

Advances in Research on Competency Frameworks and Assessment Tools for Public Health Nurses

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Abstract: *With the growing concern for public health, higher demands have been placed on the competence of public health nurses. The public health nursing system in foreign countries is better developed, while the public health nursing system in China has developed more slowly due to the influence of history and policy changes. In recent years, affected by the frequent occurrence of public health events, administrators have recognized the important role of nurses in public health. This paper introduces the concept, framework and assessment tools of public health nurse competency in order to provide a reference for constructing a multi-faceted and multi-level assessment tool and service quality evaluation index system suitable for the competency of public health nurses in China.*

Keywords: *public health, nurses, competence, review*

1. Introduction

In recent years, the frequent occurrence of public health events, such as infectious diseases and natural disasters globally, has attracted significant attention from various sectors both domestically and internationally. In the context of the new era, the scope and definition of public health have been redefined, leading to an increasing emphasis on cultivating multidisciplinary expertise among public health professionals^[1]. Public health nurses, as professionals with backgrounds in nursing, sociology, and public health, play a pivotal role in balancing the distribution of healthcare resources and delivering health services to individuals, families, and communities^[2]. They achieve this by leveraging fundamental healthcare skills and public health intervention strategies. Researches have demonstrated that nurses with insufficient competencies often experience high levels of job stress, diminished professional satisfaction, and burnout, all of which can compromise patient safety and destabilize the nursing workforce^[3,4]. Correctly assessing the competency of public health nurses can help identify the weaknesses in the professional skills and provide targeted training for them, thereby enhancing their ability to meet job requirements. Accordingly, it is of great significance to assess the competency of public health nurses scientifically and reasonably. This study reviews the competency framework and assessment tools for public health nurses at home and abroad, aiming to provide an insight into constructing a quality system for public health nursing services.

2. Concepts Related to Public Health Nurse Competency

The definition of a public health nurse varies across countries, and no single, universally accepted concept exists. In the United Kingdom, a public health nurse is defined as a registered nurse or midwife who is trained in public health and works in specialized health facilities^[5]. In Japan, a public health nurse is defined as someone who has received training in nursing education and community healthcare and has obtained both nursing and public health nurse licenses through national examinations^[6]. In Canada, public health nurses are described as professionals who assess the relationships between individuals, families, and society, applying knowledge from public health, nursing, and sociology to address health needs^[7]. In China, public health nurses are defined as healthcare providers who manage public health events in public health institutions, clinical medical institutions, and community service centers^[8]. Competency, in this context, refers to the knowledge, skills, abilities, values, personality traits, and motivations that enable employees to excel in specific roles^[9]. In summary, public health nurse competency can be understood as the knowledge, skills, and attributes that nurses working in public health settings require to maximize patient health outcomes while minimizing health risks.

3. Competency Framework for Public Health Nurses

3.1 Competency Framework in the United States

The Quad Council Coalition (QCC) developed a Public Health Nursing Competency Framework that encompasses eight domains: policy development/program planning skills, communication skills, cultural competency, community practice skills, public health science skills, financial planning and evaluation, management skills, leadership, and systems thinking^[10]. The framework classifies public health nurse competencies into three levels: entry-level, advanced-level, and executive leadership. Each level has tailored practice requirements. The first level focuses on developing core competencies for entry-level and frontline clinical staff. The second level targets public health nurses with postgraduate education who are responsible for supervision and management. The third level is designed for public health nurses in senior leadership roles. This framework emphasizes multiple population-based perspectives of nursing practice and provides professional guidance, clarifying role orientation, professional development, training, and performance assessment.

3.2 Competency Framework in Japan

The Japan Education Curriculum Committee (JECC) developed a competency framework based on the 2017 Core Curriculum for Public Health Nursing Education Model and the standards for graduation of public health nurses. The framework consists of six primary indicators, including the ability to assess problems and plan implementation, collaboration, health crisis management, policy planning and implementation, self-development, and nursing practice for different groups. These are further divided into 24 secondary indicators and 37 tertiary indicators. Each entry in the tertiary indicators was categorized into four levels according to the degree of difficulties from the cognitive, affective, and spiritual domain perspectives, with level I referring to the ability to implement independently with a little advice; level II as being able to implement after guidance; level III indicating that it can be implemented after practicing in school; and level IV as knowledge understanding^[11]. This framework is characterized by clear structure and comprehensive content, providing theoretical support for public health nursing education by addressing competencies for various nursing roles.

3.3 Competency Framework in Canada

The framework was developed by the Canadian Nursing Association and public health nursing experts from around the world through a literature review and multiple expert interviews. The framework consists of five dimensions, namely public health nursing practice, population-based/community assessment and analysis, health planning, implementation, evaluation, collaboration and consultation, and communication competencies, for a total of 21 items. Under each dimension is a set of indicators, and these provide specific knowledge, skills, and attitudinal requirements for public health nurses, competency-based assessment of public health nurse practice competencies, and direction for nursing educators' curriculum development and teaching^[12]. The framework is directional, designed for pre-graduate nursing students, and can help educators prepare students to reach standardized levels of competency more closely aligned with job requirements and improve the incompetence of public health nurses entering practice.

3.4 Competency Framework in the UK

The competency framework for public health nurses in the UK is based on the Nurses and Midwives Act 2011 and Department of Health and Children's Circular No.41/2000 and the definition of a public health nurse^[13]. It addresses six dimensions: professional values and conduct (8 entries), public health nursing practice and clinical decision-making competencies (10 entries), knowledge and cognitive competencies (4 entries), communication and interpersonal competencies (4 entries), management and team competencies (5 entries), and leadership potential and professional scholarship competencies (4 entries). Targeting primary public health nurses, the framework is characterized by clear directionality, logical clarity and well-defined structure, which provides a scientific basis for the practical education of public health nurses in different roles, and helps to cultivate public health nurses who meet the health needs of patients.

3.5 Competency framework in Norway

Norwegian scholar Dahl et al.^[14] constructed a competency framework for public health nurses using focus group methods and personal interview. The framework covers 10 competency areas, including health promotion and disease prevention, child and adolescent health promotion, holistic thinking, cultural competence, ethical competence, evidence-based practice, communication competence, relational competence, collaboration competence, and management and organizational competence. From the perspective of public health nursing service providers, the framework explores the public health nurse community's perceptions of the competency profiles required for practice, and promotes advocacy, program development, and deployment of educational programs in public health nursing.

3.6 Competency Framework in China

Li et al.^[15] developed a competency framework for public health nurses in China through literature review, semi-structured interviews, and expert correspondence method, which includes five primary indicators, including basic public health practice competency, basic competency in program management and implementation, emergency response competency for public health emergencies, epidemiological investigation competency, and leadership. And it was subdivided into twenty-six secondary indicators and seventy-nine third level indicators. This is the first specific competency framework for public health nurses in China, which fully takes into account the context of China's public health construction and society's demand for public health personnel, and is practical in nature, providing guidelines for the cultivation of public health nurses and the transfer training of nurses from medical institutions in China.

4. Competency Assessment Tool for Public Health Nurses

4.1 Community/Public Health Nurse Competency Evaluation Tool

The Quadripartite Council Alliance of Public Health Nursing Organizations (QCPHNO) developed a tool in 2018 to assess public health nurses' practice, education, research, and policy activities. The questionnaire includes 57 entries across nine dimensions such as assessment and analytic skills, policy development/program planning skills, communication skills, cultural competence, community practice skills, public health science skills, financial planning, evaluation and management skills, leadership skills, and systems thinking. These are categorized into three levels: satisfactory, needs improvement, and unsatisfactory. Satisfactory indicates standardized practice and skilled use of nursing procedures^[16]. Needs improvement indicates an inability to be proficient in nursing procedures and operations in practice. Unsatisfactory indicates lack of knowledge to use nursing procedures to solve problems and lack of basic skills. The scale can help primary public health nurses adapt to different states and meet expectations in different settings and roles. The questionnaire can be modified and added or subtracted by the institution or organization according to the nature and needs of the position, and it can also be used as a template for a competency assessment tool for public health nurses in a multicultural context, but it has not yet been widely used. Translation of the tool needs to take into account the cultural context of the country and be culturally adapted before it can be used to survey the level of competence of public health nurses.

4.2 Competency Assessment Tier 1 Public Health Professionals tool

Public Health Foundation^[17] developed the questionnaire based on the Janet Place competency assessment for entry-level public health professionals. The questionnaire covers eight domains, in the order of analytical/assessment skills, policy development/program planning skills, communication skills, cultural competency skills, community practice skills, public health sciences skills, financial planning and management skills, leadership and systems thinking skills, for a total of 83 entries. The questionnaire was revised for the year 2021, with the addition of competencies for promoting health equity, partnership competencies, and the deletion of cultural competencies and community practice competencies, for a total of 56 entries. Competencies, for a total of 56 entries^[18]. Participants self-rated their mastery of each competency on a 4-point scale from "not proficient" to "proficient" on a scale of 1-4. A mean score of 3 to 4 on each dimension was considered a high level of competence. Siemon et al.^[19] used this questionnaire to survey 106 students, and the results showed that after training in a

population and community-based health program, the students' public health competencies increased significantly, especially in the areas of social practice skills and communication skills. The instrument was designed to meet the requirements of the public health profession and provided an opportunity for systematic and comprehensive self-assessment for junior public health personnel.

4.3 Self-Perceived Public Health Nursing Competencies

The Public Health Nursing Self-Perceived Competency Scale was developed by Poulton team^[20]. An assessment tool based on a literature review and the United Kingdom national consensus on public health competencies was developed to investigate the extent to which community nursing students self-assess their knowledge and skills in ten key areas of public health practice after completing a community and public health nursing program. This questionnaire consists of three dimensions, leadership and management (24 entries), public health principles and practice competencies (16 entries), and communication (12 entries). Cronbach's α coefficients ranged from 0.85 to 0.96. A 5-point rating scale was used, with entries scored on a scale from 1 to 5, with smaller scores indicating less competence in the competency. The scale focuses on the mastery of skills in the field of public health, which is highly instructive and also provides direction for nurses in different roles to learn public health skills to improve public health practice. Therefore, this tool has high reference value in assessing the level of public health practice of individual nurses and provides an effective assessment tool to improve the level of public health nursing practice.

4.4 Public Health Nurses' Professional Competency Scale

The Professional Competency Scale for Public Health Nurses was developed in 2010 by Lin et al., in Taiwan^[21], based on the six key competency factors published by the Taiwan Public Health Nurses Association. It is designed for practicing public health nurses to self-assess their competency levels. The scale includes four domains and thirty-eight entries: basic-care competency, community-based competency, teaching competency and self-development competency. The entries were scored on a Likert 4-point scale ranging from 1 (needs improvement) to 4 (very good), and the total score ranged from 38 to 152. Cronbach's α was 0.93 to 0.97, which has good reliability and validity. The scale is feasible and is the first tool for public health nurses to self-assess their competence in the country of China, and it can measure their competence level well.

4.5 Public Health Nursing Competency Instrument Abbreviated

Cross et al.^[22] developed the Public District Health Nurse Competency Inventory (PHNCI) by synthesizing four theoretical perspectives, including the public health practice model, the public health intervention wheel, general systems theory, and the nursing process, and by using a literature review and expert interviews. The scale focuses on self- and other-assessment of public health nursing competencies. It consists of 4 dimensions, including assessment competencies, population-based planning competencies, implementation intervention competencies, and evaluation process and outcomes competencies, with a total of 193 entries. A 4-point Likert scale was used, ranging from 1 to 4 on a scale from "I need to learn the skills for this activity" to "I can teach others to do this skill". In 2013, Reckinger^[23] simplified the Public Health Nursing Practice Skills Scale. Factor analysis yielded six factors for evaluative competencies (16 entries), individual/family/community competencies (11 entries), systems' competencies (4 entries), partnership/collaboration competencies (9 entries), planning competencies (23 entries), and assessment competencies (18 entries) for a total of 81 entries. Each dimension Cronbach's coefficient ranges from 0.92 to 0.98. The simplified version is suitable for assessing employee competence and helping new nurses to master the knowledge, skills, and other aspects of competence required for the position. The scale can dynamically monitor changes in public health nursing competencies, which is helpful for leaders and nurses themselves to identify deficiencies in time and strengthen training to meet patients' health needs. However, the scale has a large number of entries and takes a long time to fill in, which makes the filler easily fatigued and affects the quality of the questionnaire.

4.6 Self-Reported Competency of Public Health Nurses and Faculty

This self-report questionnaire was developed by Issel's team^[24]. It was based on 10 basic public health service skills and was revised by researchers. It was used to assess the competency levels of public health nurses and public health nurse educators. The scale includes nine factors: monitoring

community health status, informing, educating, and empowering populations at risk, mobilizing community partnerships, policy and planning skills, enforcing laws and regulations, linking people to services, ensuring a competent workforce, evaluating health services, and researching and innovating. It contains a total of 67 entries, each rated on a 5-point Likert scale, with scores ranging from 1 to 5, where higher scores indicate better mastery of competencies. The Cronbach's alpha coefficients of each dimension are from 0.90 to 0.97, with good reliability. This scale can objectively measure the differences in competency levels between public health nurses and teaching staff, while also exploring in depth the connection between competency and educational experience, which can provide an important reference for public health education and practice.

4.7 Professional Competencies of Public Health Nurses Scale

Japanese scholars Saeki et al.^[25] developed a professional competency scale for public health nurses applicable at the executive leadership level based on a literature review and the requirements of administrative positions. The scale covers two main areas, interpersonal health support competencies (8 entries) and community health support and administration competencies (12 entries), totaling 20 specific entries. A 4-point Likert scale was used, with each entry scored according to whether it was competent to perform daily tasks, with scores ranging from 1 to 4, representing "not competent" to "competent", respectively. Cronbach's α was 0.96. The reliability is good. Then, Saeki et al. ^[26] applied this questionnaire to a survey of 1614 public health nurses working in local government organizations in Japan, and showed that public health nurses' interpersonal health support competencies scores were significantly higher than those of community health support and administration competencies. In addition, work experience was a major factor in interpersonal health support competence. The scale assesses the professional competence of public health nurses at the executive leadership level in terms of work outcomes and truly reflects the shortcomings of nurses in terms of job competence.

5. Conclusion

This review analyzes public health nurse competency frameworks and their assessment tools in different countries, such as the United States, Canada, and Japan, which have developed competency frameworks encompassing entry-level to advanced nurse practice requirements based on their respective public health needs. These frameworks emphasize the development of core competencies and provide a theoretical basis and assessment criteria for nurse training, role orientation, performance evaluation, and development to help nurses adapt to the complex public health environment. Assessment tools such as the C/PHN competency evaluation tool and public health nurses' professional competency scale promote nurses' self-assessment and competency enhancement through multidimensional assessment, but there are problems such as too many entries and long time to fill in the tool, which may affect the accuracy of the assessment, and cross-cultural application requires cultural adaptation to ensure applicability. Future research should focus on optimizing these frameworks and tools, simplifying the assessment process, enhancing cross-cultural applicability, and exploring dynamic assessment methods to improve public health nurse competencies in real-world settings.

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