Assessing the relationships between nurse work hours/overtime and nurse and patient outcomes: Systematic literature review

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ABSTRACT

Background: The effects of work hours/overtime on nurse and patient outcomes and specific components of work hours (per shift and per week) and overtime on these effects have not been systematically examined.
Purpose: The purpose of this review was to systematically evaluate the effect of nurse overtime and long work hours on nurse and patient outcomes.
Methods: An online search of six electronic bibliographic databases was conducted for research published from 2000 to 2013.
Discussion: Twenty-one nurse outcome measures and 19 patient outcome measures were found in relationships with work hours and overtime. A total of 67 relationships to nurse outcomes and 41 relationships to patient outcomes were examined.
Conclusions: The findings of this review suggested that evidence supporting positive relationships between working long hours and adverse outcomes to the nurses is strong. However, to make a conclusion of the positive relationship between long work hours and adverse patient outcomes, more evidence is needed.

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In order to provide continuous nursing care, 24-hour coverage goes beyond the typical 9:00 a.m. to 5:00 p.m., Monday through Friday work day (Trinkoff et al., 2011). Traditionally, three 8-hour shifts have been used (Josten, Ng-A-Tham, & Thierry, 2003). Globally, various work scheduling methods are used to cover the 24 hours a day, 7 days a week needs for patient care. Some scheduling methods exceed traditional 8 work hours per day (e.g., 12 hours). When nurses work overtime, they often work long periods of time per day as well as per week. For example, in 2008, an estimated 3,063,162 licensed registered nurses (RNs) lived in the United States (U.S. Department of Health and Human Services, 2010). According to the 2010 U.S. Census (U.S. Census Bureau, 2010), licensed RNs comprised 1% of the total population (308,745,538). Fifty-four percent of the respondents to the 2008 National Sample Survey of Registered Nurses worked more than 39 hours per week, resulting in more than half of RNs working at least 2,000 hours per year in their principal nursing positions (U.S. Department of Health and Human Services, 2010). This is approximately 200 hours per

year more than the average American worker (Fleck, 2009). If we consider those nurses who have more than one position, the total number of hours could be more than this. Furthermore, nurses are more likely to work 12-hour shifts in the United States (American Nurses Association [ANA], 2009). All this implies nurses not only work long hours, but they also return to work more quickly, resulting in less sleep and rest between shifts.

Long work hours can be defined by per shift as well as per week. In a similar concept, overtime can be measured by the contrast between scheduled work hours and actual work hours. Overtime can lead to long work hours. The culmination of working longer hours throughout a workweek leads to shorter periods of rest between shifts, which not only can affect nurses' recovery time but also increase their exposure time to work stress and potential hazards (Centers for Disease Control and Prevention, 2002; Sonnentag & Zijlstra, 2006). To protect nurses from working such long hours, since 2000, states began to regulate nurses' mandatory overtime and shift lengths with the minimum resting time between shifts (Bae, Brewer, & Korvner, 2012). The ANA supports the state legislation of such laws and is in pursuit of federal legislation (ANA, 2012a). Proponents of a ban on mandatory overtime expect that these state regulations improve not only nurses' working conditions but also nurses' job satisfaction and retention, which may result in compromised patient quality of care (Washington State Department of Labor and Industries, 2002).

Evidence shows that nurses working longer shifts or overtime experienced fatigue and poor quality of sleep, which affected their vigilance, alertness, reaction time, and decision-making ability (Geiger-Brown, Tinkoff, & Rogers, 2011; Trinkoff et al., 2011). As a result, the likelihood of sustaining an injury dramatically increased. Previous studies found that long work hours per day and per week were associated with a higher incidence of musculoskeletal injuries and needlesticks in nurses (Ilhan, Durukan, Aras, Turkcuoglu, & Aygun, 2006; Trinkoff, Le, Geiger-Brown, Lipscomb, & Lang, 2006; Trinkoff, Le, Geigher-Brown, & Lipscomb, 2007). Working unplanned overtime was also associated with the occurrence of work-related injuries and work-related illnesses (de Castro et al., 2010).

Regarding patient outcomes, researchers found a link between long work hours and adverse patient outcomes. Stone et al. (2007) found a higher ratio of overtime was associated with occurrences of catheter-associated urinary tract infection and decubitus ulcers. The risk of making medical errors was three times higher when nurses worked shifts lasting of 12.5 hours or more (Rogers, Hwang, Scott, Aiken, & Dignes, 2004). The most recent study found long work hours per day during nurses' typical work schedules were significantly related to patient mortality after controlling for hospital staffing levels and hospital characteristics (Trinkoff et al., 2011). Nurses working more than 40 hours per week also perceived an increase in the number of medication errors, falls with injuries, and nosocomial infections (Olds & Clarke, 2010).

Several reviews have been conducted in the health care sector to examine the effects of shift length on the quality of patient care and health care provider outcomes (Poissonnet & Veron, 2000; Fletcher et al, 2004; Estabrooks et al, 2009). Recently, Estabrooks et al. (2009) reviewed 12 studies to identify evidence on the effect of shift length (8-hour vs. 12-hour shifts) on the quality of patient care and health care provider outcomes. They found insufficient evidence to conclude the shift length has an impact on patient outcomes or specific health provider outcomes.

However, these reviews were limited to the effects of the shift length on outcomes. We found no reviews of studies to date that rigorously and systematically assessed the evidence about the strength of the effect of nurse work hours/overtime and nurse and patient outcomes and the specific components of work hours (e.g., per shift and per week) and overtime (e.g., mandatory and voluntary overtime), which may have an adverse effect on nurse and patient outcomes. Because each study uses various measures of nurse work hours and overtime, accumulative evidence from those studies should be carefully evaluated to make a conclusion.

Therefore, the current review conducted a systematic assessment of these empirical studies to draw specific evidence of the impact of nurse work hours and overtime practice on nurse and patient outcomes. Eventually this evidence can be used to develop guidelines on nursing work hours and overtime usage, and researchers, managers, and policy makers will have a better ability to assess and modify nurses' working hours.

Aim

The aim of this review was to systematically evaluate the effect of nurse overtime and long work hours on nurse and patient outcomes. The research questions were how strong was the effect of nurse overtime and long work hours on nurse and patient adverse outcomes and which specific components of nurse overtime (e.g., mandatory and voluntary) and work hours (e.g., per shift, per week, and how many hours) were adversely related to nurse and patient outcomes.

Design

From the preliminary assessment, we found the majority of studies were observational in nature. For the homogeneity of studies included in this review, only observational studies were included. Therefore, the recommendations for meta-analysis of observational