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ORIGINAL ARTICLE

Preliminary study of outcome-based clinical practicum for undergraduate nursing students

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Abstract

Aim: A growing trend in South Korean nursing education is toward outcome-based education. In response, there is now a greater emphasis on achieving the learning outcomes that are outlined in the curricula of outcome-based education. This study aimed to describe the effectiveness of outcome-based clinical practicum for nursing students.

Methods: In this preliminary longitudinal study, 62 third-year nursing students were enrolled from a university in Seoul, Korea. Three parameters of proficiency were measured three times in the students for 1 year including: achievement of expected learning outcomes, nurses' core competence, and critical thinking. For the data analysis, a descriptive analysis and repeated-measures ANOVA were used with the IBM SPSS v. 23.0 software program.

Results: Completing the outcome-based clinical practicum was associated with a significantly enhanced achievement of expected learning outcomes, nurses' core competency, and critical thinking. All of the six expected learning outcomes significantly improved across the pre-, mid-, and postpracticum time points.

Conclusions: The outcome-based clinical practicum improved the achievement of the expected learning outcomes, nurses' core competency, and critical thinking of the nursing students. Further study is recommended to investigate students' and educators' qualitative experiences of outcome-based clinical practicum.

Key words: clinical practicum, competence, critical thinking, nursing education, outcome-based.

INTRODUCTION

In accordance with innovations in science and technology in health care and increasing needs to improve the quality of life among patients and families, there has been a corresponding demand for redesigning the academic model to foster well-qualified graduates with higher knowledge and skills to fulfill specific professional roles and social needs (Mohieldein, 2017). However, the existing teacher-centered model of education, the most prevalent form of education in Korea, has shown to have lower clinical performance and nursing competence among students (Andre & Barnes, 2010; Bae & Park, 2013). As an alternative to the teacher-centered model, the Korean Accreditation Board of Nursing Education (KABONE) recently introduced compulsory, outcome-based education (Song, Park, Seo, & Yoo, 2015).

This study is part of an initial assessment of the newly adopted outcome-based nursing education model. The investigation of expected learning outcomes in baccalaureate nursing students, who took the 1 year outcome-based clinical practicum, was undertaken.

Background

Outcome-based education was first introduced to health professions in the 20th century, and related

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curriculum since have been developed in various fields (Kim, 2012). With outcome-based curricula, each part of an educational system is centered on the learning goals or outcomes that students are expected to have attained by the time they complete the curriculum (Harden, 2007). Therefore, the educational contents and learning processes are determined by the outcomes and aim to nurture competent nurses (Kim, 2012). Furthermore, outcome-based education overcomes the drawbacks of conventional educational systems that rely heavily on theoretical subjects by incorporating application, work, and experience as the central concepts (Anema & McCoy, 2010; Park, 2008).

In clinical education, "competency" is known as the subset of learning outcomes among health science educators (Hodges, 2010; Morcke, Dornan, & Eika, 2013). The core competency of newly registered nurses is having the essential skills, knowledge, attitudes, and ability to carry out specific activities or tasks that are expected of any newly registered, baccalaureate nurse in professional nursing practice (KABONE, 2012a). Following the definitions of nursing competency by the American Association of Colleges of Nursing and by the National League for Nursing, KABONE categorized nurses' core competency into seven competence areas: (i) integrating knowledge and skills; (ii) interdisciplinary communication and collaboration; (iii) critical thinking skills; (iv) awareness of legal and ethical responsibilities; (v) leadership skills; (vi) conducting research; and (vii) responding to changes in health policies. On the basis of these competence areas, KABONE developed 12 learning outcomes for baccalaureate nursing programs and each competence area was allocated with one or two program outcomes (KABONE, 2012b).

Nursing competency is the manifestation of one's ability in one's performance (Lenburg, 1999). In providing a clinical practicum in nursing education, the main goal is for students to demonstrate clinical competence (Hur & Roh, 2013). Outcome-based nursing education involves practicum through which students can holistically interact with patients, learn how to integrate theory and practice, and adapt to new situations. This requires not only their creativity but also critical thinking skills in order to carry out patient-centered care (Hsieh & Hsu, 2013). Outcome-based education has been applied in medical and pharmaceutical education to overcome the limitations of traditional education, which focused on knowledge retention (Mohieldein, 2017; Slavcev, Tjendra, & Cheung, 2013). In previous clinical practicum, learning goals were provided to the students from an educator's perspective. However, in the outcome-based clinical practicum, learning goals are provided to the students from the students' perspective. In addition, the new model emphasizes students' experience-based self-learning and prepares structured evaluation criteria, not only in the qualitative method but also in a quantitative method, to evaluate learning outcomes (KABONE, 2012b). Accordingly, nurse educators have a responsibility to assess the nursing students' variance in outcome-based education and to prepare them for the development of advanced nursing education programs.

Therefore, as part of a preliminary assessment of the newly adopted outcome-based nursing education, this study investigated the initial-to-middle-to-final achievement of expected learning outcomes, nurses' core competency, and critical thinking skills in third-year baccalaureate nursing students who underwent the outcome-based clinical practicum.

METHODS

Aim

The research question was: "Is the newly adopted outcome-based nursing education effective for the achievement of students' expected learning outcomes, nurses' core competency, and critical thinking?" Therefore, this study aimed to determine the level of achievement of learning outcomes, nurses' core competency, and critical thinking after a 1 year outcome-based integrated clinical practicum in third-year baccalaureate nursing students.

Study design

A longitudinal, descriptive study that assessed the difference in nursing students between before, during, and after an outcome-based integrated clinical curriculum, in terms of the achievement of expected learning outcomes, nurses' core competency, and critical thinking.

Participants

The study's participants were nursing students who were pursuing a third-year outcome-based integrated nursing clinical practicum at a university in Seoul, South Korea. All the participants were recruited through a notice on the bulletin boards in the university and on the university website by using a convenient sampling method. The sample size that was required to detect a significant difference between groups was calculated as $n = 43$ by using the G-Power 3.1.9.2 program (Faul, Erdfelder, Lang, & Buchner, 2007). The following

parameters and assumptions were used: effect size of 0.25, significance level of 0.05, power of 0.95, one study group, three measurements, and an intervariable correlation of 0.05. To account for dropouts or non-compliant participants, 82 participants were enrolled among a total of 84 third-year students. Among the study's participants, 73 (89.02%) were women and most were in their early twenties (mean ± standard deviation = 21.74 ± 1.41 years). In the final analysis, there was a total of 62 participants, excluding all withdrawals and non-respondents during the three measurement times of the longitudinal survey.

Curriculum of the clinical practicum

The nursing school students commenced the clinical practicum in the third-year of this 4 year course. This clinical practicum led to a total of 12 credits, six credits for each semester, which is about half of the minimum credit hours (504 h of 1000 h) required for the nursing baccalaureate program that is approved by KABONE (the other half of the credit hours are taken in the fourth year). Four-to-five weeks of clinical practicum were undertaken for each domain, corresponding to 18 h per week.

Outcome-based clinical practicum

The outcome-based clinical practicum was delivered over a single academic year for the third-year students. Through the outcome-based integrated clinical practicum, the students were expected to strengthen their core competency as professional nurses, such as the ability to determine health problems at the individual, family, and community level and to initiate nursing interventions that restored, maintained, and enhanced patient health (Fig. 1).

Among the 12 learning outcomes of KABONE (KABONE, 2012a), six were expected to be achieved in the third year. To achieve all the expected learning outcomes, various types of educational methods were applied. These outcomes, the relevant education methods, and contents are described in Table 1. The curriculum included not only field practice but also orientation sessions, group discussion, and simulation courses where basic nursing skills were taught and assessed. The students experienced the nurses' role through shadowing during the field practice. This assisted with the achievement of the first six expected learning outcomes. Case studies or group discussions were used to accomplish the integration of knowledge and skills, nursing process-based critical thinking, the nurses' role in the multidisciplinary team, and nurses' professional standards. Both face-to-face engagement with patients and caregivers and maintaining a reflective journal played important roles in helping the students to achieve therapeutic communication and relationships. The students were asked to complete a final report (which included a case study) at the conclusion of each practicum. Using teaching methods that were relevant to each expected learning outcome, the

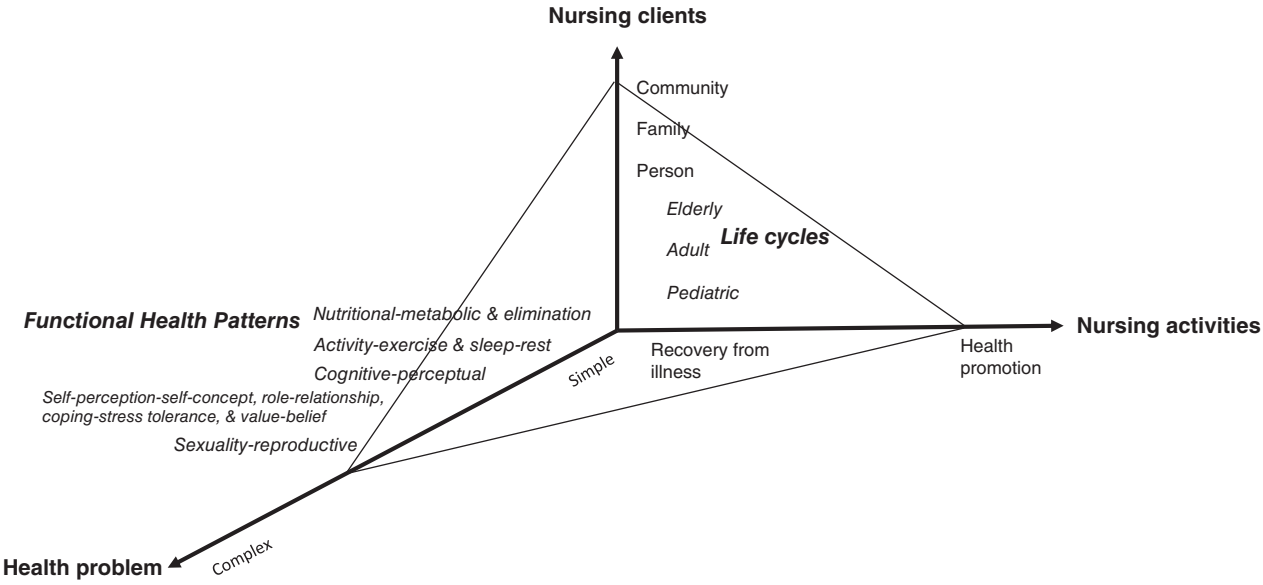

Figure 1 Framework for the outcome-based and integrated nursing clinical practicum.

Table 1 Six expected learning outcomes and the clinical practicum education methods

Expected learning outcome	Methods	Contents
Integration of knowledge and skills	Shadowing	Rounds, nursing activities
	Preparation	Diseases, medical examinations, interventions
	Quiz	Anatomy and physiology, terminology, medicine
	Review of latest articles	Clinical guidelines, nursing research, nursing interventions
	Development of educational resources	Patient-centered information, health promotion
	Case study	History-taking, physical assessment, nursing diagnosis
Nursing skills	Shadowing	Rounds, nursing activities
	Nursing skill simulation and test	Case-based nursing skill practice
Therapeutic communication and relationship	Shadowing	Rounds, nurses' communication and interaction with patients and caregivers
	Face-to-face talk with patients and caregivers	Nursing history-taking, emotional support, education
	Reflective journal	Review and analysis of conversation with patients and caregivers
Nursing process based on critical thinking	Shadowing	Rounds, nursing activities
	Case study	History-taking, physical assessment, nursing process
	Group discussions	Presentation of nursing process and feedback
Nurses' role in the multidisciplinary team	Shadowing	Rounds, nursing activities, patient education program
	Case study	History-taking, physical assessment, nursing diagnosis
	Group discussions	Presentation by using examples of nurses' role in the multidisciplinary team and feedback
Nurses' professional standards	Shadowing	Rounds, nursing activities
	Group discussions	Review of nurses' ethical code, presentation of ethical issues and feedback

educators taught key health concerns and nursing interventions that were pertinent to the health domains of each clinical practicum, while supporting the students to understand patients' health concerns holistically. The educational contents also were diverse, ranging from disease-related knowledge to ethical issues.

Domains of the clinical practicum

The clinical practicum consisted of six domains that were based on Gordon's Functional Health Patterns (Gordon, 1994) and the concept of nursing practice across the life span: (i) nutritional-metabolic and elimination in adults and geriatric patients; (ii) activity-exercise and sleep-rest in adults and geriatric patients; (iii) cognitive-perceptual in adults and geriatric patients; (iv) sexuality-reproductive in adults and geriatric patients; (v) self-perception/self-concept, value-belief, role-relationship, and coping/stress-tolerance in adults and geriatric patients; and (vi) nutritional-metabolic, elimination, activity-exercise, sleep-rest, and cognitive-perceptual in pediatric patients (Table 2). Each clinical practicum of the six functional health domains corresponds to the six expected learning outcomes that must be achieved by the students, who also attended lectures that had built up on Gordon's Functional Health Patterns in the clinical practicum. The students could meet patients with various kinds of health problems in acute and chronic settings to consolidate their learning.

Educators: instructor–preceptor model

The role of the educator in the instructor–preceptor model is shown in Tables 1 and 2. In Korea, most universities are implementing a clinical preceptor model in the clinical practicum in which staff nurses or managers adopt major roles to teach students in the clinical settings. However, a complementary instructor–preceptor model is applied to the undergraduate clinical practicum in this school. The practicum educators consist of school instructors, clinical preceptors, and professors. During the field practice, the students are taught by two groups of teaching staff: (i) a skilled school instructor who has ≥2 years of clinical experience and is a graduate student in the Master's or doctoral degree course; and (ii) a clinical preceptor at the hospital (i.e. trained unit managers). The role of the school instructors and clinical preceptors was similar during the field practice,

Table 2 Arrangement of the clinical practicum, based on Gordon's Functional Health Pattern

Pattern	Setting		Patient	Educator	Number of students
Nutritional, metabolic, and elimination	Hospital A-1	Acute	Adult, geriatric	Preceptor, instructor	4
	Hospital B-1	Acute	Adult, geriatric	Preceptor	2
	Hospital B-2	Acute	Adult, geriatric	Preceptor	2
	Hospital B-3	Acute	Adult, geriatric	Instructor	5–6
Activity, exercise, and sleep-rest	Hospital B-4	Acute	Adult, geriatric	Instructor	5–6
	Hospital B-5	Acute	Adult, geriatric	Preceptor	2
	Hospital C-1	Acute	Adult, geriatric	Preceptor, instructor	3
	Hospital C-2	Acute	Adult, geriatric	Preceptor, instructor	3
Cognitive–perceptual	Hospital B-6	Acute	Adult, geriatric	Instructor	5–6
	Hospital B-7	Acute	Adult, geriatric	Preceptor	2
	Hospital C-3	Acute	Adult, geriatric	Preceptor, instructor	2
	Hospital A-2	Acute	Adult, geriatric	Preceptor, instructor	4
Self-perception–self-concept, role–relationship, coping–stress tolerance, and value–belief	Hospital D	Acute	Adult, geriatric	Instructor	5
	Hospital E	Acute	Adult, geriatric	Preceptor	3
	Community health center	Chronic	Adolescent, adult, geriatric	Instructor	6
Sexuality–reproductive (female)	Hospital B-8	Acute	Adult, geriatric (female)	Instructor	7
	Hospital B-9	Acute	Adult, geriatric (female)	Instructor	7
	Hospital B-10	Acute	Adult, geriatric (female)		
Nutritional, metabolic, and elimination pattern	Hospital B-11	Acute	Pediatric	Instructor	6–7
	Hospital B-12	Acute	Pediatric		
Activity, exercise, sleep-rest, and cognitive-perceptual (pediatrics)	Hospital B-13	Acute	Pediatric	Instructor	7
	Hospital B-14	Acute	Pediatric		

but the school instructors had more duties, including orientation, conferencing, teaching, and evaluation of the core nursing skills. The school instructors were allocated to seven or fewer students, whereas the clinical preceptors, or unit managers, were allocated to two or fewer students as per their full-time duty. It must be noted that the students were given equal opportunities to be taught by the school instructor and the clinical preceptor. The professors supervised each practicum and they led a group discussion, which was for debriefing of the students' experience during the practicum and for giving them feedback in the school. They also visited the hospital to educate the students during their field practice.

Data collection

The data were collected from March to December, 2015 by a self-report questionnaire. The data collection was conducted at three time points: (i) prepracticum (March); (ii) mid-practicum (June, at the end of the first semester); and (iii) postpracticum (December, at the end of the second semester).

Instruments

Expected learning outcomes

The expected learning outcomes were measured by six learning outcomes, as suggested by KABONE: (i) the integration of knowledge and skills; (ii) basic nursing skills; (iii) therapeutic communication and relationships; (iv) nursing diagnosis, based on critical thinking; (v) nurses' role in the multidisciplinary team; and (vi) nurses' professional standards (KABONE, 2012b). The achievement of the expected learning outcomes was assessed with a 5-point Likert scale, where 1 = "strongly disagree" and 5 = "strongly agree." From a possible score range of 6–30 points, higher scores denoted higher achievement in the expected learning outcomes. The internal consistency of the scale, measured as the Cronbach's α, was 0.85 in this study.

Nurses' core competency

The nurses' core competency scale that had been developed by Lee, Kim, and An (2017) contains 70 items that are categorized into five subscales covering the following topics: (i) human understanding and communication skills; (ii) professional attitudes; (iii) critical thinking skills; (iv) general clinical performance; and (v) specific clinical performance. With consent from the original developers, "nurse" was changed to "nursing student" in the sentence of two items in order to be applicable for the study's purpose. The instrument score competency was on a 5-point Likert scale (where 1 = "inability to carry out the task in the item" and 5 = "ability to carry out the task in the item;" score range = 70–350 points), whereby a higher score denotes higher core competency. The Cronbach's α was 0.97 in the original article and 0.98 in this study.

Critical thinking

The critical thinking of the nursing students was assessed by using a critical thinking disposition scale that had been developed by Park (1999). This 20 item scale is subdivided into four subscales: (i) intellectual passion and sound skepticism; (ii) intellectual honesty; (iii) prudence; and (iv) objectivity. The 5-point Likert scale, where 1 = "strongly disagree" and 5 = "strongly agree," has a range of scores between 20 and 100 points. Positively worded questions (13 items) were positively scored and negatively worded questions (seven items) were reverse-scored. The final score, where a higher score corresponds to a stronger disposition for critical thinking, was categorized into four levels: "high" for >80 points; "moderate" for 60–79 points; "low" for 40–59 points; and "very low" for <39 points. The Cronbach's α was 0.73 in the original article and 0.82 in this study.

Data analysis

The collected data were analyzed by using the IBM SPSS v. 23.0 program (IBM Corporation, Armonk, NY, USA). The following statistical methods were used:

1) The general characteristics, achievement of expected learning outcomes, nurses' core competency, and critical thinking skills of the study's participants were analyzed by using descriptive statistics.

2) The effect of time in changes in the achievement of the expected learning outcomes, of nurses' core competency, and critical thinking skills were analyzed with a repeated-measures ANOVA by taking measurements at three time points: pre-, mid-, and postpracticum.

Ethical considerations

This study was approved by the institutional review board of the university (IRB No. 2015-0008). Before the data collection, all the participants who voluntarily agreed to participate in the study were provided with written informed consent forms. They were informed that their decision to participate in the study would not cause any disadvantage and that they were free to withdraw at any time. Confidentiality was ensured throughout the study by using individual identification numbers.

RESULTS

Expected learning outcomes

The achievement of the expected learning outcomes significantly improved over the three time points (first measurement: 19.92 $\pm$ 3.68 *vs* second measurement: 23.89 $\pm$ 2.93 *vs* third measurement: 25.44 $\pm$ 3.33; F = 77.87, $P < 0.001$). The achievement of the expected learning outcomes between the three time points significantly improved (first-to-second, $P < 0.001$; second-to-third, $P = 0.001$; first-to-third, $P < 0.001$). Among the six expected learning outcomes, the integration of knowledge and skills and nurses' professional standards largely improved and nursing skills improved less over the 1 year. However, all of the six expected learning outcomes significantly improved across the pre- and postpracticum time points (Table 3).

Nurses' core competency

The nurses' core competency significantly improved over the three time points (first measurement: 217.74 $\pm$ 36.28 *vs* second measurement: 261.32 $\pm$ 31.36 *vs* third measurement: 282.63 $\pm$ 31.09; F = 110.39, $P < 0.001$) and the scores between the three time points significantly improved (first-to-second, $P < 0.001$; second-to-third, $P < 0.001$; first-to-third, $P < 0.001$). Five subdomains of nurses' core competency (human understanding and communication skills; professional attitudes; critical thinking skills; general clinical performance; and specific clinical performance) significantly improved by the mid- and postpracticum time points and the ability of critical thinking and evaluation improved the most over the 1 year (Table 3).

Critical thinking

The ability of critical thinking significantly improved over the three time points (first measurement: 67.27 $\pm$ 8.02 *vs* second measurement: 68.23 $\pm$ 7.55 *vs* third measurement: 71.23 $\pm$ 7.41; F = 13.82, $P < 0.001$). Although the difference between the average of the pre- and mid-practicum

Table 3 Changes in the expected learning outcomes, nursing core competency, and critical thinking of the study's participants (n = 62)

Variable (range)	Time point			
	First Mean ± SD	Second Mean ± SD	Third Mean ± SD	F(p)
Total expected learning outcomes[†] (6~30)	19.92 ± 3.68	23.89 ± 2.93	25.44 ± 3.33	77.87 (<0.001)
Integration of knowledge & skills[‡](1~5)	3.18 ± 0.69	3.92 ± 0.58	4.18 ± 0.62	52.84 (<0.001)
Nursing skills[§](1~5)	3.47 ± 0.80	4.19 ± 0.57	4.16 ± 0.63	28.17 (<0.001)
Therapeutic communication and relationship[¶] (1~5)	3.55 ± 0.86	4.23 ± 0.66	4.40 ± 0.71	30.73 (<0.001)
Nursing diagnosis, based on critical thinking[††] (1~5)	3.31 ± 0.80	3.94 ± 0.70	4.29 ± 0.66	45.56 (<0.001)
Nurses' role in the multidisciplinary team[‡‡] (1~5)	3.23 ± 0.76	3.79 ± 0.60	4.21 ± 0.68	59.27 (<0.001)
Nurses' professional standards[§§] (1~5)	3.19 ± 0.96	3.82 ± 0.71	4.19 ± 0.72	33.15 (<0.001)
Nurses' core competency[¶¶] (70~350)	217.74 ± 36.28	261.32 ± 31.36	282.63 ± 31.09	110.39 (<0.001)
Understanding human beings and communication[a] (21~105)	74.82 ± 13.57	87.18 ± 10.46	92.52 ± 10.44	79.89 (<0.001)
Professional attitudes[b] (13~65)	43.26 ± 8.37	48.45 ± 7.01	51.06 ± 7.22	34.65 (<0.001)
Critical thinking and evaluation[c] (14~70)	41.82 ± 7.09	52.94 ± 6.49	58.05 ± 6.25	164.92 (<0.001)
General clinical performance[d] (13~65)	37.60 ± 7.79	47.97 ± 6.12	52.44 ± 5.84	100.04 (<0.001)
Specific clinical performance[e] (9~45)	23.85 ± 5.64	28.95 ± 5.72	32.87 ± 5.91	58.93 (<0.001)
Critical thinking[f] (20~100)	67.27 ± 8.02	68.23 ± 7.55	71.23 ± 7.41	13.82 (<0.001)
Intellectual passion and sound skepticism[g] (7~35)	22.27 ± 4.66	23.55 ± 4.59	24.44 ± 4.67	9.98 (<0.001)
Intellectual honesty (6~30)	22.73 ± 3.18	22.50 ± 3.01	23.19 ± 2.89	2.16 (0.120)
Prudence[h] (4~20)	13.44 ± 2.41	13.84 ± 2.21	14.61 ± 2.01	12.45 (<0.001)
Objectivity (3~15)	8.84 ± 1.94	8.34 ± 2.24	8.98 ± 2.32	2.60 (0.078)

[†] First-to-second (P < 0.001); second-to-third (P = 0.001); first-to-third (P < 0.001).
[‡] First-to-second (P < 0.001); second-to-third (P = 0.012); first-to-third (P < 0.001).
[§] First-to-second (P < 0.001); second-to-third (P = 0.755); first-to-third (P < 0.001).
[¶] First-to-second (P < 0.001); second-to-third (P = 0.086); first-to-third (P < 0.001).
[††] First-to-second (P < 0.001); second-to-third (P = 0.001); first-to-third (P < 0.001).
[‡‡] First-to-second (P < 0.001); second-to-third (P < 0.001); first-to-third (P < 0.001).
[§§] First-to-second (P < 0.001); second-to-third (P = 0.002); first-to-third (P < 0.001).
[¶¶] First-to-second (P < 0.001); second-to-third (P < 0.001); first-to-third (P < 0.001).
[a] First-to-second (P < 0.001); second-to-third (P < 0.001); first-to-third (P < 0.001).
[b] First-to-second (P < 0.001); second-to-third (P = 0.004); first-to-third (P < 0.001).
[c] First-to-second (P < 0.001); second-to-third (P < 0.001); first-to-third (P < 0.001).
[d] First-to-second (P < 0.001); second-to-third (P < 0.001); first-to-third (P < 0.001).
[e] First-to-second (P < 0.001); second-to-third (P < 0.001); first-to-third (P < 0.001).
[f] First-to-second (P = 0.253); second-to-third (P < 0.001); first-to-third (P < 0.001).
[g] First-to-second (P = 0.004); second-to-third (P = 0.068); first-to-third (P < 0.001).
[h] First-to-second (P = 0.100); second-to-third (P = 0.002); first-to-third (P < 0.001).
SD, standard deviation

scores was not statistically significant (P = 0.253), those between the pre- and postpracticum scores and between the mid- and postpracticum scores were statistically significant (P < 0.001). Among the four subscales of critical thinking, intellectual passion and sound skepticism, as well as prudence, significantly improved over the three time points (F = 9.98, P < 0.001; F = 12.45, P < 0.001) (Table 3).

DISCUSSION

Highly developed technology and complex health care in an outcome-oriented society have led to demands for high-quality nursing care. In clinical practice, this has meant that there has been greater pressure on cultivating competent and qualified professional nurses. Nursing education has responded by setting nurses' core competency and achievement of learning outcomes as primary end-points of nursing education and by adopting various strategies to evaluate them. However, there are limited studies that have validated outcome-based curricula for nursing students, especially those that contain a clinical practicum that is aimed at integrating theoretical knowledge with practice in Korea. Therefore, this study analyzed the achievement of expected learning outcomes, nurses' core competency, and critical

thinking at different time points of a third-year baccalaureate program by nursing students who undertook an outcome-based integrated clinical practicum.

The study's participants showed a relatively higher score in the achievement of outcomes. The average of prepracticum achievement of the expected learning outcomes improved from 3.32 to 4.24 by the end of the year. This value was higher than the average 3.47 points that was reported by Bae and Park (2013) among fourth-year nursing students, even though the participants were not in the same grade. Similarly, it was found that the highest score in the expected learning outcomes at the end of the curriculum was in "therapeutic communication and relationships." These findings mean that nursing is predominantly a relationship-centered profession and that nursing curriculum tend to focus on improving students' therapeutic communication skills through subjects, such as "nursing communication" (Bae & Park, 2013; Boschma *et al.*, 2010; Son, Kim, Koh, & Yu, 2011).

In this study, the increase in the core competency of the nursing students between the pre- and midpracticum scores was greater than that between the mid- and postpracticum scores ($P < 0.01$). These findings were similar to those of Hsieh and Hsu (2013), who also investigated the effectiveness of an outcome-based curriculum in baccalaureate students. They reported that nurses' core competencies (such as an interest in nursing, clinical performance, and ability to provide nursing care) were significantly enhanced by the sixth week of the practicum, compared to the first week. Thus, this study's findings, as well as others, suggest that outcome-based integrated curricula enhance nursing competency in students and promote the integration of theory and nursing practice.

The average score for critical thinking in this study's population significantly increased in the mid- and postpracticum, compared to the prepracticum scores. This increase may be attributed to the residence of school instructors in the clinical wards with students, who provided training on the use of critical thinking skills to diagnose a nursing problem and to conduct a nursing process through evidence-based intervention. In agreement, many previous studies have shown that critical thinking, which refers to both cognitive and affective dispositions (Hsu & Hsieh, 2013), is a subfactor that affects clinical performance (Chaung, 2011; Shin & Cho, 2012). Altogether, these findings highlight the importance of developing clinical practicum that reinforce the critical thinking of nursing students.

Several characteristics of outcome-based curriculum might contribute to the proficiency of nursing students. It is speculated that nurses' core competency, such as "human understanding and communication," was improved by the self-appraisal of communication skills. Throughout the practicum, the students were asked to maintain a log of therapeutic communications or to write a reflection journal of consultations on a daily basis. This is anticipated to have promoted their self-directed learning. Yoo, Son, Kim, and Park (2009) reported reflection or self-awareness is an effective learning strategy to improve nursing students' clinical communication skills and learning outcomes, which helps them to evaluate their strengths and weaknesses in their performance.

The authors also suggest that "professional attitudes," another core competency, were enhanced through effective teacher staffing provided by the three different groups of teaching staff members who were participating in the outcome-based curriculum: (i) the professors who provided conferencing and circulation tutoring; (ii) the school instructors who provided full-time tutoring at each unit; and (iii) the clinical preceptors who provided direct, on-site tutoring. These educators taught the students, based on the professional nursing standards that are demanded in clinical nursing practice and gave ongoing feedback on issues relating to maintaining professional attitudes in various clinical situations (such as punctuality, a tidy appearance, enthusiasm, and compassion), respecting privacy, financial situations, and the opinions of patients at all stages of nursing. Furthermore, it is suggested that "general clinical performance" and "specific clinical performance" were likely to have been enhanced because the students were assessed through simulation and practicum assessments, under case scenarios that prompted the use of the basic nursing skills that are advocated by both KABONE and the university; this meant that the students had to execute not only general clinical skills, but also the specific clinical skills that were required to pass the particular practicum (Yang, 2012).

Irrespective of the curriculum, the students generally became more proficient when they completed the outcome-based education than at the outset; thus, the end-point of the program (the students have learnt, understood, and attained the expected learning outcomes) might be uniform. However, because the curricular contents and resources of each nursing school might differ from each other, the parts of the educational system and time should be assessed differentially by each school. In this study, the achievement of the six expected leaning outcomes and the satisfaction level of

the practicum are assessed at different time points and stages of the nursing program. Additionally, self-evaluation of one's nursing performance is made by the students. Such time-course assessments of achievement might reveal a non-uniform progress in the achievement of the expected learning outcomes by students. Evaluating the students' academic progress in this way could help in optimizing educational methods; for instance, when students are found to be underperforming in a particular learning outcome or at a particular stage, the educational methods that are used for that particular learning outcome can be reevaluated and replaced with more appropriate tools, if needed.

There are some limitations regarding validity issues in this study. First, there were no possible outcome data of a control group because this was a preliminary study for the newly adopted, outcome-based education program in a nursing school. Second, the potential contribution of theoretical courses, alongside clinical practicum, towards achieving the learning outcomes cannot be excluded from this study design as they were carried out in parallel. Thus, these findings and the effects of outcome-based clinical practicum should be viewed in light of complementary theoretical courses. Lastly, because this study population consisted of students from a single baccalaureate nursing program, it is difficult to generalize this study's findings to the curriculum of other nursing schools.

Recommendations

More research should be carried out in order to evaluate the effectiveness of outcome-based integrated nursing curriculum and to develop effective self-learning strategies to achieve learning outcomes. It is suggested that integrated education in nursing schools, with the consideration of the human and material resources of each school, be initiated. This will enhance the achievement of students' learning outcomes by applying appropriate educational methods and practical models. Moreover, it is recommended that continuous assessment and evaluation of the learning outcomes in nursing undergraduates be carried out for the development of future nursing education; for example, observation of the clinical nursing practice skills. Furthermore, the qualitative experience of not only the students, but also the curriculum providers, has to be investigated.

Conclusion

In this preliminary study, the achievements of outcome-based integrated practicum for the expected learning outcomes, nurses' core competency, and critical thinking in undergraduate nursing students was investigated. The increased awareness of assessing outcome-based performance in integrative curriculum also has brought to attention the importance of clinical practicum in nursing education. Furthermore, the particular outcome-based integrated curriculum that was assessed in this study used clinical practicum that were conceptualized by using functional health patterns and nursing practice across the lifespan and set learning outcomes that took into account the recently revised national nursing licensure examination in Korea. This has called for not only the development of novel educational methods for clinical practicum, such as simulation approaches, but also for a more in-depth evaluation of their effectiveness at different stages of the curriculum so that the educational content that is appropriate for each stage can be developed.

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DISCLOSURE

The authors declare no conflict of interest.

AUTHOR CONTRIBUTIONS

K. L., S. K., and Y. L. Y. contributed to the conception and design of the study; K. L. and Y. L. Y. acquired and analyzed the data; K. L., S. K., and Y. L. Y. contributed to the interpretation of the data; K. L. and Y. L. Y. drafted the article; and K. L., S. K., and Y. L. Y. revised the manuscript critically for important intellectual content. All the authors approved the final manuscript.

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