



RESEARCH PROGRESS AND APPLICATION PROSPECT OF ICU NURSE CORE COMPETENCE SCALE IN CHINA

Yinji Liang¹, Yingfang Huo¹, Chenli Lin^{2,*}

¹ School of Nursing, Jinan University, No. 601 Huangpu Avenue West, Guangzhou, Guangdong 510632, China

² School of Medicine, Jinan University, No. 601 Huangpu Avenue West, Guangzhou, Guangdong 510632, China

* Corresponding Author:

Chenli Lin, PhD, School of Medicine, Jinan University, No. 601 Huangpu Avenue West, Guangzhou, Guangdong 510632, China.
Email: 253503166@qq.com Tel: +86-20-85220252

Received : 17, June 2020; Accepted :28, June 2020 ; Published :30, June 2020

Abstract: Despite the importance of human resource management, training, and competency-based performance evaluation, there are currently no national standards or competency requirements for Intensive Care Unit (ICU) nurses in Chinese hospitals. Some studies have explored the importance of the core competence of ICU nurses, but the core competence of ICU nurses is a diversified concept, which should not be equated with the core competence of nurses. Based on the systematic description of the research results of the core competence of ICU nurses in China, this paper proposes that the future research on the core competence scale of ICU nurses should focus on the verification and application of the scale. The research on the application of ICU nurse core Competence Scale aims to better play the application value of ICU nurse core competence scale as a unified competence standard, establish a scientific and reasonable evaluation index system of ICU nurse specialist core competence, and provide basis for promoting the development of nursing career to the direction of nursing specialization.

Keywords- Intensive care unit; Core competence scale; Nurse; Research progress

I. Introduction

Despite the importance of human resource management, training, and competency-based performance evaluation, there are currently no national standards or competency requirements for Intensive Care Unit (ICU) nurses in Chinese hospitals. In China, most nurses receive three-year or four-year undergraduate training and provide care for patients with different specialties or specialties, including ICU patients¹. In order to improve the clinical core competence of ICU nurses, according to the spirit of the "National Nursing Development Plan (2016-2020)" document, the development of nursing in China takes improving the quality as the core and strengthening the training of nursing talents, and the demand for the ability research and ability assessment tools in ICU nursing is growing day by day. A number of studies have explored the importance of the core competencies of ICU nurses, particularly around the role and activities of nurses in different Settings in intensive care. In this paper, the core competence scale of domestic intensive care nurses is reviewed, and combined with the core competence of nurses². The purpose is to point out that the core competence of intensive care nurses should be a diversified concept, which should not be equated with the core competence of nurses. Therefore, the research on the core competence of ICU nurses in China still needs further development.

II. The concept and connotation of nurses' core competence

In 2003, International Council of Nurses (ICN) proposed the definition of nurse's core competence: as a performance level, nurse's core competence indicates the effective application of knowledge, skill and judgment, and requires it to reflect a nurse's knowledge level, understanding ability, judgment ability, skill level, personal attitude and personal traits. Macao scholar Liu believes that "Personal Attributes" include personality characteristics, personality development, physical quality and professional attitude³. The nurse will (American take Association, ANA) is put forward in 2001, the core competence of the Nurses, including seven aspects: the health problems of management ability, the relationship between Nurses and patients to build and sustain ability, guiding ability of health education, nursing quality monitoring and protection ability, leadership, multicultural ability to adapt and to provide a multi-cultural nursing ability and five personal professional development ability⁴. Liu, a domestic scholar, has discussed the framework of nurse competence, and the results show that the definition of nurse core competence by domestic nursing colleagues is different from the international definition to some extent. In addition to medical and nursing knowledge and skills, it also

emphasizes the knowledge of laws and regulations and the attitude of nurses.

The intensive work, complex medical techniques and treatments, and wide range of knowledge in the INTENSIVE care unit mean that only nursing staff with excellent comprehensive quality and diversified ability can undertake ICU work⁵. In 2001, the American Association of Critical-Care Nurses (AACN)⁷ defined the scope of the Critical Care Nurse's core competencies: Critically ill nurses rely on a large amount of professional knowledge, skills, abilities and experience, and the connotation of the core competence of ICU nurses is detailed from the six links of assessment, diagnosis, identification, planning, implementation and evaluation⁶. Lakanmaa proposed in 2012 to divide the core competence of ICU nurses into clinical competence and professional competence⁷. Clinical competence refers to the ability of nurses to perform duties directly related to patient care. Professional competence refers to the ability of nurses to be competent for the duties related to the profession and analyze the four main areas of clinical and professional competence including "knowledge base, skill base, attitude and value base, and experience base" from the four aspects of "I know, I can, I think important and I have experience"⁸. The core competence of intensive care nurses should be a diversified concept, which should not be equated with the core competence of nurses. However, as far as most of the studies on the core competence of ICU nurses in China are concerned, the setting of the scale is much the same, with few innovations, and cannot be distinguished from the core competence of nurses, and cannot reflect the specialized characteristics of ICU.

III. Literature retrieval, inclusion and exclusion criteria

This review is based on a systematic search on CNKI database. All relevant literatures before January 2019 were retrieved by means of key care, ICU, nurse, core competence, competence, nursing competence, clinical practice ability, scale, index system, model and other retrieval words, and the retrieval literatures were summarized and sorted by inductive content analysis method. Inclusion criteria: Literature on the preparation of the ICU nurse Core Competence Scale. Exclusion criteria: (1) research on factors affecting ICU core competence; (2) Research on nurses' core competence Scale in other departments other than intensive care, such as operating room and emergency room; (3) Investigation and analysis of the status quo of ICU nurses' core competence.

Research status and analysis of ICU Nurse core Competence Scale

The research on the scale of core competence of ICU nurses in China is mainly based on Liu's 2003 Capacity framework of Registered nurses in China, which mainly focuses on the introduction of the concept of core competence of nurses and the development and development of assessment tools. After literature retrieval and analysis, there were 14 kinds of critical care nurse core competence scale, which were sorted according to the time of publication of the scale, as shown in Table 1.

Table 1 Summary of the Core Competence Scale for ICU Nurses in China

No.	The literature	n	Survey method	Dimensions/items	Description of each dimension
1	Chen et al. (2004) ⁹		Individual analysis	6/17	Nursing responsibilities, legal and ethical responsibilities, team responsibilities, management responsibilities, nursing professional development responsibilities, personal professional development responsibilities
2	Gao et al. (2008) ¹⁰	-	Personal interviews	4/5	High professional ethics, good psychological quality and strong will, healthy physical quality, team spirit
3	Cheng et al. (2008) ¹¹	632	Self-assessment questionnaire survey	4/72	ICU setting and management ability, critical patient care ability, specialized technical ability, education and training ability
4	Wu et al. (2009) ¹²	210	Self-assessment questionnaire survey	3/62	Communication and coordination, health education, emergency response
5	Huang et al. (2009) ¹³	363	Self-assessment questionnaire survey	3/13	Personality characteristics, knowledge and skills, interpersonal communication
6	Xiao et al. (2010) ¹⁴	84	Self-assessment questionnaire survey	7/39	Clinical treatment ability, health education ability, professional quality, communication ability, management ability, teaching ability, research ability
7	Qiao et al. (2011) ¹⁵	220	Self-assessment questionnaire survey	4/16	Professional knowledge, professional technology, professional ability, psychological characteristics
8	Tian et al. (2013) ¹⁶	17	Delphi method	5/16	Clinical practice ability, critical thinking ability, management ability, interpersonal skills, professional development ability
9	Cao et al. (2013) ¹⁷	334	Self-assessment questionnaire survey	7/32	Professional knowledge ability, clinical treatment ability, specialized technical ability, education and training

					ability, professional quality
10	Xu et al. (2013) ¹⁸	32	Self-assessment questionnaire survey	7/28	Professional theoretical knowledge, specialized operational technology, emergency response skills, management knowledge, education and consulting skills, professional ethics, self-development ability
11	Zhang et al. (2014) ¹⁹	26	Behavioral event interview	15 identifying competency features / 7 benchmarking competency features	Knowledge updating and application ability, professional experience, problem solving ability, communication ability, guidance ability, focus on work quality and organization, teamwork spirit, desire for achievement, patience, initiative, self-confidence, self-independence, professional ethics, emotional stability, sense of self-protection
12	Li et al. (2014) ²⁰	551	Self-assessment questionnaire survey	6/91	Professional knowledge and skills, patient safety and rights, research and academic competence, professional ethics, teamwork, professional development
13	Peng et al. (2014) ²¹	551	Self-assessment questionnaire survey	6/107	Professional skills, medical ethics, patient safety, professional ethics, self-improvement and professional development, team spirit
14	Li et al. (2017) ²²	20	Behavioral event interview	2 discriminatory competency features / 9 benchmarking competency features	Team leader, professional training
15	Li et al. (2017) ²³	22	Delphi	6/20	Master and apply

			method		professional knowledge and technical ability, clinical thinking ability, communication and health education ability, management and professional development ability
--	--	--	--------	--	----------------------------------------------------------------------------------------------------------------------------------------------------------------------

All the 15 studies were conducted from 2004 to 2017. From the perspective of research methods, the samples mainly involved personal analysis/shallow talk (n=2), self-assessment questionnaire (n=8), Delphi method (n=2) and behavioral event interview (n=2). The sample size of the questionnaire ranged from none (personal analysis) to 632. The construction of the scale model includes taking the competence architecture of Chinese registered nurses as the template (n=11) and the competency characteristic model (n=3), and most of the studies (n=2) on the establishment of the core competence evaluation system of ICU nurses were carried out in 2017.

In 2004, in accordance with ICU Specialist nursing Service Guideline 24 of The Hospital Authority of Hong Kong, Chan believed that ICU nurses should implement nursing theories and procedures when appropriate, so as to achieve the goal of overall nursing. ICU nurses can only have six core aspects: nursing duties; Legal and ethical responsibilities; Responsibilities in the team; Management responsibilities; Responsibilities for nursing professional development and personal professional development. Gao in 2008 individuals such as introduction to feel ICU nurses should have five big quality: lofty professional ethics, good psychological quality and health quality, strong will and team cooperation consciousness, and four should have the ability to: solid comprehensive rich theoretical knowledge and skilled operating technology, keen sense of observation and good communication skill. In 2008, Cheng et al. believed that ICU nurses should have the ability to master and use ICU Settings and management. To master and apply the ability to care for critically ill patients; The ability to master and use specialized technology and education and training ability, and conducted a series of investigations and studies. Wu et al. in 2009 on the ICU nurses core competence scale development, the final scale including communication and coordination, health education and emergency response factor, a total of 72 entries, internal consistency reliability of three factors were 0.96, 0.94 and 0.90, entries on each dimension of load all above 0.4, achieved good structure validity, has good characteristics of geodesy. Xiao et al. conducted qualification training for ICU nurses in 2010 and summarized 39 items in 7 dimensions, including clinical processing ability, communication ability, health education ability, teaching ability, management ability, scientific research ability and professional quality. The internal consistency reliability and content validity of the questionnaire were 0.847 and 0.901 respectively. Qiao et al. constructed the theoretical framework and evaluation index system of ICU nurses' core competence structure through semi-structured interviews with

experts in 2011, which included 4 first-level indicators, 16 second-level indicators and 53 third-level indicators. The first-level indicators are professional knowledge, professional technology, professional ability and psychological characteristics, while the second-level indicators and the third-level indicators are the specific connotation analysis of the first-level indicators. In 2013, Cao et al. proposed the Core Competence Assessment Scale for KNOWLEDGE, Trust and Practice of ICU Nurses, which contains 32 items in 7 dimensions. The internal consistency reliability Cronbach's coefficient and content validity CVI of the questionnaire were 0.75 and 0.92 respectively. Tian Haiyan et al. conducted a preliminary study on the evaluation index system of ICU nurses' core competence in 2013, which included 5 first-level indicators, 16 second-level indicators and 50 third-level items. After the expert consultation method, the positive coefficients of the two rounds of experts were calculated as 0.94 and 1.0 respectively. The authority coefficient is 0.85; The coordination coefficient is 0.336 for the first-level index and 0.356 for the second-level index, respectively. The chi-square test calculates $P < 0.05$, and sets the weight coefficient for the index, providing a reference basis for the evaluation of ICU nurses. In 2013, Xu et al. established the training model of ICU nurses' core competence, believing that ICU nurses' core competence includes 7 parts, including professional theoretical knowledge, specialized operational skills, emergency skills, management knowledge, education and consulting skills, professional ethics and self-development ability, and 28 secondary indicators. Ge in 2014 created such as intensive care nurses core competence evaluation scale, eventually contains six dimensions, a total of 91 entries, respectively, the professional knowledge and skills, patient safety and rights, scientific research and academic ability, professional ethics, teamwork, professional development, the scale of the Cronbach's alpha coefficient is 0.988, content validity I - CVI value range of 0.842-1.000, is the ideal reliability and validity. In 2014, Peng et al. compiled a comprehensive evaluation table for the core competence of nurses in intensive care. Exploratory factor analysis revealed 107 items with 6 factors in total. The Cronbach's coefficient of the total table was 0.982, and the retest reliability was 0.987. In 2017, Li et al. constructed the evaluation system of the core competence of ICU nurses in Ningxia based on Delphi method, including 6 first-level indicators, 20 second-level indicators and 51 third-level indicators. The authority coefficients of experts were 0.84 and 0.85 respectively, similar to the results of Qiao et al.

In 2009, Huang et al. used O*NET job analysis scale and focus interview method to build a competency model for ICU nurses, and obtained 24 benchmark and discriminative competency features and 13 competency feature elements models from 3 dimensions. The classification consistency reliability was 86%, with good reliability and validity. In 2014, Based on the Dictionary of Job Competency Characteristics of ICU Nursing staff, Zhang Ying et al. constructed the job competency characteristics model of ICU nursing staff. The established job competency model of ICU nursing staff consists of 15 identification competency characteristics and 7 benchmark competency characteristics, and the classification consistency coefficient is 0.839, with

good reliability and validity. In 2017, Li Jianhua et al. used behavioral event interview method to construct the competency model of critical clinical nurses, including 2 discriminative competency characteristics and 9 benchmark competency characteristics, with a total classification consistency of 0.790 and a total coding reliability coefficient of 0.882.

To sum up, the research on the core competence of nurses in China started late, and the research on the core competence scale of specialist nurses was later. With the ministry of health jointly in 2003, the ministry of education of the nursing professional talent training scheme, Chinese nurses have been proposed for the first time the concept of core competence, and by the scholar Liu for registered nurses in China for the first time after the core ability to establish a system of evaluation architecture, domestic nursing colleagues began to establish a scientific and reasonable ICU specialty nurses core competence evaluation index system to make in-depth exploration, contribute to promote our country to develop in the direction of specialization of nursing.

Prospects

By searching the literature induction, the core ability of the ICU nurses gold standard evaluation tool is not yet exist, the definition of ICU nurses core ability is still not clear, does not highlight the characteristics of junior nurses, at the same time, due to limited research environment, so if you want to prepare a can apply to a wide range of, relatively unified systemic evaluation of core competence scale still has some limitations. Now, with the continuous development of nursing career in China, more and more intense demand for nursing specialization, nurse's core competence scale study has profound practical significance, we will also constantly improve the core competence evaluation questionnaire, therefore the existing scale continuous correction and improvement is needed to meet the needs of our growing.

Funding

This work was supported in part by the 22nd Batch of Teaching Reform Research Projects of Jinan University (JG2020080), Teaching Quality and Teaching Reform project of Undergraduate University of Guangdong in China (no. 214 [2017]), Undergraduate Training Programs for Innovation and Entrepreneurship of Jinan University in China (no. CX20157, CX20145 and S201910559055).

Reference

- [1] Benner P. Issues in competency-based testing. *NursOutlook*, 1982,30(5):303-309
- [2] Li zhiyue, jiang xiaojian. Research progress on the core competence of ICU nurses in China. *General nursing*, 2017,15 (22) : 2710-2712
- [3] ICN Framework of competencies for the Generalist Nurse. In *Standards and Competencies*.Geneva:2003.
- [4] Liu Ming. Discussion on the core Competence structure of specialist nurses. *China Nursing Management*, 2009, 04:27-29
- [5] American Nurses Association. *Advanced Practice Nurse Statements*.In *American Nurses Association*. Kansas City: 2001.3-29
- [6] Liu Ming. Wipada Kunaiktikul,Wilawan senaratana.ouyporn Tonmukayakul. A qualitative study of capacity structure of registered nurses in China. *Chin j of nursing*,2006,41(8): 661-694

- [7] American Association of Critical-care Nurses.AACN Scope and Standards for Acute and Critical Care Nursing Practice.USA:An AACN Critical Care Publication,2015,11-14
- [8] Lakanmaa RL. Tarja Suominen.Juha Perttila.Marita Ritmala-Castren.Tero Vahlberg and Helena Leino-kilpi. Basic Competence in intensive and critical care nursing: Development and psychometric testing of a competence scale.Journal of Clinical Nursing,2012, 23:799 -- 810
- [9] Chen yongqiang. Core competence of ICU nurses. Chinese journal of nursing, 2004,39 (12) : 955
- [10] Gao xiaohong, zhang santao. On the quality and ability of nurses in intensive care unit. Modern clinical nursing, 2008,7(2) : 52-53,58
- [11] Cheng shou zhen, peng gang yi, et al. Investigation and research on the current situation of ICU nurses' professional core competence in 16 top three general hospitals in China. Modern clinical nursing, 2008,8 (8) : 1-3
- [12] Wu xueqin, yu yong, et al. Development of ICU specialist nurse competence evaluation scale. Chinese journal of modern nursing, 2010,16(11) : 1279-1281
- [13] Huang jinfang, wang xinli, et al. Research on the competency model of ICU nurses. Chinese journal of nursing, 2009,44(11) : 1030-1032
- [14] Xiao jiangqin, wang xihua, et al. Investigation and analysis on the core competence of specialist nurses in intensive care units. Nursing research, 2010,24(8) : 1999-2001
- [15] Qiao anhua, liao shuhua. Research on the evaluation index system of ICU nurses' competence. Chinese journal of practical nursing, 2011,27(7) : 13-17
- [16] Tian Haiyan. Preliminary Study on evaluation Index System of core Competence of ICU nurses: Master's Thesis. Shanxi: Shanxi Medical University, 2013
- [17] Cao LAN, li yinglan, et al. Discussion on training scheme of critical and critical sub-specialist nurses. Chinese people's liberation army nursing journal, 2013,30(19) : 60-62
- [18] Xu jingjuan, Chen jianfen, et al. Establishment and evaluation of ICU nurse core competence training model. Nursing research: late edition, 2013,27 (36) : 4206-4207
- [19] Zhang ying, MAO jingfu, et al. Construction of ICU nursing staff post competency model. China hospital management, 2014,34(4) : 60-62
- [20] Li Qian. Preparation of comprehensive Evaluation Scale for core Competence of intensive care nurses: Master's Thesis. Hunan: Central South University, 2014
- [21] Peng hua, li qian, et al. Compilation and evaluation of comprehensive evaluation table of core competence of nurses in intensive care. Chinese journal of modern medicine, 2014,24(25) : 109-112
- [22] Li jianhua, huang huigen, et al. Constructing the competency model of clinical nurses in acute critical illness based on behavioral event interview. Modern clinical nursing, 2017,16(4) : 1-6
- [23] Li guifang, hu qian, et al. Research on the evaluation system of core competence of ICU nurses in ningxia based on Delphi method. General practice nursing, 2017,15(31) : 3841-3843