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Prevalence of sexual harassment of nurses and nursing students in China: a meta-analysis of observational studies

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Received: 2018.06.27; Accepted: 2018.09.10; Published: 2019.01.29

Abstract

Sexual harassment experienced by nurses and nursing students is common and significantly associated with negative consequences. This study is a meta-analysis of the pooled prevalence of sexual harassment of nurses and nursing students in China. Electronic databases (PubMed, EMBASE, PsycINFO, Web of Science and Ovid, China National Knowledge Internet, WanFang, SinoMed and Chinese VIP Information) were independently and systematically searched by two reviewers from their commencement date to 12 March 2018. Forty-one studies that reported the prevalence of sexual harassment were analyzed using the random-effects model. The pooled prevalence of sexual harassment was 7.5% (95% CI: 5.5%-10.1%), with 7.5% (5.5%-10.2%) in nurses and 7.2% (3.0%-16.2%) in nursing students. Subgroup analyses showed that the year of survey and sample size were significantly associated with the prevalence of sexual harassment, but not the seniority of nursing staff, department, hospital, economic region, timeframe, age, working experience or subtypes of harassment. In China, sexual harassment was found to be common in nurses and nursing students. Considering the significant negative impact of sexual harassment, effective preventive and workplace measures should be developed.

Key words: Sexual harassment, nurses, China

Introduction

Sexual harassment, defined as repeated and unwelcome sexual behavior including its verbal, physical, mental or visual forms [1-3], is common in the workplace. Healthcare workers, especially nursing staff, are more likely to be exposed to offensive behaviors, including sexual harassment, than other professions [4, 5]. Sexual harassment is associated with negative health consequences, such as physical and mental health problems and impaired occupational performance [6, 7].

The results across studies on the pattern of sexual harassment of nursing staff have been conflicting [8], probably due to different sampling methods, measures, and the given sociocultural
context [4]. For instance, the prevalence of sexual harassment of newly licensed registered nurses in Korea was 22.4% [9]. Other studies reported that the prevalence of sexual harassment in nurses was 16.2% in Europe [8], while the corresponding figure was 13.02% in Ethiopia, 10% in Gambia [10, 11] and 3.9% in China [12].

In order to develop preventive measures and reduce the negative consequences of sexual harassment of nursing staff, it is necessary to understand the patterns of sexual harassment. However, due to variable sociocultural and economic impact of sexual harassment in different countries, findings in a country cannot be generalized to other countries or regions. Some studies have examined the patterns of sexual harassment of nursing staff in China, which yielded mixed results. For instance, the prevalence of sexual harassment in nurses was 63.4% in Wuhan [13], and 3.9% in another survey of 16 provinces of mainland China [12]. In contrast, the corresponding figure was 12.9% in Taiwan and 4.6% in Macau [14, 15]. The mixed findings in China gave the impetus to conduct a meta-analysis of the pooled prevalence of sexual harassment of nurses and nursing students in China and examined its associated factors. Both English and Chinese databases were searched for ascertaining studies for this meta-analysis.

**Methods**

**Search strategy**

This meta-analysis was conducted according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. Both English (PubMed, EMBASE, PsycINFO, Web of Science and Ovid) and Chinese (China National Knowledge Internet, WanFang, SinoMed and Chinese VIP Information) databases were independently and systematically searched by two reviewers (ZLN and ZQQ) from their commencement date to 12 March 2018. The search terms are shown in Supplemental Table 1 (The asterisk “*” in Supplemental Table 1 is a commonly used wildcard symbol that broadens the search by finding words that start with the same letters). The reference lists of the selected papers were also searched manually to avoid missing any additional papers.

**Study selection**

Studies were included if they fulfilled the following criteria: (1) cross-sectional or cohort studies conducted in mainland China, Hong Kong, Macao and Taiwan (only baseline data were extracted in cohort studies); and (2) the prevalence of workplace sexual harassment or its different subtypes, such as physical or verbal sexual harassment, of nurses and/or nursing students were reported.

Three reviewers (ZLN, ZQQ and ZJW) independently screened the literature by reviewing titles and abstracts first, and then reading the full papers. Any discrepancies between the three reviewers in the process were discussed and resolved by involving a fourth reviewer (LL). If more than one paper was published based on the same study, only the paper with the largest sample size was included in the analyses.

**Quality evaluation**

The methodological quality of included studies was evaluated by a quality assessment instrument for epidemiological studies [16], which was completed by two independent reviewers (ZQQ and ZJW). The assessment instrument contains the following parts: (1) the targeted population was clearly defined; (2) the sample was recruited by random or consecutive sampling methods; (3) the response rate was equal or more than 70%; (4) the sample was representative; (5) a clear definition of sexual harassment was given; and (6) the instruments used to assess sexual harassment were validated measures. One point was given when a study satisfied each item and a total score was generated by adding the score of each item.

**Statistical analysis**

All data were analyzed using the Comprehensive Meta-Analysis statistical software (Version 2.0) (http://www.meta-analysis.com). Heterogeneity across studies was measured using the $I^2$ statistics, with $I^2$ statistics higher than 50% being defined as great heterogeneity. Due to diverse demographic characteristics, sampling methods and measures on sexual harassment, prevalence estimates were synthesized using the random-effect model [17]. Subgroup analyses were conducted to investigate the potential sources of heterogeneity based on the following variables: age, working experience and seniority of nursing staff, department, hospital, economic region, geographic regions of greater China (i.e., mainland China vs. Hong Kong/Macao/Taiwan), year of survey, sample size, timeframe (1 year prevalence vs. others), and subtype of harassment. The seniority of nursing staff consists of nurses and nursing students. According to the National Chinese Bureau of Statistics [18], China is collapsed into four regions for the purpose of this study: east, west, central, and northeast of China. Hospital types included tertiary, secondary, primary hospitals [19]. Year of survey, sample size, mean age and working experience were categorized using the median splitting method. Publication bias was
assessed by funnel plot and the Egger’s regression model [20]. All analyses were two-tailed, and the significance level was set at 0.05.

Results

Literature search, study characteristics and quality assessment

The process of the literature search and selection process are shown in Figure 1. In total, 4,696 records were identified of which 41 studies (8 published in English and 33 in Chinese) covering 40,617 participants were included in the meta-analysis. Thirty-seven studies reported the overall prevalence of sexual harassment, two studies [21, 22] provided the prevalence of verbal and physical harassment separately, and another two [23, 24] only reported the prevalence of verbal harassment.

Table 1 shows the basic characteristics of the studies included in the meta-analysis. They were published from 2004 to 2018; in the 34 studies with data on gender distribution, 95.81% of participants were females. Thirty-one studies had nurse participants, 9 had nursing student participants and one study had both nurses and nursing students [25].

The mean score of the quality assessment was 5.1 ranging from 3 to 6. Five studies [13, 26-29] did not report sampling methods, and 6 studies [14, 30-34] did not report the response rate or the response rate was less than 70%. The definition of sexual harassment was not defined in 14 studies [12, 13, 21, 26, 28, 33, 35-42] and the instruments on sexual harassment were not validated in 11 studies [21, 26, 27, 32-36, 43-45].

Prevalence of sexual harassment against nursing staff

The overall prevalence of sexual harassment from the 37 studies covering 39,486 participants was 7.5% (95% CI: 5.5-10.1%) (Figure 2), 7.5% (5.5%-10.2%) in nurses and 7.2% in nursing students (3.0%-16.2%). The pooled 1-year prevalence of sexual harassment was 7.1% (95% CI: 5.1%-9.8%) (Table 2).

Figure 1. Flowchart of study selection
Subgroup analyses

Subgroup analyses revealed that the prevalence of sexual harassment reported in studies conducted before 2012 was higher than those after 2013 (11.1% vs. 5.2%, \( P=0.014 \)), while the figure was lower in studies with sample size larger than 436 than those with simple size of \( N \leq 436 \) (5.3% vs 11.1%, \( Q=6.311, P=0.012 \) (Table 2). In contrast, the prevalence of sexual harassment was not significantly associated with mean age, seniority and length of working experience of nursing staff, department, hospital, economic and geographic regions of China, and the timeframe (all \( p \) values>0.05).

Thirteen studies reported at least one type of sexual harassment: 6 studies reported both physical and verbal sexual harassments and 7 studies reported only verbal sexual harassment. The overall prevalence of physical and verbal harassment was 2.2% and 7.0%, respectively.

Publication bias

Figure 3 shows the results of the funnel plot and the Egger’s test (\( t=0.574, 95\% \) CI: -3.15, 5.64%, \( P=0.57 \)) showing no publication bias.
Figure 2. Forest plot of the prevalence of sexual harassment of nurses and nursing students

Table 2. Subgroup analyses by study characteristics

<table>
<thead>
<tr>
<th>Subgroups</th>
<th>Categories (No. of studies)</th>
<th>Prevalence (%)</th>
<th>95% CI (%)</th>
<th>Sample size</th>
<th>Events</th>
<th>P (%)</th>
<th>P value within subgroup</th>
<th>Q (P value across subgroups)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population type</td>
<td>Nurses (28)</td>
<td>7.5</td>
<td>5.5-10.2</td>
<td>3523</td>
<td>2122</td>
<td>97.79</td>
<td>&lt;0.001</td>
<td>0.013 (0.099)</td>
</tr>
<tr>
<td></td>
<td>Nursing students (8)</td>
<td>7.2</td>
<td>3.0-16.2</td>
<td>2990</td>
<td>353</td>
<td>97.22</td>
<td>&lt;0.001</td>
<td></td>
</tr>
<tr>
<td>Department</td>
<td>Psychiatry (4)</td>
<td>28.5</td>
<td>9.1-61.4</td>
<td>807</td>
<td>234</td>
<td>98.09</td>
<td>&lt;0.001</td>
<td>4.928 (0.085)</td>
</tr>
<tr>
<td></td>
<td>Emergency (9)</td>
<td>6.3</td>
<td>3.0-12.5</td>
<td>1991</td>
<td>168</td>
<td>94.28</td>
<td>&lt;0.001</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Others (4) *</td>
<td>8.7</td>
<td>4.9-14.9</td>
<td>967</td>
<td>84</td>
<td>81.95</td>
<td>&lt;0.001</td>
<td></td>
</tr>
<tr>
<td>Hospital type</td>
<td>Tertiary (12)</td>
<td>7.3</td>
<td>4.2-12.5</td>
<td>14354</td>
<td>905</td>
<td>98.15</td>
<td>&lt;0.001</td>
<td>0.444 (0.801)</td>
</tr>
<tr>
<td></td>
<td>Secondary (5)</td>
<td>9.9</td>
<td>4.8-19.4</td>
<td>1225</td>
<td>176</td>
<td>90.97</td>
<td>&lt;0.001</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Primary (2)</td>
<td>7.9</td>
<td>3.0-18.9</td>
<td>380</td>
<td>37</td>
<td>73.00</td>
<td>&lt;0.054</td>
<td></td>
</tr>
<tr>
<td>Economic region</td>
<td>Central (7)</td>
<td>12.0</td>
<td>4.8-27.1</td>
<td>3593</td>
<td>464</td>
<td>98.76</td>
<td>&lt;0.001</td>
<td>3.643 (0.303)</td>
</tr>
<tr>
<td></td>
<td>East (10)</td>
<td>5.6</td>
<td>3.7-8.4</td>
<td>7856</td>
<td>642</td>
<td>95.13</td>
<td>&lt;0.001</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Northeast (4)</td>
<td>8.7</td>
<td>3.5-20.0</td>
<td>3392</td>
<td>314</td>
<td>98.29</td>
<td>&lt;0.001</td>
<td></td>
</tr>
<tr>
<td></td>
<td>West (5)</td>
<td>13.8</td>
<td>3.5-41.6</td>
<td>225</td>
<td>27</td>
<td>88.58</td>
<td>&lt;0.001</td>
<td></td>
</tr>
<tr>
<td>Regions of China</td>
<td>Mainland China (28)</td>
<td>7.1</td>
<td>5.0-10.0</td>
<td>35690</td>
<td>2229</td>
<td>98.32</td>
<td>&lt;0.001</td>
<td>0.261 (0.610)</td>
</tr>
<tr>
<td></td>
<td>Hong Kong, Macao and Taiwan (4)</td>
<td>5.7</td>
<td>2.5-12.4</td>
<td>2404</td>
<td>155</td>
<td>95.76</td>
<td>&lt;0.001</td>
<td></td>
</tr>
<tr>
<td>Year of survey</td>
<td>2003-2012 (13)</td>
<td>11.1</td>
<td>7.1-17.3</td>
<td>7023</td>
<td>706</td>
<td>96.74</td>
<td>&lt;0.001</td>
<td>6.022 (0.014)</td>
</tr>
<tr>
<td></td>
<td>2013-2016 (14)</td>
<td>11.1</td>
<td>3.4-7.8</td>
<td>27792</td>
<td>1309</td>
<td>97.69</td>
<td>&lt;0.001</td>
<td></td>
</tr>
<tr>
<td>Sample size</td>
<td>&gt;436 (19)</td>
<td>5.3</td>
<td>4.1-7.0</td>
<td>34907</td>
<td>1840</td>
<td>96.60</td>
<td>&lt;0.001</td>
<td>6.311 (0.012)</td>
</tr>
<tr>
<td></td>
<td>*/&lt;436 (18)</td>
<td>11.1</td>
<td>6.7-17.9</td>
<td>4579</td>
<td>704</td>
<td>97.10</td>
<td>&lt;0.001</td>
<td></td>
</tr>
<tr>
<td>Timeframe</td>
<td>1 year (23)</td>
<td>7.1</td>
<td>5.1-9.8</td>
<td>32723</td>
<td>2020</td>
<td>97.97</td>
<td>&lt;0.001</td>
<td>0.007 (0.177)</td>
</tr>
<tr>
<td></td>
<td>Others (4) &amp;</td>
<td>7.7</td>
<td>1.3-34.6</td>
<td>617</td>
<td>39</td>
<td>94.84</td>
<td>&lt;0.001</td>
<td></td>
</tr>
<tr>
<td>Age (years)</td>
<td>&gt;26 (12)</td>
<td>11.2</td>
<td>6.2-19.4</td>
<td>9118</td>
<td>827</td>
<td>98.43</td>
<td>&lt;0.001</td>
<td>1.825 (0.177)</td>
</tr>
<tr>
<td></td>
<td>*/&lt;26 (10)</td>
<td>6.1</td>
<td>3.1-11.7</td>
<td>4229</td>
<td>408</td>
<td>97.23</td>
<td>&lt;0.001</td>
<td></td>
</tr>
<tr>
<td>Working experience (years)</td>
<td>&gt;3.4 (11)</td>
<td>9.6</td>
<td>5.1-17.5</td>
<td>8822</td>
<td>784</td>
<td>98.51</td>
<td>&lt;0.001</td>
<td>0.279 (0.598)</td>
</tr>
<tr>
<td></td>
<td>*/&lt;3.4 (9)</td>
<td>7.4</td>
<td>5.1-17.5</td>
<td>8822</td>
<td>784</td>
<td>98.51</td>
<td>&lt;0.001</td>
<td></td>
</tr>
<tr>
<td>Types of harassment</td>
<td>Physical harassment (6)</td>
<td>2.2</td>
<td>0.4-11.4</td>
<td>2227</td>
<td>135</td>
<td>97.57</td>
<td>&lt;0.001</td>
<td>1.531 (0.216)</td>
</tr>
<tr>
<td></td>
<td>Verbal harassment (13)</td>
<td>7.0</td>
<td>3.3-14.2</td>
<td>4545</td>
<td>365</td>
<td>97.57</td>
<td>&lt;0.001</td>
<td></td>
</tr>
</tbody>
</table>

Q: Cochran’s Q.
Bold value: p<0.05
#: Others: contains departments of emergency, psychiatry, internal medicine, surgery, pediatrics and outpatient.
&: Others: timeframe contains 2, 4, 6 months of prevalence of sexual harassment.
Discussion

To the best of our knowledge, this was the first meta-analysis of the prevalence of sexual harassment of nurses and nursing students in China. The overall prevalence of sexual harassment of nursing staff and nursing students was 7.5% and 7.2% respectively. This implies that of the estimated 3.79 and 1.8 million registered nurses and nursing students in China in 2017 and 2016, respectively [46, 47], around 284,250 nurses and 129,600 nursing students in China may have been subjected to sexual harassment.

The prevalence of sexual harassment of Chinese nursing staff in this study was lower than the figures reported from most other countries. For example, 13.0% of nurses reported sexual harassment in the past 6 months in Southern Ethiopia [10], while the corresponding figures were 22.8% in Malaysia [48] and 22.4% in South Korea. Different definitions, measures and time frames may partly contribute to the discrepancy between these results. In addition, it is possible that the training and campaign against sexual harassment in medical settings in China have resulted in the lower prevalence of sexual harassment of nursing staff.

In this study the prevalence of sexual harassment was associated with year of survey (2003-2012 vs. 2013-2016, \( P=0.014 \)). In 2012, the law on the protection of rights of female employees was implemented in China [49], which may have reduced the risk of sexual harassment of female health workers. Similar to other studies [50], smaller simple size was associated with higher prevalence of sexual harassment in this study. There is no explanation for this observation except that the findings of studies with smaller sample size may not have been stable. Maybe participants in a smaller sample could have been more thoroughly interviewed and disclosed more cases of sexual harassment.

A survey in Italy [51] found that the prevalence of sexual harassment of nurses was higher than that of nursing students (13.9% vs. 5.8%; \( P<0.001 \)), which was not confirmed in this study (7.5% vs. 7.2%; \( P=0.909 \)). In this study, the prevalence of sexual harassment was highest in departments of psychiatry (28.5%), which is consistent with previous findings [52]. Compared to patients in other medical departments, psychiatric patients are more likely to present with disinhibited or antisocial or aggressive behaviour including sexual harassment [53]. Older nurses with longer working experience were more likely to experience sexual harassment [54, 55]. This is partly because the experienced nurses are usually responsible for handling more challenging patients, which could increase the likelihood of workplace violence and sexual harassment. However, this finding was not confirmed in the current meta-analysis. Although the difference between verbal and physical harassments did not reach statistically significant level (7% vs. 2.2%, \( P=0.216 \)), verbal harassment was more common, which is consistent with a Malaysian study (46.6% vs. 20.7%) [48].

There are several limitations to this meta-analysis. First, most studies did not report the perpetrators of sexual harassment, hence this variable could not be examined. Second, substantial heterogeneity was present in subgroup analyses as it is unavoidable in meta-analysis of epidemiological surveys [56]. Third, most nurses in the included studies were females, therefore the prevalence of
sexual harassment in male nurses could not be examined. Fourth, there have been no gold standard measures on sexual harassment, therefore the sexual harassment was measured by different instruments across studies. Finally, some relevant factors pertaining to sexual harassment, such as age and sex, were not reported in some studies, which may have affected the findings of subgroup analyses.

In conclusion, sexual harassment, particularly verbal harassment of nurses and nursing students, is common in China. Considering the significant negative impact of sexual harassment, effective preventive and workplace measures should be developed.

Supplementary Material

Acknowledgements
The study was supported by the University of Macau (MYRG2015-00230-FHS; MYRG2016-00005-FHS), National Key Research & Development Program of China (No. 2016YFC1307200), Beijing Municipal Administration of Hospitals Clinical Medicine Development of Special Funding Support (No.ZYLX201607) and Beijing Municipal Administration of Hospitals’ Ascent Plan (No. DFL20151801).

Competing Interests
The authors have declared that no competing interest exists.

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