



Citation analysis of workplace violence: A review of the top 50 annual and lifetime cited articles☆



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ABSTRACT

Objective: The purpose of the study was to review the most influential articles on the topic of workplace violence, while using the amount of accumulated citations as an outcome measure.

Methods: Hazring's Publish or Perish non-proprietary software was used to perform this bibliometric analysis. Two raters evaluated the top 50 annual and lifetime cited articles in the field. Inter-rater agreement was evaluated using Cohen's kappa.

Results: The mean of the top 50 cited articles on workplace violence accumulated a lifetime total of 137.7 ± 135.8 citations. The absolute number of citations of papers accumulated since publication ranged from 12 to 683, with an average of 117.1 ± 128.9 lifetime citations. In total, we report the prevalence of nine major categories that are found to comprise the main focus of both citation cohorts. A detailed discussion of the category-specific findings follows.

Discussion: We have identified the top 50 most highly cited papers in workplace violence, as well as the 50 papers that have accumulated the highest citation rates. The publications highlighted in this paper present currently discussed and the most influential contributions on the topic of workplace violence.

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1. Introduction

Workplace violence is an occupational hazard in numerous sectors including healthcare (CDC Workplace Safety and Health, 2002), education (Robers, Zhang, & Truman, 2010; Tiesman, Konda, Hendricks, Mercer, & Amandus, 2013), and corrections (Cashmore, Indig, Hampton, Hegney, & Jalaludin, 2015). The most extreme acts of workplace violence (e.g., violence, other injuries by persons or animals) accounted for 16% of fatal occupational accidents in 2013 (Bureau of Labor Statistics, 2015). It emphasizes psychological aggression such as harassment, verbal abuse, threats, and bullying to name a few (Kelloway, Barling, & Hurrell, 2006).

To improve workplace safety, efforts have been made to identify predictors of violence, develop preventative interventions and understand the health and social consequences associated with workplace violence (Budd, Arvey, & Lawless, 1996; Di Martino, Hoel, & Cooper, 2003). Aggressive acts are more prevalent in occupations where workers have unavoidable direct contact with people in distress as part of their jobs, which suggests that occupations in healthcare sectors are exposed targets (Chen, Ku, & Yang, 2013). For instance, in the health sector, more than 50% of workers have encountered some form of violence (Merecz, Rymaszewska, Mościcka, Kiejna, & Jarosz-Nowak, 2006) with rates being up to 70–80% for paramedics, nurses and doctors (Di Martino et al., 2003).

When comparing different areas of research within workplace violence, the extent of investigation is inconsistent. Some areas of research in workplace violence may be more developed compared to others, effectively creating gaps in the research. As a result, intervention programs developed based on the current research may not be well informed. It is important to examine current literature on workplace violence in order to identify these possible gaps. This may then direct future research, allowing for a more comprehensive understanding of these areas of workplace violence, and, in turn, workplace violence as a whole. An empirical method by which the level of development in an area of literature can be determined is to measure the number of

citations in that area (Ibrahim, Carter Snead, Rutka, & Lozano, 2012; Meho, 2006).

One measure of the scientific contribution of a published work is the frequency that it has been cited by other publications (Ibrahim et al., 2012). Citation analysis permits for evaluation of directionality and trends in scientific articles of the particular topic (Lipsman, Woodside, & Lozano, 2014) by examining articles citation rates. They also offer insight into highly active areas of research within the discipline (Ibrahim et al., 2012). We believe it is beneficial to perform a citation analysis on the growing field workplace violence to be able to identify gaps in research and provide an overview of the types of studies being reported.

The primary objective for the review was to identify 50 top-cited peer-reviewed papers and reasonably analyze the focus of workplace violence by comparing the 50 articles that have accumulated the highest annual citation rates. The publications reviewed highlight the current most influential work in the field of workplace violence, underlining the studies that may be shaping its directionality and trends.

2. Methods

Hazring's Publish or Perish non-proprietary software was used to perform this bibliometric analysis (Harzing, 2007). This software in an internet-based search engine that collects raw citation data without time restriction through Google Scholar allowing users to perform a literature search and compute various citation metrics on up to 1000 articles retrieved based on a comprehensive set of search terms. Our citation metrics are accurate to June 30, 2015.

Our search was specific to workplace violence. We performed our search with the inclusion of only one search term field using the keywords "workplace violence, occupational violence" to identify publications specific. Articles were retrieved using Harzing's Publish or Perish (Harzing, 2007) if they included all of the words of our search term in the title words only. The full list of articles generated by Harzing's Publish or Perish (Harzing, 2007) was sorted by total

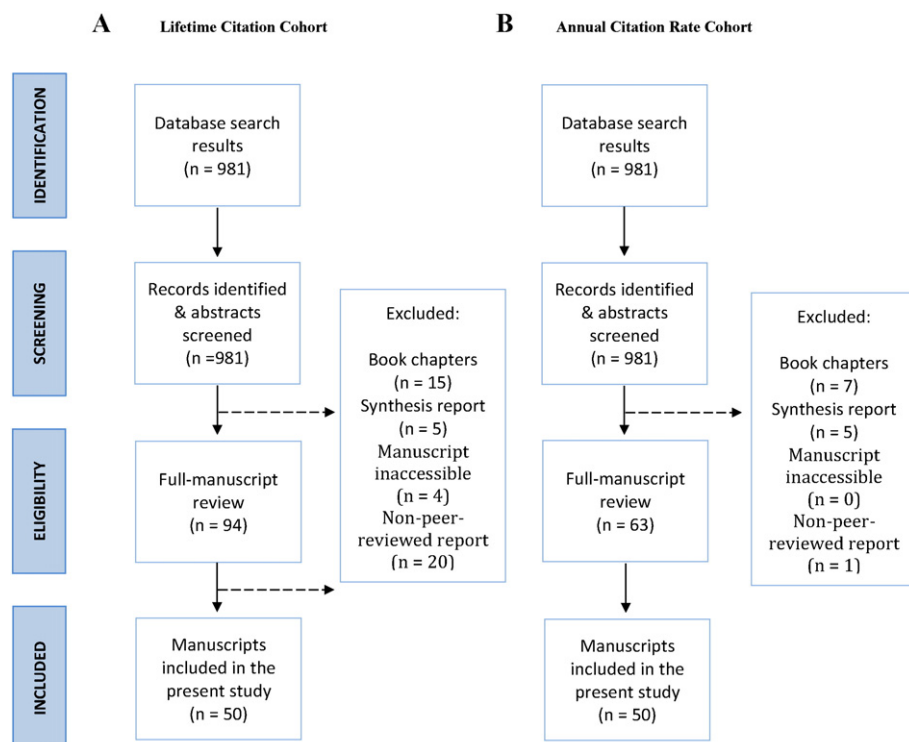


Fig. 1. Flow diagram representing the study selection process for the (A) lifetime cohort and (B) annual citation rate cohort.

Table 1
Workplace violence publications with the most lifetime citations ($n = 50$).

Rank	First author	Study title	Year of publication	Number of citations	Annual citation rate (citations/year)	Topic/focus
1	Baron, RA	Workplace violence and workplace aggression: evidence on their relative frequency and potential causes	1996	683	31.0	Predictor of outcome
2	Neuman, JH	Workplace violence and workplace aggression: evidence concerning specific forms, potential causes, and preferred targets	1998	665	36.9	Theoretical framework
3	Fitzgerald, LF	Sexual harassment: violence against women in the workplace	1993	360	16.4	Predictor of outcome
4	Jackson, D	Who would want to be a nurse? Violence in the workplace – a factor in recruitment and retention	2002	353	27.2	Predictor of outcome
5	LeBlanc, MM	Predictors and outcomes of workplace violence and aggression	2002	336	25.8	Predictor of outcome
6	Baron, RA	Workplace aggression – the iceberg beneath the tip of workplace violence: evidence on its forms, frequency, and targets	1998	242	14.2	Predictor of outcome
7	Schat, ACH	Reducing the adverse consequences of workplace aggression and violence: the buffering effects of organizational support	2003	224	18.7	Predictor of outcome
8	Sofield, L	Workplace violence: a focus on verbal abuse and intent to leave the organization	2003	204	17.0	Predictor of outcome
9	Barling, J	Behind closed doors: in-home workers' experience of sexual harassment and workplace violence	2001	201	14.4	Predictor of outcome
10	Hesketh, KL	Workplace violence in Alberta and British Columbia hospitals	2003	195	16.2	Predictor of outcome
11	Schat, ACH	Effects of perceived control on the outcomes of workplace aggression and violence	2000	183	12.2	Predictor of outcome
12	Kwok, RPW	Prevalence of workplace violence against nurses in Hong Kong	2006	157	17.4	Epidemiology
13	Barling, J	Predicting workplace aggression and violence	2009	150	25.0	Predictor of outcome
14	Kowalenko, T	Workplace violence: a survey of emergency physicians in the state of Michigan	2005	146	15.6	Epidemiology
15	Dietz, J	The impact of community violence and an organization's procedural justice climate on workplace aggression	2003	138	11.5	Epidemiology
16	Beech, B	Workplace violence in the health care sector: a review of staff training and integration of training evaluation models	2006	132	14.7	Intervention/management
17	Hegney, D	Workplace violence in nursing in Queensland, Australia: a self-reported study	2003	130	10.8	Epidemiology
18	McPhaul, KM	Workplace violence in health care: recognized but not regulated	2004	123	11.2	Prevention/intervention
19	Lin, YH	The impact of workplace violence on nurses in South Taiwan	2005	114	11.4	Predictor of outcome
20	Hegney, D	Workplace violence in Queensland, Australia: the results of a comparative study	2006	114	12.7	Predictor of outcome
21	Budd, JW	Correlates and consequences of workplace violence	1996	113	6.0	Predictor of outcome
22	Flannery, RB	Violence in the workplace, 1970–1995: a review of the literature	1996	107	5.6	Intervention/descriptive
23	Kamchuchat, C	Workplace violence directed at nursing staff at a general hospital in southern Thailand	2008	103	14.7	Predictor of outcome
24	Anderson, C	Workplace violence: are some nurses more vulnerable?	2002	95	7.3	Predictor of outcome
25	Swanberg, JE	Intimate partner violence, employment, and the workplace consequences and future directions	2005	94	9.4	Predictor of outcome
26	Chen, WC	Prevalence and determinants of workplace violence of health care workers in a psychiatric hospital in Taiwan	2008	93	13.3	Epidemiology
27	Warshaw, LJ	Workplace violence: preventive and interventive strategies	1996	85	4.5	Prevention/intervention
28	Cole, LL	Psychosocial correlates of harassment, threats and fear of violence in the workplace	1997	84	4.7	Predictor of outcome
29	Merecz, D	Violence at the workplace – a questionnaire survey of nurses	2006	80	8.9	Predictor of outcome
30	Mayhew, C	Workplace violence: an overview of patterns of risk and the emotional/stress consequences on targets	2007	77	9.6	Epidemiology
31	Catlette, M	A descriptive study of the perceptions of workplace violence and safety strategies of nurses working in level I trauma centers	2005	75	7.5	Descriptive
32	Runyan, CW	Administrative and behavioral interventions for workplace violence prevention	2000	70	4.7	Intervention/characterization
33	Johnson, PR	Workplace violence: an issue of the nineties	1994	63	3.0	Predictor of outcome
34	Boyle, M	A pilot study of workplace violence towards paramedics	2007	63	7.9	Epidemiology
35	Pai, HC	Risk factors for workplace violence in clinical registered nurses in Taiwan	2011	61	15.2	Predictor of outcome
36	Spector, PE	Perceived violence climate: a new construct and its relationship to workplace physical violence and verbal aggression, and their potential consequences	2007	59	7.4	Predictor of outcome
37	Kansagra, SM	A survey of workplace violence across 65 US emergency departments	2008	58	8.3	Predictor of outcome
38	AbuAlRub, RF	Workplace violence among Iraqi hospital nurses	2007	55	6.9	Predictor of outcome
39	Taylor, JL	A systematic review of the literature: workplace violence in the emergency department	2011	54	13.5	Intervention/characterization
40	Magnavita, N	Workplace violence against nursing students and nurses: an Italian experience	2011	52	13.0	Predictor of outcome
41	Fisher, BS	Violence in the workplace: gender similarities and differences	2001	52	3.7	Predictor of outcome
42	Hegney, D	Workplace violence: differences in perceptions of nursing work between those exposed and those not exposed: a cross-sector analysis	2010	52	10.4	Predictor of outcome

(continued on next page)

Table 1 (continued)

Rank	First author	Study title	Year of publication	Number of citations	Annual citation rate (citations/year)	Topic/focus
43	Clements, PT	Workplace violence and corporate policy for health care settings	2005	51	5.1	Intervention/management
44	Hinchberger, PA	Violence against female student nurses in the workplace	2009	51	8.5	Predictor of outcome
45	Laschinger, HKS	The influence of personal dispositional factors and organizational resources on workplace violence, burnout, and health outcomes in new graduate nurses: a cross-sectional study	2012	51	17.0	Model
46	Antai-Otong, D	Critical incident stress debriefing: a health promotion model for workplace violence	2001	48	3.4	Model
47	Boyd, N	Violence in the workplace in British Columbia: a preliminary investigation	1995	48	2.4	Intervention/management
48	Tobin, TJ	Organizational determinants of violence in the workplace	2001	48	3.4	Model
49	Wassell, JT	Workplace violence intervention effectiveness: a systematic literature review	2009	47	7.8	Prevention/characterization
50	Smith-Pittman, MH	Workplace violence in healthcare environments	1999	46	2.9	
		Intervention/descriptive				

number of citations. Two-independent raters reviewed the top 50 cited articles that met the inclusion criteria of the study. The studies were also filtered by annual citations per year to identify the top 50 workplace violence articles with the highest annual citation rates. We did not place any limitations to our search results by date of publication. This review includes both qualitative and quantitative research as well as theoretical/model/framework articles. An article was excluded if it was a book, book chapter, conference-proceeding or literature review (Fig. 1). The authors categorized each article based on topic of study and study design. Collectively, nine categories emerged: predictors of outcome, theoretical framework, epidemiology, prevention, intervention, management, model, characterization and descriptive.

Inter-rater agreement was evaluated using Cohen's kappa. All of the data were entered and coded by the first rater in an electronic database. A second rater was provided a random sample of 25% of the first rater's data. The second rater coded the answers independently of the first rater. Inter-observer agreement was achieved for both groups (total cites and annual citation rate) ($n = 100$). The identical process was conducted by the second rater. Cohen's kappa was situated between 0.93–0.96, indicating a close agreement between both observers for both groups (lifetime citations and annual citation rates).

3. Results

The results are reported for both total lifetime citations and annual citation rate for articles on workplace violence. The mean of the top 50 cited articles on workplace violence accumulated a lifetime total of 137.7 ± 135.8 citations (range: 46–683). The mean citation rate of these articles was 1.9 ± 7.5 citations per year, with a range between 2.4 and 36.9. In the second group (annual citation rate), the mean was 12.8 ± 6.7 citations per year (range: 36.9–6.2). Results of both groups are provided in Tables 1 and 2. The characteristics of the articles as found in Table 3.

The absolute number of citations of papers accumulated since publication ranged from 12 to 683 with an average of 117.1 ± 128.9 lifetime citations. Over three quarters (38/50, 76.0%) of the publication with the highest annual citation rates were common to the 50-workplace violence papers with the most lifetime citations. In total, we report the prevalence of nine major categories that are found to comprise the main focus of both citation cohorts. A detailed discussion of the category-specific findings follows.

3.1. Predictor of outcome studies

The study topic within the scope of workplace violence that has received the most attention is predictors of outcome studies accounting

for over half (28/50, 56.0%) of the 50 top-cited articles. The most frequently used study design in predictors of outcome studies were cross-sectional questionnaires (18/28, 60.7%) followed by systematic literature reviews (6/28, 21.4%). The sampling population was aimed at healthcare professionals (18/28, 64.3%) with an emphasis on nurses (13/28, 46.4%). There were also two studies (2/28, 7.1%) that exclusively involved female participants. The latter study was specific to non-fatal workplace incidences accounting for twenty-six articles (26/28, 92.8%). Within the extent of non-fatal workplace occurrences, five (5/28, 27.8%) articles examined direct, overt aggression alone whereas the majority of the remainders (20/28, 71.4%) were comprehensive in the degree of non-lethal workplace incidences. Of these articles, five (5/28, 27.8%) were products of international collaboration.

Comparatively, of the 50 articles with the highest annual citation rates, exactly half (25/50, 50.0%) investigated predictors of outcome. Almost all (24/25, 96.0%) of these studies were common to the 50 top-cited articles in workplace violence. When compared to the cohort of predictor studies with the most lifetime citations, a similar proportion of these articles were cross-sectional questionnaires (16/25, 64.0%) followed by six (6/25, 24.0%) systematic literature reviews. There were two (2/25, 8.0%) studies that focused on the female working population which were also common in the most lifetime citation cohort, five studies (5/25, 20.0%) were distributed throughout all occupations, and the remainder of the papers focused on the healthcare sector (18/25, 68.0%). Similar to the cohort of papers with the most lifetime citations, the bulk of the publications were specific to non-lethal forms of workplace violence (24/25, 96.0%).

3.2. Descriptive studies

One of the 50 highly cited publications performed a descriptive study approach. This study was also used in the citation rate cohort. A retrospective questionnaire method was directed towards nurses encountering both overt and covert forms of non-lethal workplace violence.

3.3. Epidemiology studies

Of the 50 most frequently cited articles in workplace violence, there were a total of seven (7/50, 14.0%) epidemiological studies. The most common study design among these publications was a cross-sectional questionnaire (5/7, 71.4%). Epidemiological studies were mostly conducted in healthcare sectors with a total of five (5/7, 71.4%) articles that exclusively used healthcare professionals as the sample participants, in particularly nurses (3/6, 50.0%). More than half (4/7, 57.1%)

Table 2
Workplace violence publications with highest annual citation rates ($n = 50$).

Rank	First author	Study title	Year of publication	Number of citations	Annual citation rate (citations/year)	Topic/focus
1	Neuman, JH	Workplace violence and workplace aggression: evidence concerning specific forms, potential causes, and preferred targets	1998	665	36.94	Theoretical framework
2	Baron, RA	Workplace violence and workplace aggression: evidence on their relative frequency and potential causes	1996	683	31.04	Predictor of outcome
3	Jackson D	Who would want to be a nurse? Violence in the workplace – a factor in recruitment and retention	2002	353	27.15	Predictor of outcome
4	LeBlanc, MM	Predictors and outcomes of workplace violence and aggression	2002	336	25.84	Predictor of outcome
5	Barling, J	Predicting workplace aggression and violence	2009	150	25	Predictor of outcome
6	Schat, ACH	Reducing the adverse consequences of workplace aggression and violence: the buffering effects of organizational support	2003	224	18.67	Predictor of outcome
7	Kwok, RPW	Prevalence of workplace violence against nurses in Hong Kong	2006	157	17.44	Epidemiology
8	Solfield, L	Workplace violence: a focus on verbal abuse and intent to leave the organization	2003	204	17	Predictor of outcome
9	Laschinger, HKS	The influence of personal dispositional factors and organizational resources on workplace violence, burnout, and health outcomes in new graduate nurses: a cross-sectional study	2012	51	17	Model
10	Fitzgerald, LF	Sexual harassment: violence against women in the workplace	1993	360	16.36	Predictor of outcome
11	Hesketh, KL	Workplace violence in Alberta and British Columbia hospitals	2003	195	16.25	Predictor of outcome
12	Kowalenko, T	Workplace violence: a survey of emergency physicians in the state of Michigan	2005	146	15.6	Epidemiology
13	Pai, HC	Risk factors for workplace violence in clinical registered nurses in Taiwan	2011	61	15.25	Predictor of outcome
14	Kamchuchat, C	Workplace violence directed at nursing staff at a general hospital in southern Thailand	2008	103	14.71	Predictor of outcome
15	Beech, B	Workplace violence in the health care sector: a review of staff training and integration of training evaluation models Intervention/management	2006	132	14.67	
16	Barling, J	Behind closed doors: in-home workers' experience of sexual harassment and workplace violence	2001	201	14.36	Predictor of outcome
17	Baron, RA	Workplace aggression – the iceberg beneath the tip of workplace violence: evidence on its forms, frequency, and targets	1998	242	14.23	Predictor of outcome
18	Taylor, JL	A systematic review of the literature: workplace violence in the emergency department Intervention/characterization	2011	54	13.5	
19	Chen, WC	Prevalence and determinants of workplace violence of health care workers in a psychiatric hospital in Taiwan	2008	93	13.28	Epidemiology
20	Magnavita, N	Workplace violence against nursing students and nurses: an Italian experience	2011	52	13	Predictor of outcome
21	Hegney, D	Workplace violence in Queensland, Australia: the results of a comparative study	2006	114	12.67	Epidemiology
22	Schat, ACH	Effects of perceived control on the outcomes of workplace aggression and violence	2000	183	12.2	Predictor of outcome
23	Speroni, KG	Incidence and cost of nurse workplace violence perpetrated by hospital patients or patient visitors	2014	12	12	Epidemiology
24	Dietz, J	The impact of community violence and an organization's procedural justice climate on workplace aggression	2003	138	11.5	Epidemiology
25	Lin, YH	The impact of workplace violence on nurses in South Taiwan	2005	114	11.4	Predictor of outcome
26	McPhaul, KM	Workplace violence in health care: recognized but not regulated	2004	123	11.18	Prevention/intervention
27	Hegney, D	Workplace violence in nursing in Queensland, Australia: a self-reported study	2003	130	10.83	Predictor of outcome
28	Hegney, D	Workplace violence: differences in perceptions of nursing work between those exposed and those not exposed: a cross-sector analysis	2010	52	10.4	Predictor of outcome
29	Mayhew, C	Workplace violence: an overview of patterns of risk and the emotional/stress consequences on targets	2007	77	9.62	Epidemiology
30	Swanberg, JE	Intimate partner violence, employment, and the workplace consequences and future directions	2005	94	9.4	Predictor of outcome
31	Chapman, R	Examining the characteristics of workplace violence in one non-tertiary hospital	2010	46	9.2	Epidemiology
32	Merecz, D	Violence at the workplace – a questionnaire survey of nurses	2006	80	8.89	Predictor of outcome
33	Kitaneh, M	Workplace violence against physicians and nurses in Palestinian public hospitals: a cross-sectional study	2012	26	8.67	Epidemiology

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Table 2 (continued)

Rank	First author	Study title	Year of publication	Number of citations	Annual citation rate (citations/year)	Topic/focus
34	Hinchberger, PA	Violence against female student nurses in the workplace	2009	51	8.5	Predictor of outcome
35	Campbell, JC	Workplace violence: prevalence and risk factors in the safe at work study	2011	34	8.5	Epidemiology
36	Kansagra, SM	A survey of workplace violence across 65 US emergency departments	2008	58	8.29	Predictor of outcome
37	Boyle, M	A pilot study of workplace violence towards paramedics	2007	63	7.88	Epidemiology
38	Wassell, JT	Workplace violence intervention effectiveness: a systematic literature review	2009	47	7.83	Prevention/intervention
39	Gillespie, GL	Workplace violence in healthcare settings: risk factors and protective strategies	2010	38	7.6	Epidemiology
40	Catlette, M	A descriptive study of the perceptions of workplace violence and safety strategies of nurses working in level I trauma centers	2005	75	7.5	Descriptive
41	Chen, WC	Incidence and risk factors of workplace violence on nursing staffs caring for chronic psychiatric patients in Taiwan	2009	45	7.5	Epidemiology
42	Spector, PE	Perceived violence climate: a new construct and its relationship to workplace physical violence and verbal aggression, and their potential consequences	2007	59	7.38	Predictor of outcome
43	Kowalenko, T	Workplace violence in emergency medicine: current knowledge and future directions	2012	22	7.33	Prevention/intervention
44	Anderson, C	Workplace violence: are some nurses more vulnerable?	2002	95	7.31	Predictor of outcome
45	AbuAlRub, RF	Physical violence in the workplace among Jordanian hospital nurses	2011	28	7	Intervention/descriptive
46		Workplace violence among Iraqi hospital nurses	2007	55	6.88	Predictor of outcome
47	Child, RJH	Violence against women: the phenomenon of workplace violence against nurses	2010	34	6.8	Prevention/descriptive
48	Fujita, S	Risk factors of workplace violence at hospitals in Japan	2012	20	6.67	Epidemiology
49	Rhodes, C	Violence and workplace bullying: what are an organization's ethical responsibilities?	2010	31	6.2	Predictor of outcome
50	Johnston, M	The bullying aspect of workplace violence in nursing	2009	37	6.17	Prevention/intervention

of the articles researched the severity of workplace violence remaining within non-lethal incidences inclusively considering both overt and covert aggression. Collaboration with international countries was incorporated into two of the articles (2/7, 28.6%).

In contrast, of the 50 articles with the highest annual citation rates, fourteen (14/50, 28.0%) focused on epidemiological investigations; all seven (7/14, 50.0%) of the 50 top-cited articles were common. More than half of these articles (9/14, 64.3%) were cross sectional questionnaires. In addition to the cohort papers with the most absolute citations, both direct and indirect forms of non-fatal workplace violence were studied in eleven articles (11/14, 78.6%) with the remaining three articles (3/14, 21.4%) open to examination of both lethal and non-lethal workplace violence. Half of these articles (7/14, 50.0%) were specific to nurses. The dissection of experimental samples revealed that the healthcare sector is the current target (12/14, 85.7%).

3.4. Prevention studies

Prevention was the focus of four (4/50, 8.0%) of the 50 top-cited articles in workplace violence. Three (3/4, 75.0%) of which implements intervention strategies dividing them into a separate sub-category than the remaining article (1/4, 25.0%) that primarily describes the effectiveness of already existing preventative tactics. Research within the breadth of prevention are strictly review articles applying a systematic literature approach. Half (1/2, 50.0%) of the papers worked with a variability of occupations while the other half focused exclusively on the healthcare sector. The majority (3/4, 75.0%) of these articles provided guidelines pertaining to both lethal and non-lethal workplace violence.

Of the 50-workplace violence articles with the highest annual citation rates, five (5/50, 10.0%) considered preventative policies on workplace violence; two (2/5, 40.0%) of these were common to the lifetime citation cohort. An analysis by violence severity revealed that relative to the cohort of papers with the most absolute citations, a greater proportion of citation rate studies focused on non-lethal incidences (4/5,

80.0%), three of which (3/5, 60.0%) inclusively investigated both overt and covert workplace aggression. One (1/5, 20.0%) prevention study was general to any profession while the rest of the publications were evenly distributed between nurses or other healthcare occupations (may include nurses).

3.5. Interventions

The most lifetime citation cohort included a total of six (6/50, 12.0%) interventional studies. Half the studies comprise of the sub-category intervention/management (3/6, 63.6%), which discuss the maintenance of a safe working environment for organizations and management programs available for the victims. Other appropriately divided sub-categories identify characteristics that are the basis for guiding intervention practices in clinical settings. This makes up the intervention/characterization sub-category (2/6, 33.3%) and intervention/descriptive sub-category simply describing a variety of intervention strategies (1/6, 16.7%). All articles employed a systematic literature review approach. The aim of intervention studies is primarily for the general workforce (4/6, 66.7%), focusing on severity of all levels including both lethal and non-lethal (5/6, 83.3%) and in both overt and covert circumstances.

Of the 50-workplace violence articles that have accumulated the highest annual citation rate, only three (3/50, 6.0%) articles primarily focused on intervention strategies; two of these were common to the 50 most-cited articles in workplace violence. As a result of a dissection among the three articles on violence severity and sample population, they were consistently distributed throughout all levels of severity and all sampling groups.

3.6. Theoretical framework

Of the 50 articles with the highest citation, only one (1/50, 2.0%) of the papers focused on a theoretical framework. A systematic literature

Table 3
Characteristics of the two citation cohorts.

		Workplace violence publications with most lifetime citations: n (%)	Workplace violence publications with highest annual citation rates: n (%)
Sample	Healthcare professionals	30 (60.0%)	38 (76.0%)
	Nurses	19 (63.3%)	25 (65.8%)
	Other (may include nurses)	11 (36.7%)	13 (34.2%)
	Women	2 (4.0%)	2 (4.0%)
	Non-specific	18 (36.0%)	10 (20.0%)
Severity	Lethal (i.e. homicide)	0 (0.0%)	0 (0.0%)
	Non-lethal	36 (72.0%)	44 (88.0%)
	Overt (physical, direct, active)	5 (13.9%)	7 (16.0%)
	Covert (psychological, indirect, verbal)	1 (2.8%)	1 (2.2%)
	Non-specific	30 (83.3%)	36 (81.8%)
	Both (includes non-lethal and lethal)	14 (28.0%)	6 (12.0%)
Study design	Cross-sectional questionnaire	23 (46.0%)	29 (58.0%)
	Systematic literature review	19 (38.0%)	13 (26.0%)
	Descriptive correlation questionnaire	1 (2.0%)	1 (2.0%)
	Prospective cohort	2 (4.0%)	3 (6.0%)
	Review/meta-analysis	2 (4.0%)	1 (2.0%)
	Retrospective questionnaire	3 (6.0%)	3 (6.0%)
Data analysis	Qualitative	22 (44.0%)	18 (36.0%)
	Quantitative	28 (56.0%)	32 (64.0%)
Country of correspondence	USA	26 (52.0%)	21 (42.0%)
	Canada	9 (18.0%)	8 (16.0%)
	Australia	6 (12.0%)	7 (14.0%)
	China	1 (2.0%)	1 (2.0%)
	UK	1 (2.0%)	2 (4.0%)
	Taiwan	3 (6.0%)	4 (8.0%)
	Thailand	1 (2.0%)	1 (2.0%)
	Poland	1 (2.0%)	1 (2.0%)
	Iraq	1 (2.0%)	1 (2.0%)
	Italy	1 (2.0%)	1 (2.0%)
	Palestine	0 (0.0%)	1 (2.0%)
	Jordan	0 (0.0%)	1 (2.0%)
	Japan	0 (0.0%)	1 (2.0%)
	Product of international collaboration		7 (14.0%)
Average number of authors		2.9 ± 1.9	3.52 ± 2.4

approach was used to study both lethal and non-lethal severity of workplace violence without restrictions in occupation sectors.

3.7. Model

Three of the 50 most cited papers (3/50, 6.0%) provided a model in studying workplace violence; one (1/3, 33.3%) of these was common to the citation rate cohort. Both a cross-sectional questionnaire (1/3, 33.3%) and systematic literature review (2/3, 66.7%) were appropriately executed as study designs. Most of these articles focused on nurses (2/3, 66.7%). The severity level mainly stayed within the borders of non-lethal aggression inclusive to both indirect and direct forms (2/3, 66.7%) with the remaining article considering the scope of lethal workplace violence occurrences (1/3, 33.3%).

4. Discussion

Measures of studies with the most lifetime citations and the highest annual citation rates guide the direction of research on workplace violence. Our findings suggest that studies on non-lethal form of workplace incidences continues to be on a rise currently accumulating the most citations per year (Table 3). The pattern and directionality of the level of severity in workplace violence has not changed as the number of articles studying within the extent of non-lethal incidences has only slightly increased. Comparatively, research that inclusively investigated both overt and covert forms of non-lethal violence has also been most widely cited, suggesting that milder forms of violence have always been a central point of discussion.

Over half of the 50 top-cited articles in workplace violence studied predictors of outcome either setting violence as the predictor finding the associated consequences or as the outcome investigating probable predictors. Research effort into predictors of outcome is relevant in

identifying the predictors of violence specific to different occupations and industry sectors. In our findings, most of the research on workplace violence is focused on the health care sector and specifically nurses. There is a dearth of evidence regarding predictors of workplace violence in other sectors such as mining and education.

We observed that there is a greater proportion of papers comprised of epidemiological studies in the highest annual citation rate cohort. This suggests that the epidemiological characteristics in workplace violence continues to be an expanding area of interest advancing knowledge in the areas of prevalence and risk factors. Moreover, this also indicates epidemiological data may be used to identify vulnerable populations and for prevention and management of workplace violence. Continued epidemiological research into workplace violence may be implemented given that majority of these incidences in the healthcare sectors go unreported, especially susceptible in nurses (Chapman, Styles, Perry, & Combs, 2010). Hence, persisting future research in the prevalence of workplace violence may help promote awareness as well as actively improve intervention and prevention models to allocate appropriate training to defend against the epidemic.

This study has several limitations. Harzing's Publish or Perish uses the search engine Google Scholar to collect raw citation data. Google Scholar is influenced by user preference, therefore journals are cataloged with higher inclusivity. As a result, the use of the program may have biased the results towards inclusivity. Moreover, the keywords were queried in the title of the articles. In addition, limitations stem from our single restricted search term "workplace violence," and reviewed the top 1000 results as reported by the software.

5. Conclusion

We have identified the top 50 most highly cited papers on the topic of workplace violence, as well as the 50 papers that have accumulated

the highest citation rates. The publications highlighted in this paper present currently discussed and the most influential contributions in workplace violence. The impact of workplace violence has many negative personal and organizational consequences that reduce the quality of living of the victim. This review provides a framework outlining where the field of research is approaching towards and also suggesting that further allegations in preventative and management programs should be examined in future literature.

Conflict of interest

None to declare.

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