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Nurse-Perceived Patient Adverse Events depend on Nursing Workload

Jeong-Hee Kang [a], Chul-Woung Kim [b,*], Sang-Yi Lee [c]

[a]*Department of Nursing Science, Youngdong University, Youngdong, Korea.*
[b]*Department of Preventive Medicine, College of Medicine, Chungnam National University, Research Institute for Medical Sciences, Daejeon, Korea.*
[c]*Department of Health Policy and Management, School of Medicine, Jeju National University, Jeju, Korea.*

Abstract

Objectives: The purpose of this study was to investigate the correlation between nursing workload and nurse-perceived patient adverse events.
Methods: A total of 1,816 nurses working in general inpatient units of 23 tertiary general hospitals in South Korea were surveyed, and collected data were analyzed through multilevel logistic regression analysis.
Results: Among variables related to nursing workload, the non-nursing task experience had an influence on all four types of patient adverse events. Nurses with non-nursing tasks experienced patient adverse events—falls [odds ratio (OR) = 1.31], nosocomial infections (OR = 1.23), pressure sores (OR = 1.16), and medication errors (OR = 1.23)—more often than *occasionally*. In addition, when the bed to nurse ratio was higher, nurses experienced cases of pressure sores more often (OR = 1.35). By contrast, nurses who said the nursing workforce is sufficient were less likely than others to experience cases of pressure sores (OR = 0.78). Hospitals with a relatively high proportion of nurses who perceived the nursing workforce to be sufficient showed a low rate of medication error (OR = 0.28).
Conclusion: The study suggested that the high level of nursing workload in South Korea increases the possibility of patient adverse events.

1. Introduction

Nursing workload, which refers to the direct supervision of patients, may affect the incidence of patient adverse events. That is, the incidence of patient adverse events may increase when the number of patients allocated to each nurse is high and nursing workload is great. Patient adverse events that occur within a hospital not only put patients at a direct disadvantage but also place significant financial burden on the healthcare system [1].

Three variables were used in previous studies to determine nurses' workload: the number of beds per nurse [2]; the number of patients per nurse (showing the amount of nursing workforce available); and patient severity [3]. Moreover, by measuring the number of

*Corresponding author.
E-mail: woung@cnu.ac.kr (C.-W. Kim).

non-nursing tasks performed by nurses, such as transporting patients, delivering and retrieving food trays, and housekeeping duties, the level of nursing workload may be computed [4].

When the number of non-nursing tasks performed by each nurse is high, it may be concluded that there is a heavy workload burden and, thus, that nurses may not be able to properly carry out jobs that require professional skills, such as training and consultation [4]. In other words, when the number of non-nursing tasks performed by nurses increases, patient adverse events may occur because nurses lack the time to provide patients with necessary supervision. This, in turn, may affect the quality of the healthcare service provided at the hospital [4,5].

When a hospital lacks sufficient nursing workforce, patients may not be provided with timely nursing, and patient adverse events, such as medication error, patient falls, nosocomial infections, pressure sores, cardiopulmonary resuscitation failure, and death, may occur [6−9].

Due to the lack of nursing workforce in South Korea, nurses may face considerable workload and have to perform numerous non-nursing tasks [10], and this may influence the incidence of patient adverse events. Comprising 46.0% of the healthcare personnel in South Korea the number of active nurses in the Korean population is 4.8/1,000 people, which is lower than the Organization for Economic Cooperation and Development average of 9.3 [11,12]. Switzerland and Norway had the highest number of nurses/1,000 people: 16.6 and 16.5, respectively, [10]. In other words, nurse staffing in Korea was half of the average in Organization for Economic Cooperation and Development countries and a quarter of that in Northern European countries such as Switzerland and Norway. Furthermore, the number of nurses per acute-stage patient in South Korea is 0.33. This is very low in comparison to the 1.56 nurses in the USA, 1.75 in Norway, and 1.61 in Australia [11]. According to the current state of nursing management pay rates implemented in South Korea, the nursing workforce of South Korean hospitals is not at an optimal level [13].

The purpose of study is to evaluate the workload and the amount of non-nursing tasks performed by nurses who work at tertiary general hospitals and to analyze the causality between patient adverse events and workload, as perceived by nurses.

2. Material and methods

2.1. Participants

A total of 11,731 nurses participated in the union training program, and 5,654 nurses participated in the survey, for a response rate of 48.2%. The present study analyzed 1,816 nurses who worked at the general ward of the 23 tertiary general hospitals whose number of respondents per hospital was 10 or above.

2.2. Data

The dependent variables were the four categories of patient adverse events as perceived by the nurses: *medication errors*, *patient falls*, *nosocomial infections*, and *pressure sores*. Nurses were asked the question, "How often did you perceive in-hospital accidents and patient side effects over the past year?" for each category, and the answers were rated on a 4-point scale (1 = *not at all*, 2 = *very few times*, 3 = *occasionally*, and 4 = *frequently*). The patient adverse events perceived by the nurses were classified into dichotomous variables with 0 indicating *not at all* and *very few times* and 1 indicating *occasionally* and *frequently*.

The major explanatory variable in this study was the *workload of the nurses*. The workload of the nurses could be measured using three different variables: (1) the amount of the non-nursing tasks performed; (2) the bed to nurse ratio, which is an objective nurse workforce variable; and (3) the nurses' subjective perception regarding whether or not sufficient workforce is available.

The first of these variables, the amount of non-nursing tasks performed by nurses, was measured using the *delivering and retrieving food trays*, *housekeeping duties*, and *transporting patients* variables. Nurses were asked, "How often did you perform non-nursing tasks over the past year?" Their answers were rated on a 4-point scale (1 = *not at all*, 2 = *very few times*, 3 = *occasionally*, and 4 = *frequently*). The performance of the non-nursing tasks was classified into dichotomous variables with 0 indicating *not at all* and *very few times* and 1 indicating *occasionally* and *frequently*. The tasks were also sorted into three categories, *delivering and retrieving food trays*, *transporting patients*, and *housekeeping duties* as follows: *not performed at all/performed very few times* for all three categories (0); *not performed at all/performed very few times* for at least one of the three categories (1); *performed occasionally/performed frequently* for at least one of the three categories (2); and *performed occasionally/performed frequently* for all three categories (3).

The second of the explanatory variables was the bed to nurse ratio. This is an objective nursing workforce variable. At a tertiary general hospital, there are six possible grades of bed to nurse ratios, with higher grades implying a lower nurse-workforce to bed ratio. In this study, the bed to nurse ratio was classified into *< 2.5 beds per nurse* (1); *2.5−3.0 beds per nurse* (2); and *3.0−3.5 beds per nurse* (3).

The third of the explanatory variables was the nurses' subjective perception of the presence of sufficient workforce. In order to measure the nurses' subjective perception regarding the sufficiency of their workforce,