



Original Article

Increased low back pain risk in nurses with high workload for patient care: A questionnaire survey



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ABSTRACT

Objective: To examine whether the prevalence of low back pain (LBP) increased in hospital nurses with high patient care workload.

Materials and Methods: A structured, self-administered questionnaire was used to collect information on the prevalence of LBP and its associated factors from 788 registered nurses from a medical center in Taiwan.

Results: Among all nurses with eligible questionnaires, 567 (72.0%) had LBP. Mean daily hours of working, standing, and walking were persistently longer in the LBP group. Results from multivariate logistic regression analysis showed that daily working for 1 hour longer is linked to a 35% (95% confidence interval (CI) = 2–78%) greater risk of LBP. Compared with <2 years of service as nurse, nurses with 2–5 years of service had the highest risk (odds ratio (OR) = 2.11, 95% CI = 1.07–4.18). LBP risk was also higher for nurses with chore duty responsibilities (OR = 1.99, 95% CI = 1.12–3.53) and other back related disorders (OR = 4.43, 95% CI = 1.99–9.86).

Conclusion: Our results suggest that longer daily working hours and a large number of cared patients per shift should be discouraged in order to prevent musculoskeletal problems such as LBP in registered nurses.

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Introduction

Low back disorders are prevalent in most societies and subsequently lead to a surge in the costs for caring individuals with such disorders [1,2]. In the United States, ~6% of the labor force have received compensation for back-related complaints among >3,200,000 occupational injuries [3]. Nurses, in particular, are at higher risk than other health professionals to suffer from injuries and work related musculoskeletal disorders such as low back pain (LBP) [4,5].

Trinkoff et al [6] found that the prevalence of LBP among 45 years old American nursing staff was 47%. A German study reported

a LBP prevalence of 61.2% among 2176 participated nursing staff with an average age of 31.9 years [7]. In Asia, a Japanese study revealed that 30% of nurses had the LBP complaints in the recent month before survey [8]. However, in Taiwan, a nationwide cross-sectional study observed a staggering LBP prevalence of nearly 70% in the surveyed hospital nurses [9]. The lifetime prevalence even reached 82% [10].

Musculoskeletal diseases remain the main cause of injury among hospital work forces, whereas LBP has been the major reason of absence in nursing staff [11,12]. Nurses are the main hospital staff in frequent close contacts with patients. They injure their backs from the physical burden associated with manual handling of patients. Persistent and repeated patient lifting and transferring combined with physical restrictions owing to poor ergonomics of hospital equipment leads to physiological stress for nurses. LBP is thus one important health concern in nursing practice [13–15]. This is especially true in many developed countries

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where high workloads in the delivery of healthcare services has drastically impacted the nursing practice [4].

The complex nature of patient care, extended shift schedules, and reduced staffing has increased job demands of nurses [16]. Long working hours, a large number of cared patients, in addition to the frequent manual lifting and improper postures, are all critical factors associated with LBP in nurses, implying that LBP is an occupational disease of complex origins [4,17–19].

Although LBP is not a life threatening disorder, it occurs relatively readily and requires long-term treatment. It also exerts financial impact on nursing practice, insurance costs, and occupational compensation. Therefore, it is important to constantly investigate factors associated with LBP in nurses, which has become one of the most critical healthcare issues for hospital staff with high patient-care workload.

Nevertheless, despite an abundance of evidence describing characteristics of LBP in nursing staff from the Western context, studies examining the factors associated with this occupational disorder in hospital nurses are still lacking from the Asian perspective. This study wishes to investigate the current working conditions of nurses with LBP in Taiwan in relation to their physical workload, and to depict whether working prolonged shifts is associated with events of LBP.

Materials and methods

This study is a cross-sectional survey which adopted the United States (US) Department of Health and Human Services definition of LBP—it is considered as chronic and/or acute pain experienced in the regions of lumbosacral, buttock, or upper leg [20]. We focused on the nonspecific type of LBP in this study.

Participants

Data used in this study was collected using the “Low Back Pain in Nurses” questionnaire, adopted from a previous study [21]. A total of 992 registered nurses working at a medical center in the central region of Taiwan were invited to participate in the self-administered questionnaire survey which they were asked to complete in their own leisure time. With informed consents, 796 (80.2%) participants completed valid questionnaires. This study has been reviewed and approved by the Institutional Review Board of China Medical University [No. 97.06.11–5].

Questionnaire

The questionnaire collected information including job title, age, educational level, marital status, history of pregnancy, and obligation to household chores. The questionnaire also asked for information on work-related indicators associated with LBP, including years of service as nurse, average daily hours of standing, sitting and walking at work, average daily hours at work, weekly frequency of exercise for >30 minutes, and history of selected diseases that can be associated with pain in the low back area (i.e., herniated intervertebral disk, degenerate arthritis of lumbar spine palsy, spondylolisthesis, sciatic nerve pain, scoliosis, osteoporosis, etc.).

To ensure the questionnaire contents would align with the purpose of the study, a measurement tool validation was performed to assess reliability. A Cronbach α of 0.95 suggests high reliability of the questionnaire used for this study.

Data analyses

Among all respondents, questionnaires from 788 nurses (out of 796; 99.0%) were eligible for data analyses. They were divided into

two groups, one group with LBP ($N = 567$) and the other group without LBP ($N = 221$). We compared the LBP group and non-LBP group regarding their age, job type, education level, marital status, employment years as nurse, history of delivery, whether conducted chore duties, life style (routine weekly exercise), and history of illnesses related to back problems (e.g., herniated intervertebral disk, degenerate arthritis of lumbar spine palsy, spondylolisthesis, sciatic nerve pain, scoliosis, visceral diseases, or other back-related problems). Characteristics at work such as hours of sitting, standing, working, and walking were also compared. Stepwise multivariate logistic regression analysis was finally conducted to estimate odds ratios (OR) and 95% confidence intervals (CI) for the presence and strength of association between LBP and risk factors. Confounders such as routine exercise, chore duties, history of specific illnesses, and age were adjusted in the final analysis to control for their extraneous effect. Statistical software SAS 9.1 (SAS Institute Inc., Cary, NC, USA) was used for data analyses.

Results

Most participants were clinical bed-side care nurses (94.5%) and only 3.7% ($N = 29$) participants were nursing administrators (Table 1). The majority of participants (83.4%) were 20–29 years old or younger, whereas the rest of participants were aged between 30 and 55 years (16.5%). The participants were well-educated and more likely to be unmarried. Only 95 (12.2%) participants had the experience of giving birth. More than 60% of nurses were responsible for chore duties at home.

Characteristics associated with LBP

Seven questions were designed to implicate the risk factors of LBP. Table 1 shows that 72.0% (567/788) of study participants reported having LBP. The prevalence increased with age, from 65.2% (214/328) in 20–24 year old group to 75.5% (37/49) in those aged 35 years and older. Nurses with LBP were older and had a longer work history, with a prevalence rate of 78.8% in those with a work history of 8 years or longer. Less than half of study participants worked for >5 years. The LBP group was more likely to have chore duties than the non-LBP group. Nurses rarely had exercise. Twenty-five percent of participants had a history of associated diseases such as herniated intervertebral disk, degenerate arthritis of lumbar spine palsy, spondylolisthesis, sciatic nerve pain, scoliosis, visceral diseases, or other back-related problems. These complaints were more prevalent in nurses with LBP than in those without LBP (30.8% vs. 9.9%).

Association with work condition

Daily work-related conditions were compared between nurses with and without LBP. Compared with non-LBP group, nurses with LBP had longer average hours at work (9.44 ± 1.11 vs. 9.15 ± 1.00 h, $p = 0.001$) (Table 2). They also had longer average hours of standing (2.59 ± 1.02 vs. 2.37 ± 0.94 h, $p = 0.009$), and walking (2.54 ± 0.97 vs. 2.29 ± 0.90 h, $p = 0.002$).

Logistic regression analysis

Variables that appeared to be significantly different between nurses with and without LBP in Tables 1 and 2 were included in the multivariate logistic regression analysis. Table 3 shows that LBP was associated with work as nurses for 2–5 years compared with work for <2 years (OR = 2.11, 95% CI = 1.07–4.18); chore duties (OR = 1.99, 95% CI = 1.12–3.53); selected spine or back related diseases (OR = 4.43, 95% CI = 1.99–9.86); and additional daily work hours (OR = 1.35, 95% CI = 1.02–1.78).

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