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Feature Article

Contributing influences of work environment on sleep quantity and quality of nursing assistants in long-term care facilities: A cross-sectional study

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ABSTRACT

The effect of shift work on nurses' sleep is well-studied, but there are other challenging aspects of health care work that might also affect the sleep of direct caregivers. This study examined the influence of the long-term care work environment on sleep quantity and quality of nursing assistants. A cross-sectional survey collected data from 650 nursing assistants in 15 long-term care facilities; 46% reported short sleep duration and 23% reported poor sleep quality. A simple additive index of the number of beneficial work features (up to 7) was constructed for analysis with Poisson regression. With each unit increase of beneficial work features, nursing assistants were 7% less likely to report short sleep duration and 17% less likely to report poor sleep quality. These results suggest that effective workplace interventions should address a variety of work stressors, not only work schedule arrangements, in order to improve nursing assistants' sleep health.

Introduction

According to the National Health Interview Survey of 2004–2007, 30% of U.S. workers (approximately 40.6 million) experienced long-term sleep deprivation with average sleep duration of six or less hours per day.[1] Short-term sleep deprivation can negatively affect an individual's alertness, mood, attention, and ability to concentrate,[2] while long-term sleep deprivation is associated with chronic fatigue,[3] cardiovascular diseases,[4] obesity and diabetes,[5] and all-cause mortality.[6] Health care workers provide continuous services around the clock; as a result, they are at risk for decreased sleep quantity and quality, continuous sleep deprivation, and cumulative sleep debt.[3,7]

Shift work, long work hours, and associated sleep problems and fatigue may influence the health and safety of both workers and patients.[7,8] Fatigue resulting from shift work and poor sleep tends to reduce an employee's ability to concentrate and decrease the quality of decision-making,[9] increasing the possibility of errors and injuries. Rogers et al. (2004)[10] reported that the likelihood of hospital nurses making an error was two to three times higher when they worked longer shifts. Sleep deprivation, sleepiness, and fatigue were consistently associated with nurse performance and patient safety.[11–13] Wagstaff and Lie (2011)[14] estimated from 14 high-quality epidemiology studies that accident rates increased 50%–100% for employees working long or irregular shifts.

Sleep quantity and quality has been better studied for nurses[3,15] than for nursing assistants. Nursing assistants provides most of the front-line services in long-term care (LTC) facilities, so their ability to ensure resident safety and quality of care is essential. Poor sleep is a critical issue for nursing assistants. Eriksen, Bjorvatn, Bruusgaard, and Knardahl (2008)[16] reported about 30% of nursing aides had poor sleep quality in Norway. Another study by Takahashi et al. (2008)[17] reported a number of sleep problems among nursing home caregivers in Japan, including short sleep duration, poor sleep quality, and insomnia symptoms. Identified risk factors for sleep

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problems include socio-demographics such as age[18,19]; gender[18]; race[20]; marital status[21]; education[22]; and dependent family members.[23] Sleep problems have also been linked to lifestyle factors such as smoking[24] and physical activity[25]; and health conditions such as obesity,[26] chronic diseases,[27] and musculoskeletal pain.[28]

The association between work stressors and sleep has been documented. Charles et al. (2011)[29] and Kashani, Eliasson and Vernalis (2012)[30] reported that workers with higher perceived stress had significantly shorter sleep duration and worse sleep quality than workers with lower perceived stress. Work stress might directly affect employees' sleep quality, and indirectly affect sleep quantity. For example, an employee may sacrifice sleep hours voluntarily for jobs or activities, and involuntarily from poor sleep quality. Nursing assistants face multiple work stressors in the LTC environment, including demanding work schedules,[31] heavy workload and short staffing,[32] workplace assaults,[33] and low latitude in decision-making.[34] These work stressors adversely impact nursing assistants' health.[31,35,36] Previous studies on sleep of nurses focused primarily on the effect of work schedules,[3,7] an investigation of other work features associated with sleep quantity and quality for LTC nursing assistants is warranted.

The objective of this study was therefore to examine the influence of the organizational and psychological LTC work environment on sleep quantity and quality of nursing assistants. The study hypothesis was that more beneficial working conditions (employee perceived low physical and psychological demands, feeling safe in general and from violence at work, decision-making opportunities, support from coworkers and supervisors, and balance between work and family life) would improve nursing assistants' sleep quality and/or quantity, after adjustment for other known risk factors.

Material and methods

Setting and subjects

As part of a larger research study of clinical caregivers, information was collected on nursing assistants' work and health in a large chain of LTC facilities in the eastern United States. All centers were non-unionized skilled nursing facilities owned or managed by a single for-profit company. This study used cross-sectional survey data collected from a sample of 744 nursing assistants working in 15 LTC facilities located in Maryland and New England between January, 2008 and October, 2009. A non-probability convenience sampling method was used to recruit study participants. All full-time, part-time, and per-diem nursing assistants over 18 years old and hired directly by the company were eligible to participate.

Questionnaires were distributed and collected at the LTC facilities by the research team over a two to four day period to accommodate nursing assistants from different shifts and units. The research team members explained the study purpose and procedure, and potential benefits and risks to participants in person and requested them to sign the informed consent form. Participants were reassured that the employer would not receive any identifying information obtained, and they were given the option to take home the questionnaires to complete in private. Most participants completed questionnaires during break times and returned them in person. For others, such as third-shift and weekend workers, a pre-stamped and addressed-return envelope was provided. Compensation of $20 was offered in exchange for each completed questionnaire returned with a consent form. The study was approved by the University of Massachusetts Lowell Institutional Review Board (No. 06-1403).

Measurement of variables

Socio-demographics, lifestyle, and health

The questionnaire collected detailed information on nursing assistants' socio-demographics, including age, gender, race, education, marital status, and responsibility for children and other dependents.

Information on smoking, sedentary behavior, obesity, chronic health conditions, and musculoskeletal disorders (MSDs) was collected. Sedentary behavior was defined as "exercise less than three times per week (for at least 20-min per session to work up a sweat)." BMI was calculated from self-reported weight and height, expressed as weight/height^2. History of several chronic health conditions was assessed: diabetes, hypertension, elevated cholesterol level, and low back diseases or spine problems. Chronic health conditions were defined as "yes" for participants who reported any one of the above conditions. MSD symptoms were assessed for four body regions: low back, shoulder, wrist/forearm, and knee. MSD symptoms were defined as "yes" for participants who reported pain with severity $\geq$3 (scale 1–5) in any region.

Work environment

The questionnaire inquired about work characteristics from three physical domains (physical demands, physical safety, and violence at work) and five psychosocial domains (psychological demands, decision latitude, social support, schedule control, and work-family conflict), using items selected from standardized instruments. A 4-point Likert scale (strongly disagree; disagree; agree; and strongly agree) was used for each item.

The psychological demands (4 items), decision latitude (7 items), and social support (4 items) subscales were selected from the Job Content Questionnaire (JCQ).[37] The JCQ is a well-established instrument to measure different aspects of work characteristics, including subscales of physical demands (original 5 items), psychological demands (original 9 items), decision latitude (original 19 items), social support (original 11 items), and job insecurity (original 6 items).[37] The JCQ subscales have demonstrated good validity and acceptable internal consistency in large study populations from six countries.[37] Schedule control was measured with two items derived from Büssing (1996).[38] Work-family conflict was measured with three items derived from Kopelman, Greenhaus, and Connolly (1983).[39] Work Interference with Family Scale, which has demonstrated good reliability and validity in different populations.[39]

Physical demands subscale included 4 items from the JCQ and one item written by the research team. Physical safety was measured with two items from Griffin and Neal (2000),[40] along with two items developed by the investigators. Violence at work was measured with one item: "In the past 3 months, have you been hit, kicked, grabbed, shoved, pushed or scratched by a patient, patient's visitor or family member while you were at work?" The questionnaire also collected information about work shift schedule (day, evening, night, or rotating), shift length, work hours/two weeks, and working other paid jobs (yes or no).

Instrument internal consistency was assessed in these study participants with Cronbach's alpha (α). Four subscales: physical demands ($\alpha = 0.82$), social support ($\alpha = 0.77$), schedule control ($\alpha = 0.74$) and work-family conflict ($\alpha = 0.78$), had acceptable reliability ($\alpha \geq 0.7$); and three subscales: physical safety ($\alpha = 0.45$), psychological demands ($\alpha = 0.47$), and decision latitude ($\alpha = 0.61$), had lower values ($\alpha < 0.7$). Previous studies with hospital nurses[41,42] have also shown lower reliability of psychological demands and decision latitude subscales; this may be due in part to the fact that the demands scale also reflects physical workload for some workers,[43,44] and similarly that decision latitude scale has two dimensions, skill discretion and decision authority.