Health Consequences of Bullying in the Healthcare Workplace: A Systematic Review

Running head: Bullying in the healthcare workplace

Dr. Isabel LEVER, BA (Hons)¹
Mr. Daniel DYBALL, BSc (Hons)²
Professor Neil GREENBERG, M.D.²
Dr. Sharon A. M. STEVELINK, PhD²

¹ King’s College London, Faculty of Life Sciences and Medicine, Henriette Raphael House, Guy’s Campus, London, SE1 1UL, UK
² King’s Centre for Military Health Research, King’s College London, Weston Education Centre, 10 Cutcombe Road, London, SE5 9RJ, UK

Corresponding Author: Isabel Lever email: Isabel.Lever@kcl.ac.uk address: 2.16 Weston Education Centre, 10 Cutcombe road, London, SE5 9RJ

This research was conducted as part of the first author’s MD at King’s College London, presented as a poster at Combined Faculties of Child and Adolescent Psychiatry and General Adult Psychiatry Annual Conference (6-7/10/2016) and adapted for article submission.

Conflict of interest
No conflict of interest has been declared by the authors.

Funding Statement
This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

This article has been accepted for publication and undergone full peer review but has not been through the copyediting, typesetting, pagination and proofreading process, which may lead to differences between this version and the Version of Record. Please cite this article as doi: 10.1111/jan.13986

This article is protected by copyright. All rights reserved.
ABSTRACT

Aims:
To review both mental and physical health consequences of bullying for healthcare employees.

Design:
Systematic literature review.

Data sources:
EMBASE, MEDLINE, PsycINFO, PUBMED and Web of Science Core Collection were searched for articles published between 2005 - January 2017.

Review methods:
This review was conducted using the framework described by Khan and reported using the Preferred Reporting Items for Systematic Reviews and Meta-Analyses. Two independent reviewers performed systematic data extraction and appraised the methodological quality of included articles. A pooled mean prevalence of bullying was estimated.

Results:
Forty-five papers met inclusion criteria. Bullying prevalence ranged from 3.9-86.5%, with a pooled mean estimate of 26.3%. Perceived bullying was associated with mental health problems including psychological distress, depression and burnout, as well as physical health problems including insomnia and headache. Bullied staff took more sick leave.

Conclusion:
Bullying occurs frequently amongst healthcare staff and is deleterious to health and occupational functionality.
Impact:

What problem did the study address?
Rates of perceived bullying amongst healthcare staff are high, however no review has focused on health and occupational implications for this population. This is concerning given the high-responsibility nature of their work.

What were the main findings?
The prevalence of bullying was 26.3%. Bullying was associated with negative mental and physical health consequences and increased sick leave.

Where and on whom will the research have impact?
This should encourage healthcare organizations to optimize policy, training and reporting pathways. It should promote research into the financial cost of bullying and implications for patient safety.

Key words: bullying, healthcare professionals, nurses, doctors, mental health, physical health, review

INTRODUCTION
Workplace bullying is a global phenomenon described by the World Health Organization (WHO) as a ‘major public health problem’ (WHO, 2010). It has been called a worldwide ‘silent epidemic’ (McAvoy & Murtagh, 2003). Reported prevalence varies greatly, from 0.3%-86.5% depending on the investigator’s methods and definition of bullying (Zapf,
Escartín, Einarsen, Hoel, & Vartia, 2011). Given the size of the global working population even low estimates suggest a problem of great magnitude.

Studies have suggested that bullying occurs more frequently in healthcare than in other sectors (Dellasega, 2009; Hutchinson, Vickers, Jackson, & Wilkes, 2006; Zapf et al., 2011). It has been theorized that this may be due to the interpersonal and emotional nature of healthcare work, the hierarchical structure of healthcare institutions and the conflicting priorities of multidisciplinary teams (Atwal & Caldwell, 2005; Mayhew & Chappell, 2001; Zapf et al., 2011).

Bullying has been associated with altered hypothalamic-pituitary-adrenocortical (HPA)-axis functioning (Hansen, Hogh, & Persson, 2011; Knack, Jensen-Campbell, & Baum, 2011; Tracy et al., 2008). The HPA-axis is a complex set of endocrine interactions eliciting cortisol responses. HPA-axis dysregulation has been associated with adverse health consequences such as depression, anxiety, sleep disorders, burnout, obesity, diabetes and hypertension (Bellingrath, Weigl, & Kudielka, 2008; Buckley & Schatzberg, 2005; Chrousos, 2000; Forbes et al., 2006; Heim & Nemeroff, 1999; Rosmond, 2003; Wirtz et al., 2007).

A large meta-analysis by Dickerson and Kenny found that of all psychological stressors the largest cortisol changes were associated with tasks containing uncontrollable or social-evaluative elements (Dickerson & Kemeny, 2004). This is particularly pertinent in a healthcare setting where many variables cannot be controlled by staff, for example the timing, nature and severity of patients’ illnesses. Additionally, healthcare work is inherently socio-evaluative, with interpersonal interactions involving judgement from patients, family and colleagues. Bullied healthcare workers may therefore be at particular risk of cortisol dysregulation and the associated health consequences.
Background

For the purposes of this review bullying was defined as follows:

The targeted individual perceives an interpersonal, systematic harassing, ganging up on or psychological terrorization (Leymann, 1996). The target feels inferior and unable to defend themselves, as they perceive that the two parties involved are not of ‘equal strength’ (Einarsen & Skogstad, 1996). The bullying behaviour occurs frequently, over an extended period of time and has a negative impact on the bullied individual (Leymann, 1996).

This combines key elements from definitions by Leymann and Einarson who have written extensively on the subject (Einarsen & Skogstad, 1996; Leymann, 1996). Crucially, it highlights that bullying is not an objective phenomenon, rather something subjectively perceived and often self-reported. When we refer to bullying in this article, we are referring to ‘perceived’ bullying.

In 2006 Moayed et al. undertook a systematic review of risk factors and outcomes of workplace bullying, which found that bullying was associated with chronic disease, stress, low self-confidence, psychological health complaints, psychosomatic complaints, cardiovascular disease and sick leave (Moayed, Daraiseh, Shell, & Salem, 2006). In 2015 a meta-analysis was published which found that workplace bullying was associated with depression, anxiety and stress-related psychological complaints (Verkuil, Atasayi, & Molendijk, 2015). These were both broad reviews, gathering data from multiple professions, however they did not focus on any specific workplace. There is now a need for investigation into the effects of bullying in medical settings. This review will examine the relationship between bullying and both physical and mental health amongst healthcare workers. This is
crucial given the safety-critical nature of healthcare work and higher rates of bullying in this sector (Kapur, Parand, Soukup, Reader, & Sevdalis, 2016).

This review is set apart from previous studies by its focus on healthcare. To our knowledge, no systematic review has examined the consequences of bullying on the health of staff in this sector. This is important from a patient safety perspective, as poor health in staff is associated with increases in medical errors and ‘near misses’ (Fahrenkopf et al., 2008; Kerr, 2009; Landrigan et al., 2004) Furthermore, this topic has considerable financial implications. Between April 2016 and February 2017 sickness absence in the United Kingdom’s (UK) National Health Service (NHS) made up an average of 4.3% of total staff working time (Dawson & West, 2018). In a workforce of over one million this represents a sizeable economic burden (Horan, 2017).

A comprehensive understanding of this topic will be of use to policy makers, managers and future researchers looking for targeted interventions to improve staff health, patient safety and economic efficiency in healthcare organizations.

THE REVIEW

Aims

To provide a synthesis of studies examining both mental and physical health consequences for staff who report being bullied in healthcare settings.
Design

The design and conduct was guided by the steps for conducting a systematic review outlined by Khan et al. (Khan, Kunz, Kleijnen, & Antes, 2003) and reported using the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statement (Moher, Liberati, Tetzlaff, Altman, & The, 2009). See Supplementary material 1 for PRISMA checklist.

Search methods

Five databases were searched for suitable studies; EMBASE, MEDLINE, PsycINFO, PUBMED and Web of Science Core Collection. Search terms were selected based on previous published research relating to workplace bullying and were agreed by a second reviewer.

Titles and abstracts were identified using two queries. The first query used a combination/variation on terms such as [“bullying” OR “harassment”] AND [“workplace” OR “work”] AND [“mental health” OR “depression” OR “anxiety”]. The second query terms such as [“bullying” OR “harassment”] AND [“workplace” OR “work”] AND [“physical health” OR “cardiovascular diseases” OR “musculoskeletal diseases”]. For a full list of search terms see Supplementary material 2. A first search was finalized in November 2015 and updated in January 2017.

Papers were included if they were published between 2005 and January 2017 and investigated how bullying in healthcare settings affected the mental or physical health of employees. Papers were excluded if they if they were not reported in English, if they did not fulfill the definition of bullying outlined above (e.g. papers relating to ‘racism’, ‘sexual harassment’ and ‘violence’), if they did not measure a mental and/or physical health outcome,
if they did not examine the healthcare setting, if they did not examine an adult population, if they were not primary research (e.g. conference proceedings, PhD dissertations, books, case reports) and if they were inaccessible in full text.

Search Outcomes

Papers (N=8,862) were initially identified, 628 of which were excluded as duplicates. The remaining 8,234 papers were screened on title and abstract and 7,976 were excluded. 258 full-text papers remained and were assessed; 41 were deemed eligible. The bibliographies of included papers were checked for relevant references and four further papers were added, see Figure 1. Summaries of included studies are shown in Table 1.

Data Abstraction

The quality of included papers was critically appraised independently by two reviewers, IL and DD. The quality assessment methodology was based on guidance for the critical appraisal of research evidence (Ajetunmobi, 2002). This framework has been used in previous peer-reviewed systematic reviews and can be found in Supplementary material 3 (Debell et al., 2014; Stevelink et al., 2015). In brief, the appraisal included a review of the methodological quality based on factors including study design, sample size, validity of measurement instruments, the use of robust statistical methods accounting for confounding variables etc. Any discrepancies between independent appraisers were discussed until a consensus was reached.

A judgement-based quality assessment was then completed based on this appraisal and papers were rated as either “Good”, “Fair”, or “Poor”. The overall quality of each paper is shown in Table 1 with a more detailed breakdown in Supplementary material 4.

This article is protected by copyright. All rights reserved.
Longitudinal design, sample size, validated measurement instruments (instruments measuring bullying, mental health outcomes or physical health outcomes should be pre-validated in the language in which they were being administered) and appropriate statistical analysis accounting for confounders were deemed to be particularly important to the quality of a study for this review.

**Data Extraction**

Data were systematically extracted by IL using a pre-designed extraction form and checked by DD. The following data were extracted: authors; year of publication; study design; country; professions investigated; number of respondents; response rate; prevalence of bullying; bullying measurement instrument; health measurement instrument; mental health outcomes; physical health outcomes; definition of bullying. A summary of key information is provided in table 1. Bullying and health measurement instruments are presented in Supplementary material 5 and bullying definitions in Supplementary material 6.

**Synthesis**

All mental and physical health outcomes investigated in the forty-five studies are presented in table 1. Health outcomes are discussed in the text if they were specifically reported in ≥4 papers. Data relating to health outcomes found in <4 papers was included in the table 1 rather than the full text.

A forest plot of studies reporting prevalence was created using meta data viewer (Boyles, Harris, Rooney, & Thayer). A random effect meta-analysis model was chosen due to the significant differences in methodological quality, functional inequivalence (e.g. country of origin, sample composition, national health services versus private health services etc.) and
heterogeneity between study populations. Variation in the studies’ estimates were attributed to heterogeneity I²=99.7%, Cochran’s Q p<.001. Outcomes were therefore pooled and compared with a random effects model (DerSimonian & Laird, 1986) using STATA 14.2. Smaller meta-analyses were conducted on moderating values of continent of origin and profession. Samples were only included in the profession subgroup analyses if specific professions had been investigated and reported on, therefore any which did not specify a profession (e.g. categorized ‘healthcare professionals’ to include several different professions, such as nurses and doctors together) were not included in the profession moderator analysis. If longitudinal data were extracted, the latest time point prevalence of bullying was used. If more than one type of bullying was investigated and reported, the term most in line with this review’s definition of bullying was used (e.g. persistent mobbing prevalence used over occasional mobbing prevalence).

RESULTS

Forty-five papers were included in the current review (table 1). Nurses (66.7%) and doctors (22.2%) were the most frequently represented healthcare professionals, but midwives (8.9%), eldercare workers (6.7%), allied health professionals (4.4%), ambulance personnel (2.2%), dentists (2.2%), healthcare assistants (2.2%) and nutritionists (2.2%) were also investigated. Europe (37%) and North America (32.6%) were most represented in the literature, while Asia and Australia made up 15.2%. Thirty-six studies were cross-sectional in design, nine were longitudinal cohort studies. Sample size ranged from N=61 to N=9,949 (mean N=1,430). Twelve papers were rated as ‘good’, twenty-eight as ‘fair’ and five as ‘poor’.
Prevalence of bullying

Twenty-eight papers reported on the prevalence of bullying between healthcare professionals (Table 1). Seventeen papers did not report on prevalence but were included as they examined mental and/or physical health outcomes. The pooled mean estimate of bullying prevalence was of 26.3% (95% CI 22.4, 30.1). See figure 2 for a forest plot of the reported prevalence.

The pooled mean prevalence of bullying in Asia was 47.1% (95% CI 4.0, 90.0 N=4), Australia 36.1% (95% CI 23.2, 48.9 N=6), Europe 18.4% (95% CI 14.7, 22.2 n=16) and North America 24.5% (95% CI 15.9, 33.1 N=2). Across all papers with reported prevalence for bullying doctors report 31.9% (95% CI 23.1, 40.6 N=8), nurses 30.8% (95% CI 19.3, 42.4 N=14), allied health professionals 12.4% (95% CI 0.0, 34.9 n=2) and administrative workers in healthcare services 2.3% (95% CI 1.1, 3.5 N=1).

Mental Health

Forty of the forty-five papers in the review examined mental health outcomes. Fourteen papers examined ‘depression’, ‘severe depression’ or ‘major depressive episode’; eleven ‘burnout’; nine ‘psychological distress’, ‘psychological stress’ or ‘reduced psychological wellbeing’; eight ‘mental health’, ‘mental health symptoms’ or ‘mental strain’; five ‘anxiety’; five ‘suicidal ideation’ or ‘suicide attempt’; two ‘PTSD’; one ‘panic attacks’ and one ‘alcohol/substance addiction’.

Depression

Fourteen papers measured depression; eight found significant associations with bullying (Demir, Rodwell, & Flower, 2013; Ekici & Beder, 2014; Loerbroks et al., 2015; Nixon & Spector, 2015; Rodwell & Demir, 2012; Rugulies et al., 2012; Sá & Fleming, 2008; D.
Yildirim, 2009), three did not comment on significance (Shabazz, Parry-Smith, Oates, Henderson, & Mountfield, 2016; Vessey, Demarco, Gaffney, & Budin, 2009; A. Yildirim & Yildirim, 2007) and three found no significant association (Aykut et al., 2016; Pranjic, Males-Bilic, Beganlic, & Mustajbegovic, 2006; Reknes et al., 2014). Of the papers which presented correlation coefficients, the strongest positive correlation was in a cross-sectional study of 286 Turkish nurses; Pearson’s product moment correlation $r$.51 ($p$<.001) (D. Yildirim, 2009). The weakest was in a cross-sectional study of 107 Portuguese nurses; Pearson’s correlation $r$.26 ($p$<.01) (Sá & Fleming, 2008). In a two-wave longitudinal study of 5,701 Danish eldercare workers Major Depressive Episodes (MDE) were measured as an outcome (Rugulies et al., 2012). Odds Ratios (OR) of developing MDE (T2) from baseline bullying (T1) were OR 2.12 (95% CI 1.3, 3.5) for occasional bullying (being bullied “now and then” or “monthly”) and OR 6.39 (95% CI 3.1, 13.2) for frequent bullying (being bullied “weekly” or “daily/almost daily”). The association between bullying and MDE was significant in both crude and adjusted analyses, even when only participants with no symptoms of reduced psychological health at T1 were included ($p$<.002). The results of a three-wave longitudinal study of 507 junior physicians in Germany indicated that those with exposure to bullying at baseline (T1) were more likely to experience depressive symptoms after one year (T2) $\beta$=1.43 ($p$<.01) and after three years (T3) $\beta$=1.58 ($p$<.01) (Loerbroks et al., 2015). However, a third longitudinal study of 1,582 Norwegian nurses found that in a hierarchical multiple regression analysis exposure to bullying at baseline (T1) did not significantly increase depressive symptoms after one year (T2) $\beta$=.01 ($p$=.47) (Reknes et al., 2014).
Eleven papers measured burnout, all of which found that bullying and burnout were significantly associated (Allen, Holland, & Reynolds, 2015; Aykut et al., 2016; Deery, Walsh, & Guest, 2011; H. K. Laschinger & Fida, 2014; H. K. Laschinger, Grau, Finegan, & Wilk, 2010; H. K. Laschinger, Wong, & Grau, 2012; H. K. S. Laschinger, Grau, Finegan, & Wilk, 2012; Read & Laschinger, 2013; Sá & Fleming, 2008; Trepanier, Fernet, & Austin, 2013a, 2015). Six papers used the subscales developed by Maslach et al, which measure burnout via ‘emotional exhaustion’ and ‘cynicism’ (Maslach, Schaufeli, & Leiter, 2001). Of these, the strongest positive correlation was in a cross-sectional study of 415 Canadian nurses, which found that bullying was positively correlated with both emotional exhaustion $r_{.50}$ ($p<.01$) and cynicism $r_{.53}$ ($p<.01$) (H. K. Laschinger et al., 2010). In a two-wave longitudinal cohort study of 205 nurses, the correlation between bullying at baseline (T1) and emotional exhaustion after 1 year (T2) was $r_{.39}$ ($p<.01$) and cynicism (T2) $r_{.42}$ ($p<.01$) (H. K. Laschinger & Fida, 2014). A cross-sectional investigation of 1,179 Canadian nurses reported a strong positive correlation between workplace bullying and burnout of $r_{.73}$ ($p<.001$) (Trepanier et al., 2013a). In a two-wave longitudinal study of 508 Canadian nurses carried out by the same author the correlation between bullying at T1 and burnout one year later at T2 was $r_{.25}$ ($p<.05$) (Trepanier et al., 2015).

Psychological distress

Nine papers measured psychological distress, psychological stress or reduced psychological wellbeing; eight found significant associations with bullying (Brunetto et al., 2016; Carter et al., 2013; Demir & Rodwell, 2012; Demir et al., 2013; Rodwell & Demir, 2012; Rodwell, Demir, & Steane, 2013; Taniguchi, Takaki, Hirokawa, Fujii, & Harano, 2016; Trepanier,
Fernet, & Austin, 2013b) and one found no significant association (Eriksen, Tambs, & Knardahl, 2006). The strongest positive correlation coefficient was reported in a study of 2,950 UK healthcare workers, reporting a correlation of $r .52$ ($p<.001$) between bullying (NAQ-R) and psychological distress (GHQ-12 score) (Carter et al., 2013). Three studies carried out ANCOVAs, all of them finding a significant elevation in psychological distress in bullied individuals: $F(1,194)=10.48$ ($p<.05$) (Demir & Rodwell, 2012); $F(1,252)=5.75$ ($p<.05$) (Rodwell et al., 2013); $F(1,208)=3.93$ in hospital nurses $(p=.049)$ and $F(1,187)=4.56$ in aged care nurses $(p=.034)$ (Rodwell & Demir, 2012). A two-wave longitudinal study of 543 Japanese eldercare workers found that chronic person-related bullying (bullying of a more personal nature, such as “gossip or rumours about you”) at T1 predicted high psychological stress two years later at T2 with an OR of 2.91 (95% CI 1.3, 6.6) (Taniguchi et al., 2016). A two-wave longitudinal study of 4,076 Norwegian nurses’ aides found no significant association between baseline (T1) bullying and psychological distress fifteen months later (T2) in a multivariate logistic regression model $\beta=.065$ ($p>.05$) (Eriksen et al., 2006).

**Anxiety**

Five papers measured anxiety as an outcome; two reported a significant association with bullying (Pranjic et al., 2006; Reknes et al., 2014), two did not comment on the significance of their results (da Silva Joao & Saldanha Portelada, 2016; Vessey et al., 2009) and one found no significant association (Sá & Fleming, 2008). A two-wave longitudinal study involving 1,582 Norwegian nurses found in a hierarchical multiple regression analysis that exposure to bullying behaviours at baseline (T1) predicted symptoms of anxiety after at least one year (T2), $\beta=.06$ ($p<.01$) (Reknes et al., 2014). In a cross-sectional study of 303 nurses from the USA 95% of those who were bullied reported symptoms of anxiety, however the percentage

This article is protected by copyright. All rights reserved.
of non-bullied nurses suffering anxiety was not reported and significance of the findings not commented on (Vessey et al., 2009). A cross sectional investigation of 107 nurses from Portugal found no significant difference in reported anxiety symptoms between bullied and non-bullied nurses in an independent t test t=-1.8 (Sá & Fleming, 2008).

Suicidal ideation or attempted suicide

Five papers measured suicidal ideation or attempted suicide; two found significant associations with bullying (Sterud, Hem, Lau, & Ekeberg, 2008; Wall et al., 2014), two did not comment on the significance of their results (Shabazz et al., 2016; A. Yildirim & Yildirim, 2007) and one found a non-significant association with bullying (Aykut et al., 2016). In a cross-sectional study of 1,286 ambulance personnel in Norway suicidal ideation was found to be independently associated with bullying at work, with an OR of 1.70 (95% CI 1.0, 2.7) (Sterud et al., 2008). A multivariate regression in a second cross-sectional study found that there was significant association between bullying and suicide ideation in a sample of 272 Swedish surgeons; OR 4.10 (95% CI 1.8, 9.2) and a sample of 149 Italian surgeons OR 2.97 (95% CI 1.2, 7.1), although in subsequent multivariate regression analysis with adjustment for non-significant sociodemographic factors only the Swedish sample remained significant AOR 2.83 (95% CI 1.3, 6.9) (Wall et al., 2014). A third paper, which looked at 505 nurses in Turkey, found that 10% of those mobbed ‘consider committing suicide sometimes’ however the percentage of non-mobbed nurses who considered suicide was not reported and therefore significance cannot be commented on (A. Yildirim & Yildirim, 2007).
Other

Eight papers measured ‘mental health’ (no specific classification given), mental health symptoms or mental strain, all of which found significant associations between bullying and poor mental health (Askew et al., 2012; Farley, Coyne, Sprigg, Axtell, & Subramanian, 2015; Hogh, Hoel, & Carneiro, 2011; H. K. S. Laschinger et al., 2012; Qian, Han, Wang, & Wang, 2015; Read & Laschinger, 2013; Sá & Fleming, 2008; Wing, Regan, & Spence Laschinger, 2015). The strongest positive correlation was in a cross-sectional study of 227 Chinese nurses where abusive supervision was correlated with mental health risks (depression/anxiety symptoms), $r_{.66}$ ($p<.001$) (Qian et al., 2015). The weakest was found in a three-wave longitudinal study investigating 2,154 Danish healthcare workers; $r_{.13}$ ($p<.01$) (Hogh et al., 2011).

Physical Health

Fifteen of the forty-five papers in the review examined physical health outcomes. Nine examined ‘insomnia’, ‘sleep deficiency’, ‘sleep changes’, ‘prolonged sleep’ or ‘fatigue’; six ‘physical health’, ‘physical symptoms’, ‘physical stress’ or ‘somatic symptoms’; five ‘headache’; four ‘gastrointestinal symptoms’ or ‘nausea’; two ‘back pain’; two ‘eating excessively or having no appetite’ or ‘weight loss/gain’; two ‘chest pain/palpitations/sweating’; one ‘blood pressure changes’ and one ‘joint pain’. It is important to note that these outcomes are based on questionnaire responses rather than clinical diagnoses.
Insomnia, Sleep Deficiency, Sleep Changes

It should be noted that while sleep is included in the physical health section of this paper, it can also be an important mental health indicator and a symptom of several mental health conditions (Hunt, Greenberg, & Jones, 2016). Nine papers measured sleep; two found significant associations with bullying (Reknes et al., 2014; Sorensen et al., 2011), four did not comment on significance (da Silva Joao & Saldanha Portelada, 2016; Shabazz et al., 2016; Vessey et al., 2009; A. Yildirim & Yildirim, 2007) and three were non-significant (Aykut et al., 2016; Pranjic et al., 2006; Sá & Fleming, 2008). A two-wave longitudinal study of 1,582 nurses in Norway found that bullying at T1 significantly predicted an increase in fatigue one year later at T2 β=.06 (p<.01) (Reknes et al., 2014). A cross-sectional investigation of 1,572 healthcare workers in the USA showed significant association between harassment at work and sleep deficiency OR 1.38 (95% CI 1.1, 1.8) (Sorensen et al., 2011). Three papers finding no significant association included a cross-sectional study of 107 Portuguese nurses with a correlation between bullying and insomnia of r .17 (p=.07) (Sá & Fleming, 2008), a cross-sectional investigation of 511 physicians in Bosnia and Herzegovina where 31% of the bullied group experienced sleeplessness by comparison to 25% of the non-bullied group (p=.65) (Pranjic et al., 2006) and a cross-sectional study of 101 anaesthesiologists in Turkey where 29.7% of the bullied group experienced prolonged sleep problems, compared with 8.9% of the non-bullied group (p>.05) (Aykut et al., 2016).

Headache

Five papers measured headache as an outcome; three found significant associations (Pranjic et al., 2006; Takaki, Taniguchi, & Hirokawa, 2013; Wright & Khatri, 2015) and two did not comment on significance (Vessey et al., 2009; A. Yildirim & Yildirim, 2007). In a cross-
sectional study of 511 physicians, 37% of bullied individuals reported headaches compared with 14% non-bullied, \( \chi^2 \) (unreported, \( p < .001 \)) (Pranjic et al., 2006). A cross-sectional study of 1,642 healthcare workers in Japan found, via a Cox regression analysis adjusting for demographics and depression, that work-related bullying was significantly associated with headache in both men (OR 1.05 (95% CI 1.0, 1.1)) and women (OR 1.03 (95% CI 1.0, 1.1)), but that person-related bullying was only significantly associated with headache in women (OR 1.01 (95% CI 1.0, 1.0)) (Takaki et al., 2013).

**Gastrointestinal Problems, Nausea**

Four papers measured gastrointestinal complaints or nausea; two showing significance (Pranjic et al., 2006; Wright & Khatri, 2015), two not commenting on significance (Vessey et al., 2009; A. Yildirim & Yildirim, 2007). In one study 14% of the non-bullied suffered nausea compared with 26% of the bullied group (\( p < 0.01 \)) (Pranjic et al., 2006). A cross-sectional study of 505 Turkish nurses reported that 52.9% of those bullied had gastrointestinal symptoms (A. Yildirim & Yildirim, 2007). Another cross-sectional investigation of 303 nurses from the USA showed that 72% of bullied individuals had a headache or gastrointestinal complaints, however there was no control group (Vessey et al., 2009).

**Sick Leave**

Sick leave may result from either mental or physical health disorders. Nine papers measured sick leave; seven showed significant associations with bullying (Askew et al., 2012; Aykut et al., 2016; Carter et al., 2013; Ortega, Christensen, Hogh, Rugulies, & Borg, 2011; Pranjic et al., 2006; Suadicani, Olesen, Bonde, & Gyntelberg, 2014; Wright & Khatri, 2015) and two
did not comment on significance (da Silva Joao & Saldanha Portelada, 2016; Shabazz et al., 2016). A cross-sectional study of 534 physicians in Bosnia and Herzegovina found in multivariate analysis that persistent mobbing experience was a significant predictor for taking sick leave in the previous year OR 3.42, (95% CI 3.1, 3.8) (Pranjic et al., 2006). A cross-sectional study of 1,801 healthcare workers in Denmark found that less sick leave was taken by those who were not exposed to bullying in the preceding year OR 0.50, (95% CI 0.3, 0.8) (Suadicani et al., 2014). A longitudinal study of 9,749 eldercare workers in Denmark suggested that the risk of sick leave was higher in both the occasionally bullied group; Relative Risk (RR) 1.40 (95% CI 1.1, 1.7) and the frequently bullied group; RR 2.27, (95% CI 1.6, 3.3) compared with the non-bullied group (Ortega et al., 2011).

DISCUSSION

The findings of this review suggest that up to one in four healthcare professionals perceive regular bullying and that this can have a negative impact on their mental and physical health. Self-reported outcomes included mental health problems, such as depression, burnout and psychological distress, as well as physical health problems such as sleep disturbance, headache and gastrointestinal symptoms. Furthermore, healthcare employees who perceived being bullied took more sick leave.
Comparison Literature

This paper aimed to provide an update on the evidence which has emerged since Moayed’s 2006 review of workplace bullying (Moayed et al., 2006). Unlike Moayed, we focused specifically on the healthcare workplace. Moayed’s results suggested that key risk factors for workplace bullying were the bullied individual’s personality and organizational problems. He also found that bullying was associated with chronic physical and mental ill health, as well as sick leave. The current review has additionally found that perceived bullying amongst healthcare workers is associated with ‘burnout’, ‘psychological distress’, ‘gastrointestinal problems’ and ‘nausea’. In addition, unlike Moayed, we provide weighted prevalence rates of bullying, both broken down by occupation and as an overall estimate.

In 2015 Verkuil et al. published a meta-analysis examining the associations between workplace bullying and mental health in the general working population (Verkuil et al., 2015). Unlike the current review, Verkuil did not focus on a specific workplace. As in our paper, Verkuil’s cross-sectional data showed positive associations between workplace bullying and symptoms of depression $r=.28$ (95% CI 0.2, 0.3), anxiety $r=.34$ (95% CI 0.3, 0.4) and stress-related psychological complaints $r=.37$ (95% CI 0.3, 0.4). The longitudinal studies showed a causal link between workplace bullying and mental health complaints $r=.21$ (95% CI 0.1, 0.2), but also an inverse relationship, with baseline mental health complaints predicting workplace bullying $r=0.18$ (95% CI 0.1, 0.3). This pattern was also noted in longitudinal studies included in our review where mental health problems at baseline predicted bullying at follow-up (Loerbroks et al., 2015; Reknes et al., 2014).
Implications for Practice and Policy

Given the prevalence and associated health consequences of perceived bullying amongst healthcare staff, we suggest that all healthcare organizations should be aware of this topic and put in place appropriate management strategies. Senior managers should consider a range of measures including transparent anti-bullying policies and providing all staff, especially those in supervisory positions, with training on this topic (Salin et al., 2018). Additionally, there should be well-publicized accessible pathways for reporting bullying. Dealing effectively with this issue is necessary both to protect staff and patients.

Whilst there appears to be little evidence to guide employers as to the most evidence-based approached to tackle bullying, it is highly likely that managers in supervisory positions both have a role in minimizing the likelihood that their staff will feel bullied and in ensuring that those staff who do so feel empowered to take action to deal with it. Military health studies have, for instance, identified that immediate supervisors have an important role on protecting their team’s mental health and encouraging them to seek help (Jones, Campion, Keeling, & Greenberg, 2018).

Recommendations for Further Research

This review found that bullying has consequential effects on staff’s functional capacity. It is not clear how bullying affects patient outcomes. Dangers may be posed both by presenteeism with reduced functioning and absenteeism resulting in staff shortages. Further research is required to evaluate of the scale of these effects.

Little research has been done into the most effective treatment for those whose health has already been damaged by workplace bullying and more is required. Investigations should focus on rehabilitative interventions.
Bullying is associated with increased sick leave, which is known to have a significant economic impact on organizations (Henderson, Glozier, & Elliott, 2005; Johnson, Croghan, & Crawford, 2003). Given the current financial issues facing the NHS and other healthcare establishments worldwide, researchers should seek to evaluate the economic cost of workplace bullying.

Two longitudinal studies in this review found that individuals with poor health at baseline were more likely to report bullying at follow-up (Loerbroks et al., 2015; Reknes et al., 2014). We suggest that researchers should explore this interesting causal relationship between ill health and bullying.

Lastly, we consider that there is a pressing need for research on what interventions are effective in reducing bullying in healthcare organizations.

**Limitations**

The present review is subject to limitations. The definition of bullying was not the same across all included papers. Whilst definitions were extracted from each paper (Supplementary material 6) and steps were taken to make the data as comparable as possible, there remains variability that will have an impact on the reported prevalence of bullying. Also, thirty-six of the papers were cross-sectional in design; definite causal inferences can only be drawn from the other nine longitudinally designed papers. Strengths of this review include the broad search strategies employed for five literature databases and quality assessment by two independent reviewers.
CONCLUSION

This systematic review has shown that perceived workplace bullying in healthcare settings is prevalent and associated with negative mental and physical health consequences. Primary prevention of workplace bullying and/or early intervention, should lead to an improvement in the mental and physical health of staff and patients. In addition, a reduction in bullying should lead to cost savings due to a decrease in sick leave and costly events associated with presenteeism such as additional patient care or litigation. However, whilst policy development and education of employees and managers may well help organizations to deal with this issue, there appears to be little high-quality evidence about the best approach to adopt.

Conflict of Interest statement

N/A

Author Contributions:

All authors have agreed on the final version and meet at least one of the following criteria (recommended by the ICMJE*):

1) substantial contributions to conception and design, acquisition of data, or analysis and interpretation of data;

2) drafting the article or revising it critically for important intellectual content.

* http://www.icmje.org/recommendations/
References


This article is protected by copyright. All rights reserved.
doi:10.1080/14719037.2015.1114136

Buckley, T. M., & Schatzberg, A. F. (2005). On the interactions of the hypothalamic-
pituitary-adrenal (HPA) axis and sleep: normal HPA axis activity and circadian
doi:10.1210/jc.2004-1056

Carter, M., Thompson, N., Crampton, P., Morrow, G., Burford, B., Gray, C., & Illing, J.
(2013). Workplace bullying in the UK NHS: A questionnaire and interview study on
prevalence, impact and barriers to reporting. *BMJ Open, 3*(6).
doi:http://dx.doi.org/10.1136/bmjopen-2013-002628

Chrousos, G. P. (2000). The role of stress and the hypothalamic-pituitary-adrenal axis in the
pathogenesis of the metabolic syndrome: neuro-endocrine and target tissue-related

Interpersonal Relationships at the Workplace. *J Interpers Violence*.
doi:10.1177/0886260516662850


Debell, F., Fear, N. T., Head, M., Batt-Rawden, S., Greenberg, N., Wessely, S., & Goodwin,
*Social psychiatry and psychiatric epidemiology, 49*(9), 1401-1425.

on job burnout and turnover intentions. *Work, Employment and Society, 25*(4), 742-
759. doi:http://dx.doi.org/10.1177/0950017011419707

This article is protected by copyright. All rights reserved.


This article is protected by copyright. All rights reserved.


This article is protected by copyright. All rights reserved.


This article is protected by copyright. All rights reserved.


This article is protected by copyright. All rights reserved.


This article is protected by copyright. All rights reserved.
doi:http://dx.doi.org/10.1016/j.ijnurstu.2013.06.017

doi:http://dx.doi.org/10.1111/j.1466-7657.2012.01018.x

doi:http://dx.doi.org/10.1111/ijn.12065


This article is protected by copyright. All rights reserved.
Sorensen, G., Stoddard, A. M., Stoffel, S., Buxton, O., Sembajwe, G., Hashimoto, D., . . .


This article is protected by copyright. All rights reserved.


### Table 1.

**Study characteristics**

<table>
<thead>
<tr>
<th>Authors, year of publication</th>
<th>Study design</th>
<th>Country</th>
<th>Professions investigated</th>
<th>Number of Respondents (Response Rate %)</th>
<th>Prevalence of bullying</th>
<th>Mental health findings (significance or %)*</th>
<th>Physical health findings (significance or %)*</th>
<th>Quality Appraisal</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Allen, Holland, &amp; Reynolds, 2015)</td>
<td>Cross-sectional</td>
<td>Australia</td>
<td>Nurses</td>
<td>762 (NR)</td>
<td>61%</td>
<td>Burnout, S</td>
<td>N/A</td>
<td>Good</td>
</tr>
<tr>
<td>(Askew et al., 2012)</td>
<td>Cross-sectional</td>
<td>Australia</td>
<td>Doctors</td>
<td>747 (1.2)</td>
<td>25%</td>
<td>Mental health, S</td>
<td>Physical health, NS</td>
<td>Fair</td>
</tr>
<tr>
<td>(Aykut et al., 2016)</td>
<td>Cross-sectional</td>
<td>Turkey</td>
<td>Anaesthesiologists</td>
<td>101 (NR)</td>
<td>69.3%</td>
<td>Suicide attempt, NS, Alcohol/substance addiction, NS, Severe depression, NS, Panic attacks, NS</td>
<td>Prolonged sleep problems, NS, Gaining/losing excessive weight, S, Heart attack, NS</td>
<td>Poor</td>
</tr>
<tr>
<td>(Brunetto et al., 2016)</td>
<td>Cross-sectional</td>
<td>Australia, Italy</td>
<td>Nurses</td>
<td>Australia: 760 (32.4), Italy: 827 (54.3)</td>
<td>NR</td>
<td>Psychological wellbeing, S</td>
<td>N/A</td>
<td>Fair</td>
</tr>
<tr>
<td>(Carter et al., 2013)</td>
<td>Cross-sectional</td>
<td>UK</td>
<td>Nurses Midwives Healthcare assistants Dentists</td>
<td>2,975 (46)</td>
<td>19.9% to some degree; 2.7%</td>
<td>Psychological distress, S</td>
<td>N/A</td>
<td>Fair</td>
</tr>
<tr>
<td>Study</td>
<td>Design</td>
<td>Location</td>
<td>Profession</td>
<td>Sample Size</td>
<td>Anxiety</td>
<td>Insomnia</td>
<td>Distress</td>
<td>Psychological Distress</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>-------------------</td>
<td>--------------</td>
<td>--------------------------</td>
<td>-------------</td>
<td>---------</td>
<td>----------</td>
<td>----------</td>
<td>------------------------</td>
</tr>
<tr>
<td>(da Silva Joao &amp; Saldanha, 2016)</td>
<td>Cross-sectional</td>
<td>Portugal</td>
<td>Nurses</td>
<td>1,689 + 1,538 online respondents (36.7)</td>
<td>18.3%</td>
<td>71.5%</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>(Deery, Walsh, &amp; Guest, 2011)</td>
<td>Cross-sectional</td>
<td>UK</td>
<td>Nurses</td>
<td>2,221 (28)</td>
<td>34%</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>(Demir &amp; Rodwell, 2012)</td>
<td>Cross-sectional</td>
<td>Australia</td>
<td>Nurses/Midwives</td>
<td>207 (26.9)</td>
<td>34.3%</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>(Demir, Rodwell, &amp; Flower, 2013)</td>
<td>Cross-sectional</td>
<td>Australia</td>
<td>Allied health professionals</td>
<td>166 (76)</td>
<td>24%</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>(Ekici &amp; Beder, 2014)</td>
<td>Cross-sectional</td>
<td>Turkey</td>
<td>Physicians/Nurses</td>
<td>Physicians: 201 (52) Nurses: 309 (65)</td>
<td>11%</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Authors, year of publication</td>
<td>Study design</td>
<td>Country</td>
<td>Professions investigated</td>
<td>Number of Respondents (Response Rate %)</td>
<td>Prevalence of bullying</td>
<td>Mental health findings (significance or %)*</td>
<td>Physical health findings (significance or %)*</td>
<td>Quality Appraisal</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>-------------</td>
<td>---------</td>
<td>-------------------------</td>
<td>----------------------------------------</td>
<td>----------------------</td>
<td>----------------------------------------</td>
<td>------------------------------------------</td>
<td>------------------</td>
</tr>
<tr>
<td>(Eriksen, Tambs, &amp; Knardahl, 2006)</td>
<td>Two-wave longitudinal cohort</td>
<td>Norway</td>
<td>Nurses’ aides</td>
<td>T1: 5,076 (62.3) T2: 4,076 (80.3)</td>
<td>3.9%</td>
<td>Psychological distress, NS</td>
<td>N/A</td>
<td>Good</td>
</tr>
<tr>
<td>(Farley, Coyne, Sprigg, Axtell, &amp; Subramanian, 2015)</td>
<td>Cross-sectional</td>
<td>UK</td>
<td>Doctors</td>
<td>158 (7.9)</td>
<td>46.2%</td>
<td>Mental strain, S</td>
<td>N/A</td>
<td>Fair</td>
</tr>
<tr>
<td>(Hogh, Hoel, &amp; Carneiro, 2011)</td>
<td>Three-wave longitudinal cohort</td>
<td>Denmark</td>
<td>Healthcare workers, comprising healthcare helpers and healthcare assistants</td>
<td>T1: 5,696 (89.5) T2: 3,708 (65) T3: 2,154 (55)</td>
<td>9.2%</td>
<td>Mental health, S</td>
<td>Somatic symptoms, S</td>
<td>Good</td>
</tr>
<tr>
<td>(H. K. Laschinger, Grau, Finegan, &amp; Wilk, 2010)</td>
<td>Cross-sectional</td>
<td>Canada</td>
<td>Nurses</td>
<td>415 (39)</td>
<td>33%</td>
<td>Burnout, S</td>
<td>N/A</td>
<td>Fair</td>
</tr>
<tr>
<td>(H. K. S. Laschinger, Grau, Finegan, &amp; Wilk, 2012)</td>
<td>Cross-sectional</td>
<td>Canada</td>
<td>Nurses</td>
<td>420 (30)</td>
<td>NR</td>
<td>Burnout, S</td>
<td>Mental health, S</td>
<td>N/A</td>
</tr>
<tr>
<td>(H. K. Laschinger, Wong, &amp; Grau, 2012)</td>
<td>Cross-sectional</td>
<td>Canada</td>
<td>New graduate nurses</td>
<td>342 (38)</td>
<td>29.2%</td>
<td>Burnout, S</td>
<td>N/A</td>
<td>Fair</td>
</tr>
<tr>
<td>(H. K. Laschinger &amp; Two-wave longitudinal</td>
<td>Canada</td>
<td>Nurses</td>
<td>T1: 342 (37.7) T2: 205 (59.9)</td>
<td>NR</td>
<td>Burnout, S</td>
<td>N/A</td>
<td>Good</td>
<td></td>
</tr>
<tr>
<td>Study</td>
<td>Design</td>
<td>Country</td>
<td>Setting</td>
<td>Sample Size</td>
<td>Prevalence</td>
<td>Symptoms</td>
<td>Quality</td>
<td></td>
</tr>
<tr>
<td>--------------------------------</td>
<td>-------------------</td>
<td>---------</td>
<td>--------------------------</td>
<td>-------------</td>
<td>-------------</td>
<td>---------------------------</td>
<td>---------</td>
<td></td>
</tr>
<tr>
<td>Fida, 2014</td>
<td>Cohort</td>
<td>Canada</td>
<td>Nurses</td>
<td>875 (NR)</td>
<td>NR</td>
<td>PTSD, S</td>
<td>Good</td>
<td></td>
</tr>
<tr>
<td>H. K. S. Laschinger &amp; Nosko, 2015</td>
<td>Cross-sectional</td>
<td>Germany</td>
<td>Junior hospital physicians</td>
<td>T1: 621 (62.1) T3: 507 (82)</td>
<td>T1 12.9% T2 14.9% T3 15.9%</td>
<td>Depression, S</td>
<td>N/A</td>
<td>Good</td>
</tr>
<tr>
<td>Loerbroks et al., 2015</td>
<td>Cross-sectional</td>
<td>USA</td>
<td>Nurses</td>
<td>579 (64)</td>
<td>NR</td>
<td>Depression, S Physical symptoms, S</td>
<td>Fair</td>
<td></td>
</tr>
<tr>
<td>(Nixon &amp; Spector, 2015)</td>
<td>Cross-sectional</td>
<td>USA</td>
<td>Nurses</td>
<td>579 (64)</td>
<td>NR</td>
<td>Depression, S Physical symptoms, S</td>
<td>Fair</td>
<td></td>
</tr>
<tr>
<td>Ortega, Christensen, Hogh, Rugulies, &amp; Borg, 2011</td>
<td>Longitudinal cohort</td>
<td>Denmark</td>
<td>Elderly-care workers</td>
<td>9,749 (78.1)</td>
<td>1.8% frequently bullied 7.3% occasionally bullied</td>
<td>N/A</td>
<td>N/A</td>
<td>Fair</td>
</tr>
<tr>
<td>Pranjic, Males-Bilic, Beganic, &amp; Mustajbegovic, 2006</td>
<td>Cross-sectional</td>
<td>Bosnia &amp; Herzegovina</td>
<td>Physicians</td>
<td>511 (76)</td>
<td>76% mobbing 26% persistent mobbing</td>
<td>Anxiety, S Depression, NS Nausea, S Palpitation/sweating, S Headache, S Insomnia, NS</td>
<td>Fair</td>
<td></td>
</tr>
<tr>
<td>Qian, Han, Wang, &amp; Wang, 2015</td>
<td>Cross-sectional</td>
<td>China</td>
<td>Nurses</td>
<td>227 (64.1)</td>
<td>NR</td>
<td>Mental health, S</td>
<td>N/A</td>
<td>Fair</td>
</tr>
</tbody>
</table>

This article is protected by copyright. All rights reserved.
<table>
<thead>
<tr>
<th>Authors, year of publication</th>
<th>Study design</th>
<th>Country</th>
<th>Professions investigated</th>
<th>Number of Respondents (Response Rate %)</th>
<th>Prevalence of bullying</th>
<th>Mental health findings (significance or %)*</th>
<th>Physical health findings (significance or %)*</th>
<th>Quality Appraisal</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Read &amp; Laschinger, 2013)</td>
<td>Cross-sectional</td>
<td>Canada</td>
<td>Nurses</td>
<td>342 (48)</td>
<td>NR</td>
<td>Mental health, S</td>
<td>Physical health, S</td>
<td>Fair</td>
</tr>
<tr>
<td>(Reknes et al., 2014)</td>
<td>Two-wave longitudinal cohort</td>
<td>Norway</td>
<td>Nurses</td>
<td>T1: 2,059 (38.1) T2: 1,582 (76.8)</td>
<td>NR</td>
<td>Anxiety, S</td>
<td>Fatigue, S</td>
<td>Good</td>
</tr>
<tr>
<td>(Rodwell &amp; Demir, 2012)</td>
<td>Cross-sectional</td>
<td>Australia</td>
<td>Hospital nurses and midwives: Aged care nurses and midwives</td>
<td>233 (29.1) Aged care nurses: 208 (43.8)</td>
<td>Hospital nurses and midwives: 37.3% Aged care nurses and midwives: 35.6%</td>
<td>Depression, S Psychological distress, S</td>
<td>N/A</td>
<td>Fair</td>
</tr>
<tr>
<td>(Rodwell, Demir, &amp; Steane, 2013)</td>
<td>Cross-sectional</td>
<td>Australia</td>
<td>Hospital nurses and midwives: Aged care nurses and midwives</td>
<td>267 (23.1) Aged care nurses: 168 (29.8)</td>
<td>Hospital nurses and midwives: 34.8% Aged care nurses and midwives: 35.5%</td>
<td>Psychological distress, S</td>
<td>N/A</td>
<td>Fair</td>
</tr>
<tr>
<td>(Rugulies et al., 2012)</td>
<td>Two-wave longitudinal cohort</td>
<td>Denmark</td>
<td>Eldercare workers</td>
<td>T1: 9,949 (78.1) T2: 5,701 (63.4)</td>
<td>10% occasional bullying 1.9% frequent bullying</td>
<td>Major depressive episode, S</td>
<td>N/A</td>
<td>Good</td>
</tr>
</tbody>
</table>

This article is protected by copyright. All rights reserved.
<table>
<thead>
<tr>
<th>Study</th>
<th>Design</th>
<th>Country</th>
<th>Group</th>
<th>Sample Size</th>
<th>Prevalence</th>
<th>Outcomes</th>
<th>Methodology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sá &amp; Fleming, 2008</td>
<td>Cross-sectional</td>
<td>Portugal</td>
<td>Nurses</td>
<td>107 (71)</td>
<td>13%</td>
<td>Burnout, S Mental health, S Anxiety, NS Severe depression, S Somatic symptoms, S</td>
<td>Fair</td>
</tr>
<tr>
<td>Sansone, Sansone, &amp; Wiedereman, 2007</td>
<td>Cross-sectional</td>
<td>USA</td>
<td>Physicians in primary care</td>
<td>61 (54)</td>
<td>NR</td>
<td>PTSD, significance</td>
<td>N/A</td>
</tr>
<tr>
<td>Shabazz, Parry-Smith, Oates, Henderson, &amp; Mountfield, 2016</td>
<td>Cross-sectional</td>
<td>UK</td>
<td>Obstetrics and gynaecology consultants</td>
<td>664 (28)</td>
<td>44%</td>
<td>Major outcomes including suicide, depression 22% Moderate outcomes including significant sleep disturbance 44%</td>
<td>Poor</td>
</tr>
<tr>
<td>Sorensen et al., 2011</td>
<td>Cross-sectional</td>
<td>USA</td>
<td>Staff nurses Patient care associates Other</td>
<td>1,572 (79)</td>
<td>NR</td>
<td>N/A</td>
<td>Low back pain, S Sleep deficiency, S</td>
</tr>
<tr>
<td>Sterud, Hem, Lau, &amp; Ekeberg, 2008</td>
<td>Cross-sectional</td>
<td>Norway</td>
<td>Ambulance personnel</td>
<td>1,286 (41)</td>
<td>27.2%</td>
<td>Suicidal ideation, S</td>
<td>N/A</td>
</tr>
<tr>
<td>Authors, year of publication</td>
<td>Study design</td>
<td>Country</td>
<td>Professions investigated</td>
<td>Number of Respondents (Response Rate %)</td>
<td>Prevalence of bullying</td>
<td>Mental health findings (significance or %)*</td>
<td>Physical health findings (significance or %)*</td>
</tr>
<tr>
<td>------------------------------</td>
<td>-------------</td>
<td>---------</td>
<td>--------------------------</td>
<td>----------------------------------------</td>
<td>-----------------------</td>
<td>------------------------------------------</td>
<td>---------------------------------------------</td>
</tr>
<tr>
<td>(Suadicani, Olesen, Bonde, &amp; Gyntelberg, 2014)</td>
<td>Cross-sectional</td>
<td>Denmark</td>
<td>Physicians Administrative personnel Nurses Nurses’ aides Therapists and technicians Craftsmen and unskilled workers</td>
<td>1,801 (65)</td>
<td>7.6%</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>(Takaki, Taniguchi, &amp; Hirokawa, 2013)</td>
<td>Cross-sectional</td>
<td>Japan</td>
<td>Professional caregivers Nurses Clerks Nutritionists Others</td>
<td>1,642 (85)</td>
<td>NR</td>
<td>N/A</td>
<td>Headache, S Lumbago, S Joint pain, S</td>
</tr>
<tr>
<td>(Taniguchi, Takaki, Hirokawa, Fujii, &amp; Harano, 2016)</td>
<td>Two-wave longitudinal cohort</td>
<td>Japan</td>
<td>Eldercare workers</td>
<td>T1: 1,642 (85) T2: 543 (80)</td>
<td>NR</td>
<td>Psychological stress, S</td>
<td>Physical stress, S</td>
</tr>
<tr>
<td>(Trepanier, Fernet, &amp; Austin, 2013a)</td>
<td>Cross-sectional</td>
<td>Canada</td>
<td>Nurses</td>
<td>1,179 (23)</td>
<td>NR</td>
<td>Burnout, S</td>
<td>N/A</td>
</tr>
<tr>
<td>(Trepanier, Fernet, &amp; Austin, 2013b)</td>
<td>Cross-sectional</td>
<td>Canada</td>
<td>Nurses</td>
<td>1,179 (23)</td>
<td>20.4%</td>
<td>Psychological distress, S</td>
<td>N/A</td>
</tr>
<tr>
<td>(Trepanier, Fernet, &amp; Austin, 2015)</td>
<td>Two-wave longitudinal cohort</td>
<td>Canada</td>
<td>Nurses</td>
<td>T1: 699 (52.83) T2: 508 (72.68)</td>
<td>NR</td>
<td>Burnout, S</td>
<td>N/A</td>
</tr>
<tr>
<td>Study Reference</td>
<td>Design</td>
<td>Country</td>
<td>Setting</td>
<td>Sample Size</td>
<td>Anxiety</td>
<td>Depression</td>
<td>GI Symptoms</td>
</tr>
<tr>
<td>-----------------</td>
<td>--------</td>
<td>---------</td>
<td>---------</td>
<td>-------------</td>
<td>---------</td>
<td>------------</td>
<td>-------------</td>
</tr>
<tr>
<td>Vessey et al. (2009)</td>
<td>Cross-sectional</td>
<td>USA</td>
<td>Nurses</td>
<td>303 (NR)</td>
<td>Anxiety: 95%</td>
<td>Depression: 56%</td>
<td>GI symptoms: 72%</td>
</tr>
<tr>
<td>Wall et al. (2014)</td>
<td>Cross-sectional</td>
<td>Italy, Sweden</td>
<td>Surgeons</td>
<td>Italy: 149 (41.3) Sweden: 272 (59.8)</td>
<td>Anxiety: 30.2%</td>
<td>Depression: 56%</td>
<td>GI symptoms: 72%</td>
</tr>
<tr>
<td>Wing et al. (2015)</td>
<td>Cross-sectional</td>
<td>Canada</td>
<td>Nurses</td>
<td>394 (39)</td>
<td>Anxiety: 30.2%</td>
<td>Depression: 56%</td>
<td>GI symptoms: 72%</td>
</tr>
<tr>
<td>Wright &amp; Khatri (2015)</td>
<td>Cross-sectional</td>
<td>USA</td>
<td>Nurses</td>
<td>241 (23)</td>
<td>Anxiety: 30.2%</td>
<td>Depression: 56%</td>
<td>GI symptoms: 72%</td>
</tr>
<tr>
<td>A. Yildirim &amp; Yildirim (2007)</td>
<td>Cross-sectional</td>
<td>Turkey</td>
<td>Nurses</td>
<td>505 (71)</td>
<td>Anxiety: 30.2%</td>
<td>Depression: 56%</td>
<td>GI symptoms: 72%</td>
</tr>
<tr>
<td>D. Yildirim (2009)</td>
<td>Cross-sectional</td>
<td>Turkey</td>
<td>Nurses</td>
<td>286 (58)</td>
<td>Anxiety: 30.2%</td>
<td>Depression: 56%</td>
<td>GI symptoms: 72%</td>
</tr>
</tbody>
</table>

This article is protected by copyright. All rights reserved.
Figure 1.
Flowchart of Systematic Selection of Studies

Identification of papers via database searches (N=8862)

Duplicates excluded (N=628)

Titles and abstracts screened (N=8234)

Exclusions based on title and abstract (N=7976)

Full-text papers assessed for eligibility (N=258)

Exclusions on full-text assessment (N=217)
- Not healthcare setting (N=151)
- Non-bullying (N=27)
- Inadequate health outcomes (N=18)
- No access (N=11)
- Inappropriate format (N=8)
- Non-English language (N=1)
- Other (N=1)

Papers selected (N=41)

Screening bibliographies of selected papers (N=4)

Final papers included (N=45)
Figure 2

Forest Plot of Studies Reporting Prevalence of Bullying

<table>
<thead>
<tr>
<th>Reference</th>
<th>Location</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Al-hak, C. et al, 2016</td>
<td>Asia</td>
<td>101</td>
</tr>
<tr>
<td>Elver, C. et al, 2012</td>
<td>Asia</td>
<td>613</td>
</tr>
<tr>
<td>Vikman, B. et al, 2001</td>
<td>Asia</td>
<td>655</td>
</tr>
<tr>
<td>Winkin, C. et al, 2009</td>
<td>Asia</td>
<td>289</td>
</tr>
<tr>
<td>Almén, B. C. et al, 2015</td>
<td>Austria</td>
<td>792</td>
</tr>
<tr>
<td>Lam, C. J. et al, 2012</td>
<td>Australia</td>
<td>747</td>
</tr>
<tr>
<td>Chen, Y. et al, 2012</td>
<td>Australia</td>
<td>207</td>
</tr>
<tr>
<td>Chen, Y. et al, 2013</td>
<td>Australia</td>
<td>150</td>
</tr>
<tr>
<td>Polder, J. et al, 2012</td>
<td>Australia</td>
<td>491</td>
</tr>
<tr>
<td>Polder, J. et al, 2013</td>
<td>Australia</td>
<td>420</td>
</tr>
<tr>
<td>Center, K. et al, 2013</td>
<td>Denmark</td>
<td>2910</td>
</tr>
<tr>
<td>Dara, M. &amp; al, 2014</td>
<td>Malaysia</td>
<td>3227</td>
</tr>
<tr>
<td>Dara, M. et al, 2011</td>
<td>Malaysia</td>
<td>3331</td>
</tr>
<tr>
<td>Ehren, V. et al, 2006</td>
<td>Denmark</td>
<td>4316</td>
</tr>
<tr>
<td>Farrow, S. et al, 2012</td>
<td>Denmark</td>
<td>660</td>
</tr>
<tr>
<td>Haddad, S. et al, 2011</td>
<td>Denmark</td>
<td>3154</td>
</tr>
<tr>
<td>Lam, S. et al, 2014 (TF)</td>
<td>Singapore</td>
<td>809</td>
</tr>
<tr>
<td>Cardoni, M. et al, 2017 (T2)</td>
<td>Singapore</td>
<td>8476</td>
</tr>
<tr>
<td>Wang, H. et al, 2005 (morning)</td>
<td>Singapore</td>
<td>530</td>
</tr>
<tr>
<td>Phoo, R., et al, 2012</td>
<td>Singapore</td>
<td>147</td>
</tr>
<tr>
<td>Wei, L. et al, 2014</td>
<td>Singapore</td>
<td>466</td>
</tr>
<tr>
<td>Wasil, T. et al, 2009</td>
<td>Singapore</td>
<td>1286</td>
</tr>
<tr>
<td>Sawidis, I. et al, 2014</td>
<td>Singapore</td>
<td>1821</td>
</tr>
<tr>
<td>Veal, M. et al, 2014</td>
<td>Singapore</td>
<td>1187</td>
</tr>
<tr>
<td>Treasure, G.G et al, 2013</td>
<td>North America</td>
<td>1179</td>
</tr>
</tbody>
</table>

[-] Confidence Intervals  ♦ Estimated  ♦ Overall Pooled Estimate
Blue: “good” quality appraisal  Green: “fair” quality appraisal  Red: “poor” quality appraisal

This article is protected by copyright. All rights reserved.