover intentions, and lower job satisfaction (Cortina et al., 2017; Nielsen & Einarsen, 2018). Psychological aggression is positively associated with fear, anger, anxiety, depression, emotional exhaustion, depersonalization, physical symptoms, irritation, and musculoskeletal injury (Pacheco et al., 2021). Abusive supervision also has an impact on fear, anger, anxiety, depression, emotional exhaustion, and on commitment, turnover intentions, and job satisfaction (Tepper et al., 2017).

Furthermore, research has examined potential moderators that can minimize those effects, such as a safety climate, perceived organizational support (Cortina et al., 2017; Nielsen & Einarsen, 2018; Pacheco et al., 2021), or coping strategies (e.g., Tepper et al., 2017).

In this context, we focused on violence prevention climate (VPC). Taken from the accident/injury literature, Spector et al. (2007) adapted the concept of safety climate to violence at work and developed the violence climate construct. A VPC reflects employees' perceptions of whether managers lay emphasis on the control and elimination of physical and verbal violence. Based on Spector et al. (2007), Kessler et al. (2008) developed the Violence Climate Survey, currently called VPCS.

Exploratory factor analysis of the measure provided evidence that violence climate is a multidimensional construct comprised of three factors: Practices and Response, Policies and Procedures, and Pressure for Unsafe Practices. Practices and Response assess employees' perceptions about practices that exist in the organization to enforce policies that have been previously defined to prevent violence. Policies and Procedures measure employees' perceptions about formal rules, regulations, and information provided by the organization about violence prevention. Pressure for Unsafe Practices evaluates the pressure perceived by employees' to ignore violence prevention policies in order to perform other work demands.

Kessler et al. (2008) also found that VPC dimensions are relevant predictors of physical and verbal aggression as well as various strains (anger, anxiety, depression, satisfaction, physical symptoms). That is, when employees perceived that managers provided policies and practices to prevent violence and not followed by any pressure that compromises those safety practices, these had a positive effect on violence exposure and strains. Since then, VPCS has been extensively used in the original (18 items) or short version (12 items) in a great variety of occupations and organizations and across different cultural groups to examine perceptions of a VPC at the individual and unit level (organizational climate).

The three-factor structure and the good internal reliability of the VPCS have also been empirically confirmed in many studies as well as the correlations between VPC and other outcomes, which confirm the construction validity of the measure. For example, the longitudinal studies by Yang et al. (2012) and Spector et al. (2015) showed that VPC was positively related to temporal changes in nurses' exposure to violence with benefits for their health. Chang et al. (2012) found that the relationship between VPC and previous exposure to violence and prevention behaviors (e.g., participation) is mediated by anger, anxiety, depression, and violence prevention motivation. Yang and Caughlin (2017)

suggest that VPC mediates the relationship between supervisors' behaviors to prevent aggression and nurses' exposure to aggression, job attitudes, and physical symptoms. Chang et al. (2018) reported that VPC moderated the effect of violence on nurses' turnover intention through work frustration. These studies, which have used the VPCS, suggest the theoretical and practical relevance of a VPC for research on violence at work, organizations and nursing practice and encourage us to proceed with our main goal, that is, to assess the psychometric properties of VPCS in the Portuguese context.

Methods

Sample and procedure

The sample of 120 nurses working in Portugal was obtained from a major quantitative cross-sectional self-report examining workplace violence in the nursing context. A random sampling computer technique was used to select participants. The communalities of the measured variables were high (an average of .705) and all measured variables load on each factor. These data characteristics suggest that the sample is adequate and good estimates can be obtained (Fabrigar & Wegener, 2012).

This study was approved by the Council of Ethics and Deontology of the University of Aveiro (32-CED/2018, 06/06/2018). Participants completed an online survey that was available between November 23, 2018 and February 17, 2019. An e-mail message describing the study and providing the link to the questionnaire was sent to all nurses registered in that period with the Ordem dos Enfermeiros [Portuguese Order of Nurses]. Informed consent was included in the online questionnaire and was a mandatory condition to participate. All items had to be answered.

Participants

All participants were currently employed as nurses (87.5% female). Average age was 39.01 years (standard deviation [SD] = 8.88) and all of them had a university degree. They worked in different settings (65% Hospital, 19.2% Primary Care, and 15.8% other

health care settings) and 63.3% worked shifts. Thirty-five point eight percent had held their present job for more than 20 years.

Measure

The VPCS developed by Kessler et al. (2008) assesses participants' perceptions of how organizational management provides a climate conducive to preventing physical and verbal violent events. The original version of this multidimensional scale consists of 18 items, focused on (a) Practices and Responses of management to respond to physical and verbal violent events (e.g., *Management in this organization quickly responds to episodes of violence*. [Subscale 1]), (b) Policies and Procedures related to violence prevention (e.g., *My employer provides adequate assault/violence prevention training*. [Subscale 2]), and (c) Pressure for Unsafe Practices that compromise violence prevention (e.g., *In my unit in order to get the work done, one must ignore some violence prevention policies*. [Subscale 3]).

In this study, we used the abbreviated VPCS used in Yang et al. (2012), with the 12 items organized as follows: 1–4 (Practices and Responses), 5–8 (Policies and Procedures), and 9–12 (Pressure for Unsafe Practices). Participants indicated their level of agreement on a 6-point Likert scale (1 = *disagree very much*, 6 = *agree very much*). High scores in each subscale indicate a positive VPC. Previous studies have shown a good internal consistency of this short-version with alpha coefficients ranging from .87 (Gazica & Spector, 2016) to .91 (Yang & Caughlin, 2017) for the full scale.

To achieve the final version of the 12-item Portuguese VPCS (PT VPCS-12; Table 1), we considered the online guidelines of the World Health Organization (2019) for translation and adaptation of instruments. This process included forward translation, back-translation and pretesting, and involved two bilingual PhD students, a bilingual expert, a monolingual expert in health, and six employees of an organization.

Statistical data analysis

For statistical data analysis, we used SPSS Version 25.0 (IBM Corp, 2017) and Amos 25 (Arbuckle, 2017). The VPCS is a fully developed measure and its psychometric

properties have been tested empirically (e.g., Kessler et al., 2008; Spector et al., 2015). Considering this, factor validity of the Portuguese version was tested with CFA (Byrne, 2016). Psychometric reliability was analyzed with alpha and composite reliability coefficients (≥.70). Guided by Byrne (2016) and Marôco (2014), Amos' cut-off point for the modification indices was fixed at 11 ($p < .001$).

The model fit was assessed by the chi-squared (nonsignificant chi-square) and the following fit indices and respective cut-off criterion suggested by Hu and Bentler (1999) for a relatively good fit between the hypothesized and the observed model: cut-off point close to .08 or below for Standardized Root Mean Square Residual (SRMR); cut-off point close to .06 or below for Root Mean Square Error of Approximation (RMSEA) and the Comparative Fit Index (CFI) with a value close to .95 or greater. The comparison between models was based on the Expected Cross-Validation Index (ECVI) (Byrne, 2016).

The assessment of normality was analyzed through Skewness (*Sk*, < 3.0) and Kurtosis (*Ku*, ≤ 7.0) coefficients and the assessment of multivariate outliers was provided by analysis of the squared Mahalanobis distance (d^2) (Byrne, 2016).

Convergent validity was assessed by computing the average variance extracted (AVE; ≥ .50). Discriminant validation was also determined by the evidence that AVE values are equal to or greater than the squared correlation between the factors (Fornell & Larcker, 1981; Marôco, 2014).

Results

No missing data were produced. Estimates of reliability indicated good internal consistency per subscale with Cronbach's alpha values and composite reliability coefficients ranging from .76 (Pressure) to .89 (Policies). The alpha coefficient for the global score was .87 (see Table 2).

For factorial validity, we examined a first-order CFA model comprising three factors: Practices, Policies, and Pressure. The information about this model (Model 1) is presented in Figure 1 and Table 3. First, an overview of the model fit provided by the chi-square statistic ($\chi 2$ (51, n = 120) = 105.89, $p < .001$) showed an unsatisfactory fit for Model 1. Further information from the CFA results was analyzed: (a) the assessment of normality showed variables with absolute Skewness values below 3.0 (values range from

.027 to 1.537) and Kurtosis below 7.0 (values range from .297 to 1.427). From observation of the squared Mahalanobis distance (d^2), one outlying case was detected, suggesting minimal evidence of multivariate outliers in the data. This case was retained due to its irrelevant influence on the analysis. (b) All nonstandardized parameter estimates show strong statistical significance (i.e., estimates divided by standard error were higher than 1.96 and *p* values less than .001) (Byrne, 2016). An examination of the standardized regression weights (see Figure 1) suggested that all indicators load on the common factor with factor loadings ranging from .56 (VPCS12) to .90 (VPCS3) and error variance estimates ranged from .31(VPCS 12) to .80 (VPCS 3). We also found moderate positive correlations between factors (ranging from .33 to .58). (c) However, we observed one parameter with an MI value greater than 11 (covariance between VPCS1 and VPCS4) and one standardized residual that shows values greater than 2.58 (Byrne, 2016) in the covariance between VPCS12 ("In my unit, violence prevention policies and procedures are ignored.") and VPCS5 (My employer provides adequate assault/violence prevention training). (d) Also, an examination of other fit statistics of Model 1 showed that RMSEA has a value higher than .08., SRMR presented a value of .08, and the CFI a value of .92 (Table 3).

Convergent and discriminant validity were also computed (Table 2). Values of AVE were .63, .68, and .46 for Practices, Policies, and Pressure, respectively. For discriminant validation, the values ranged from .33 and .10, suggesting discriminant validation between factors.

Table 1. The original and the Portuguese version of the 12-item VPCS.

	12-Item VPCS (Kessler et al., 2008)						**PT VPCS-12**					
	Disagree very much	*Disagree moderately*	*Disagree slightly*	*Agree slightly*	*Agree moderately*	*Agree very much*	*Discordo muito*	*Discordo moderadamente*	*Discordo pouco*	*Concordo pouco*	*Concordo moderadamente*	*Concordo muito*
	To what extent do you agree or disagree with each of the following statements?						Em que medida concorda ou discorda com as seguintes afirmações?					
Items												
1	Management in this organization quickly responds to episodes of violence.						Nesta organização, a administração responde de forma rápida a episódios de violência (física ou não física).					
2	Management encourages employees to report physical violence.						A administração encoraja os trabalhadores a reportar violência física.					
3	Management encourages employees to report verbal violence.						A administração encoraja os trabalhadores a reportar violência verbal.					
4	Reports of workplace violence from other employees are taken seriously by management.						Os reportes de violência de outros colegas são levados a sério pela administração.					
5	My employer provides adequate assault/violence prevention training.						O meu empregador providencia formação adequada em prevenção da violência.					
6	In my unit, violence prevention procedures are detailed.						Na minha unidade (serviço), os procedimentos relativos à prevenção da violência são pormenorizados.					
7	In my unit, there is training on violence prevention policies and procedures.						Na minha unidade (serviço), há formação sobre políticas e procedimentos de prevenção de violência.					
8	In my unit, employees are informed about potential violence hazards.						Na minha unidade (serviço), os trabalhadores são informados sobre os potenciais fatores de risco associados à violência.					
9[a]	In my unit in order to get the work done, one must ignore some violence prevention policies.						Na minha unidade (serviço) por forma a levarmos a cabo a realização das tarefas, temos que ignorar algumas políticas de prevenção da violência.					
10[a]	In my unit, whenever pressure builds up, the preference is to do the job as fast as possible, even if that means compromising violence prevention.						Na minha unidade (serviço), sempre que a pressão aumenta, a preferência é fazer o trabalho o mais depressa possível, mesmo que isso signifique comprometer a prevenção da violência.					
11[a]	In my unit, human resource shortage undermines violence prevention standards..						Na minha unidade (serviço), a escassez de recursos humanos condiciona os parâmetros de prevenção da violência.					
12[a]	In my unit, violence prevention policies and procedures are ignored.						Na minha unidade (serviço), as políticas e procedimentos de prevenção da violência são ignorados.					

Note. VPCS = Violence Prevention Climate Scale.

[a]Reverse score.

Table 2. Construct reliability, convergent and discriminant validity of the Portuguese version of the 12-item VPCS.

Factors	Cronbach's Alfa (α)	CR	AVE	Discriminant validity
VPCS – global score	.87			
Subscales				
Practices	.87	.87	.63	.33; .18
Policies	.89	.89	.68	.33; .10
Pressure	.76	.77	.46	.18; .10

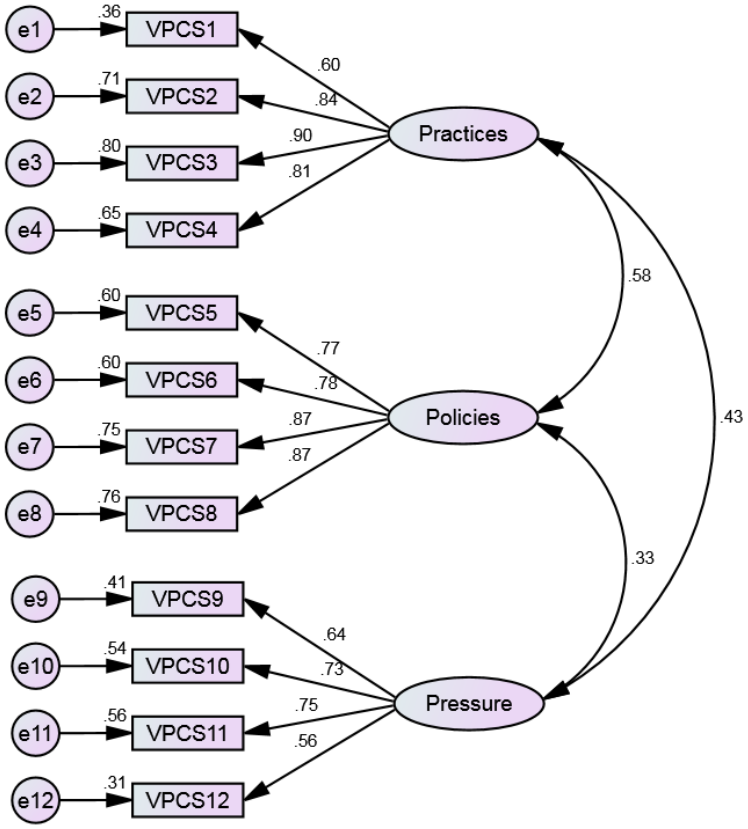

Figure 1. Standardized parameter estimates of the three-factor, first-order confirmatory factor analysis model of the Portuguese version of the 12-item violence prevention climate scale (VPCS); e = measurement error (Model 1).

Table 3. Goodness-of-fit statistics for first and second-order CFA models of the Portuguese version of the 12-item VPCS.

Model	$\chi 2$	*df*	CFI	RMSEA	RMSEA 90% CI	SRMR	ECVI	ECVI 90% CI
First-order CFA model								
Model 1	105.89*	51	.92	.09	.07, .12	.08	1.34	1.12, 1.62
Model 2 with 1 error covariance specified (Items 1 & 4)	92.63*	50	.94	.08	.06, .11	.08	1.24	1.05, 1.51
Second-order CFA model								
Model 3 with 1 error covariance specified (Items 1 & 4)	92.63*	50	.94	.08	.06, .11	.08	1.24	1.05, 1.51

Note. CFA = Confirmatory Factor Analysis; CFI = comparative fit index; ECVI = expected cross-validation index; RMSEA = root mean square error of approximation; SRMR = standardized root mean square residual; 90% CI = with 90% confidence interval; VPCS = Violence Prevention Climate Scale.
*p < .001.

Re-specification and re-estimation of the model

Because we found evidence of model misspecification, a subsequent analysis was made considering the information derived from modification indices. As we found an MI of 11.619 and a parameter change statistic (PCS) of .496 related to error covariance of VPCS1 and VPCS4, a covariance between e1 and e4 was added. This modification was justified conceptually as this error covariance can reflect overlapping content. More specifically, both items are designed to measure organizational policies to prevent violence at work, namely, the extent to which management responds quickly to episodes of violence (VPCS1) and the extent to which reports of violence are taken seriously by management (VPCS4) [see Table 1].

A new factorial structure—Model 2 (Figure 2)—was estimated and better fit indices were found for CFI = .94. Point estimates of RMSEA (.08 with 90% confidence interval .06, .11) and SRMR (.08) are close to the acceptable criteria. Compared to Model 1, the information given by the ECVI allows us to conclude that Model 2 should be the best solution for replication, that is, the model has an acceptable fit and represents a reasonable approximation to the population (Table 3).

Second-order PT VPCS-12 factorial structure

Based on previous factor analysis (Spector et al., 2015; Yang & Caughlin, 2017), we examine the validation of the second-order PT VPCS-12 factorial structure, that is, whether a higher order general factor (VPC) could account for all variance and covariance related to the first-order factors.

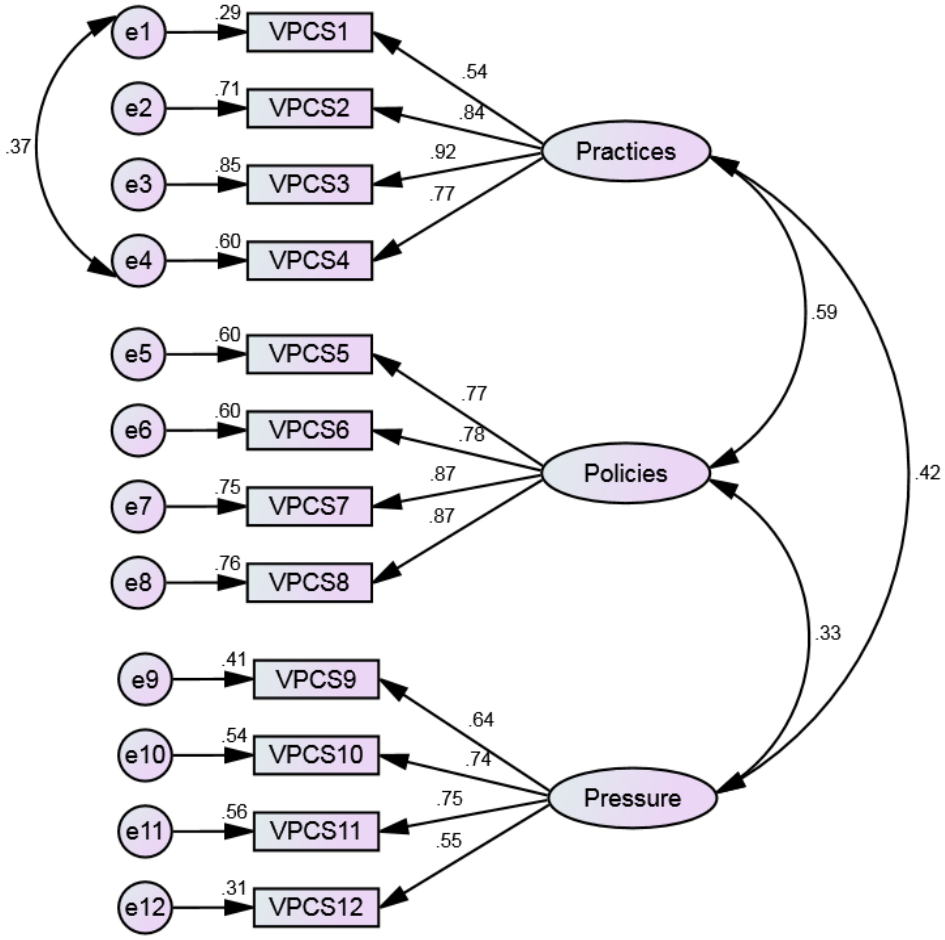

Figure 2. Standardized parameter estimates of the re-specified three-factor, first-order confirmatory factor analysis model of the Portuguese version of the 12-item violence prevention climate scale (VPCS); e = measurement error (Model 2).

The path diagram of this structure (Model 3) is presented in Figure 3. As illustrated, second-order factor loadings ranged from .49 to .86. Comparing the goodness-of-fit statistics reported in Table 3, we can see that both the first and second-order CFA models showed identical values.

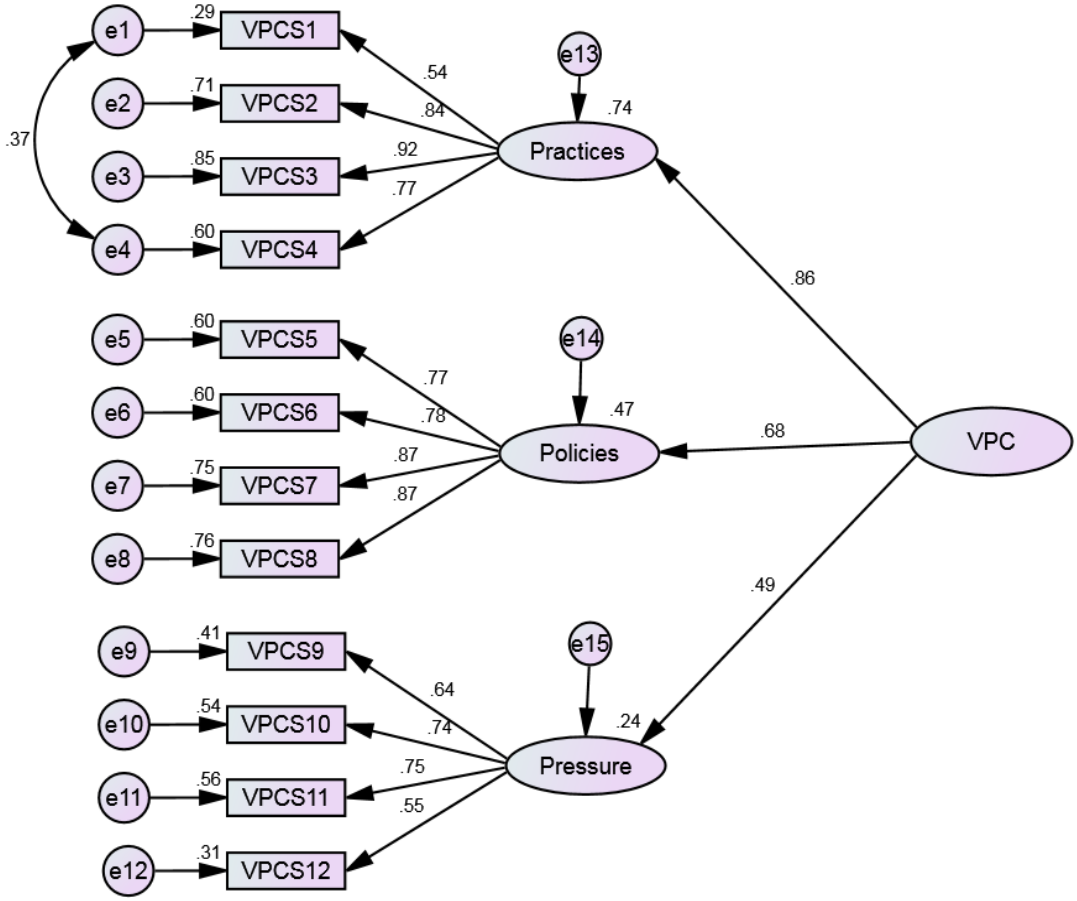

Figure 3. Standardized parameter estimates of the second-order confirmatory factor analysis model of the Portuguese version of the 12-item violence prevention climate scale (VPCS); e = error (e1–e12 measurement error; e13–e15 residual error); VPC = violence prevention climate (Model 3).

Discussion

The advantages of carrying out research about important variables in different cultures are well known (e.g., theory development, better conceptualization of variables). Frequently, this process involves the translation of instruments from one language to another (Brislin, 1970; Triandis & Brislin, 1983). This study assesses the psychometric properties of the Portuguese version of the 12-item VPCS, specifically their validity.

Originally developed and normed with samples of American employees, the VPCS has been used in a variety of organizations (e.g., healthcare, Spector et al., 2015; service/sales, clerical, banking, Kessler et al., 2008; retail industry, Gazica & Spector, 2016) and across Chinese and Turkish cultural groups (Aytac & Dursun, 2011; Chang et

al., 2018, respectively). The psychometric properties of the VPCS have been tested over the years, mainly based on exploratory procedures (e.g., Aytac & Dursun, 2011; Chang et al., 2018; Kessler et al., 2008). The VPCS has kept its three-factor structure across studies, including translated versions used by Chang et al. (2018) and Aytac and Dursun (2011).

In this research, confirmatory factor analysis was conducted to test a three-factor solution using the maximum likelihood method. As noted previously, PT VPCS-12 structure was hypothesized considering the three factors established a priori in research (see Yang et al., 2012). The next step was to determine if the hypothesized model was consistent with data collected from 120 nurses providing care in Portugal. To do so, two CFA aspects were evaluated: goodness-of-fit of the model as a whole and goodness-of-fit of individual parameter estimates.

The global assessment of fit was determined by examining the overall $\chi 2$ value and CFI, RMSEA, and SRMR fit index values. All goodness-of-fit values are slightly less or greater than the cut-off criterion previously presented for a good model. However, as noted by the literature, the likelihood ratio $\chi 2$ statistic and those fit indices are highly sensitive to sample size (e.g., Byrne, 2016; Hu & Bentler, 1999). Regarding the individual parameter of the model, we found that all parameter estimates were statistically significant; the variances were all positive and the correlations below 1.00, suggesting the appropriateness of the estimates.

Our findings also show that the PT VPCS-12 structure can be represented as a first or second-order model. The same solutions were validated for American nurses by Yang and Caughlin (2017; $\chi 2$ (df = 18, n = 237) = 55.29, CFI = .97, RMSEA = .10, SRMR = .05 values for both first and second-order models).

The PT VPCS-12 shows itself to be a reliable measure. Our findings are aligned with those of other studies revealing alpha coefficients per subscale ranging from .71 (Yang et al., 2012; VPCS 12-item) to .95 (Kessler et al., 2008; VPCS 18-item) and for the global score, alpha coefficients from .87 (Gazica & Spector, 2016) to .91 (Yang & Caughlin, 2017). Convergent and discriminant validity were also found in our study, suggesting evidence of construct validity.

To summarize, this article aimed to test the factorial validity of the VPCS for Portuguese nurses. To this end, we evaluated first and second-order CFA structures. This process involved a series of analytical steps, which, taken together, indicate that both

structures are acceptable solutions to represent the sample data. Nevertheless, we suggest that future studies should replicate the findings with another independent sample, analyzing the two statistical issues of the measurement model identified above (Byrne, 2016; Goodboy & Kline, 2017).

Managers should respond suitably to episodes of violence, as employees' perception of the organizational climate of violence prevention is an important step that can help managers to identify the main dimensions and paths related to violence prevention. The use of both models (first and second-order CFA structures) is indicated to assess Portuguese perceptions of a VPC. This study also highlights the importance of examining the validity of the VPCS as an ongoing process and new perspectives to improve the model are suggested.

Relevance to nursing practice

Two potential contributions of this study can be emphasized. First, the PT VPCS-12 is an instrument that can provide empirical understanding about nurses' perceptions of the organizational policies and practices to prevent violence. It is therefore a useful scale that can help management to define priorities and design strategies to build a positive organizational climate. Organizations that provide a VPC also increase patient safety, quality of care, and commitment to a career in nursing. Second, use of the PT VPCS-12 can contribute to a set of reliable and validated data with important implications for cross-cultural research on workplace violence in the nursing context.

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STUDY 3

The role of fear in the relationship between vicarious violence at work and work ability in nurses: a cross-sectional study

Publication

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Abstract

Fear is a powerful emotion that can influence future behavior. This study investigates how fear influences the relationship between vicarious violence at work and employees' work ability. This is a quantitative cross-sectional study. Self-report data were collected from 154 Portuguese nurses who completed an online survey. Statistical significance of the indirect effect was based on bias-corrected bootstrap confidence intervals. The results support the mediation model. Those who observe/hear of others being beaten or threatened experience strong affective reactions, such as fear, which in turn has a negative impact on the assessment of their work ability. We suggest that occupational safety and health programs designed to prevent violence at work take into account those who experience violence at work vicariously and include strategies and interventions focused on affective reactions to minimize the negative effects of vicarious violence at work, with benefits in employees' improved ability to work.

Keywords: cross-sectional study, fear, mediation model, vicarious violence, work, work ability

Key points:

Fear of future violence at work mediates the relationship between vicarious violence at work and work ability.

Vicarious violence at work in nursing is positively associated with fear of future violence at work.

Fear of future violence at work has a negative significant impact on nurses' ability to work.

Introduction

Violence at work and work ability are two important issues due to their impact on individuals, organizations, and society as a whole. The International Labour Organization (ILO; 2019) Convention (No. 190) and Recommendation (No. 206) urge leaders to take action to eliminate violence and harassment in the world of work.

Under the heading of workplace violence, we find various definitions or conceptualizations related to different forms of unacceptable behaviors that occur at work. The ILO (2019) uses a broader concept, termed *violence and harassment*, and refers to "a range of unacceptable behaviors and practices, or threats thereof, whether a single occurrence or repeated, that aim at, result in, or are likely to result in physical, psychological, sexual or economic harm, and includes gender-based violence and harassment".

Violence at work experienced by nurses is a global and complex phenomenon. There is a shared concern in both international nursing organizations (e.g., International Council of Nurses, 2017) and research that nurses worldwide are exposed to a high occurrence of violence at work throughout their career (e.g., Campbell et al., 2011; Gillespie et al., 2010; Pariona-Cabrera et al., 2020; Spector et al., 2014). Li et al. (2020) investigated the prevalence of workplace physical violence among healthcare workers, including nurses. They found that, worldwide, nurses experienced annually more physical violence from patients or visitors than physicians (22.9% and 14.6%, respectively).

The growth of work ability research has arisen in response to the challenges related to the current trends of an ageing workforce, namely, an increasing number of older workers, absenteeism, early retirement and work disability (Brady et al., 2019; Ilmarinen, 2019; Tuomi et al., 2001), issues that also affect nurses. In American and European regions the proportion of nurses nearing retirement and nursing shortages are high (World Health Organization [WHO], 2020).

The work ability concept proposes a balance between human resources (e.g., health and functional capacities) and work (e.g., work environment) to develop and maintain the functional ability that enables well-being in older age with positive effects on a healthy extension of individuals' careers. Good work ability predicts well-being, high quality and

productivity of work, and enjoyment of staying in the job (Ilmarinen, 2019; Tuomi et al., 2001; World Health Organization [WHO], 2017).

Violence at work could compromise employees' work ability. However, there is little available evidence of the impact of workplace violence on work ability and the process through which this relationship happens (e.g., Fischer et al., 2006; Nikolic &Višnji´, 2020).

In the present study, we assess one dimension of violence at work, the experience of vicarious violence among nurses. We propose that fear of future violence at work will mediate the effect of vicarious violence at work on nurses' work ability. In so doing, we provide more detail in understanding how vicarious violence at work affects nurses' work ability.

Background

In an attempt to advance research on workplace violence, Barling (1996) proposed a framework to investigate its predictors, experience and consequences. Barling (1996) suggested an integrative approach examining the interaction between personal and organizational variables in the prediction of workplace violence, investigating direct and indirect outcomes, and moderator variables that can eliminate, reduce or minimize the impact on individuals and organizations. Drawing on the work stress literature (Pratt & Barling, 1988), the central idea of the model emphasizes individual perceptions of objective events that occur in the workplace. The subjective experience of workplace violence reflects psychological stress, which, in turn, leads to strains (outcomes). Stress and strains are dependent on prior stressors (workplace violence).

Another important feature of the approach by Barling (1996) is that both direct and vicarious violence should be studied. That is, research on workplace violence should examine individuals who themselves have experienced workplace violence and those that have been vicariously exposed to it, that is, those who have witnessed or heard about violent acts perpetrated toward similar others and the impact of this experience on personal and organizational outcomes (Barling, 1996; Rogers & Kelloway, 1997; Schat & Kelloway, 2005).

Vicarious violence

As defined by Bandura (1965), a vicarious learning event is "one in which new responses are acquired or the characteristics of existing response repertoires are modified as a function of observing the behavior of others and its reinforcing consequences without the modeled responses being overtly performed by the viewer during the exposure period." Individuals do not need to be engaged in the event to be affected.

Studies concerning the role of different forms of vicarious aggressive experiences at work provided coherent theoretical and empirical support for this. For example, Schat and Kelloway (2000, 2003) and Dupré et al. (2014) investigated the effects of vicarious violence at work. Dionisi and Barling (2018) examined the impact associated with witnessing the sexual harassment of a male colleague, while Miner and Cortina (2016) examined the effects of observed incivility on women in the workplace.

Specifically in the context of healthcare settings and nursing in particular, studies examining vicarious violence are scarce. Da Silva et al. (2015) showed that witnessed violence among primary health care teams predicts depression. Direct and witnessed violence at work has an impact on turnover intentions among nurses (Chang et al., 2018) and healthcare workers, including nurses (Akbolat et al., 2019).

In this study, vicarious violence at work refers to a pattern of behaviors experienced by observing or hearing about violent events or threats experienced by co-workers, supervisors, friends, or relatives (Rogers & Kelloway, 1997). The confirmatory factor analysis of Schat and Kelloway (2003) showed that vicarious behaviors, although correlated with physical (e.g., being hit, kicked, threatened with a weapon) and psychological (e.g., being yelled at or sworn at) violent behaviors at work, are distinct, and vicarious violence is a unique dimension. Excluded from our scope is vicarious trauma (see Molnar et al., 2017).

Fear

According to the Affective Events Theory (AET; Weiss & Cropanzano, 1996) of affective experiences at work, work events (i.e., something that occurs in a certain place during a particular period) are proximal causes of affective reactions that have a direct

influence on work attitudes and work behaviors. Workers react emotionally (e.g., fear, anger, surprise) to an event occurring at work and these affective experiences are multidimensional and fluctuate over time.

Compared to positive emotions, the response to deal with negative emotions can be more extensively and continuously disruptive and can compromise behaviors in the job domain (i.e., behaviors required to do one's job). Based on these premises, we suggest that, as aggressive behavior, vicarious violence at work yields adverse consequences and negative emotions such as fear.

Fear is a powerful emotion that shapes human behavior in many life aspects, even in the workplace (Kish-Gephart et al., 2009). Fear is one negative emotion to respond to a specific damaging cause or target that triggers the desire for escape or avoidance. It is associated with a great sense of uncertainty about one's ability to resist or handle a given threat and control the situation. Fearful individuals consistently make relatively pessimistic judgments and choices, which may have numerous effects on their daily life (Frijda, 1988; Grandey, 2008; Lerner & Keltner, 2000, 2001).

Fear can jeopardize improved patient safety. Chiang and Pepper (2006) found that underreporting of administrative errors regarding medication was associated with fear of, for example, patients' negative attitudes or physicians' reprimands. Remaining silent because of fear is often one of the choices and this brings major negative consequences for individuals and organizations (see Kish-Gephart et al., 2009).

Fear is a critical outcome for those that experience violence at work, influencing work attitudes, work behaviors, and physical and psychological well-being (Barling, 1996; Schat & Kelloway, 2005). Nurses who had experienced workplace violence also experienced higher levels of fear of future violence at work. Research also showed a significant association between fear of future workplace violence and burnout among nurses (Fu et al., 2021a,b). Research on violence at work also suggested a relationship between fear of future violence (i.e., fear of being the target of physically violent events, such as being hit or threatened with a weapon) and vicarious violence in the healthcare setting, including nurses (Akbolat et al., 2019; Schat & Kelloway, 2003).

Work ability

Work ability is determined by job demands and job resources but also by personal resources that are independent of the job, such as self-efficacy, conscientiousness, positive traits (e.g., optimism), negative traits (e.g., hostility), grit, and resilience (Brady et al., 2020).

Work ability is a positive resource of health that aims to promote and improve employees' abilities through a holistic approach focused on work demands and environment, work organization and work community, the promotion of workers' health, functional capacity and professional competence (Ilmarinen, 2006, 2009; Tuomi et al., 2001; Tuomi et al., 1997). Research showed a positive, statistically significant relationship between work ability and job resources (e.g., support from colleagues and co-workers), psychosocial personal resources (e.g., self-efficacy, self-esteem), general, mental and physical health, health behaviors (e.g., physical activity), job attitudes (e.g., organizational commitment), job performance and job motivation (Brady et al., 2020).

Since the work ability index was constructed in the early 1980s, the work ability concept has developed and expanded. Today, several conceptualizations exist for work ability, depending on the scientific area, and new methods to assess it have increased (e.g., Work Ability-Personal Radar, Ilmarinen et al., 2015; Ilmarinen, 2019). For a review of the main definitions and terms used, see Lederer et al. (2014). As defined by Tuomi and colleagues, in this study, work ability represents the extent to which a worker is able to do his/her job at the present, in the near future and concerning work demands, health, and mental resources (Ilmarinen & Tuomi, 1992; Tuomi et al., 1991).

Few studies have explored the relationship between violence at work and work ability and, to date, research has failed to focus on the relationship between vicarious violence at work and work ability among nurses. Brady et al. (2020) showed that workplace mistreatment (i.e., any act of mistreatment or hostility) has a negative and statistically significant association with work ability. Recently, Nikolić and Višnjić (2020) showed that exposure to threats of violence and physical violence from patients predicts decreased work ability.

Our research examines the association between vicarious violence at work and work ability and goes further by exploring the way this relationship happens. Following the

AET (Weiss & Cropanzano, 1996) and the model proposed by Barling (1996), we suggest that the effect of vicarious violence at work on work ability will be indirect, as fear of future violent events at work will mediate the relationships between vicarious violence at work and work ability. We also hypothesize that vicarious violence at work will be positively associated with fear and that fear will be negatively related to work ability. The conceptual diagram of our model is presented in Figure 1.

Methods

Design and data collection

This quantitative study used cross-sectional self-report data. We collected data through an anonymous online questionnaire. The aims of the study and the link that gave access to the questionnaire were disseminated through the webpage and the official e-mail address of the Portuguese Order of Nurses. At no time did any of the researchers have access either to the website of the Order of Nurses or to the e-mail addresses. The questionnaire was available on the web between November 2018 and February 2019.

Ethical considerations

The study was approved by the Council of Ethics and Deontology of the University of Aveiro (32-CED/2018, 06/06/2018). Informed consent was included in the online questionnaire and was a mandatory condition to participate.

Measures

Vicarious violence at work was assessed using five-item vicarious violence at work measure (Rogers & Kelloway, 1997). On a 4-point Likert scale (ranging from 0 = *never* to 3 = *~~4~~ four or more times*), participants were asked to indicate how often during the past year they had witnessed or heard about violent events experienced by co-workers, supervisors, friends, or relatives. The measure has been shown to have acceptable construct validity and reliability (Rogers & Kelloway, 1997; Schat & Kelloway, 2000, 2003), also in

the Portuguese version (Pacheco et al., 2016). In the present study, the internal consistency of the measure was 0.89.

The eight-item measure of fear of future violent events at work by Rogers and Kelloway (1997) was used to assess the degree to which participants were afraid of experiencing or being threatened with violent events at work during the next year. On a 5-point Likert scale, response options ranged from 1 (*strongly disagree*) to 5 (*strongly agree).* Previous studies have shown the scale to be valid and reliable (Rogers & Kelloway, 1997; Schat & Kelloway, 2000, 2003), also in the Portuguese version (Pacheco et al., 2016). In the present study, the internal consistency of the measure was 0.97.

Work ability was measured using the Work Ability Index (WAI; Tuomi et al., 1994). This is a self-report instrument with 7 items assessing: (i) present work ability compared with the lifetime best (0-10 points), (ii) physical and mental work demands (2-10 points), (iii) number of diagnosed diseases (1-7 points), (iv) work impairment due to disease (1-6 points), (v) absence due to sickness during the past year (1-5 points) (vi) prognosis of work ability after 2 years (1-4 or 7 points), and (vii) psychological resources (1- 4 points). High scores indicate high perceived work ability (total score 7–49 points). It is a widely validated (Ilmarinen & Tuomi, 1992; Ilmarinen et al., 1997) and used index and has been translated and validated in different contexts and cultures. We used the Portuguese version of the WAI validated by Silva et al. (2000). In the present study, the internal consistency of the measure was 0.78.

Demographic information collected included gender, age, position, organizational tenure, activity sector, setting, and hours worked per week.

Statistical data analysis

Descriptive statistics and Pearson correlations were calculated with SPSS Version 25.0 (IBM Corp. Released 2017). The psychometric reliability of each measure was analyzed through the Cronbach alpha (≥ 0.70). Hypotheses were tested using mediation analysis. We apply structural equation modeling (SEM) with maximum likelihood regression using Amos 25 (Arbuckle, 2017) software. Amos assumes complete data. Before submitting the model to analysis, we request a test of normality (the skewness and kurtosis of each parameter) and possible outliers in the data. Covariates will be included in

the model by adding a path of the covariate to the mediator and another path to the dependent variable (Hayes & Rockwood, 2017).

To examine how well the proposed simple mediation model fits the data, we also followed the recommendations for statistical mediation analysis by Hayes and Rockwood (2017). First, inference about mediation is focused on the indirect effect. That is, the analysis will be based on the product of path coefficients from the effect of vicarious violence on fear and the effect of fear on work ability because it directly quantifies the mechanism of work ability by vicarious violence through fear. Second, the inference test about that product will be conducted using a bootstrap test, specifically, a bias-corrected bootstrap, with 5000 bootstrap samples. Third, as the bootstrapped distribution is accompanied by a confidence interval (95%) informing about the uncertainty attached to the estimate, this allows us to conclude about the reliability or accuracy of the findings (Fritz & MacKinnon, 2007; MacKinnon & Fairchild, 2009). If zero is not in the interval, we can be confident that the indirect effect is different from zero, so the indirect effect is found.

The fit of the hypothesized mediation model will be assessed by the overall $\chi 2$ value, together with its degrees of freedom and probability value, and the following fit indices and respective criterion cut-off suggested by Hu and Bentler (1999): a cut-off point close to 0.08 or below for Standardized Root Mean Square Residual (SRMR); a cut-off point close to 0.06 or below for Root Mean Square Error of Approximation (RMSEA) and the Comparative Fit Index (CFI) with a value close to 0.95 or greater.

Results

A summary of the demographic characteristics of the study participants is presented in Table 1. Data came from a sample of 154 registered nurses (RN). On average, nurses were 39.97 years old (SD 9.48). Most of them (89% female; n = 137) had an organizational tenure of more than 20 years (38.3%; n = 59), worked in the public sector (86.4%), in a hospital (70.1%; n = 108), and 35 to 40 hours per week (75.3%; n = 116).

Descriptive statistics (M/SD), reliabilities, score range, and intercorrelations of the study variables are presented in Table 2. Pearson correlations showed that vicarious violence at work had a statistically significant and positive association with fear (r = 0.57,

p = 0.01), and fear had a statistically significant and negative association with work ability (r = -0.31, p = 0.01). Vicarious violence at work and work ability were not correlated. No significant correlations were found between the study variables and the demographic variables described above, except for age revealing a statistically significant relationship with work ability (r = -0.18, p = 0.05). According to these results and previous research showing that work ability is influenced by age (Brady et al., 2020), we included age as a control variable in the mediation analysis.

The analytic summary of the mediation model showed an overall $\chi 2$ value of 3.925 with 2 degrees of freedom and a probability value of 0.141, resulting in an adequate solution. In addition, the goodness-of-fit statistics corroborate that the model fits the sample data acceptably (SRMR = 0.05; RMSEA = 0.07; CFI = 0.97).

We hypothesized that vicarious violence at work has an indirect effect on work ability through fear of future violence at work. The 95% bias-corrected bootstrap confidence interval for the indirect effect (ab = -0.18) was above zero (95% CI: -0.304, -0.086), showing that fear significantly mediates the relationship between vicarious violence at work and work ability. Standardized parameter estimates and the associated R^2 for the mediation model are presented in Figure 2. The results show a statistically significant direct effect between vicarious violence and fear (a = 0.57, p = 0.001) and between fear and work ability (b = -0.32, p = 0.001). There was no evidence that vicarious violence at work influences work ability independent of its effect on fear (c' = 0.00, p = 0.99). In the model, R^2 = 0.14. So vicarious violence, fear, and age together explain 14% of the variance in work ability.

Discussion

Empirical research shows that experiencing violent events, sexual harassment, or uncivil behaviors vicariously at work is associated with detrimental effects on mental and physical health, affective commitment, turnover intentions, perceptions of interpersonal injustice, job satisfaction, organizational trust, and perceptions of safety (Dionisi & Barling, 2018; Dupré et al., 2014; Miner & Cortina, 2016).

Vicarious violence at work in nursing remains understudied. There is evidence that vicarious violent events at work can be experienced significantly more often than direct

workplace aggression. In addition, the effects of workplace violence are expected to be more detrimental to the target, the individual at the receiving end of the violent behavior, than for those who experience violence at work vicariously. However, research has suggested that, whether directly or indirectly experienced, violence at work is associated with negative and serious effects for individuals and organizations (Dupré et al., 2014; Schat & Kelloway, 2000).

This study investigated the impact of vicarious violence at work on work ability in a sample of Portuguese nurses. We evaluated the role of affective reactions, specifically, fear of future violence at work, in the relationship between vicarious violence and work ability. Findings showed that fear is a significant mediator in that relationship. Vicarious violence at work influence nurses' work ability through fear. This is consistent with the AET (Weiss & Cropanzano, 1996). Harmful events at work predict negative emotions. Negative emotions, in turn, influence future behaviors at work. As suggested from our results, seeing a colleague at work experiencing violent events, for example, is associated with fear of being the target of future violent events. This negative effect, in turn, predicts a decrease in nurses' ability to work.

Our results are also in line with previous research on aggressive behaviors experienced at work. Evidence showed that affective reactions such fear and irritation mediate the relationship between workplace aggression and health outcomes and between workplace aggression and work attitudes (affective commitment, job satisfaction), which in turn influence turnover intentions (Rogers & Kelloway, 1997; Schat et al., unpublished manuscript; Schat & Kelloway, 2000).

This study suggested that affective reactions play an important role between work events and work ability. The existence of conditions that moderate employees' fear of future violence would be expected to affect their ability to work positively. For example, Mueller and Tschan (2011) found that perceived prevention of violence and perceived coping ability reduce fear of future violence at work. Portoghese et al. (2017) showed that job control moderated the relationship between fear of future violence at work and emotional exhaustion.

Limitations and future directions

Our results are limited for several reasons. First, vicarious violence was examined independently of direct subjective experience of violence. Our rationale for this focus was supported by Schat and Kelloway (2003). However, as individuals are affected by direct experiences but also regulate their behavior based on observed consequences, it would be socially meaningful to examine the interactive effects of these two sources of social learning (Bandura, 1971a, b) and their relationship with work ability.

Second, our model examines one of the various potential hypotheses that can be investigated through AET (Weiss & Cropanzano, 1996). A deeper comprehensive approach will expand the causal model to examine the relationship between violence at work, experienced directly or vicariously, and work ability. For example, including individual dispositions (e.g., positive and negative affectivity, self-efficacy) already identified by research as associated with work ability (Brady et al., 2020). In fact, in AET (Weiss & Cropanzano, 1996), both dispositions and work events have an impact on affective reactions. However, linking individual dispositions, particularly personality traits (stable in nature) with affective reactions (change over time) could be a challenging goal. We indicate the discussion by Weiss and Kurek (2003) on this subject and their guidance. In addition, we suggest extending the model to examine the impact of work ability on work behavior decisions. Vicarious violence may have an impact on affective reactions, which in turn affect retirement, absenteeism, or turnover (Brady et al., 2020) via work ability.

Third, the results should be interpreted with some reservations, as the sample is drawn from one occupational group (nurses), which may result in sample bias. However, these results are consistent with previous research on vicarious violence at work with other professional groups (e.g., service industry; Dupré et al., 2014). Likewise, the meta-analysis by Brady et al. (2020) showed that white-collar vs. nursing occupations did not explain a significant variation in the relationship between workplace mistreatment and work ability, and no moderated effects of blue-collar vs. nursing occupations were found in that relationship.

Fourth, although mediation is a powerful causal statistical method that allows us to confirm our hypothesis, causal inference is limited. The mediation model is defined by theory and previous research, so other models are equally possible, depending, for

example, on whether we are interested in the functional relationship between variables or focusing on changes (Weiss & Cropanzano, 1996).

In addition, our findings come from cross-sectional correlations of self-reported data. We suggest that future studies use longitudinal methods to allow measuring within-sample changes over time and drawing causal inference related to the effects advanced in the current study. To minimize the bias arising from self-reporting we suggest a multi-method approach. For example, different study designs—individual and multi-level—that converge to the study findings (Yang & Caughlin, 2017) or using both quantitative and qualitative data (Grandey et al., 2002). Finally, as data for independent and dependent variables came from the same subjects, we suggest collecting data from other sources, for example, the information provided by the occupational health services.

Conclusion

This study shows that vicarious violence is experienced at the workplace and has negative effects on nurses. Results suggest that fear of future violence is a direct outcome of vicarious violence at work and mediate the impact of vicarious violence at work on work ability. However, more research is needed in other settings and contexts to enhance the generalization of our findings. Replication of the proposed mediation model with a larger sample can give a deeper understanding of the process by which vicarious violence at work and work ability are linked. We also encourage future researchers to go further and examine under which circumstances we can change the negative effects associated with vicarious violence at work.

Our findings are also important for practice. Violence at work exists and will continue to exist. Even when organizations implement primary interventions to prevent it, violence at work will occur. Interventions should cover not only those who directly experience acts of violence but also those who experience them indirectly. Our findings highlight our understanding of the role of affective emotions between vicarious violence at work and work ability and suggest that future interventions aiming to buffer the impact of vicarious violence at work on work ability could be directed to reducing proximal strains and focus on the decrease of negative emotions. Fear is a powerful emotion, therefore, interventions designed to reduce its effects will have a positive influence on employees' work ability.

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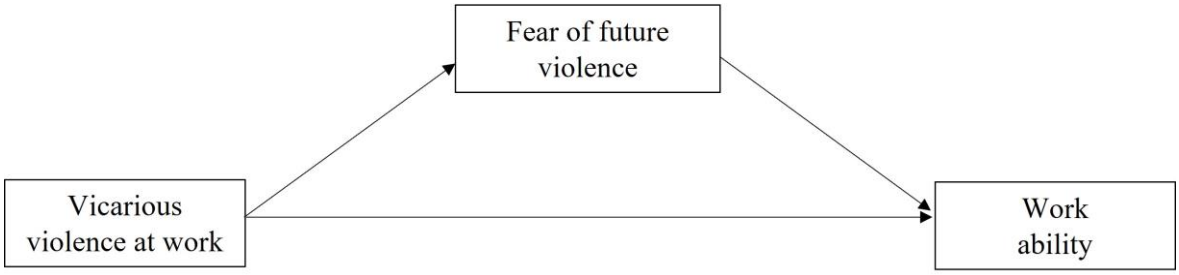

Figure 1. Conceptual diagram of the proposed simple mediation model.

Table 1. Demographic variables of study participants.

Variables		**Total (N = 154) n(%)**
Gender	Female	137(89.0)
	Male	17 (11.0)
Age	Female	M = 39.95 (SD = 9.44)
	Male	M = 40.18 (SD = 10.14)
Position	Registered Nurse	100%
	Clinical Nurse Specialist	43.5%
Organizational tenure (years)	< 1	7(4.5)
	1-5	14(9.1)
	6 - 10	28(18.2)
	11 - 15	25(16.2)
	16 - 20	21(13.6)
	> 20	59(38.3)
Activity sector	Public	115(74.7)
	Private	21(13.6)
	Public and private	18(11.7)
Setting	Hospital	108(70.1)
	Others	46(29.9)
Worked hours (week)	< 35	10(6.5)
	35 – 40	116(75.3)
	41 – 50	22(14.3)
	> 50	6(3.9)

Table 2. Descriptive statistics, score range, and intercorrelations of study variables.

Variables	*M*	*SD*	Score range	α	Pearson correlations		
					1	2	3
1. Vicarious violence at work	9.94	4.74	0-15	.89			
2. Fear of future violence at work	20	10.20	8-40	.97	.574**		
3. Work ability	34.09	7.81	7-49	.78	-.151	-.305**	
4. Age	38.80	9.33		-	-.156	-.062	-.183

Note. $n = 154$. *** $p < 0.001$, **$p < .01$., * $p < 0.05$

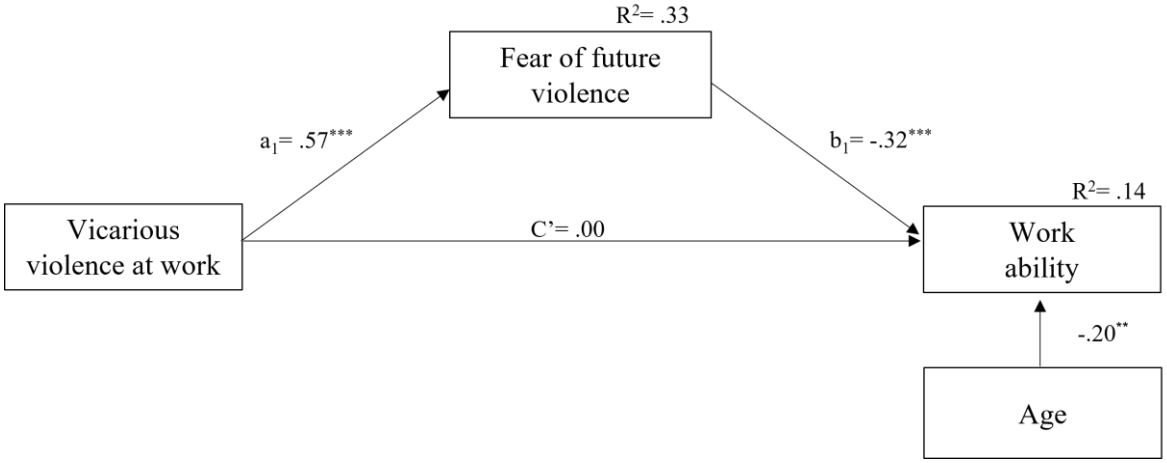

Figure 2. Standardized parameter estimates for the study model.
***$p < 0.001$; ** $p < 0.01$; * $p < 0.05$

STUDY 4

Impact of workplace violence on nurses' work ability through violence prevention climate and anxiety

Publication

Pacheco, E., Bártolo, A., Pereira, A., Duarte, J.C., Silva, C.F. Impact of workplace violence on nurses' work ability through violence prevention climate and anxiety. *Psychology, Health & Medicine* (under review)

Abstract

Workplace violence is a major and ongoing threat to nurses' health and safety as well as to organizations. However, the effect of workplace violence on work ability remains understudied, particularly the mechanism which can explain how exposure to workplace violence influences nurses' work ability. This study aim to examine the mediating role of violence prevention climate and anxiety in the relationship between workplace violence and work ability in nursing. This is a quantitative cross-sectional study using data from 200 Portuguese nurses. The STROBE guidelines were followed. Descriptive statistics, Pearson's correlation, and path analysis through structural equation modeling were performed. We test a serial multiple mediator model. Statistical inference about indirect effects was based on bias-corrected bootstrap confidence intervals. The two-mediator model in which workplace violence affects work ability through violence prevention climate and anxiety in a causal sequence was supported. Workplace violence influences violence prevention climate, which in turn influences anxiety, which in turn influences work ability. There was no direct effect of workplace violence on work ability. The results were consistent with the prediction that workplace violence is positively associated with anxiety, and negatively associated with violence prevention climate and work ability. However, the effect of workplace violence on work ability is indirect. Specifically, workplace violence from customers is related to work ability through violence prevention climate first and then anxiety. Organizations interested in preventing workplace violence and minimizing its negative effects on work ability should promote and implement interventions aiming for a positive violence prevention climate, which in turn would decrease anxiety among nurses and benefit their work ability.

Keywords: anxiety, cross-sectional study, mediation model, nurses, violence, violence prevention climate, work, work ability

Introduction

Understanding the phenomenon of workplace violence continues to be a major challenge for researchers and organizations. Workplace violence is a broad concept capturing different types of harmful behaviors experienced in the course of, linked with, or arising out of work (International Labour Organization [ILO], 2020).

For this study, we draw on Kelloway and colleagues' (Rogers & Kelloway, 1997; Schat & Kelloway, 2003) research and use the term *workplace violence* as a higher-order construct encompassing physical violence, psychological aggression and vicarious violence. Physical violence has the intent to injure workers physically or property through violent physical behavior or its threat. Vicarious violence is experienced when a worker sees or hears about violent behavior perpetrated toward similar others. Psychological aggression includes overt behavior with the intent to harm workers psychologically, such as yelling (Schat & Kelloway, 2005).

Depending on the perpetrator, different strategies could be designed to prevent and minimize the effects of violent and aggressive behavior on individuals and organizations (Hershcovis & Barling, 2010). This study focus on the effects of workplace violence perpetrated by customers (patient, family/friend). This decision is based on the evidence that violent and aggressive behaviors experienced by nurses come mainly from customers (Pariona-Cabrera et al., 2020).

Physical violence and psychological workplace aggression are associated with severe personal and organizational outcomes. Physical violence at work predicts long-term adverse health-related outcomes: high number of visits to a general practitioner, more outpatient treatment, more admissions in a hospital, and use of antidepressants (Friis et al., 2019). Psychological aggression at work is positively related to anger, fear, anxiety, depression, emotional exhaustion, depersonalization, personal accomplishment and physical symptoms (Pacheco et al., 2021a).

Specifically in nursing, research has shown a link between experiencing violent and aggressive behavior and increased anger, musculoskeletal injury, accidental contagious disease, psychological distress, anxiety, depression, burnout, decreased job satisfaction, work frustration, lower career commitment, lower organizational effectiveness, turnover intention, care quality and patient safety (Chang et al., 2018; Cho et al., 2020; Li et al.,

2019; Nixon & Spector, 2015; Pariona-Cabrera et al., 2020; Wu et al., 2020; Yang et al., 2012; Zhou et al., 2015).

Workplace violence can also influence individuals' work ability (Cadiz et al., 2019). There is less empirical research examining the relationship between workplace violence and work ability (Converso et al., 2021). Brady et al. (2020) found a negative relationship between work ability and workplace mistreatment. McGonagle et al. (2015) observed no significant relations between interpersonal conflict and perceived work ability, and Pacheco et al. (2021b) suggested that vicarious workplace violence experienced by nurses is indirectly related to work ability through fear. Defined as a person's ability to meet the demands of their job, work ability is a function of one's health and mental resources and the requirements of the job (Cadiz et al., 2019; Tuomi et al., 1991).

According to Brady et al. (2020) work ability has a significant relationship with job demands (e.g., emotional demands), job resources (e.g., positive organizational climate), psychosocial personal resources (e.g., grit/resilience), health-based personal resources (e.g., depressive symptoms), job attitudes (e.g., commitment), exit intentions and behavior (e.g., disability status, absenteeism, retirement), fatigue, burnout, perceived stress, job performance, and motivation. In this study, we suggested that workplace violence is negatively associated with nurses' work ability.

The literature and research show that anxiety has been linked to nurses' experience of workplace violence (e.g., Pariona-Cabrera et al., 2020). Anxiety refers to an unpleasant emotional state or condition at a given moment in time with a particular level of intensity and characterized by feelings of tension, apprehension, nervousness, and worry (Spielberger et al., 1983). Transitory in nature, state anxiety reactions may vary as a function of the amount of stress induced by unavoidable real-life stressors such as violence at work (Spielberger et al., 1983). Thus, we also posit that anxiety is positively associated with workplace violence and negatively associated with work ability.

An organization with an aggression-inhibition climate may positively influence the relationship between workplace violence, anxiety, and work ability. That is, if employees believe their organization has policies, procedures and practices available to reduce workplace violence, they will feel more motivated to take action to reduce exposure to workplace violence, thereby reducing strains (Yang et al., 2014). The current study will focus on one type of psychological climate related to inhibiting workplace violence,

violence prevention climate. Violence prevention climate is defined as employees' perceptions of the extent to which management emphasizes control and elimination of violence and verbal aggression (Yang et al., 2014). Violence prevention climate is negatively related to physical violence, psychological aggression, anger, anxiety, depression, and physical symptoms (Spector et al., 2015). Although a positive organizational climate and culture and work ability are related, there is a shortage of knowledge in this area (Cadiz et al., 2019).

This study aims for a deeper understanding of this link. We predict a positive significant correlation between violence prevention climate and work ability. In contrast, we also posit a significant negative relationship between violence prevention climate and physical violence, psychological aggression, vicarious violence, and anxiety.

This study aimed to examine the role of violence prevention climate and anxiety in the relationship between workplace violence and work ability. We extend Spector and colleagues' simple mediation model (Kessler et al., 2008), propose and test a serial mediation model suggesting that both violence prevention climate and anxiety mediates the relationship between workplace violence and work ability. More specifically, we propose that workplace violence and work ability are linked through anxiety. We also posit that a violence prevention climate mediates the effect between workplace violence and anxiety and in turn, violence prevention climate and work ability are linked through anxiety.

Methods

Study Design

The study used a quantitative cross-sectional design. We followed the STROBE checklist for cross-sectional studies.

Data collection

Data were collected through an online anonymous questionnaire that was available between November 2018 and February 2019. The announcement of the study objectives and the link that gave access to the web-based survey was disseminated via the website of

the [information removed for anonymity] and the internal email listserv of the organization. Therefore, we were not able to calculate an exact response rate for the survey. Informed consent was included in the online questionnaire and was a mandatory condition to participate. Participants were also informed about data protection.

Sample

Data came from 200 nurses selected based on the following criteria: (i) registered nurses providing care in [information removed for anonymity]. Student nurses and nurses with other positions such as researchers, teachers, nurse manager/administrator, and nurses practicing in other countries were not included, (ii) working for a minimum of 12 months, (iii) employed in the public or private sector.

Measures

Predictors

Physical violence at work

Physical workplace violence was assessed using the [information removed for anonymity] version (Pacheco et al., 2016) of the scale developed and validated by Rogers and Kelloway (1997), which measures the experience or the threat of physical violence during the past year. Eight items are rated on a 4-point Likert scale ranging from 0 (*never*) to 3 (*four or more times*), with high scores indicating more experience of physical violence. Cronbach's coefficient alpha of the scale in this study was 0.78.

Psychological aggression at work

Psychological workplace aggression was measured using the scale developed and validated by Schat and Kelloway (2003). Three items, rated on a 4-point Likert scale ranging from 0 (*never*) to 3 (*four or more times*), assess the experience of psychological aggressive behaviors (e.g., been yelled at), during the past year. High scores indicate more experience of psychological aggression. In the present study, the Cronbach's coefficient alpha for the [information removed for anonymity] version was 0.89.

Vicarious violence at work

Vicarious workplace violence was measured using the [information removed for anonymity] version (Pacheco et al., 2016) of the five-item scale developed and validated by Rogers and Kelloway (1997). Participants were asked to indicate whether they had witnessed or heard about violent events experienced by co-workers, supervisors, friends or relatives, at work, during the past year. Items are rated on a 4-point Likert scale ranging from 0 (*never*) to 3 (*four or more times*), with high scores indicating more experience of vicarious violence. In the present study, the internal consistency of the measure was $\alpha = 0.86$.

Outcomes

Violence prevention climate

Violence prevention climate was assessed with the [information removed for anonymity] version (Pacheco et al., 2021c) of the 12-item Violence Prevention Climate Scale developed by Kessler et al. (2008) to assess participants' perceptions of how organizational management provides a climate conducive to preventing physical and verbal violent events. Participants indicated their level of agreement on a 6-point Likert scale (1 = *disagree very much*, 6 = *agree very much*). High scores indicate a positive violence prevention climate. In the present study, the internal consistency of the measure was $\alpha = 0.83$.

Anxiety

The [information removed for anonymity] version (Santos & Silva, 1997) of the State-Trait Anxiety Inventory from Spielberg et al. (1983) was used to assess anxiety (state anxiety 20-items). On a 4-point Likert scale, ranging from *not at all* to *very much so*, participants describe how they feel at the moment. High scores indicate high anxiety. In the present study, the internal consistency of the measure was $\alpha = 0.95$.

Work ability

Work ability was measured with the [information removed for anonymity] version (Silva et al., 2000) of the Work Ability Index (Tuomi et al., 1994), made up of seven items assessing: (i) present work ability (0-10 points), (ii) physical and mental work demands (2-

10 points), (iii) number of diseases (1-7 points), (iv) work impairment due to disease (1-6 points), (v) sickness absence (1-5 points), (vi) prognosis of work ability (1-4 or 7 points), and (vii) psychological resources (1- 4 points). Total scores range from 7 to 49 points with high scores indicating high work ability. In the present study, the internal consistency of the measure was $\alpha = 0.78$.

Participants were also asked about the following sociodemographic and occupational variables: gender, age, level of education, organizational tenure, activity sector (public/private), and hours worked per week.

Ethical considerations

This study was approved by the Council of Ethics and Deontology of the University of [information removed for anonymity] (32-CED/2018, 06/06/2018). Participation was voluntary and consent. Information about the benefits/absence of risk was given. The anonymity of participants and confidentiality of the research data were ensured.

Statistical data analysis

For statistical data analysis, we used SPSS Version 25.0 (IBM Corp. Released [IBM], 2017). Psychometric reliability was analyzed with alpha coefficients (≥ 0.70). To test the hypotheses, we used structural equation modeling based on maximum likelihood estimation, performed with Amos Version 25.0 (Arbuckle, 2017). Amos assumes complete data, this means that, in the presence of any missing data, Amos computes maximum likelihood estimates (IBM, 2017).

As suggested by Hayes and Rockwood (2017), we applied path analysis to make a serial multiple mediation analysis. This approach allowed us to test, simultaneously, two or more mediators linked in a causal sequence, operating in series. That is, the first mediator transmits its effects to the second mediator and so forth (Hayes, 2018; Hayes & Rockwood, 2017). Considering prior evidence (Schat & Kelloway, 2003) and the statistically significant association found in the present study between physical violence, vicarious violence and psychological aggression, we loaded the predictors' variables into a latent

variable, named workplace violence. Because age, in the present study, had a statistically significant correlation with work ability, we included it as a control variable by adding a path from age to work ability (Hayes & Rockwood, 2017).

Inference tests for each specific indirect effect were based on a bias-corrected bootstrap test, using 5000 bootstrap samples, accompanied by a confidence interval (95%). A confidence interval that does not include zero represents a statistically significant effect (Hayes & Rockwood, 2017).

Research on power and sample size selection in mediation analysis is scarce (Hayes, 2018). Based on Fritz and MacKinnon (2007) and the methods used in the present study for testing inference about indirect effects, we can say that our sample has the size needed to detect indirect effects.

Model fit was assessed by the chi-squared, degrees of freedom and significance level, the Standardized Root Mean Square Residual (SRMR; ≤ 0.08); the Root Mean Square Error of Approximation (RMSEA; ≤ 0.06), and the Comparative Fit Index (CFI) with a value close to 0.95 (Hu & Bentler, 1999). Figure 1 represents the conceptual diagram for the serial multiple mediation model proposed here.

Results

Characteristics of participants

Nurses' mean age was 38.80 years old (SD 9.33). All of them (85.5% female) were university graduates, and 33% had an organizational tenure of 20 years or more. Most (78%) were employed in the public sector, 10.5% in the private sector and 11.5% worked in both the public and private sector. Eighty-two percent of them worked 35 to 40 hours per week.

Means, standard deviations, reliabilities, and intercorrelations of study variables

Means, standard deviations, reliabilities, and intercorrelations for study variables are presented in Table 1. As we can see, reliability (α) estimates are all greater than 0.70. Physical violence, psychological aggression and vicarious violence have a statistical

significant association with each other. No significant correlations (not shown in Table 1) were found between the study variables and the demographic variables described above, except for age revealing a statistically significant relationship with work ability (r =-0.263, $p \leq 0.01$). According to these results and previous research showing that work ability is influenced by age (Brady et al., 2020), we included age as a control variable in the mediation analysis.

Model fit and mediation

Standardized parameters of the model are shown in Figure 2. Direct paths were controlled and dependent errors were correlated. The fit indexes indicated the good fit of the serial multiple mediation model (χ 2 (11) = 18.547, p = 0.070; CFI = 0.975; RMSEA = 0.059; SRMR = 0.035).

Estimates for specific indirect effects and bias-corrected bootstrap confidence intervals showed a significant indirect effect of workplace violence on work ability through anxiety (95% CI = -0.241, -0.058, $p \leq 0.001$).

Results also showed that violence prevention climate and anxiety sequentially mediate the relationship between workplace violence and work ability, and controlling for age, explained 30% of the variance in work ability. More specifically, there was a statistically significant indirect effect of workplace violence on anxiety through violence prevention climate (95% CI = 0.052, 0.205, $p \leq 0.001$) and a statistically significant indirect effect of violence prevention climate on work ability, through anxiety (95% CI = 0.080, 0.240, $p \leq 0.001$).

No direct effect of workplace violence on work ability was found.

Discussion

Nurses are the largest occupational group in the health sector, facing serious concerns related to high rates of workplace violence (Li et al., 2020). Few studies have examined the relationship between workplace violence and work ability, and to our knowledge, none has investigated the role of violence prevention climate and anxiety in that relationship (Cadiz et al., 2019).

The current study extended prior research by developing and proposing a model to examine the mediating role of violence prevention climate and anxiety in the relationship between workplace violence and work ability. Our model fits the data, and the results showed no direct effect of workplace violence on work ability. It is possible that other violence-related outcomes are responsible for transmitting the effects of workplace violence on work ability.

We proposed that workplace violence perpetrated by customers would influence nurses' work ability through anxiety. This proposition was supported. Workplace violence predict anxiety, which in turn has a negative influence on nurses' work ability. These results are in line with the stress framework (Hershcovis & Barling, 2010) and past research (Converso et al., 2021; Pacheco et al., 2021b). Additionally, we argue that, in that process, violence prevention climate would reduce anxiety, which in turn influences work ability positively. The findings suggested the mediating role of violence prevention climate with regard to outcomes such as anxiety and work ability. As found by Kessler et al. (2008), in the present study, violence prevention climate is an important factor influencing the relationship between workplace violence and anxiety.

Further, our results suggest that a good violence prevention climate affects the relationship between workplace violence and work ability through the impact of violence prevention climate on anxiety, and in turn, anxiety is negatively associated with work ability. This is consistent with previous study concerning the relevance of a positive violence prevention climate in predicting reduced workplace violence exposure and related negative strains (Chang et al., 2012). When nurses perceive that management responds quickly to episodes of violence, this encourages employees to report episodes of violence, and that violence prevention is a priority and the organization provides adequate prevention training, for example, this might increase their sense of control and reduce their anxiety, with a beneficial effect on their ability to work. As stated by Bandura (1988), those who believe they can exercise control over potential threats do not engage in apprehensive thinking and are not perturbed by them. However, those who believe they cannot manage threatening events that might occur, experience high levels of anxiety. We believe that reducing the effects of workplace violence on work ability would influence further work ability-related outcomes, such as quality of work and enjoyment of staying in

the job, productivity, quality of life, higher levels of subjective well-being, and active and meaningful retirement (Cadiz et al., 2019).

Limitations

As cross-sectional research, this study provides an important first step in understanding the impact of workplace violence on work ability. However, other research designs and other source data (unit-level) would be helpful to be able to generalize the study results. Other mediators could explain how workplace violence affects work ability and we have not examined the circumstances in which the effects occur (e.g., power relationship). Our workplace violence measure is limited to three specific forms of workplace violence perpetrated from one source. It would be interesting to examine the impact of abusive supervision on work ability. Although the sample of the current study represents a professional group at high risk of exposure to violence, future research should consider other occupational contexts for additional information.

Implications for practice

Nurses who experience physical and psychological aggressive behavior also experience anxiety that in turn influences their work ability. The assessment of psychological adjustment, such as anxiety, is critical to develop effective measures and interventions to influence workplace violence and work ability. Increased detection and management of people with anxiety is related to restored work ability, return to work, and absenteeism and presenteeism rates (Chisholm et al., 2016).

The findings emphasize the importance of organizational climate, providing a first indication that individual perceptions of a good violence prevention climate might be a promising approach to improve and maintain nurses' ability to do their job. Changes in the violence prevention climate could have strong positive effects on work ability.

Workplace violence is a complex social phenomenon. Actions to reduce anxiety, promote, and develop policies, practices, and procedures to prevent workplace violence would affect workplace violence prevalence and incidence and related outcomes, such as work ability.

Conclusion

The results of this study are of practical interest for research and practice. Physical violence, psychological aggression and vicarious violence were positively associated with anxiety, and negatively related to violence prevention climate and work ability. Using a serial multiple mediator model, two significant variables were identified as influencing the relationship between workplace violence and work ability, violence prevention climate and anxiety, respectively. The sooner they are identified and measures taken to promote a good violence prevention climate and reduce employees' anxiety, the better. This should not only prevent workplace violence and a premature fall in nurses' work ability but also positively affect other important work-related decisions by nurses such as turnover or early retirement.

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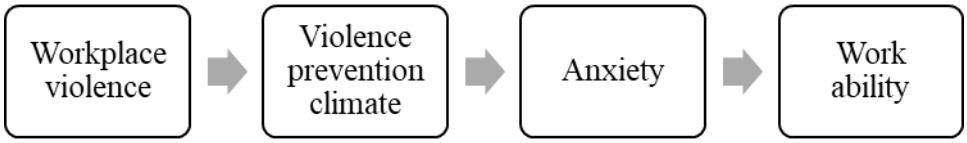

Figure 1. Conceptual diagram of the proposed serial multiple mediator model.

Table 1. Descriptive statistics, internal consistency coefficients, and intercorrelations of study variables (n = 200).

	M	*SD*	α	Pearson correlations					
				1	2	3	4	5	6
1. Physical violence at work	2.94	3.76	0.78						
2. Psychological aggression at work	5.01	3.21	0.89	0.586**					
3. Vicarious violence at work	5.58	4.56	0.86	0.506**	0.581**				
4. Violence prevention climate	33.20	11.37	0.83	-0.241**	-0.258**	-0.321**			
5. Anxiety	44.31	12.08	0.95	0.235**	0.254**	0.111	-0.383**		
6. Work ability	32.10	5.26	0.78	-0.155*	-0.106	-0.033	0.218**	-0.476**	
7. Age	38.80	9.33	-	-0.001	-0.051	0.096	-0.030	-0.017	-0.263**

*$p < 0.05$; **$p < 0.01$; ***$p < 0.001$

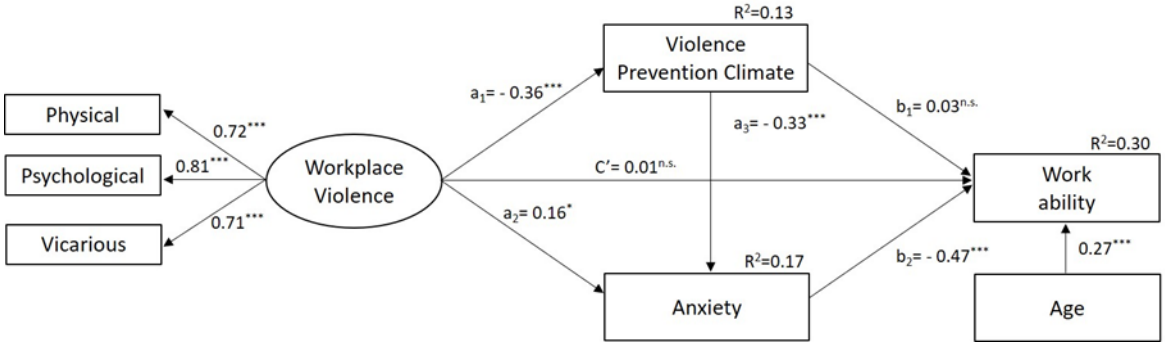

Figure 2. Standardized parameters estimates of the serial multiple mediator model. Model adapted from Hayes (2018).
* $p < 0.05$; **$p < .01$; *** $p < 0.001$; n.s. = non significant.

CHAPTER IV

INTEGRATIVE CONCLUSION

Workplace violence is an important health public issue. In healthcare, the number of workplace violence injuries and illnesses with days away from work grew from 8180 in 2011 to 15230 in 2018 (BLS, 2020). The present investigation seeks to answer questions about the effects of exposure to violence at work. Specifically, it contributes to understanding the impact of workplace violence on employees' work ability, which forms of violence are experienced at work and how they affect work ability. Key research contributions are discussed below.

Synthesis of the Psychological Workplace Aggression Outcomes

Over the course of a single working day, people experience various forms of harmful behaviors from costumers, patients, relatives, coworkers, supervisors. One of the most common forms is psychological aggression (e.g., Schat & Frone, 2011), also called verbal violence, nonphysical violence, verbal aggression, or verbal abuse, for example. Unlike research on bullying, abusive supervision, or incivility, no review has focused on the outcomes of psychological aggression at work. This need was identified.

Outcomes of psychological workplace aggression

Based on quantitative evidence from published studies, by summarizing data, the systematic review made more explicit that the subjective experience of being the target of psychological aggression affect severely workers well-being. It identified many outcomes which had not been included in previous systematic reviews related to workplace violence (e.g., Lanctôt & Guay, 2014; Pariona-Cabrera et al., 2020). The findings reinforce the importance of considering workplace psychological aggression in practice and research.

Preventing psychological workplace aggression outcomes

Furthermore, this review contributes to preventing workplace psychological aggression by providing a summary of relevant third variables that interfere in the relationship between workplace psychological aggression and outcomes. Knowledge about how and under what circumstances the relationship processes provides empirical evidence for researchers and organizations in designing strategies and interventions to prevent and

minimize the effects of psychological aggression in the workplace more effectively. For instance, a declarative, active, and proactive aggression-preventive leadership behavior predicted the existence of a positive climate against workplace psychological aggression (Yang & Caughlin, 2017).

Influence of Affective Responses

Many workers experience workplace violence vicariously (Dupré et al., 2014; Pacheco, 2016). To date, less attention has been given to the impact of workplace violence on work ability (Cadiz et al., 2019). Vicarious violence is likely to be associated with decreased on work ability. The results of the third study of this dissertation represents a first step to understand this relationship, showing the negative impact of vicarious violence on work ability and suggesting that this relationship is mediated by fear. People who experienced vicarious violence, also experience fear of future violent events, which in turn affect their work ability. Also, the findings highlight that affective responses related to work events are a meaningful construct that could frame future work ability research and practice.

The Role of Violence Prevention Climate

Reducing workplace violence and minimizing its impact on individuals and organizations is a priority (ILO, 2019) and it is urgent to find ways to do so. Empirical studies showed violence prevention climate as a potential protective factor that would be related to less workplace violence with effects on strains (Spector et al., 2015). Few studies considered the impact of positive organizational climate on work ability (Cadiz et al., 2019). The second and fourth studies of this dissertation contributes to filling this gap by testing the psychometric properties of the Portuguese version of the VPCS, and suggesting, in a sequential mediating process, that violence prevention climate predict anxiety following physical violence, psychological aggression, and vicarious violence, with effects on work ability. Similar findings have been examined in previous studies suggesting the mediating role of strains such as anger, anxiety, and depression between violence prevention climate and prevention performance (Chang et al., 2012).

Implications for research

This investigation has important contributions for the workplace violence and work ability research. Despite the profusion of research focus on the prevalence and incidence of workplace violence in nursing, less research has examined the psychological experience of workplace violence and the psychological processes through which these experience affect people. More than established an effect it is important to comprehend how and under which circumstances workplace violence influences workers behavior, attitudes, decisions, and relationships. The present research offer a strong support for this.

This research propose the Affective Events Theory (Weiss & Cropanzano, 1996) as a framework in understand the relationship between workplace violence and work ability. Future studies should explore the role of positive or negative emotions as an antecedent of work ability.

Prevention climate in nursing could be particularly complex and challenging. On the one hand, there are organizational measures to reduce violence and on the other hand, preference is given to carrying out the work even if this compromises the policies and procedures established to prevent violence. This research provided a Portuguese version of a validated measure that assess violence prevention climate dimensions, and showed that violence prevention climate is significantly related to workplace violence, anxiety, and work ability.

Implications for practice

This research also has practical implications for organizations. The findings showed that workplace violence impacts negatively on nurses psychological well-being and work ability. This can compromise, for instance, nurses performance, career commitment, quality of care, and puts health-care provision at risk. Preventing workplace violence is aligned with the core principles of the ILO (2019) convention concerning the elimination of workplace violence and is an indispensable requirement for the Sustainable Development Goal 3 “ensure healthy lives and promoting well-being for all at all ages” and Goal 8 which aims to “promote sustained, inclusive and sustainable economic growth,

full and productive employment and decent work for all" of the 2030 Agenda for Sustainable Development of United Nations (UN General Assembly, 2015).

For organizations, these findings highlight the need to address and measure the subjective experience of physical violence, psychological aggression, and vicarious violence. Organizational interventions that take into account workplace violence, emotions (fear), anxiety, and climate (violence prevention), would help to sustain employees' work ability.

Directions for future research

Although studies limitations represent a weakness of this investigation, they also serve as a support for future research. Each of the four studies has its own limitations and directions for future research were also suggested. For example, relationships between variables are based on cross-sectional data, limiting causal inferences, and the ability to generalize the findings. These findings should be replicate using other research designs, such as longitudinal studies, involving repeated measurements of the study concepts across time.

One additional general constraint could be mentioned: the length of the questionnaire. In addition to the measures used here, the questionnaire was composed of a few more measures (e.g., The Nursing Teamwork Survey, Kalisch et al., 2010), requiring more attention and time from participants. Also, the Work Ability Index (Tuomi et al., 1994) used to test a global measure of work ability is comprised by 59 items. In this case, a measure of perceived work ability (e.g., McGonagle et al., 2015) might have been a better option (Brady et al., 2019). These features may have compromised data collection.

CHAPTER V

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