



# Health behaviors of Korean female nursing students in relation to obesity and osteoporosis

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## ABSTRACT

**Objectives:** It has been reported that young adults' dietary habits and health behaviors have significant effects on obesity and bone health. However, there is a lack of thorough understanding of the prevalence of unhealthy behaviors and potential relationships to obesity and osteoporosis among young females.

**Methods:** This cross-sectional study examined dietary habits, health behaviors, anthropometric measurements, and bone mineral density of 160 female nursing students.

**Results:** A relatively large number of students had vitamin D ( $n = 104$ , 65%) and calcium ( $n = 84$ , 52.5%) deficiencies but displayed excessive cholesterol ( $n = 86$ , 53.8%) and sodium ( $n = 137$ , 85.6%) intakes. Unhealthy dietary and health habits such as nighttime snacking, coffee drinking, low milk drinking, and lack of exercise were also noted.

**Conclusions:** Despite their knowledge on health, a large portion of nursing students displayed unhealthy dietary habits and health. Tailored strategies and education to narrow the gap between health behavioral knowledge and practice are urgently needed.

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## Background

College is a critical time of independent health behavior initiation and experimentation for young adults (Bonevski, Guillaumier, Paul, & Walsh, 2013). Some risky health behaviors including lack of exercise, involvement in unhealthy diet practice, and excessive consumption of caffeinated beverages, especially

coffee, may emerge during this period (Bonevski et al., 2013; Von Ah, Ebert, Ngamvitroj, Park, & Kang, 2004). Such practice of unhealthy behaviors during college may lead into settlement of those behaviors as lifestyle habits and may induce health-sensitive illnesses such as obesity, hypertension, hyperlipidemia, or osteoporosis in later life (Kim, Kim, & Jung, 2012).

Some of the health-sensitive illnesses that used to be more prevalent among the elderly population in the

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past are recently being found among young adults. This problem has been well identified among American college students and was thought to be limited to American health issues. However, such health problems are also becoming more prevalent among college students in Asian countries including Korea, China, and Japan, raising international concerns (Ekuni et al., 2013; Kim et al., 2012; Mu et al., 2014). More young Asian adults are consuming Western foods instead of traditional foods, and they are also consuming low amounts of dairy products due to a bigger presence of lactose intolerance compared with other Western and European cultures (Rizzoli, 2014; Sahni et al., 2013; Wetmore, Ichikawa, LaCroix, Ott, & Scholes, 2008). The incidence rate of osteoporosis among Korean young women has recently been on a rise (Health Insurance Review & Assessment Service, 2012). In addition to osteoporosis, the number of obese Korean young adults has also been reported to have increased within the last decade (Yoon et al., 2012). Although some factors such as lack of exercise and excessive caffeine consumption have been reported to be risk factors of multiple health-sensitive illnesses including osteoporosis and obesity, very few study results are available on the prevalence of unhealthy behaviors and potential relationships to obesity and osteoporosis among young females in the Republic of Korea (Cho & Lee, 2008; Deere, Sayers, Rittweger, & Tobias, 2012).

Nursing students may have a higher chance of being involved in healthy behaviors because of their exposure to health-related curriculum. Some reported a positive relationship between health knowledge level and healthy behaviors (Ahmadi, Torkamani, Sohrabi, & Ghahremani, 2013; Magarey, Pettman, Wilson, & Mastersson, 2013). Others, however, reported that environment outweighs knowledge, and, therefore, health behavior and knowledge may not coincide (Yilmaz et al., 2015). Only a few studies have investigated health and dietary behaviors of nursing students. Therefore, this study examined dietary intakes and patterns, health behaviors in relation to obesity and bone mineral density (BMD) of female nursing students attending a college in Seoul, Republic of Korea.

## Methods

### Ethical Review

Before subject recruitment and data collection, this study was reviewed and approved by the Institutional Review Board of College of Nursing, Seoul National University (CONSNU), Seoul, Republic of Korea (IRB approval number: 2013-37). Participants were informed about the purpose and benefits of the study, their roles in the study, and the confidential and voluntary nature of the participation in written handouts. Written and verbal consent forms were obtained from the

participants before data collection. All data were treated as confidential and stored securely with restricted access.

### Purpose, Study Framework, Design, and Setting

This study aimed to identify dietary habits and health behaviors of Korean female young adults and to analyze their relations to obesity and BMD. This study also aimed to investigate some of the modifying factors related to obesity and osteoporosis including demographical, biological, and behavioral characteristics. This is a cross-sectional study that was designed based on Nola J. Pender's Health Promotion Model, which serves as a guide for investigating the complex biopsychological processes that motivate individuals to engage in health behaviors that are directed toward the enhancement of health (Pender, Walker, Sechrist, & Stromborg, 1988). Pender's conceptual framework defines health-promoting behavior as a behavior that aims to approach wellness, which is initiated and motivated by the desire to increase well-being and actualize human health potential. It views that one's individual characteristics and experiences affect behavior-specific cognitions and effect, which, then, have an influence on behavioral outcomes. To investigate health behaviors and the health of nursing students related to obesity and osteoporosis, this study incorporated the following parts of Pender's model's subconcepts: (a) personal factor (age), (b) personal sociocultural factor and perceived benefits of action (education), and (c) perceived barriers to action and situational influences (residence and involvement in clinical practices). The study was conducted at a 4-year college of nursing located in Seoul, Republic of Korea, from June to October 2013.

### Sample

Among the total 285 enrolled students, only the female students were recruited into the study. This study excluded male students because of female students' likelihood of diet practice involvement compared to males and because of the small number of male students enrolled in CONSNU ( $n = 19$ , 6.67%). Among 266 (93.3%) female students, those who had medical histories of bone disorders, parathyroid or thyroid disorders, or diabetes mellitus were excluded along with those with surgical histories that could directly impact calcium metabolism, such as esophagectomy or thyroidectomy. Any student on a prescribed diet because of a medication or medical regimen was also excluded.

### Recruitment and Data Collection

To include all grades in CONSNU, we made visits to students' mandatory course classrooms when all students were present. For each classroom, two 30-minute visits were made (a total of eight visits were made to all students [freshmen, sophomores, juniors, and seniors]) for subject recruitment.

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