



## Poor dietary behaviors among hospital nurses in Seoul, South Korea



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### ABSTRACT

**Background:** Nurses reportedly practice unhealthy behaviors due to unfavorable work schedules. Korean nurses are particularly vulnerable to dietary and health behaviors due to high patient-to-nurse ratios; however, there are few studies on Korean hospital nurses' health behaviors.

**Purpose:** To investigate the dietary and health behaviors of Korean hospital nurses according to their work schedule type. **Method:** This was a cross-sectional descriptive study using survey data from 340 hospital nurses. Nurses' dietary and health behaviors were evaluated across different work schedules and compared to the general Korean female population.

**Results:** Nurses with rotating night shift schedules were more often overweight than nurses without night shifts and had more unhealthy dietary behaviors, such as skipping breakfast and eating late night snacks. Nonetheless, Korean nurses practiced healthy behaviors, such as engaging actively in physical activity.

**Conclusions:** Hospitals should create policies to provide healthy schedules for nurses to mitigate the negative effects of rotating and night shifts. However, these management-led measures will be effective only if individual nurses realize and take responsibility for their health behaviors and choices.

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### 1. Introduction

Nurses are the largest group of health care workers; in 2012, of the 236,026 health care workers in Korean hospital settings, 99,976 (42%) were nurses (KHISS, 2014). Due to their significant contribution to population health, their own health and lifestyle needs must be considered important nursing issues (Nahm, Warren, Zhu, An, & Brown, 2012).

Nurses, however, often practice unhealthy behaviors, such as not engaging in regular exercise, not being involved in leisure activities, and not having healthy dietary habits, particularly owing to irregular rotating shifts and night shifts (Allison, 2005; King, Vidourek, & Schwiebert, 2009; Lallukka et al., 2008). Because many Korean nurses have irregular rotating shifts and night shifts, they may practice unhealthy behaviors. Compared to US nurses, Korean nurses who have rotating shifts are younger (Kim et al., 2013; Trinkoff, Geiger-Brown, Brady, Lipscomb, & Muntaner, 2006). Further, compared to the western young women, Korean young women are known to have culturally unique behaviors, such as avidly following unhealthy diet practices for weight loss purposes, and therefore are particularly at risk for malnutrition (Byun, Lee, & Lee, 2014; Wardle, Haase, & Steptoe, 2006). Moreover, Korean nurses

have a comparatively higher workload than their US counterparts, given the differences in patient-to-nurse ratios (Korea: 11; US: 6) (Aiken et al., 2013; Cho et al., 2015). This may further hinder Korean nurses from practicing healthy dietary behaviors; for example, nurses might not be able to take meal breaks during a workday because of their busy schedules and have unhealthy nighttime snacks (Faugier, Lancaster, Pickles, & Dobson, 2001a, 2001b; Park, 2011).

As a consequence, nurses have many health problems, such as gastrointestinal discomfort, sleep disturbances, and undernutrition (Bonauto, Lu, & Fan, 2014; Geiger-Brown et al., 2012; Sveinsdóttir, 2006). Their poor health conditions could in turn impede quality nursing care delivery and ultimately affect patient outcomes (Agency for Healthcare Research and Quality (AHRQ), 2003; Geiger-Brown et al., 2012).

Therefore, the purpose of this study was to describe the dietary and health behaviors of Korean nurses and compare them across different types of work schedules (rotating schedule with night shifts [RSWN], rotating schedule without night shifts [RSWON], and fixed schedule [either day or evening shifts; FS]). We also examined their health behaviors in comparison to the general Korean female population.

### 2. Methods

#### 2.1. Sample and data collection

This was a descriptive survey study with a cross-sectional design. Data were collected from nurses working in a university hospital located in Seoul, the capital of South Korea, in May 2012. To maximize our

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chances of selecting a sample representative of all the hospital nurses, stratified sampling by nursing units and age was used. From the total of 1900 nurses in the study hospital, we selected 428 nurses based on a sample size-calculating formula for a random sample (Seong, 1999). A structured questionnaire along with an introductory letter and informed consent form were enclosed in an envelope with the selected nurses' names on the top. The questionnaire package was delivered to the units. If the nurses agreed to participate in the study, they returned the completed questionnaire to locked mailboxes, and the signed consent form to separate boxes, which were located on each floor of the hospital building. A reminder postcard with the questionnaire followed 2 weeks after the initial contact. Nurses who did not want to receive the questionnaire could individually contact the study team to be removed from the mailing list. Out of the 428 nurses, 350 returned the questionnaire (response rate = 81.8%). We excluded one nurse because of too much missing data and data from nine male nurses due to differences in health behaviors by gender (Denton, Prus, & Walters, 2004; Kandrack, Grant, & Segall, 1991). Thus, the final sample consisted of 340 nurses (79.4%).

For the comparison, we used data from the 2011 Korea National Health and Nutrition Examination Survey (KNHANES), which is a national survey that has been assessing the health and nutritional status of Koreans since 1998 (Kweon et al., 2014). Its sampling is based on a multi-stage clustered probability design, which can produce national estimates using weights. For comparability with our participants, the KNHANES sample was restricted to those who were female, aged 22–47 years old, with a college level of education or higher (2-year degree or more), and employed. The final sample size was 397 (unweighted  $n = 397$ ), representative of the 2,664,147 general population in Korea.

## 2.2. Measures

The following sample characteristics were assessed: age (in years as a continuous variable, and additionally categorized by every 5 years), marital status (married or not), cohabitant status (living alone, living with family, or living with friends), education (associate, bachelor's, or master's/doctoral degree), years of experience (in years as a continuous variable, and additionally categorized by every 5 years), and unit type (critical care [emergency room, operating room, post-anesthesia care unit, or intensive care units], general wards [medical, surgery, pediatrics, or obstetrics], or others). Obesity was measured using body mass index (BMI), which was calculated using self-reported height and weight data. Based on the recommendation for the BMI classification in Asian populations (WHO Expert Consultation, 2004), nurses were divided into four groups: underweight (BMI <18.5 kg/m<sup>2</sup>), normal weight (BMI 18.5–22.9 kg/m<sup>2</sup>), overweight (BMI 23–24.9 kg/m<sup>2</sup>), and obese (BMI ≥25 kg/m<sup>2</sup>).

Work schedules were categorized into three groups: RSWN, RSWON, and FS.

Various dietary behaviors were measured regarding meal, snacking and dietary intake patterns. For meal patterns, information was obtained regarding having meals irregularly, meal duration, frequency of meals a day, skipping breakfast, reasons for skipping meals, amount of food intake under stress, and frequency of overeating. Similarly, for snacking patterns, data on frequency, time, and reasons for snacking, and amount of snacking under stress were obtained. For dietary intake patterns, nurses were asked to report their usual dietary habits for the following items: eating a balanced diet (i.e., eating a variety of food everyday containing all the five major food groups: protein, calcium, raw vegetables/fruits, grains, fats), drinking ≥1 servings of milk or dairy products per day, eating protein (e.g., meat, fish, egg, tofu) ≥3 times per day, eating vegetables at every meal, eating ≥1 servings of fruits per day, eating fried foods at least once every other day, eating fatty foods at least once every 3 days, eating high-carbohydrate snacks every day, and adding salt or soy sauce to food (Kim, Cho, & Lee,

2003). These items matched those in the Korean Dietary Guidelines (Kim et al., 2003).

To measure the health behaviors, items were selected and modified from the 2011 KNHANES. This facilitated comparison of health behaviors between the general population and study nurses. To assess typical behavioral information, we asked nurses to report their usual behavior patterns in the past 4 weeks. Current smoking status was assessed using a question on whether nurses had smoked 100 or more cigarettes in their life and were currently smoking (Korea Centers for Disease Control & Prevention, 2008). Regular alcohol drinking was defined as drinking seven units (i.e., 70 mg of alcohol, which is equivalent to 1400 ml of beer) twice or more per week (Korea Centers for Disease Control & Prevention, 2008). Different levels of regular exercise were measured using items adopted from the Korean version of the International Physical Activity Questionnaire Short Form (IPAQ-SF) to estimate physical activity (Booth, 2000; Oh, Yang, Kim, & Kang, 2007). These included vigorous exercise (e.g., heavy lifting or aerobics, running, fast bicycling, and fast swimming in leisure time or as part of work) at least 1 day per week (yes/no), moderate exercise (e.g., carrying light loads, bicycling at a regular pace, and playing doubles tennis in leisure time or as part of work) at least 2 days per week (yes/no), and walking (during exercise, work, traveling to and from work, or going from place to place) for 30 or more min at least 5 days per week (yes/no). Frequency of eating out excluded having regular meals provided by the hospital cafeteria, which are overseen by hospital nutritionists, and were categorized into five groups: ≥1 time/day, 5–6 times/week, 3–4 times/week, 1–2 times/week, and <1 time/week. Perceived general health status was measured using a 5-point Likert type item, "my health status is very good"; the responses "strongly agree" and "agree" indicated "good health status." Additionally, nurses were asked if they had "lost weight in the past 6 months" (yes/no).

## 2.3. Analysis

Data analysis was conducted using IBM SPSS Statistics 21.0 (SPSS/IBM Inc., Somers, NY). To obtain descriptive data on the variables, the distribution of each variable was assessed using frequencies and percentages for categorical variables. For the continuous variables (e.g., age, years of RN experience), means, standard deviations, and ranges were calculated. To compare health behaviors by work schedules, chi-square tests and ANOVAs were performed. If the cell size was under five, Fisher's exact tests were used. To analyze the 2011 KNHANES data, complex sampling design effects were applied to obtain the national estimates.

This study protocol was reviewed and approved by the university's institutional review board.

## 3. Results

Out of 340 study nurses, 74% were involved in RSWN, 10% in RSWON, and 16% in FS. The average age of nurses was 30 years and 36% were married. Most nurses had a bachelor's degree or higher (90%) and worked rotating shifts (84%) (Table 1). Nurse characteristics differed by work schedule. Compared to RSWON and FS nurses (i.e., no nights), RSWN nurses were more likely to be younger, not married, and living alone or with friends, have fewer years of experience as a nurse, and work in direct patient care units (i.e., critical care or general wards) ( $p < 0.01$ ). Obesity was significantly differed according to work schedules ( $p = 0.03$ ); RSWN were more often underweight than RSWON or FS.

### 3.1. Dietary behaviors – meal patterns

More than three-quarters of our participants ate meals irregularly (Table 2). RSWN nurses had irregular meals (87%) more often than RSWON (66%) and FS (38%) ( $\chi^2 = 62.73, p < 0.01$ ) nurses did. Among RSWN nurses, only 21% had three meals per day, whereas 40% of RSWON and 55% of FS ( $\chi^2 = 28.84, p < 0.01$ ) nurses did. Moreover, 23% of RSWN nurses reported irregular meals, whereas 14% of RSWON

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