Nurse-Reported Bullying and Documented Adverse Patient Events

An Exploratory Study in a US Hospital

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ABSTRACT

Background: Negative nurse work environments have been associated with nurse bullying and poor nurse health. However, few studies have examined the influence of nurse bullying on actual patient outcomes.

Purpose: The purpose of the study was to examine the association between nurse-reported bullying and documented nursing-sensitive patient outcomes.

Methods: Nurses (n = 432) in a large US hospital responded to a survey on workplace bullying. Unit-level data for 5 adverse patient events and nurse staffing were acquired from the National Database of Nursing Quality Indicators. Generalized linear models were used to examine the association between bullying and adverse patient events. A Bayesian regression analysis was used to confirm the findings.

Results: After controlling for nurse staffing and qualification, nurse-reported bullying was significantly associated with the incidence of central-line-associated bloodstream infections (P < .001).

Conclusions: Interventions to address bullying, a malleable aspect of the nurse practice environment, may help to reduce adverse patient events.

Keywords: adverse events, bullying, cognitive failure, nurses, patient outcomes, work environment

One out of every 3 patients admitted to a US hospital will experience an adverse event.1 Health care adverse events are a significant cause of patient harm and account for over 400,000 patient deaths per year.2 Nurses are the members of the health care team that work closest and spend most time with patients, and thus play a major role in preventing adverse events.3 Patients’ health and safety is therefore largely dependent on the skills, safety, and well-being of the nurses who care for them.4,5 However, the nursing work environment presents significant challenges to nurse safety, well-being, and implementation of patient-centered safe work practices. One of those challenges is workplace bullying.6

Bullying entails repeated negative behavior directed toward an individual with the intention of offending, abusing, or intimidating them. Bullying behaviors may be threatening, humiliating, overt or covert, verbal or nonverbal.7 Workplace bullying may aim to sabotage people’s work by deliberately excluding them from meetings, withholding information, belittling them in front of colleagues, assigning an unfair workload, or giving consistently negative feedback.8 Although it is most often nonphysical, bullying is one of the most harmful forms of coworker violence in that it continues repeatedly over time.9 Among nurses, bullying is commonly recognized as part of their working culture.10,11 It is a highly

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sensitive issue, especially when the bully is a nurse supervisor. Nurse victims of bullying often hesitate to report or discuss the behavior in their work teams because they fear retribution and/or a lack of support. Nurses who witness bullying of other nurses may also remain silent to avoid becoming victims themselves. Silent victims and bystanders thus contribute to perpetuation of the bullying culture.

Bullying has been inversely associated with nurses’ physical and psychological health, job satisfaction, and morale, and directly associated with absenteeism and job turnover. Nurse bullying has also been linked to diminished team collaboration, communication, and overall work productivity, and is therefore potentially harmful to nurses, hospitals, and patients. However, the specific influence of bullying on patient outcomes is not known. Recent research found significant associations between nurse-physician and nurse-nurse collaboration and patient safety outcomes. These findings are important in that they pinpoint the role of inter- and intradisciplinary collaboration in patient safety. However, the scales measuring nurse interactions with physicians and nurses, respectively, do not measure bullying per se.

Workplace bullying has been associated with stress, burnout, and decreased self-reported productivity in novice nurses. An early conceptual model of satisfaction, stress, and performance in caring professions suggested that the negative effects of work stress on nursing performance could be seen in reduced quality of patient care. A recent German study found that hospital staff's negative perceptions of their work environment were associated with worse patient outcomes, measured as readmission rates and length of stay. It has been suggested that stressors in nursing work require high levels of cognitive control. However, under prolonged stress, the risk of cognitive failure increases. We posit that workplace bullying is a form of chronic stress that may impact nurses’ cognitive function and lead to actual cognitive failure, defined as errors of cognitive function in performing tasks that a person is normally capable of carrying out.

We identified 3 studies that examined the negative effects of nurse bullying on organizational outcomes. All were small in scale, cross-sectional, and outcomes were nurse-rated effects on nurse work performance, relationships with patients, and medical errors. None of these studies examined independently documented patient outcomes. Thus, hard evidence for a link is lacking. Should such a link be found it would provide critical information on a malleable aspect of the nurse practice environment that may negatively influence both nurse well-being and patient safety. The aim of this study was to examine the association between nurse bullying and documented nursing-sensitive patient outcomes in a large hospital.

METHODS
Study design
This study combined analysis of cross-sectional questionnaire data on workplace bullying with retrospective unit-level administrative data on patient adverse events.

Study population and setting
The study was conducted among registered nurses in a large regional hospital in the Midwestern United States in May 2017. An anonymous survey on workplace bullying was sent out via email to the total population of 1780 nurses with a link to the web-based survey. The 41-item questionnaire was administered by the research team using a secure, online survey system. The original survey invitation was followed by weekly reminders for a period of 1 month, resulting in a total of 4 attempts at data collection. A total of 432 nurses across 37 units responded to the questionnaire (24.3% response rate). Nurses reported their primary work unit from a drop-down list. Those nurses who declined to identify their unit were grouped in the 38th unit, labeled as Prefer not to disclose; nurses who simply left the unit item blank were labeled as the 39th unit, Missing. An additional 52 nurses reported Other as their unit. Therefore, nurse-level data for 223 nurses could be linked to unit-level data. The total number of respondents at the unit level ranged from 0 to 22 (mean = 6.28) representing response rates that ranged from 0% to 31.25% (mean = 12.27%). The study was approved by the institutional review boards of the university and the hospital.

Individual nurse self-reported measures
The survey tool was composed of previously validated scales and had been pilot-tested on a sample of hospital nurses prior to the study. The
questionnaire defined bullying as deliberate, persistent, negative actions (harassing, coercing, intimidating, dominating, oppressing, persecuting, and tormenting) on the part of one person or a group of persons toward a particular individual. Two dichotomous (yes/no) items were used to measure nurses’ personal experience and witnessing of bullying, respectively, at the current workplace during the past 6 months. Nurse qualification was determined by response to a question on the highest level of nursing degree completed, with response alternatives from 0 (none) to 4 (doctor of nursing practice or equivalent).

**Dependent variables: Unit-level patient outcome data**
Unit-level deidentified patient outcome data from the National Database of Nursing Quality Indicators (NDNQI) were provided to the research team by the hospital. Approximately 2000 US hospitals report nursing-sensitive quality indicator data to the NDNQI database. Outcome indicators are specific to, and most influenced by, nursing care. The current study focused on 5 patient adverse events as dependent variables: (1) total patient falls; (2) central-line-associated bloodstream infections (CLABSIs); (3) catheter-associated urinary tract infections (CAUTIs); (4) unit-acquired pressure ulcers; and (5) ventilator-associated events (VAEs). The hospital provided the research team with NDNQI data collected from the last 2 quarters preceding the bullying survey (Q4 2016 and Q1 2017). These data were used in the analysis, as this was the period closest to the participants’ reports of bullying in the past 6 months.

**Independent variables**
Since all dependent variables were on a unit-level, the analyses used average unit rates for each of the independent study variables. The 2 questions measuring personal experience and witnessing of bullying were the main independent variables. Based on the participants’ responses to each of the 2 bullying questions, the proportion of those who were bullied and/or witnessed bullying was calculated at the unit level as the number of cases of bullying divided by the total number of responses in the unit. Nurse staffing and nurse qualification were included as control variables in additional independent models, as both have been previously associated with patient outcomes. Nurse staffing was defined as the number of nurse-hours per patient-hours in a given unit, computed from nursing hours and patient days provided in the unit-level NDNQI data. Nurse qualification was also calculated as a rate, defined as the average qualification reported by nurses on each unit, with higher scores attributed to higher educational degrees (some college or less, bachelor’s, master’s, and doctoral).

**Data analysis**
The primary goal of the analysis was to examine whether self-reported experience and/or witnessing of bullying were statistically associated with patient outcomes on a unit level. Generalized linear models were used to examine associations between cross-sectional questionnaire data on workplace bullying and documented unit-level adverse events.

Due to the relatively small numbers of units with adverse events, a Bayesian regression framework was used to confirm the generalized linear regression findings. Bayesian techniques are more efficient in dealing with data-limited studies, particularly observational ones. Thus, it is a good approach to first use standard statistical techniques to identify general patterns in the data, followed by Bayesian techniques to obtain quantitative results (eg, via credibility intervals). Statistical analyses were conducted using IBM SPSS statistics, version 25 (IBM Corp, Armonk, New York), and Python’s PyMC3 package (The PyMC Development Team, Apache License, V2, 2018) was used for Bayesian modeling. Statistical significance was set at P values of < .05.

**RESULTS**
Characteristics of the study participants and patient adverse events are summarized in the Supplemental Digital Content Table (available at: http://links.lww.com/JNCQ/A651). The majority of the nurses were female (92.9%), with a mean age of 44.4 years (range 20-66). Overall, nearly 37% (n = 139) reported having been personally bullied at their workplace in the last 6 months, while more than half (51.4%, n = 191) had witnessed someone else being bullied. On a unit level, the rate of self-reported bullying ranged from 0% to 100%, with a mean of 32% and a median of 25%. Unit-level mean rates of patient adverse events for the last 2 quarters were
highest for falls (n = 3.03/1000 patient days) and VAEs (n = 5.38/1000 ventilator days), followed by CLABSI (0.84/1000 patient days) and CAUTI (0.52/1000 patient days). A comparison of adverse event rates for the 18 months (6 quarters) preceding our 6-month (Q4 2016 and Q1 2017) study period revealed overall stable rates over a 2-year period (data not shown). This confirmed that our study was conducted with typical rates of adverse events.

Bullying and patient outcomes
The results from generalized linear model analysis are shown in the Table. Self-reported bullying was positively associated with CLABSI per 1000-line days (β = 3.69, P < .001) while nurse staffing was positively associated with rates of CLABSI (β = 0.08), CAUTI (β = 0.13), and VAE (β = 1.84), with P < .001 in all 3 cases. The findings from Bayesian modeling are depicted in a forest plot in the Figure. After controlling for nurse staffing and qualification, higher unit-level reports of self-reported bullying were significantly associated with higher incidence of CLABSI, 95% credibility interval (0.013-0.211). Self-reported bullying and witnessing bullying were not significantly related to other patient adverse events at the 95% credibility level.

DISCUSSION
This study explored the association between nurse-reported experiences of workplace bullying and independently documented patient outcomes on a hospital unit level. Results revealed a significant positive association between personal experience of being bullied and CLABSI. Witnessing other nurses being bullied was not significantly associated with any patient outcomes, nor was nurse qualification. However, nurse staffing levels were significantly and positively associated with CLABSI, CAUTI, and VAE, suggesting that these adverse infection outcomes were more likely to occur when a greater number of nurses were involved in patient care.

### Table. Generalized Linear Model for Variables Associated With Patient Adverse Events at Hospital Unit Level

<table>
<thead>
<tr>
<th>Patient Adverse Events</th>
<th>Fallsa (n = 16)</th>
<th>CLABSI (n = 14)</th>
<th>CAUTI (n = 15)</th>
<th>Pressure Ulcersb (n = 11)</th>
<th>VAEs (n = 5)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>β (SE)</td>
<td>β (SE)</td>
<td>β (SE)</td>
<td>β (SE)</td>
<td>β (SE)</td>
</tr>
<tr>
<td>Self-reported bullying</td>
<td>0.42 (3.82)</td>
<td>3.69 (0.63)c</td>
<td>−0.51 (0.92)</td>
<td>−0.61 (3.67)</td>
<td>−13.33 (9.95)</td>
</tr>
<tr>
<td>Witnessed bullying</td>
<td>0.73 (4.51)</td>
<td>0.34 (0.67)</td>
<td>−0.72 (0.98)</td>
<td>−4.85 (3.73)</td>
<td>−7.22 (5.82)</td>
</tr>
<tr>
<td>Nurse qualification</td>
<td>−3.37 (5.15)</td>
<td>1.02 (0.80)</td>
<td>−0.78 (1.26)</td>
<td>−7.86 (8.92)</td>
<td></td>
</tr>
<tr>
<td>Nurse staffing</td>
<td>−0.09 (0.09)</td>
<td>0.08 (0.03)d</td>
<td>0.13 (0.04)d</td>
<td>0.20 (0.14)</td>
<td>1.84 (0.61)d</td>
</tr>
</tbody>
</table>

Abbreviations: β, unstandardized beta; CAUTI, catheter-associated urinary tract infections per 1000-line days; CLABSI, central-line-associated bloodstream infections per 1000-line days; SE, standard error; VAEs, ventilator-associated events per 1000 vent days.

aFalls per 1000 patient days.

bUnit-acquired pressure ulcers.

cP < .001.

dP < .01.
This study is the first to report a statistically significant association between workplace bullying against nurses and adverse patient outcomes. A cross-sectional questionnaire study among 286 nurses in Turkey found that those who experienced bullying in the past 12 months (21%) reported that it impacted their job performance, including their relationships with their patients.25 A questionnaire study of Canadian nurses (n = 336) reported significant associations between experienced bullying and nurse-assessed adverse patient events as well as nurse perceptions of patient safety risk.23 Similarly, a questionnaire study among nurses (n = 241) in the United States found a significant positive relationship between self-reported bullying and self-reported medical errors.24 In contrast to the current study, none of those measured actual patient outcomes or validated their findings against administrative patient outcome data.

We have no definite explanation as to why CLABSI was the only adverse outcome associated with bullying. If our hypothesis holds true, that bullying is a form of prolonged stress that can lead to distraction and cognitive failure for nurses, then why is there also no significant association with falls, CAUTI, pressure ulcers, and VAEs? One possible explanation is that central lines have a direct pathway to the patient's bloodstream, greatly increasing the risk of infection. In contrast, the other outcomes are also influenced by patient behavior (falls) or less direct pathways to the bloodstream (CAUTI, pressure ulcers, and VAEs).

The positive association between nurse staffing and the 3 adverse infection outcomes was somewhat unexpected. Numerous studies have examined the association between nurse staffing and health care-associated infection,32,33 but findings have been mixed. Some studies have found a positive association between staffing and infections, as in our study, while others have found an inverse association. A review article cited an array of possible methodological reasons for this, including varying definitions of nurse staffing and use of different databases, risk adjustment methods, and time frames.31 It is possible that having a greater number of nurses on a unit increased the number of nurses involved in interactions with each patient, thus raising the risk of infection transmission.34 A greater number of nurses also increases the likelihood that at least some nurses will not be fully compliant with hygiene protocols. Previous research linking the nurse practice environment with patient outcomes has focused on nurse staffing and education levels, which have been positively associated with better patient outcomes.29,35,36 However, Aiken et al29 found that improving nurse staffing levels in a negative work environment (measured via a composite measure of 4 subscales) had no positive effect on outcomes. Results of the current study may reflect a similar phenomenon (ie, adequate staffing levels may not counteract the negative effects of nurse bullying on patient outcomes). This underscores the necessity of examining specific negative aspects of the nurse work environment, such as bullying, that could potentially be the target of unit-based and/or organizational interventions.

The next steps in this research will be to understand the mechanisms by which bullying against nurses may influence patient care outcomes. Research suggests that unmet nursing care needs37 and both poor nurse-nurse and nurse-physician collaboration17 negatively influence patient outcomes. Poor collaboration, in particular, was inversely and significantly associated with patient pressure ulcers and falls.17 Both victims and bystanders of bullying have reported higher workplace bullying at work—either to oneself or to colleagues—may create an environment that is so stressful that nurses struggle to maintain their composure and their focus on patient care tasks due to cognitive failure.39 Future studies are needed to confirm our findings, and surveys on workplace bullying should include questions that specifically address possible mechanisms, such as chronic stress and cognitive failure.

Limitations
This study was conducted in a large single hospital system in the Midwestern United States, and this may limit the generalizability of study findings. A second limitation was the rather low response rate (24%), which raises questions regarding selection bias, as those nurses who responded may have been those who were particularly troubled by bullying at work. Bullying is clearly a sensitive issue that may have made nurses reluctant to respond, despite efforts to ensure anonymity.40 However, response rates in previous studies have ranged from 1% to...
and our response rate was within that range. Third, the survey did not include questions on hand hygiene compliance. Such data could shed additional light on the association between bullying as a work stressor and adverse patient events related to infection. Finally, this was a cross-sectional study, and cause and effect cannot be determined. Nurses reported bullying in the past 6 months, which was why we examined patient outcomes during that period. Future studies should be designed for prospective analysis of the possible effects of bullying on patient outcomes, and, if confirmed, possible mechanisms behind the findings.

CONCLUSIONS

Nurse-reported bullying was positively associated with CLABSIIs. Results should be interpreted with caution due to the study’s limitations and exploratory nature. However, it is suggested that prolonged exposure to bullying at work may represent a form of chronic stress that interferes with nurses’ capacity to focus fully on patient care tasks. Interventions to address bullying, a malleable aspect of the nurse practice environment, may help to reduce adverse patient events, as well as to improve nurse health and well-being.

REFERENCES


