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The use of body mechanics principle, clinical-practice fatigue, and practice satisfaction of nursing students

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ABSTRACT

Purpose: The purpose of this study is to investigate the relations among the use of the body mechanics principle, clinical-practice fatigue, and practice satisfaction of nursing students.
Methods: Participants were 149 nursing students with clinical-practice experience from four nursing colleges in South Korea. Data were collected from May to July of 2016 using structured questionnaires. The collected data were analyzed using PASW Statistics 22.0.
Results: The participants' scores for the use of body mechanics principle, clinical-practice fatigue, and practice satisfaction were 3.12 (out of 5), 4.61 (out of 7), and 3.58 (out of 5), respectively. The use of the body mechanics principle and clinical-practice fatigue showed a negative correlation ($r = -0.379$, $p < 0.001$) while the use of the body mechanics principle and practice satisfaction showed a positive correlation ($r = 0.341$, $p < 0.001$). Clinical-practice fatigue and practice satisfaction showed a positive correlation ($r = -0.384$, $p < 0.001$). The group of students who scored high on the use of the body mechanics principle showed significantly lower scores on clinical-practice fatigue than those who scored low on the use of the body mechanics principle ($t = 3.879$, $p < 0.001$) while the scores on the satisfaction of clinical practice were significantly high ($t = -3.338$, $p < 0.001$).
Conclusions: This study found that nursing students' use of the body mechanics principle could reduce clinical-practice fatigue and increase practice satisfaction. It is necessary to develop and teach various body mechanics programs for nursing students.

1. Introduction

Nursing students' clinical practice is an essential part of their curriculum that connects theories with real situations and, through education, allows nursing students to experience various nursing situations and gain nursing competency, which meets the needs of a rapidly changing contemporary society. All nursing students recognize the importance of clinical-practice education, but, nonetheless, they experience stress from clinical practice as well as from their academic training. Stress and anxiety can increase due to difficulties in applying theoretical knowledge to a clinical-practice situation, through difficulties in interpersonal relationships with nursing clients, due to a feeling of helplessness stemming from their ambiguous role as nursing students at the practice site, or from the mere fact of having to do a lot of practice (Lee & Noh, 2016; Sun et al., 2016).

'Body mechanics' is a term that indicates a coordinated effort of the musculoskeletal and nervous systems to maintain balance, posture, and body alignment in daily life, which is directly related to effective bodily functioning. Improper working posture increases the risk of damage to the body. Body mechanics refers to the method of efficiently using the body when making movements, such as bending the body, lifting a heavy object or person, stretching an arm, sitting, standing, or lying while performing tasks (Karahan & Bayraktar, 2004; H.J. Lee, 2002).

Research on nursing activities and body mechanics in clinical situations has been mostly related to backaches. It has been reported that most nurses who experienced backaches rarely used the body mechanics principle (Choi, 2009; Rahmah, Rozy, Halim, Jamsiah, & Shamsul, 2008). In addition, research on burdens to the body related to nurses' working posture revealed that the degree of burden on the body was highest when changing a patient's position due to improper posture, which could be the source of the backache. I.J. Lee (2002) proposed that a method should be implemented for the habitual use of body mechanics for nurses carrying out their jobs.

Similarly, nursing students also participate in nursing practices such as patient transfers and position changes. Nursing students may experience psychological anxiety from an unfamiliar ward environment during the clinical practice, psychological and physical fatigue due to long-term practice, sleep disorder, or chronic fatigue syndrome due to

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difficulties with taking breaks in time. The persistent fatigue experienced during clinical practice can be a major cause for nursing students to lose their interest in clinical practice and nursing and can bring about the negative result of harming their health (Angelone, Mattei, Sbarbati, & Di Orio, 2011; Michalec, Diefenbeck, & Mahoney, 2013). Fatigue during clinical practice was found to cause several difficulties, including trouble with clinical-practice performance, anxiety, interpersonal relationship stress, insecurity and decreased concentration in the learning process, and negative practice satisfaction (Rella, Winwood, & Lushington, 2009).

Nurses are often required to carry out work activities in an upright posture for many hours in a row, transfer patients (depending on the patients' level of consciousness), and move medical devices, all of which require application of the body mechanics principle to avoid physical harm and to effectively use the body while nursing (Jung & Suh, 2013). Therefore, it is necessary to educate nursing students at the start of their training on the use of the body mechanics principle while nursing and to implement a systematic training program for them to learn it adequately during the undergraduate program.

There has been almost no research conducted on the body mechanics of nursing students in South Korea. A correlational study was performed on postural habit, backache, and stress (Kim & Choi, 2014), but even basic studies on the effect of education on the body mechanics principle for nursing students or the use of the body mechanics principle and its necessity for nursing students in clinical practice sites have not be conducted.

Therefore, this study aimed to present basic data to support the recommendation that body mechanics can be effectively used in clinical practice by determining the effects of the body mechanics principle on clinical-practice fatigue and practice satisfaction in nursing students. The goals of the present study were as follows. a) Find the degree of use of the body mechanics principle, clinical-practice fatigue, and practice satisfaction of nursing students. b) Find the relations among use of the body mechanics principle, clinical-practice fatigue, and practice satisfaction of nursing students.

2. Methods

2.1. Study design

This study used a descriptive survey to examine and find the relationship among use of the body mechanics principle, clinical-practice fatigue, and practice satisfaction of nursing students.

2.2. Participants and data collection

The participants were nursing students who had clinical-practice experience and were enrolled in undergraduate nursing programs in four nursing colleges in South Korea. Data were collected from May to July of 2016. A structured questionnaire was used, which took approximately 10 min to complete. The number of participants ($n = 134$) was calculated using G*power 3.1.9 for the correlation test with a significance level of $\alpha = 0.05$, a power of 95%, and a medium effect size of 0.3. A total of 150 questionnaires were distributed, and, after excluding one incomplete response, 149 were included in the final analysis.

2.3. Ethical considerations for participants

For the ethical protection of the participants in the present study, the purpose and method of the study were explained to participants before the questionnaires were distributed, and only the participants who volunteered and submitted a written consent form participated in the study.

3. Measurements

3.1. Use of the body mechanics principle

For the measurement of use of the body mechanics principle, an instrument developed by Lee (2002a) was used. The instrument uses a five-point Likert scale composed of seven items, including functional and anatomical posture maintenance, posture with a lowered basal area, close proximity to an object, using the leg muscles, and utilization of body weight. In the present study, use of the body mechanics principle was measured during the clinical-practice period, and a higher score signifies higher utilization of the body mechanics principle. The instrument reliability measured by Cronbach's alpha was 0.91 in Lee's study (2002a); the Cronbach's alpha in the present study was 0.78.

3.2. Clinical-practice fatigue

The Fatigue Severity Scale was developed by Krupp, LaRocca, Muir-Nash, and Steinberg (1989). to measure clinical-practice fatigue and was tested by Lee, Jeong, Lim, Cho, Ma, and Ko (2013) for its reliability and validity for use with South Korean university students. The instrument used a seven-point Likert scale with a total of nine items. Fatigue felt during the clinical practice period was measured with a higher score signifying greater fatigue. The instrument reliability measured by Cronbach's alpha was 0.93 in the study by Lee et al. (2013); the Cronbach's alpha in the present study was 0.87.

3.3. Practice satisfaction

To measure practice satisfaction, an instrument for measuring satisfaction of nursing students developed by Kim (2010) was used. The instrument uses a five-point scale composed of nine items: acquisition of professional knowledge and skills nursing students must have, practice contents, educational environment of the practice facility, practice work, practice work instruction, appropriateness of practice hours, role models, interpersonal relationship, and satisfaction with the relationship with patients. A higher score signifies higher practice satisfaction. The Cronbach's alpha in the study by Kim (2010) was 0.91; the Cronbach's alpha in the present study was 0.88.

3.4. Data analysis

The collected data were analyzed using PASW Statistics 22.0, and detailed analysis methods were as follows: (a) Participants' characteristics and use of the body mechanics principle, clinical-practice fatigue, and practice satisfaction were analyzed using descriptive statistics (frequency, percentage, average, standard deviation, minimum, and maximum). (b) The score differences in the use of body mechanics, clinical-practice fatigue, and practice satisfaction according to participants' characteristics were analyzed using an independent *t*-test and ANOVA. (c) The relations among use of the body mechanics principle, clinical-practice fatigue, and practice satisfaction were analyzed using Pearson's correlation coefficients; the score differences in clinical-practice fatigue and practice satisfaction between the high-scoring and low-scoring groups on the use of the body mechanics principle were analyzed using an independent *t*-test. (d) The collected data were analyzed at a significance level of 0.05.

4. Results

4.1. Participant's characteristics

The participants consisted of 149 nursing students of which 132 (88.6%) were female and 17 (11.4%) were male. Thirty-three (22.1%) participants were juniors, and 116 (77.9%) were seniors. Thirty-five (23.5%) participants completed 1–2 semesters of clinical practice, and