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Prevalence of lateral violence in nurse workplace: a systematic review and meta-analysis

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ABSTRACT

Background The prevalence of inter-nurse lateral violence (LV) reported in current studies is inconsistent, ranging from 7% to 83%. The purpose of this study is to quantify the prevalence of LV in nurses' workplaces.

Methods Systematic review and meta-analysis. Cochrane, PubMed, Embase, CINAHL, CNKI and Wanfang databases were searched for relevant studies (up to 27 January 2021). We included cross-sectional, case–control or cohort studies in which both abusers and victims were nurses. Studies that did not provide specific data on abusers were excluded. Stata V.16.0 was used for statistical analysis. Fixed-effect or random-effect model was adopted according to heterogeneity, which was evaluated by Cochran's Q and I^2 values. The main indicator was LV prevalence. Sensitivity analysis, subgroup analysis and meta-regression were performed to investigate the sources of heterogeneity.

Results A total of 14 studies with 6124 nurses were included. Further, 13 articles with 5745 nurses were included in the meta-analysis, and the pooled prevalence of LV among nurses was 33.08% (95% CI: 23.41% to 42.75%, p<0.05; I^2=99.0%). The remaining one study containing 370 samples reported that the prevalence of inter-nurse LV was 7.92%. Subgroup analysis showed that region, sample size, sampling, study's quality, response rate and publication time might not be the sources of heterogeneity. Meta-regression indicated that sample size had the main influence on model heterogeneity. Egger's test showed the existence of publication bias (p=0.03).

Discussion The prevalence of inter-nurse LV is high in nurse workplace. It is suggested that scholars pay more attention to the cultural differences of inter-nurse LV between regions in the future. This study has the following limitations: there is a lack of studies on LV prevalence in many countries; lack of standard assessment tools; no grey literature was searched.

Strengths and limitations of this study

- ► The present systematic review followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses guidelines.
- ► Subgroup analysis reported culture as the potential factor of lateral violence (LV) prevalence.
- ► The heterogeneity was explored by sensitivity analysis, subgroup analysis and meta-regression analysis.
- ► Most of the studies included in the paper were from Asia, and lacked studies from Europe, Africa and other regions. The results were not representative of the global LV prevalence.

INTRODUCTION

Lateral violence (LV), which belongs to internal workplace violence, refers to inter-group conflict, manifested by sabotage, infighting, scapegoating, criticism and other explicit and implicit non-physical hostilities.[1] It focuses on the negative behaviour between peers with the same social status in the work environment, that is, the intimidation behaviour between peers.[1] Nursing profession has the characteristics of heavy workload and cumbersome work content. Therefore, nurses are prone to psychological and physiological stress responses in such high-stress situations. When interacting with colleagues, they are likely to vent their dissatisfaction to colleagues, resulting in external violence or internal violence.[2] Previous studies, which focused LV abusers on colleagues, nurses outside the department and nursing managers, reported that LV is more common in nursing profession. It has been indicated that inter-nurse LV may have a negative impact on individual physical and mental health, such as causing nurses' job burnout, post-traumatic stress disorder and other adverse consequences. In addition, LV among nurses may have a serious negative influence on the whole nursing team, increased turnover tendency of nurses and work burden of clinical nurses as examples.[3–6] In terms of patient safety, it has been indicated that LV has an indirect effect on patient safety.[7 8] Doo and Kim[7] through path model analysis found that LV plays complete mediating role between the internalised dominant values and patient safety. In addition, because the LV influenced them personally, created distraction or

decreased their willingness to ask questions or for help, their ability to provide patient care was subsequently influenced negatively.[8] That is, LV influences nurses' physical and mental health, and patient safety, which seriously hinders the development of nursing profession. It must be given sufficient attention. Therefore, we need to first understand the specific prevalence of inter-nurse LV in nurse workplace before developing and implementing interventions to improve this situation.

However, the results of the current studies reporting on the prevalence of LV in nurse workplace are inconsistent. One study from USA reported that 85% nurses suffered from LV,[9] while another study in the USA indicated that about 22% of nurses reported been subjected to violence from their colleagues.[10] Studies in Korea showed that LV prevalence among nurses ranged from 11.5% to 40%.[11 12] Another study from China reported that about 83% of neurologic nurses had suffered from inter-nurse LV.[13] To date, no systematic review and meta-analysis has been published on synthesis of LV prevalence in nurse workplace. Therefore, the purpose of this review is to quantify the prevalence of LV prevalence among nurses in nurse workplace and to analyse whether there are differences in the LV prevalence among different regions.

METHODS

This systematic review and meta-analysis was conducted on the basis of the preferred report items in the Preferred Reporting Items for Systemic Reviews and Meta-Analyses (PRISMA 2020) guidelines.

Search strategy

Articles related to the prevalence of LV in nurse workplace were retrieved from four English databases of Cochrane, PubMed, Embase and CINAHL and two Chinese databases of CNKI, Wanfang (from inception to 27 January 2021). Keywords used for searching were 'lateral violence' (including 'horizontal violence', 'horizontal hostility', 'bullying place', 'incivility') and 'nurse', with the retrieval adjusted according to the database, the search strategy is showed in online supplemental file 1. We also reviewed the list of references in the included studies to obtain additional studies.

Inclusion/Eexclusion criteria

Inclusion criteria were that: (1) both abuser and victim were nurses; (2) articles reported the data of LV prevalence in nurse workplace; (3) LV was measured by self-report; (4) research design was cross-sectional, or case–control, or cohort (using baseline data).

Exclusion criteria were: (1) meeting abstract, case reports, review, meta-analysis, letter, pilot study, qualitative study; (2) the abuser is not identified or the specific data of the abuser is not provided; (3) duplicate articles and/or data (If there are different articles in the same unit and the same sample, we will select the most recent article.); (4) studies with unclear descriptions of nurse populations and events.

Two reviewers screened the literature independently according to the inclusion and exclusion criteria, and a third reviewer made judgement if there were conflicts.

Data extraction and quality assessment

Data was extracted independently by two investigators from eligible studies and a third investigator cross-checked for accuracy. Data extracted included the first author, publication time, country, sample size, event (number of nurses subjected to LV), gender, age, measurement of LV, sampling, response rate and prevalence of LV among nurses.

Quality of the included studies was evaluated using the modified Newcastle-Ottawa Scale (M-NOS).[14] There are five items, with 1 point for each 'Yes' answer and 0 point for each 'No' answer. The total score ranges from 0 to 5, with higher scores indicating better quality. In this study, ≥3 was defined as low-risk bias and <3 as high-risk bias.

Data analysis

Stata V.16.0 was used for statistical analysis. Cochran's χ^2 test (Cochran's Q value) and I^2 value were adopted to assess heterogeneity, with $p<0.05$ or I^2 >50% indicating significant heterogeneity between studies. Fixed-effect model was performed to calculate the pooled prevalence of LV in nurse workplace when there was no significant heterogeneity, and random-effect model was used otherwise. Subgroup analysis, sensitivity analysis and meta-regression analysis were conducted to explore the sources of heterogeneity. Funnel plots and egger test were conducted to evaluate publication bias.

RESULT

Study selection

A total of 14 articles were included in this systematic review, involving 6124 nurses. Sample size of the included studies ranged from 118 to 1690. Among those studies, 13 were included in the meta-analysis, with the details shown in figure 1.

Basic information of the included studies

In this systematic review, 3 researches occurred in the Americas,[10 15 16] 10 in Asia[4–6 11 12 17–20] and 1 in Europe.[21] The prevalence of LV among nurses ranged from 6.83% to 82.68%. The lowest prevalence of LV was found in an American study and the highest in a study from China. With regard to the quality measured by M-NOS, five studies got <3 points and nine researches got ≥3 points. Details are shown in tables 1 and 2.

Pooled prevalence of LV in nurse workplace

Sensitivity analysis showed that among the 14 eligible studies, one study[20] had a great influence on the overall result and affected the stability. Therefore, we eliminated this paper in the quantitative synthesis. Moreover, we qualitatively described this paper that: this research

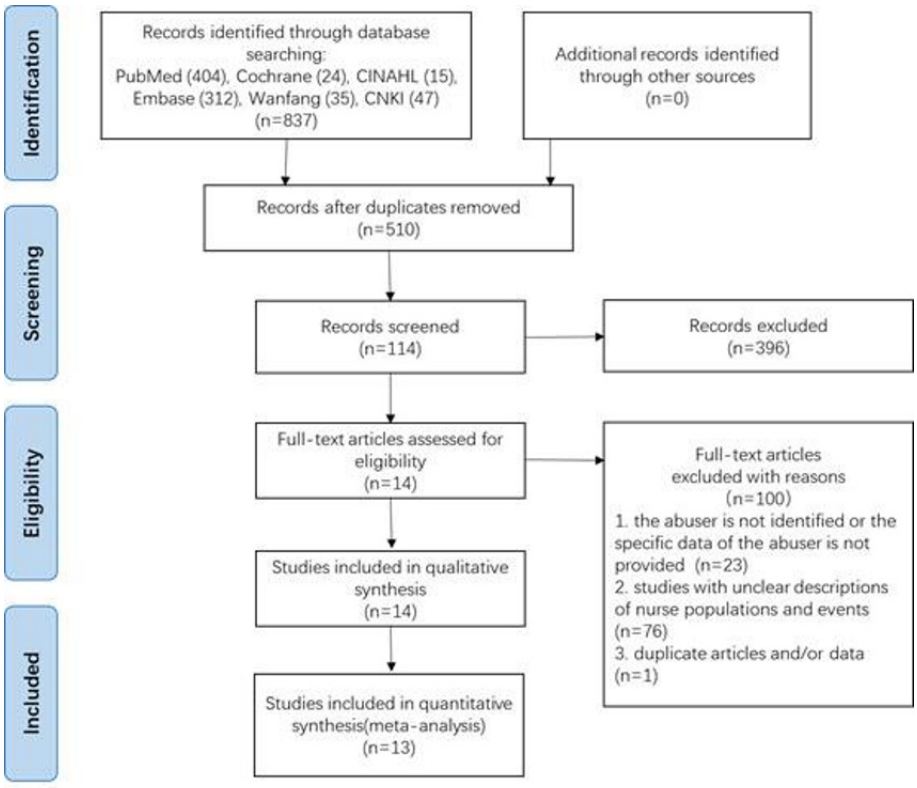

Figure 1 Screening flow chart.

published in 2017 was conducted by Cheung and Yip in Hong Kong, China, with a random sample of 370 nurses and response rate of 5.3% (data was collected through the network). LV is measured by self-rating scale, and 30 of 370 had experienced inter-nurse LV, with the prevalence of 7.92%. The scale quality evaluation score was 4 points (tables 1 and 2).

Finally, a total of 13 studies were included in the meta-analysis. The pooled prevalence of LV among nurses was 33.08% (95% CI: 23.41% to 42.75%; I^2=99.0%, p<0.001) (figure 2).

Subgroup analysis

Subgroup analysis showed that the pooled LV prevalence in Asian and non-Asian regions was 41.6% (95% CI: 27.9% to 55.4%) and 13.9% (95% CI: 7.6% to 20.1%), respectively (Q=13.01, p<0.001). In the subgroup analysis of countries, the LV prevalence was 12.4% (95% CI: 5.5% to 19.3%) in the USA, 54.2% (95% CI: 25.8% to 82.5%) in China, 25.7% (95% CI: −2.3% to 53.6%) in Korea and 27% (95% CI: 9.4% to 44.7%) in Saudi Arabia (Q=10.03, p=0.040). When the sample size was greater than 200, it was considered as large sample size, and the LV prevalence was 20.8% (95% CI: 14.0% to 27.7%), while in small sample size studies, it was 53.0% (95% CI: 25.7% to 80.3%) (Q=5.00, p=0.025). Rate of LV prevalence in studies with random sampling was 17.0% (95% CI: 7.9% to 26.1%), significantly lower than that of convenience sampling of 43.3% (95% CI: 28.1% to 58.5%) (Q=8.46, p=0.004). The LV prevalence rate of studies published before 2016 and those published between 2016–2020 were 15.2% (95% CI: 6.1% to 24.3%) and 41.3% (95% CI: 25.8% to 56.7%) (Q=8.13, p=0.004). Additionally, researches with low quality reported higher LV prevalence than that of high quality (51.7% vs 24.9%). The LV prevalence in studies with response rate <50% was 24.4%, while in ≥50% it was 38.6% (p=0.143). However, none of the factors above might be a source of heterogeneity (table 3).

Meta-regression analysis

Meta-regression was performed on region, sample size, sampling, quality score, response rate and publication time in the subgroup. The results showed that the prevalence of LV among nurses was higher in small sample studies (β=0.1176, p=0.016). In the result, sample size accounted for 80.48% of the overall heterogeneity (table 4).

Sensitivity analysis and publication bias

Sensitivity analysis was conducted on the included 14 studies, and it was found that one article[19] had a significant impact on the results (figure 3). Therefore, this article was described separately. The remaining 13 studies were finally included in meta-analysis, and the result was unchanged by serially excluding each study (figure 4). Funnel plots and egger's test indicated the existence of publication bias in the 13 studies (p=0.003) (figures 5 and 6).

DISCUSSION

This systematic review included 14 studies with a total sample size of 6124 nurses. The meta-analysis showed that the pooled prevalence of LV among nurses was 33.08% (95% CI: 23.41% to 42.75%). According to the existing

Table 1 Characteristics of the included 14 studies

Study	Country	Participants	Sampling	Response rate	Sample size	Gender (W:M)	Age (mean)	Nursing experience (%, <5 years)	Quality score
Vessey *et al*[15]	US	Registered nurses	Random	100%	303	289:14	49	NA	4
Hampton *et al*[10]	US	Nursing leaders	Convenience	1.8%	175	166:9	54	NA	2
Pien *et al*[4]	China	Nurses	Convenience	94.7%	1690	1690:0	33.4	NA	3
Park *et al*[11]	South Korea	Registered nurses	Convenience	94.4%	970	970:0	28.6	NA	3
Al-Surimi *et al*[17]	Saudi Arabia	Nurses	Convenience	48.3%	519	922:152	38.77	NA	2
Pai and Lee[5]	China	Registered nurses	Random	77.9%	521	498:23	36.2	20%	4
Rayan *et al*[6]	Saudi Arabia	Nurses	Random	98%	118	77:41	29.14	NA	2
Difazio *et al* [21]	Russia	Registered nurses	Random	0.32%	438	392:10	20.56	NA	4
Johnson and Rea[16]	US	Registered nurses	Random	32.5%	249	204:45	48.81	NA	4
Chang and Cho[12]	Korea	Registered nurses	Convenience	44.01%	312	294:18	23.7	NA	3
Li and Yu[18]	China	Nurses	Convenience	95.77%	136	120:16	NA	69.1%	1
Wang *et al*[19]	China	Nurses	Convenience	94.4%	187	187:0	35.42	59.4%	3
Wu *et al*[13]	China	Neurosurgery nurses	Convenience	100%	127	122:5	26.47	78%	2
Cheung *et al* [20]	China	Nurses	Random	5.3%	850	745:105	34–44	NA	4

M, man; NA, not available; W, woman.

Table 2 LV-related characteristics of the 14 included studies

Study	Measurement	Event	Prevalence
Vessey *et al*[15]	A 30-item anonymous electronic survey was created in SurveyMonkey	31	0.10
Hampton *et al*[10]	NAQ-R	38	0.22
Pien *et al*[4]	A self-administered questionnaire was used to record the nurses' experiences of workplace violence, including types (physical, psychological, verbal and sexual) and sources (internal and external) of violence	228	0.13
Park *et al*[11]	COPSOQ II	112	0.12
Al-Surimi *et al*[17]	It was sourced from an integrative literature review by Houck and Colbert. Responses to 15 themes were rated on a 5-point Likert scale	186	0.36
Pai and Lee[5]	WVQ	169	0.32
Rayan *et al*[6]	The modified version of the Joint Programme on Workplace Violence in the Health Sector published by the International Labour Office	21	0.18
Difazio *et al*[21]	The Bullying in the Workplace 26-itemsurvey	79	0.18
Johnson and Rea[16]	NAQ-R	17	0.07
Chang and Cho[12]	COPSOQ II	125	0.40
Li and Yu[18]	Lateral violence questionnaire compiled by Gao Yingying	96	0.71
Wang *et al*[19]	Lateral violence questionnaire compiled by Li XY	135	0.72
Wu *et al*[13]	SS	105	0.83
Cheung and Yip[20]	Workplace violence in the health sector country case studies research instruments survey questionnaires (English version) by an ILO/ICN/WHO/PSI project.	30	0.03

COPSOQ II, the second version of the medium-sized Copenhagen Psychosocial Questionnaire; ICN, International Council of Nurses; ILO, International Labor Organization; LV, lateral violence; NAQ-R, Revised Negative Acts Questionnaire; PSI, Proliferation Security Initiative; SS, sabotage savvy; WHO, World Health Organization; WVQ, a Chinese-language version of the Workplace Violence Questionnaire.

research, this systematic review and meta-analysis is the first to synthesise the prevalence of LV in nurse workplace worldwide.

Subgroup analysis revealed that there were significant differences in the overall prevalence of LV in Asia and non-Asian regions. The prevalence of LV in Asia (41.6%) is higher than that of non-Asian LV (13.9%). The possible reason may be that Asian and non-Asian cultural backgrounds are different, leading to differences in their understanding and handling of LV. In the context of collectivism in Japan, South Korea and other Asian countries, harmony and group norms are more valuable, which may lead to differences in the definition of LV between the collectivist cultural background and the Western cultural background.[22] To explore whether the LV prevalence was related to cultural differences, the region subgroup was divided into country subgroup for analysis, which showed significant differences. From the analysis of LV prevalence, among the four countries, USA has the lowest LV prevalence, while China has the

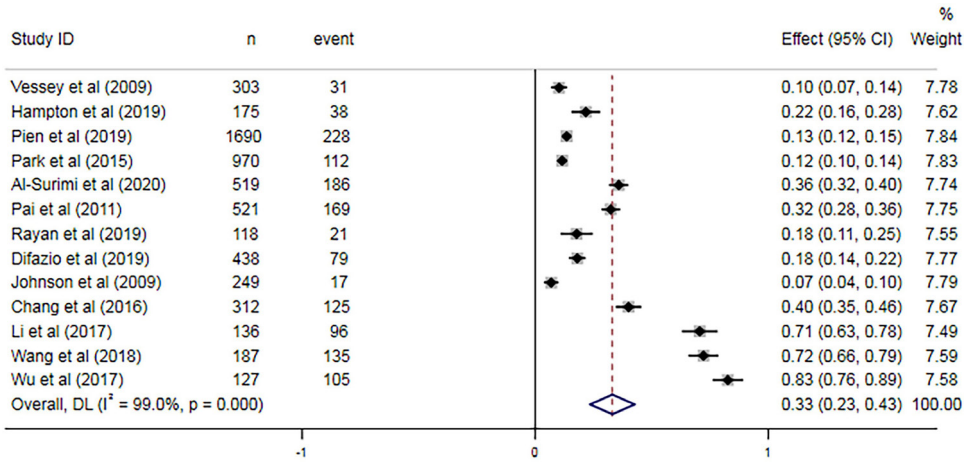

Figure 2 Forest plot of eligible studies.

Table 3 Subgroup analysis of the pooled prevalence

Subgroup	Studies	Pooled prevalence (95% CI)	I^2	Test of difference within each subgroup	
				Q	P value
Region					
Asia	9	0.42 (0.28 to 0.55)	99.20%	13.01	<0.001***
Non-Asia	4	0.14 (0.08 to 0.20)	90.60%		
Country					
USA	3	0.12 (0.05 to 0.19)	88.90%	10.03	0.040*
China	5	0.54 (0.26 to 0.82)	99.50%		
Korea	2	0.26 (–0.02 to 0.54)	98.90%		
Saudi Arabia	2	0.27 (0.09 to 0.45)	94.80%		
Sample size					
≥200	8	0.21 (0.14 to 0.28)	97.70%	5	0.025*
<200	5	0.53 (0.26 to 0.80)	98.80%		
Sampling					
Random	5	0.17 (0.08 to 0.26)	96.30%	8.46	0.004**
Convenience	8	0.43 (0.28 to 0.59)	99.30%		
Quality score					
High risk	4	0.52 (0.24 to 0.79)	98.80%	3.31	0.069
Low risk	9	0.25 (0.16 to 0.33)	98.40%		
Response rate					
<50%	5	0.24 (0.12 to 0.37)	97.80%	2.15	0.143
≥50%	8	0.39 (0.24 to 0.53)	99.30%		
Publication time					
<2016	4	0.15 (0.06 to 0.24)	97.30%	8.13	0.004**
2016–2020	9	0.41 (0.26 to 0.57)	99.10%		

*p<0.05, **p<0.01, ***p<0.001.

highest. Therefore, LV may be related to cultural differences in different countries, but currently there are only a few included studies, lacking studies in Europe, Australia, Africa and other countries. It is recommended to carry out studies on LV prevalence among nurses in more regions in the future.

The result showed significant differences in LV prevalence between different sampling methods and sample sizes. In order to facilitate sampling, participants from one or several departments are usually selected for research, but there are differences in LV prevalence between departments and different working environments.[11 16 19 23 24] The working environment and atmosphere of the selected personnel lack universality, resulting in differences between different sampling methods. With regard to sample size, it has been shown that in studies with smaller participants, due to selection bias and publication bias, more extreme prevalence estimates tend to

Table 4 Meta-regression analyses of the effects of potential moderators

Variables	B	95% CI		R^2	P value
		Lower	Upper		
Region, Asia	0.1345	–0.0544	0.5376	19.31%	0.100
Sample size, ≥200	0.1176	0.0772	0.5949	80.48%	0.016*
Sampling, random	0.1303	–0.638	0.5096	12.34%	0.115
Quality score, high risk	0.1391	–0.0259	0.5864	46.74%	0.069
Response rate, <50%	0.1445	–0.4286	0.2071	–13.10%	0.460
Publication time, <2016	0.1309	–0.0529	0.5233	25.23%	0.100

*p<0.05.

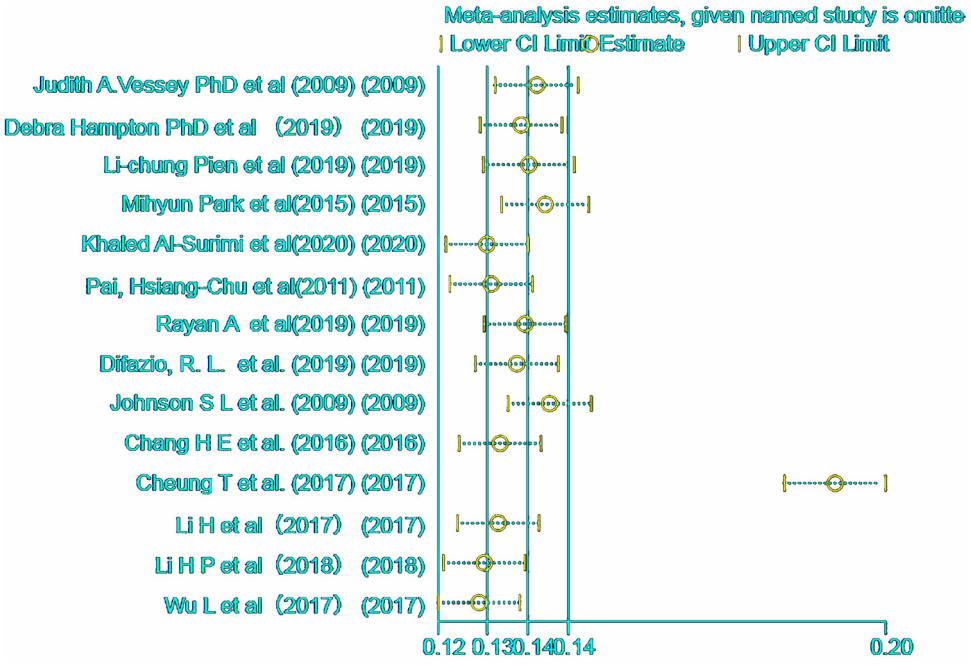

Figure 3 Sensitivity analysis estimating heterogeneity.

be obtained.[25] Therefore, researchers should be more cautious when analysing the impact of sample size and sampling method on prevalence.

Yao *et al*[1] summarised and analysed the research published by LV and found that the number of articles published before 2014 was less than 10, but it started to increase after 2015. Compared with other research fields, this may be related to the fact that this field is a new field. The development time of this field is not very long, the early stage is still in the exploratory stage, the research is not deep enough, and a large number of theoretical and practical explorations have begun in the later stage. Therefore, this study uses 2015 as the time point for observing the difference in prevalence. Subgroup analysis shows that the prevalence of LV varies at different publication times. The higher prevalence of LV reported after 2016 may be related to the fact that society has begun to attach importance to the concept of LV and has increased people's self-protection awareness after 2016. For the studies included in the meta-analysis, the prevalence of the three studies all exceeded 70%, all of which were from China and were published after 2016. The second

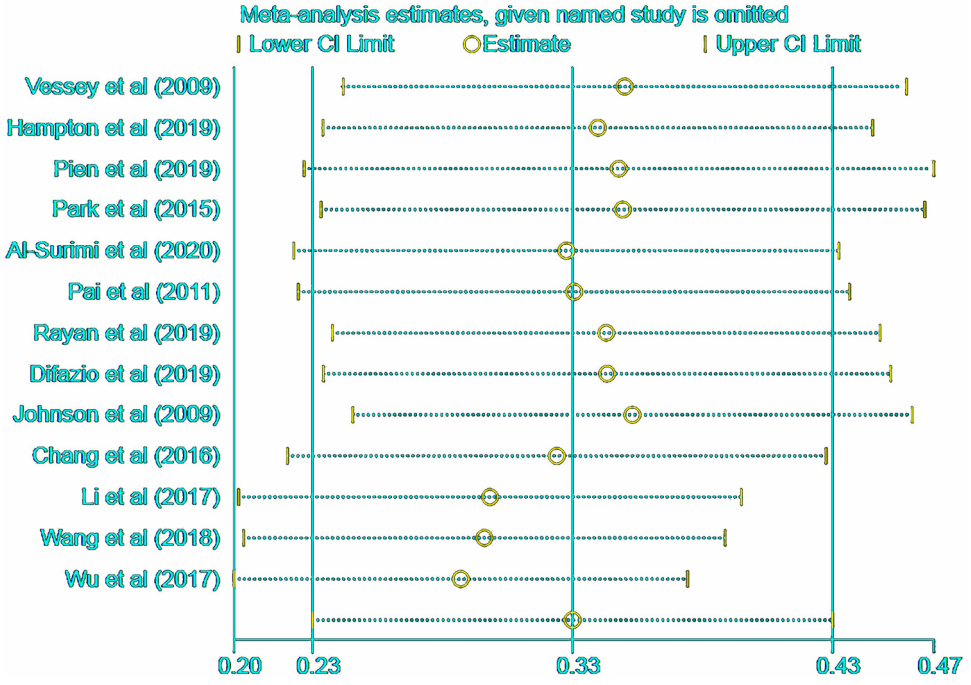

Figure 4 Sensitivity analysis estimating heterogeneity.

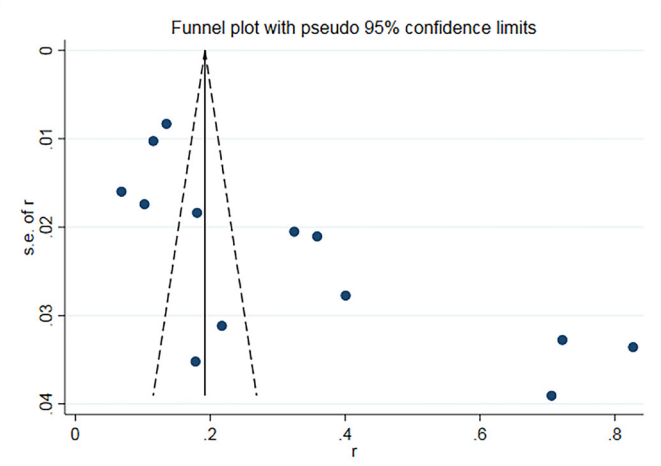

Figure 5 Funnel plots estimating small sample bias.

study is from South Korea, both of which are developing countries in Asia. It is estimated that in developed countries in Europe and America, the total prevalence of LV is about 14%, which is very different. It is recommended that future studies consider comparing the LV prevalence between developing and developed countries.

Among all the included Chinese studies, this single analysis had the lowest LV prevalence. Their analysis of the results believes that it has something to do with the nurse's attitude. They thought reporting violent behaviour will not change anything. It is similar to the attitude of subjects in an empirical analysis study on how to deal with workplace bullying.[10] This attitude may make nurses choose to endure silently, leading to insufficient reporting, resulting in measured values lower than true values, which can explain the low response rate. The results also show that unhappiness among colleagues is an important factor in workplace LV. It is suggested that the occurrence of LV may be related to a stressful environment, such as the zero tolerance attitude of the Hong Kong health department towards nursing negligence and media public opinion. Nurses are afraid of being blamed

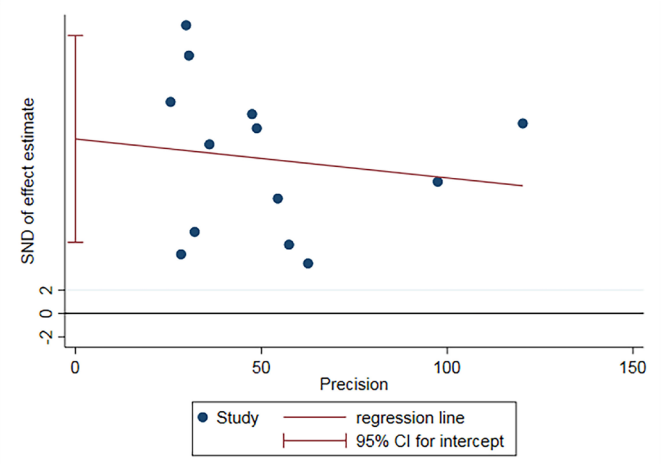

Figure 6 Egger's test estimating publication bias. SND, store and download.

for jeopardising their careers, are unwilling to help colleagues and lack team cohesion. The formal nurses or old nurses are easy to despise or attack other nurses. The tedious and high-pressure work will make nurses prone to physical and mental exhaustion. If they are subjected to LV repeatedly, their physical and mental health and work (efficiency and performance) will be affected.[18 19 26 27] It may further affect the nursing team atmosphere and nursing quality in a negative way, which may lead to more occurrence of LV.

When looking for sources of heterogeneity, subgroup analysis suggested that each subgroup variable we set was not a source of heterogeneity; and meta-regression showed that sample size might be a source of heterogeneity. Sensitivity analysis of 14 articles showed that one study would affect the overall research results. Sensitivity analysis was conducted again after removing this paper, and the results showed the stability. There was publication bias in this meta-analysis, which may exaggerate the results of this study. Therefore, it is necessary to be more rigorous in the generalisation of the conclusion.

The study showed the high level of LV, which should be paid attention to by nursing managers. Through the analysis, it is concluded that culture may cause the difference in nurses' perception of LV. In the future, researchers can focus on cultural differences to further explore and find effective intervention measures, so as to improve the adverse effects of LV on nurses' physical and mental health and patient safety. This study has the following limitations. First, more than half of the studies included were in countries in the Asian region, and many countries lacked studies on prevalence of LV, so this result may not be completely representative of the global level. Taking into account the inconsistent cultural background due to the medical environment in different regions, we recommended that more studies about LV in nurse workplace be carried out in different regions to understand the overall situation. Second, while we have excluded studies that did not define and measure descriptions, and where the description of the perpetrator was unclear, inconsistencies are still inevitable. That is, the measurement of LV in this systematic review and meta-analysis was all self-report, self-designed and self-administered questionnaires, which may lead to subjective and inconsistent data reports, as no standard assessment tool existed. Therefore, it is suggested that a standard, comprehensive and objective evaluation tool should be developed to measure LV in the future. Finally, no grey literature was searched. We focused on LV prevalence worldwide. Considering the difficulty of searching grey literature in various regions and the fact that some grey literature may have been converted to published studies over time, it increases the complexity of subsequent screening data. However, LV problem is sensitive, and the data of grey literature may explain some problems. Therefore, it is suggested that scholars pay attention to the screening of grey literature in the future.

CONCLUSION

The prevalence of LV in nurse workplace is high, with the rate of 33.08%. In addition, the analysis of this study showed that there are differences in LV prevalence among different regions, possibly influenced by cultural environment but lack sufficient evidence to support. It is suggested to further explore LV in terms of cultural differences in the future.

Contributors YZ and JC searched and checked the databases according to the inclusion and exclusion criteria, extracted the data and assessed their quality. YZ analysed the data and wrote the draft of the paper. SQ, RY, JC, HW and XS gave advice on meta-analysis methodology and revised the paper. All authors contributed to reviewing or revising the paper. LM is the guarantor of this work and had full access to all the data in the study and takes responsibility for its integrity and the accuracy of the data analysis. All authors read and approved the final manuscript.

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