

Available online at [www.sciencedirect.com](http://www.sciencedirect.com)

ScienceDirect

journal homepage: <http://www.elsevier.com/journals/international-journal-of-nursing-sciences/2352-0132>

CrossMark

## Original Article

# Application of nursing core competency standard education in the training of nursing undergraduates

Fang-qin Wu, Yan-ling Wang, Ying Wu<sup>\*</sup>, Ming Guo

School of Nursing, Capital Medical University, Beijing, China

## ARTICLE INFO

## Article history:

Received 1 June 2014

Received in revised form

9 October 2014

Accepted 20 October 2014

Available online 6 November 2014

## Keywords:

Education

Nursing

Baccalaureate

Teaching methods

Core competency

## ABSTRACT

**Purpose:** To evaluate the effectiveness of nursing core competency standard education in undergraduate nursing training.

**Methods:** Forty-two nursing undergraduates from the class of 2007 were recruited as the control group receiving conventional teaching methods, while 31 students from the class of 2008 were recruited as the experimental group receiving nursing core competency standard education. Teaching outcomes were evaluated using comprehensive theoretical knowledge examination and objective structured clinical examination.

**Results:** The performance in the health information collection, physical assessment, scenario simulation and communication in the experimental group were significantly higher than those of the control group ( $p < 0.05$ ).

**Conclusions:** Nursing core competency standard education is helpful for the training of nursing students' core competencies.

Copyright © 2014, Chinese Nursing Association. Production and hosting by Elsevier (Singapore) Pte Ltd. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/3.0/>).

## 1. Introduction

The trend of health care, including nursing, has been trending toward a more patient-centric, integrated platform in China. This includes transformation of the medical model, the renewal of the conception of health, the increasing incidence of cardiovascular and cerebrovascular diseases, new innovations in the health care system and a rapidly aging population. These changes accentuate the contradiction between limited teaching time and unlimited teaching content in the traditional nursing education model which simply based on

imparting knowledge and skills [1]. An important subject for nursing educators in the national and abroad is how to close the gap between this limited teaching time and unlimited content to train high quality nurses that are ready to adapt to the rapidly changing health care system. Competency-based education is a concept and educational model that is consistent with the idea and guidelines of reforming our vocational education and higher education issued by State Council and Ministry of Education [2]. del Bueno [3] first proposed the idea of nursing competency-based education. Lenburg [4] established competency outcomes and performance assessment model in 1999. Nursing core competencies include

<sup>\*</sup> Corresponding author.

E-mail address: [helenywu@vip.163.com](mailto:helenywu@vip.163.com) (Y. Wu).

Peer review under responsibility of Chinese Nursing Association.  
<http://dx.doi.org/10.1016/j.ijnss.2014.10.010>

2352-0132/Copyright © 2014, Chinese Nursing Association. Production and hosting by Elsevier (Singapore) Pte Ltd. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/3.0/>).

assessment and intervention, communication, critical thinking, teaching, human caring relationships, management, leadership, and knowledge integration skill were identified. Nursing core competency standard education is a holistic nursing education idea incorporating these competencies while imparting knowledge, cultivating ability and improving quality [5]. School of nursing, Capital Medical University in China has been reforming of nursing teaching model by successfully incorporating this competency based training model for undergraduate nursing students since 2005.

## 2. Materials and methods

### 2.1. Subjects

Forty-two five-year nursing undergraduates from the class of 2007 were recruited as the control group receiving conventional teaching methods, while 31 students from the class of 2008 were recruited as the experimental group receiving nursing core competency education.

### 2.2. Teaching methods

#### 2.2.1. Conventional teaching

The conventional teaching method is applied on the control group. Lessons are usually taught by the teacher introducing skills using multimedia courseware and blackboard accompanied by a verbal explanation or lecture. Practical work for students is then assigned, followed by feedback from the teacher.

#### 2.2.2. Core competency teaching

2.2.2.1. *Training objectives.* In the guidance of social demands of modern nurses' ability, to determine the core competency that is necessary for nursing graduates to engage in nursing, and to establish the goal of coordinated development in knowledge, ability, and quality. After they trained, nursing graduates will possess sound theoretical knowledge, skilled clinical nursing skill and good occupation quality, certain degree of nursing teaching ability, nursing research capacity and preliminary community skill and nursing management ability, strong critical thinking, innovation spirit. Core competency teaching attaches more importance to the cultivation of comprehensive ability of practice.

2.2.2.2. *Curriculum changes.* The knowledge system of course in the standard nursing curriculum is quite complete in China. All the clinical nursing courses are established in terms of medical departments in the clinical settings. Every chapter of a specific body function is taught in the logical sequence from general introduction to different diseases with the nursing process integrated into. The course teaching contents are illness-and-clients centered, with great emphasis on treatment and nursing care of disease. While the content related on health and illness quite lack, including the knowledge of psychology, society, culture and environment [6]. To address core nursing competencies, several additions and modifications were made to the standard nursing curriculum based on necessary skills needed by nursing graduates. These changes

are as follows: "Internal Medicine Nursing" and "Surgery Nursing" were integrated into a new course entitled "Adult Nursing"; "Gynecology Nursing" and "Pediatric Nursing" were integrated a new course entitled "Maternal and Perinatal Nursing"; and the clinical portions of "Internal Medicine Nursing", "Surgery Nursing", "Gynecology Nursing" and "Pediatric Nursing" were restructured to be taught as part of clinical teaching and research sections in Xuan wu hospital Capital Medical University. Moreover, several new courses were added including "Care Skills", "Nutrition and Cooking", "Treatment and Nursing Environment", "Intensive Care", "Nursing Communication Skills" and "Specialized Nursing Skills." In this study, the experimental group completed 3699 class hours and 283.5 credits based on the new curriculum, while the control group completed 3492 class hours and 275 credits. In addition to restructuring existing curriculum and adding additional courses, emphasis was placed on communication with early and more contacting patients is implemented uninterruptedly for the duration of the nursing program. The new curriculum cultivated practice ability throughout the whole teaching process, and placed more emphasis on professionalism based on the core competencies. For example, the experimental group communicated with the patients in the hospital and community during "Nursing Introduction" and "Basic Communicating Skills" in year one; collected the data and observed patient condition changes in the ward during year two's "Observation of the disease I"; and adapted the three-step teaching model based on "classroom teaching, clinical probation, clinical practice" in year three. This was in contrast to the traditional model where consistent patient contact does not typically occur until years four and five.

2.2.2.3. *Teaching.* The new curriculum adapted many diverse teaching methods to train students' comprehensive, critical thinking, and problem solving abilities. Traditional classroom teaching methods such as problem-based learning (PBL), scenario simulation, case analysis, discussion groups, and role playing were intermixed with new clinical nursing and the humanistic nursing courses. This included weekly scenario simulations tailored to specific disease states following PBL, scenario simulation, and role playing.

2.2.2.4. *Course assessment.* The students' nursing core competency is comprehensively evaluated in a variety of ways. Each course is assessed by the stage evaluation that included student self-evaluation (using the peer rating form in the process), teacher evaluation (using the teacher evaluation form and evaluation in form of questions and homework), and final examination. The major clinical nursing courses and examinations before the graduation were evaluated by using comprehensive theoretical knowledge examination and objective structured clinical examination. These methods evaluate students' ability of assessment and intervention, the comprehensive application ability of knowledge, ability to analyze and solve problems, and some other methods.

### 2.3. Teaching assessment

Comprehensive evaluation before graduation was done by using a nursing comprehensive theoretical knowledge

examination and an objective structured clinical examination. The clinical exam evaluated the clinical comprehensive ability by having students select a test case, collect the health information and make the physical assessment about the patient, and complete the nursing record. This served to evaluate students' assessment, communication, and knowledge application abilities. The comprehensive practice ability assessment was based on the clinical scenario simulation according to the patient's condition, including scenario simulation, specialized operation, basic nursing operation, the ability to analyze and solve problems, practical ability, communication ability, management and leadership. All examination were based on a 100 point scale.

#### 2.4. Statistical analysis

Continuous, normally distributed variables are expressed as mean standard deviation and differences between groups were assessed using student's t-test. Categorical data are presented as proportions and were analyzed with  $\chi^2$  or Fisher's exact test as appropriate. All statistical procedures were performed with SPSS for Windows version 16.0 (SPSS Inc., Chicago, IL, USA). A  $p$  value of 0.05 was considered significant.

### 3. Results

#### 3.1. The comparison of basic information between the two groups

There was no significant difference in the gender, age, college entrance examination scores, the students' residential area, and the scores of basic medical courses learned in school between the two groups (Table 1).

#### 3.2. The comparison of teaching effect between the two groups

The mean score of nursing comprehensive theoretical knowledge examination did not show any significant difference between the two groups. The objective structured clinical examination was used to evaluate students' clinical thinking, communicating and adaptability. The evaluation results

shown that the mean score of the health information collection, physical assessment, scenario simulation and communication in the experimental group were significantly higher than those of the control group (Table 2).

### 4. Discussion

Nursing is a discipline with strong practicality and practicability, and the purpose of nursing education is to train high quality nurses for the clinical nursing practice. The new core competency standard education model is based on an overall concept of education that integrates imparting knowledge, cultivating ability, and improving quality [7]. This method of education is employed by determining nursing students' core competency needs, creating new methods while modifying standard methods, and comprehensively assessing the outcomes in scientific and specific ways to effectively reform and improve the teaching quality.

#### 4.1. Nursing core competency standard education can effectively cultivate students' core competencies

Nursing core competency standard education mode has completely changed the traditional teaching methods. This model considers the student as the main body and uses the teacher as a guide, combining theoretical knowledge with practical teaching. It uses a variety of advanced teaching methods such as PBL, scenario simulation, role playing, case analysis, and cooperative learning. The method encourages students to study actively by exploring the solutions to problems in clinical nursing, using active learning in various channels to lay the foundation for lifelong learning. Specifically, the PBL increases the chance of effective communication and exchanges between students and teachers through small class discussions (7–8 students as a learning group), while the scenario simulation pays attention to the two-way interactive teaching and learning [8]. Teachers compile typical clinical cases according to syllabus requirements and clinical practice guidelines, and utilize scenarios for clinical disease progression using the high-end technology simulated man. These methods allow students to be in clinical situations, simulate a variety of different roles in the form of a team or a case, carry out patient-centered clinical nursing work, and help patients solve a variety of health problems. In this learning process, students will make nursing assessments, address nursing problems, develop care plans, implement nursing measures, and offer health education for patients of all the nursing process. Teachers give guidance and evaluation according to student performance, improving the students' comprehensive ability to use knowledge, enhance critical thinking skills and team cooperation. In the process of division of labor and cooperative learning, students learn interpersonal and communication skills, solidarity and collaboration, find the advantages and disadvantages of each other, and distribute learning tasks reasonably.

Nursing core competency standard education should also include the effective scientific evaluation methods. To objectively assess the students' clinical comprehensive abilities,

**Table 1 – The comparison of basic information between the two groups.**

Group	Experimental group (n = 31)	Control group (n = 42)	t/ $\chi^2$	p
Age ( $\pm$ s)	22.80 $\pm$ 0.95	23.21 $\pm$ 0.81	0.380	0.052
Entrance scores ( $\pm$ s)	558.26 $\pm$ 21.75	562.45 $\pm$ 31.62	0.635	0.527
Gender (n, %)			0.002	0.967
Male	2 (6.5)	4 (9.5)		
Female	29 (93.5)	38 (90.5)		
Regions (n, %)			1.055	0.304
City	26 (83.9)	31 (73.8)		
Rural	5 (16.1)	11 (26.2)		

**Table 2 – The comparison of teaching effect between the two groups ( $\pm$ s, points).**

Group	Experimental group (n = 31)	Control group (n = 42)	t	p
Comprehensive theory of knowledge	76.08 $\pm$ 4.69	77.97 $\pm$ 6.31	1.408	0.160
Health information collection	92.48 $\pm$ 3.49	88.72 $\pm$ 7.11	2.699	0.009
Physical assessment	93.54 $\pm$ 3.40	83.94 $\pm$ 7.04	7.006	0.001
The writing of medical records	92.48 $\pm$ 3.49	92.14 $\pm$ 2.44	0.478	0.634
Scenario simulation	91.83 $\pm$ 2.15	90.21 $\pm$ 3.86	2.106	0.039
Specific nursing operation	94.09 $\pm$ 2.69	93.69 $\pm$ 3.43	0.536	0.594
Basic nursing operation	92.87 $\pm$ 3.39	91.54 $\pm$ 5.14	1.257	0.213
Communication skills	91.50 $\pm$ 3.12	89.88 $\pm$ 3.54	2.033	0.046

structured clinical examinations are typically used for over 20 years [9,10]. To evaluate the students' nursing core competencies, this study applied objective structured clinical examinations to assess undergraduate comprehensive practice abilities. The health history collection performance, physical assessment, scenario simulation, and communication in the experimental group were significantly higher than the control group, indicating that the nursing core competency standard education model can help cultivate students' core competency of comprehensive application of knowledge, communication, critical thinking, and unity cooperation.

#### 4.2. Teachers play a leading role in nursing core competency standard education

For the core competency teaching model to be successful, teachers must play a leading role in the teaching process, placing a higher standard on their quality and teaching skills. Therefore, as a guide, teachers should not only have a high level of professional knowledge, professional skills, medical humanistic knowledge, and rich clinical knowledge of interdisciplinary, but should also deeply understand the new teaching concepts [11,12]. Teachers should assess students' understanding of the material, arrange team cooperation activities, and supervise and urge every student to actively participate in each class. Teachers should also give guidance, answer questions, understand whether the course schedule and content is in line with the learning objectives, be able to evaluate and provide feedback to students in a timely and productive manner, and be able to guide students to learn to combine theoretical knowledge with practical skills. To properly facilitate simulations, teachers should have rich clinical experience and good response capabilities. Compared with traditional classroom teaching, this new model gives priority to small class teaching, requiring more teachers and a higher level of coordination between them requiring more time and energy.

In short, the nursing core competency standard education model can effectively train students' nursing core competencies. It is suitable for the new teaching requirements. Teachers should play a leading role, and face higher requirements and challenges.

#### Conflicts of interest statement

The authors declare no conflicts of interest.

#### REFERENCES

- [1] Jiang HL, Zeng YH. Current status and developing trend of nursing education reform in China. *Mod Nurs* 2005;11(24):2090–2.
- [2] Wu Y. Competency-based education in nursing—concepts and practice. *Chin J Nurs Educ* 2009;6(10):435–9.
- [3] del Bueno DJ. Competency based education. *Nurs Educ* 1978;3(3):10–4.
- [4] Lenburg C. The framework, concepts and methods of the competency outcomes and performance assessment (COPA) model. *Online J Issues Nurs* 1999;30(9):2.
- [5] Zhao RR, Wu Y. The research and practice of nursing core competency standard education. *Chin J Nurs Edu* 2008;43(3):247–50.
- [6] Xu Y. Comparative study on baccalaureate nursing curriculum in China, Britain and United States – comparison of adult health nursing/medical-surgical nursing course. China: The Second Military Medical University doctoral thesis; 2005. the classification number: R-4.1–120.
- [7] Anonymous. Innovation in nursing education: a call to reform. *Nurs Educ Perspect* 2004;25(1):47.
- [8] Zhang YH, Li SS, Wang Y. Effect of scene simulation teaching on overall competency and exam results of clinical nursing students. *J Nurs Sci* 2013;28(4):64–6.
- [9] Jing HQ, Yu XS, Sun BZ. Application of objective structured clinical examination in medical education. *Foreign Med Med Educ* Vol 2002;23(2):29–33.
- [10] Zheng KQ, Liu QL, Li HZ, Wu YR. Design and evaluation of graduation clinical skill examination based on objective structured clinical examination for college nursing undergraduates. *Chin J Med Edu Res* 2013;12(5):513–6.
- [11] Deng Y, Wang YL, Wu Y, Guo M. Application of combined problem-based learning and scenarios simulated teaching method in adult nursing teaching. *Chin J Nurs Edu* 2013;4(10):147–50.
- [12] Wu FQ, Yue P, Wang YL, Wu Y. Qualitative research on the effects of practice of problem-based learning combined with scenario simulation from the perspective of nursing students. *Chin J Prac Nurs* 2013;29(24):74–8.