

Core competencies for public health nurses: a systematic review and qualitative meta-synthesis

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Abstract

Background

Public health nurses (PHNs) are pivotal in disease prevention, health promotion, and emergency response. Existing competency frameworks, however, are heterogeneous, and an integrated synthesis of qualitative evidence to guide the development, evaluation, and educational application of PHNs' core competencies is lacking.

Objective

This systematic review synthesizes qualitative evidence on the core competence evaluation indices for PHNs to provide a scientific basis for their training, assessment, and competence enhancement, with a specific focus on informing nursing education reform.

Methods

Literature related to public health nursing competence evaluation indices was gathered from multiple databases, including CNKI, Wanfang, VIP, Web of Science, PubMed, EMBASE, the Cochrane Library, and Google Scholar, with a search cutoff date of March 2, 2025. The methodological quality of included studies was assessed using the Joanna Briggs Institute (JBI) Critical Appraisal Checklist (2016). Data were analyzed through content synthesis.

Results

A total of 11 studies were included. The synthesis identified three core dimensions: "technical competencies" in public health care, "non-technical competencies" in public health care, and differences in the structure and scope of levels of public health capacity evaluation. These dimensions encompassed eight categories: practice and specialized nursing ability, evaluation and adjustment, scientific and cultural knowledge, assessment, analysis and planning, leadership, organization and collaborative communication, culture and education, attitudes, values and ethics, and competencies required for special situations. A total of 42 specific competency indicators were delineated.

Conclusion

This meta-synthesis highlights the integrated technical and humanistic competencies essential for PHNs. The evidence-based framework provides clear guidance for nursing education reform, including curriculum module design, teaching method innovation, and competency-based assessment system development, ultimately aiming to strengthen public health nursing practice globally.

Highlights

- This review synthesizes qualitative evidence on public health nursing competency evaluation frameworks.
- Three core competency dimensions were identified: technical expertise, practical competence, and humanistic qualities.
- An integrated, evidence-based framework with 42 competency indicators was developed.
- Findings reveal gaps in existing competency frameworks, particularly in ethics, culture, and emotional resilience.
- The results inform competency-based education, assessment, and workforce development in public health nursing, providing actionable guidance for curriculum design and teaching practice.

1. Background

The global public health landscape faces numerous challenges, including an aging population, the increasing prevalence of chronic diseases, recurrent public health crises (such as the COVID-19 pandemic), and health inequities (State Council of the People's Republic of China, 2003). To effectively address these issues, it is imperative to cultivate a professional and adaptable public health workforce capable of managing complex and diverse health determinants (Gebbie and Hwang, 2000). Public health nurses (PHNs), who are integral to this workforce, employ their clinical expertise to assess public health issues and provide essential services, such as disease prevention, health promotion, and emergency care during public health emergencies. They also contribute to policy formulation and clinical decision-making frameworks (Zhang et al., 2021). Their role in promoting and protecting public health, advancing health equity, preventing infectious diseases, and responding to health crises is indispensable (Atherton et al., 2017; Best et al., 2018).

Public health nursing is defined as *"the practice of promoting and protecting the health of populations using knowledge from nursing, social, and public health sciences* (American Public Health Association - Public Health Nursing Section, 2013)." Several countries have established competency frameworks to guide the practice of public health nursing (Asahara et al., 2015; Campbell et al., 2019; Cross et al., 2006; Dahl et al., 2022; Koshida and Morita, 2013; Michibayashi et al., 2020). For instance, the U.S. Quad Council Coalition (QCC) 2018 standards (Campbell et al., 2019) define eight core domains (e.g., analysis/assessment, policy planning, communication, cultural competence, community practice, public health skills, financial management, leadership/systems thinking) across three career levels (generalist, management/supervision, senior leadership). Canada's framework (Cross et al., 2006) emphasizes eight competency areas, including public health science, assessment/analysis, policy planning, partnership collaboration and etc. Japan (Asahara et al., 2015; Koshida and Morita, 2013; Michibayashi et al., 2020) emphasizes nine competencies, focusing on professionalism, practical skills, communication/collaboration, quality/safety, scientific inquiry, lifelong learning and etc. Norway (Dahl et al., 2022) mandates five competency domains (professional/ethical practice, holistic care, interpersonal skills, organization/management, personal/professional development) for nurse registration. Despite local variations, these national frameworks converge on essential competencies including public health nursing theory and practice, communication, collaborative management, assessment/analysis, policy development, and scientific research. Collectively, these frameworks portray the ideal PHNs as versatile, practice-oriented, and innovative professionals of high overall quality, and serve as the foundation for nursing education curriculum design and talent training globally.

Despite clearly defining the required competencies, these frameworks face significant challenges in their translation into nursing education practice and in the measurement of learning outcomes. Our team's recent systematic review of the psychometric properties of existing public health nursing competency assessment tools found that although several instruments exist, their content validity is often rated as "doubtful," and essential measurement properties such as cross-cultural validity, reliability, and responsiveness remain poorly examined or unreported (Nie et al., 2026). This highlights a significant gap between the conceptualization of competencies and their operational application in educational assessment.

Within China, the implementation of the "Healthy China" strategy has further elevated the demand for a highly competent public health nursing workforce (Nabizadeh-Gharghozar et al., 2021). Yet, China currently lacks a nationally unified competency framework guiding nursing education, and existing evaluation systems - particularly for emergency response roles - remain underdeveloped in educational settings. While localized research, such as the Guangdong-based competency index system developed by Li et al., offers a valuable starting point, its provincial focus limits national generalizability in education. Their proposed system comprises five first-level

indicators: basic public health practice competence, basic project management and implementation competence, emergency response competence for public health emergencies, epidemiological investigation competence, and leadership (Li, 2023). Moreover, systematic integration of qualitative evidence, both within China and internationally, for the purpose of nursing education reform remains scarce. Although qualitative studies have explored PHN competencies across various settings, a comprehensive synthesis capable of informing an actionable, context-sensitive, and measurably grounded framework is still lacking.

Therefore, building on our previous review of assessment tools, this study aims to address the upstream question: What exactly should be measured? We conduct a systematic review and qualitative meta-synthesis of domestic and international literature on PHN core competency evaluation. By integrating findings from diverse qualitative studies, this review aims to: (1) enhance the transferability and contextual understanding of PHN competencies, (2) identify commonalities and variations across settings, and (3) develop an evidence-based competency framework that is both comprehensive and measurable. The resulting framework is intended to inform competency assessment, professional development, curriculum design, and policy planning for public health nursing in China and beyond.

2. Methods

2.1 Research design

This meta-synthesis was based on the Joanna Briggs Institute (JBI) Centre for Evidence-Based Health Care, Australia, "Quality Assessment Criteria for Qualitative Research" (2016) (Lockwood, 2024). With the aim of clarifying the direction and nature of the study and conducting optimal search strategies, we formulated the following research phenomena of interest: research contexts related to core competency assessment indicators for PHNs, disease prevention, health management, emergency response to public health emergencies, and epidemiological investigations in communities and populations. We included and consulted a third researcher (GCW), who assisted in the judgment in case of disagreement to integrate different perspectives, to improve the literature, and to guarantee the applicability of our review results.

2.2 Literature search strategy

Computerized searches were conducted on seven databases: CNKI, Wanfang Database, VIP Database, Web of Science, PubMed, Embase, and the Cochrane Library. Then, relevant literature was supplemented based on the included studies. The search strategy was based on MESH subject terms combined with free words. The Chinese search strategy was: (public health OR public health nurses OR public health nursing staff OR community nurses) AND (clinical work competence OR clinical competence OR clinical practice competence OR clinical comprehensive competence OR clinical nursing competence) AND (indicator OR indicator system OR evaluation indicator OR evaluation system OR evaluation indicator system). The English search strategy was: ("public health" OR "public health nurses" OR "public health nursing" OR "public health nursing people" OR "community nurses") AND ("clinical competence" OR "competency, clinical" OR "clinical competencies" OR "competence, clinical" OR "clinical competency" OR "competencies, clinical" OR "clinical skill" OR "skill, clinical" OR "skills, clinical" OR "clinical skills" OR "clinical ability") AND ("indicator" OR "system" OR "index" OR "indicators" OR "model" OR "framework"), with a retrieval time limit of 2 March 2025 for database construction. Literature was imported into EndNote 20 for screening and de-duplication. The specific search strategy is in Appendix A.

2.3 Literature inclusion and exclusion criteria

The inclusion criteria for the studies were: Qualitative studies in Chinese and English languages, qualitative research in mixed-method studies, in which the participants were PHNs, community nurses, or public health physicians. The exclusion criteria were: Quantitative, quantitative research in mixed-method studies, or review studies; full text unavailability; publications that are similar or duplicate; conference papers, abstracts, or commentaries, draft treaties and protocols, in which the participants were undergraduate nursing students.

2.4 Study selection

Two reviewers, YG and MQN, initially reviewed the headlines and selected articles discussing the core competencies of public health care professions as part of the abstract review process. All identified headlines were directly imported into EndNote 20. Then, duplicate data were eliminated. During the abstract review step, all works focusing on comprehensive public health competencies related to PHNs but not involving undergraduate nursing students were excluded. After limiting the abstracts to those relevant to PHNs in terms of core competencies, the reviewers conducted a full-text review to classify the studies addressing PHNs' competencies. Therefore, a full analysis of all those papers was performed, and reviewers identified articles that specifically stated the public health competencies of PHNs. By investigating the bibliographies of these papers, the reviewers conducted a cross-search to identify any further related articles.

2.5 Evaluation of the quality of the literature

Two academics, YG and ZHW, independently assessed the quality of the literature based on evidence-based care and qualitative research methodology. They utilized the JBI Centre for Evidence-Based Health Care, Australia's "Quality Assessment Criteria for Qualitative Research" (2016) (Lockwood, 2024), which consists of seven items. Each item was evaluated with three possible responses: "yes," "no," and "not clear." Literature was categorized into three grades: grade A (fully compliant with the evaluation criteria), grade B (partially compliant), and grade C (not compliant at all). Only literature of grade A and B was included, while grade C was excluded. In the event of disagreement between the two researchers, during the evaluation process, the evidence-based care team would jointly make the final decision.

2.6 Data extraction and synthesis

Two researchers (YTZ and TTH), trained in evidence-based nursing and qualitative research methodology systems, independently screened, extracted, and checked the literature. A third researcher (GCW) assisted in making a judgment in case of disagreement. The screening process began with the researchers reading the titles and abstracts of the studies for initial screening. Subsequently, they read the full texts of the literature that potentially met the criteria for re-screening. The content of each study was thoroughly read and summarized. Information extracted from the studies included authors, date of publication, country, research methodology, study population, phenomenon of interest, and main findings.

The quality of evidence for the synthesized findings was evaluated using the ConQual evidence grading approach proposed (Munn et al., 2014). In accordance with this method, the integrated findings were initially assumed to be of high quality, and subsequent downgrading was performed based on systematic assessments of dependability and credibility, resulting in the final evidence levels of the synthesized results. Dependability was evaluated using Items 2, 3, 4, 6, and 7 of the methodological quality assessment criteria. When four to five items were rated as "yes," the evidence level remained unchanged; when two to three items were rated as "yes," the evidence level was downgraded by one level; and when zero to one item was rated as "yes," the evidence level was downgraded by two levels. Credibility was assessed based on the nature of the original findings contributing to each synthesized

result. When a synthesized finding was supported exclusively by unequivocal evidence, no downgrading was applied. If both unequivocal and credible findings were included, the evidence level was downgraded by one level. When only credible findings were included, the evidence level was downgraded by two levels. Synthesized findings containing unsupported results were downgraded by three levels, and those composed entirely of unsupported findings were downgraded by four levels. Based on the ConQual assessment, two synthesized findings were rated as high-quality evidence, while one was rated as medium-quality evidence.

3. Results

3.1 Study selection

7 documents were left after reading the full text for re-screening, and 4 documents were obtained by using Google Scholar for web searching with search terms similar to those used in the database search. In total, 11 documents (2 in Chinese (Gao et al., 2023; Li, 2023), 9 in English (Asahara et al., 2015; Campbell et al., 2019; Cross et al., 2006; Dahl et al., 2022; Hewitt et al., 2014; Koshida and Morita, 2013; Larsen and Reif, 2019; Michibayashi et al., 2020; Polivka et al., 2008)) were finally included. The process of identification, selection, and extraction of documents was carried out using the flowchart of Literature Screening (See Fig. 1).

3.2 The quality assessment of the included literature

The 11 included documents were reviewed for assessment of methodological quality by all three authors. The researchers use the JBI Centre for Evidence-Based Health Care, Australia's "Quality Assessment Criteria for Qualitative Research" (2016) to judge each paper whether it conformed to the 10 items or not, and score the level A, B, or C. The literature of grade A and grade B was included, and grade C was excluded. Table 1 provides full details of the scoring process. Overall, within the assessment, a rich source of data was found in the included literature; however, the nature of weakly scoring items was taken into account over the review procedure, comprising potential biases in each work (see Table 1).

Table 1
Results of quality assessment of included literature

Inclusion of studies	i	ii	iii	iv	v	vi	vii	viii	ix	x	quality level
Cross S et al (2006) Canada (Cross et al., 2006)	yes	yes	yes	yes	yes	no	yes	yes	no	yes	B
Koshida M et al (2013) Japan (Koshida and Morita, 2013)	yes	yes	yes	yes	yes	no	yes	yes	yes	yes	A
Dahl B M et al (2022) Norway (Dahl et al., 2022)	yes	yes	yes	yes	yes	no	yes	yes	yes	yes	A
Li Jia et al (2023) China (Li, 2023)	yes	yes	yes	yes	yes	no	yes	yes	no	yes	B
ASAHARA K et al (2015) Japan (Asahara et al., 2015)	yes	yes	yes	yes	yes	yes	yes	yes	no	yes	B
Michibayashi C et al (2020) Japan (Michibayashi et al., 2020)	yes	yes	yes	yes	yes	no	yes	yes	yes	yes	A
Gao Yun Yun et al (2023) China (Gao et al., 2023)	yes	yes	yes	yes	yes	no	yes	yes	yes	yes	A
Polivka B J et al (2008) US (Polivka et al., 2008)	yes	yes	yes	yes	yes	no	yes	yes	no	yes	B
Hewitt C M et al (2014)	yes	yes	yes	yes	yes	no	yes	yes	no	yes	B

Notes: i: Whether the philosophical basis and methodology are consistent; ii: Whether the methodology is consistent with the research questions or research objectives; iii: Whether the methodology is consistent with the method of data collection; iv: Whether the methodology is consistent with the representativeness of the data and the method of data analysis; v: Whether the methodology is consistent with the interpretation of the results; vi: Whether the researcher's own situation is described in terms of cultural background and values; vii: Whether it is stated that the researcher's influence on the study or the study's influence on the researcher; viii: Whether the research subjects are typical and whether they adequately reflect the research subjects and their views; ix: Whether the study has been approved by the relevant ethical review boards; x: Whether the conclusions are drawn from the analyses and interpretations of data.

Inclusion of studies	i	ii	iii	iv	v	vi	vii	viii	ix	x	quality level
US (Hewitt et al., 2014)											
Campbell L A et al (2019)	yes	yes	yes	yes	yes	no	yes	yes	no	yes	B
US (Campbell et al., 2019)											
Larsen R et al (2019)	yes	yes	yes	yes	yes	no	yes	yes	no	yes	B
US (Larsen and Reif, 2019)											
Notes: i: Whether the philosophical basis and methodology are consistent; ii: Whether the methodology is consistent with the research questions or research objectives; iii: Whether the methodology is consistent with the method of data collection; iv: Whether the methodology is consistent with the representativeness of the data and the method of data analysis; v: Whether the methodology is consistent with the interpretation of the results; vi: Whether the researcher's own situation is described in terms of cultural background and values; vii: Whether it is stated that the researcher's influence on the study or the study's influence on the researcher; viii: Whether the research subjects are typical and whether they adequately reflect the research subjects and their views; ix: Whether the study has been approved by the relevant ethical review boards; x: Whether the conclusions are drawn from the analyses and interpretations of data.											

3.3 Basic characteristics of the included literature

The 11 papers were published over the 18 years from 2006 to 2024. These studies were conducted in 4 developed countries (Canada, Japan, USA, Norway) (Asahara et al., 2015; Campbell et al., 2019; Cross et al., 2006; Dahl et al., 2022; Hewitt et al., 2014; Koshida and Morita, 2013; Larsen and Reif, 2019; Michibayashi et al., 2020; Polivka et al., 2008) and 2 studies in a developing country (China) (Gao et al., 2023; Li, 2023). The focus of this study was on the public health nurses, community nurses, and physicians who work in practice and education. All 11 studies used qualitative designs (Delphi Expert Consultation Method/purposive sampling method/Biphasic Delphi technology/Paired t-test/semi-structured interview). Table 2 presents the summary characteristics of the included studies (see Table 2).

Table 2
Basic characteristics of the 11 included papers

Author/year/ country	Aim	Study design	Population	Data collection	Data analysis	Theme reported by authors
Sharon Cross et al (2006) Canada (Cross et al., 2006)	To measure population- based public health nursing competencies	Qualitative	Expert- N: 23	Delphi Expert Consultation Method	population- based public health practice model, The Public Health Intervention Wheel, general systems theory, competencies, and the nursing process	I, II, IV, V, VI
Koshida M et al (2013) Japan (Koshida and Morita, 2013)	To establish community networks mainly involve communicative competencies	Qualitative	Expert- N: 21	literature review, individual interviews, and repeated examinations	Delphi Expert Consultation Method	II, IV, V, VI
Dahl B M et al (2022) Norway (Dahl et al., 2022)	To explore the competence areas of public health nurses in Norway	Qualitative	Expert- N: 41	focus groups and individual interviews	A qualitative content analysis	I, II, III, IV, V, VI, VII, VIII
Li Jia et al (2024) China (Li, 2023)	To construct a core competence evaluation index system for public health nurses, and to provide reference for the cultivation of public health nurses suiting national conditions	Qualitative	Expert- N: 18	literature review and semi- structured interviews	Delphi Expert Consultation Method	I, II, III, IV, V, VI
ASAHARA K et al(2015) Japan (Asahara et al., 2015)	To develop a valid and reliable self- assessment questionnaire that can be easily used by public health	Qualitative	Public health nurses working in local governments in Japan-N: 74	a cross- sectional survey	Delphi Expert Consultation Method	IV, V, VII, VIII

Summary characteristics of the studies (theme reported: I = Practical and specialist nursing competencies, II = Evaluation and adjustment capacity, III = Scientific and cultural knowledge and skills, IV = Assessing analytical and planning capacity, V = Leadership organizational and collaborative communication Skills, VI = Cultural and educational competences, VII = Attitudes, values and ethical competencies, VIII = Competencies required for the post or special circumstances)

Author/year/ country	Aim	Study design	Population	Data collection	Data analysis	Theme reported by authors
	nurses in Japan to measure their moral competence					
Michibayashi C et al (2020) Japan (Michibayashi et al., 2020)	Aim to identify competencies of public health nurses working on local tobacco control in Japan	Qualitative	Expert- N: 12	individual semi-structured interviews, and participant observation	A qualitative content analysis	I, III, ☐, ☐, ☐
Gao Yun Yun et al (2023) China (Gao et al., 2023)	To explore the competency characteristics of public health nurses in China, and to provide reference for the training of public health nurses in the future	Qualitative	community nurses, public health doctors- N: 32	purposive sampling	content analysis	I, III, IV, V, VII, ☐
Polivka B J et al (2008) US (Polivka et al., 2008)	To develop consensus regarding public health nursing competencies in the event of a public health surge event related to disaster	Qualitative	Expert- N: 131	three-round e-mail Delphi approach and purposive sampling	A descriptive content analysis	☐, IV, V, ☐
Hewitt C M et al (2014) US (Hewitt et al., 2014)	Aim to the need for a competent public health workforce in which public health nurses are able to provide safe and effective family planning services	Qualitative	Expert- N: 40	the 2011 Title X Family Planning program priorities	a three stage Delphi Method	☐, IV, V, ☐, ☐
Summary characteristics of the studies (theme reported: I = Practical and specialist nursing competencies, II = Evaluation and adjustment capacity, III = Scientific and cultural knowledge and skills, IV = Assessing analytical and planning capacity, V = Leadership organizational and collaborative communication Skills, VI = Cultural and educational competences, VII = Attitudes, values and ethical competencies, ☐ = Competencies required for the post or special circumstances)						

Author/year/ country	Aim	Study design	Population	Data collection	Data analysis	Theme reported by authors
Campbell L A et al (2019) US (Campbell et al., 2019)	To guide professional nursing practice, curricula, research, and policy development	Qualitative	Expert- N: 6	Donabedian's model	a biphasic Delphi technique and a qualitative approach, summative content analysis	I, II, III, IV, V, ☒, ☒, ☒
Larsen R et al (2019) US (Larsen and Reif, 2019)	To provide valuable insight for development and revision of public health nursing courses ensuring a nursing workforce competent in the provision of population health	Qualitative	nursing students-N: 102	pilot testing	A qualitative content analysis	I, II, III, IV, V, ☒, ☒, ☒
Summary characteristics of the studies (theme reported: I = Practical and specialist nursing competencies, II = Evaluation and adjustment capacity, III = Scientific and cultural knowledge and skills, IV = Assessing analytical and planning capacity, V = Leadership organizational and collaborative communication Skills, VI = Cultural and educational competences, VII = Attitudes, values and ethical competencies, ☒ = Competencies required for the post or special circumstances)						

3.4 Thematic analysis results

Through iterative reading and analysis of the included literature, online quality assessment, data extraction, and integration were conducted by using the Pooled Evidence Synthesis methodology of the JBI Centre for Evidence-Based Health Care. The integration results report was generated with 42 findings, generalizing and combining similar findings into 8 new categories, and finally synthesizing them into 3 integrated findings (See Fig. 2).

3.4.1 Integration Outcome 1: "Technical competencies" of public health care

Category I: Practical and specialist nursing competencies

This includes competencies in basic public health practice and emergency response to public health emergencies, as well as the specific competencies required for different types of specialist public health nurses. PHNs carrying out family planning need to understand and spread knowledge about family planning policies, provision/administration of medication and contraception, and plan for the implementation of national family planning policies (Hewitt et al., 2014); PHNs practicing tobacco control need to understand the smoking status of the population in their area and to plan and implement health promotion and disease prevention methods to reduce respiratory-related diseases such as lung cancer (Michibayashi et al., 2020). PHNs cope with major public

health and safety events, need to rapidly adapt and tackle outbreaks, conduct outbreak investigation and detection, public health triage, and apply public health nursing skills (Cross et al., 2006).

Category II: Evaluation and adjustment capacity

Before and after a public health event, PHNs need to have the ability to assess current disease process and evaluate the implementation of the health plan and make timely adjustments to facilitate post-disaster reconstruction after a significant health event, make disaster plan modifications, coordinate public efforts to address the psychosocial and public health effects of the event, and proactively report back on the process after the event is resolved (Polivka et al., 2008). For specialist public health events, PHNs are able to readily and timely assess the effectiveness of the plan implementation process before, during, and after the event, such as regular surveys and comparisons of tobacco control, the transition to a tobacco-free community needs to follow the plan-check-act cycle from positioning it as a policy issue to providing an effective solution to their evaluation, which demonstrates a structure that promotes the public health care capacity of the local government for tobacco control (Dahl et al., 2022).

Category III: Scientific and cultural knowledge and skills

PHNs need to provide professional nursing knowledge and skills when implementing public health nursing to ensure the health of individuals, families, and communities and to set an example by "assessing hazards and threats to individuals, families, and populations and reducing their risk of exposure and injury in the natural and artificial environments (i.e., chemicals and products)." "Use the determinants of health and nursing science and evidence-based practice when planning health promotion and disease prevention interventions for individuals, families, and populations (Campbell et al., 2019)." and these require PHNs to develop a solid theoretical knowledge base at the stage of being a nursing student (Zhou and Deng, 2025).

3.4.2 Integration Outcome 2: "Non-technical competencies" of public health care

Category IV: Assessing analytical and planning capacity

PHNs need to master the ability to identify the current situation and develop scientific planning, whether they are facing basic public health practices or public health emergencies, ("Able to participate in carrying out a diagnosis of needs, in identifying priority projects, and in developing intervention strategies for project plans (Nabizadeh-Gharghozar et al., 2021)", ("Positioning tobacco control as a policy issue based on regional and social conditions" and "Creating organizational systems for tobacco control" are often carried out together (Michibayashi et al., 2020).)

Category V: Leadership, organizational, and collaborative communication skills

When facing crisis and implementing set plans, PHNs have to take control of the whole situation, anticipate warning signs, be courageous, have a sense of the whole picture and responsibility, and these include decision-making skills, organizational skills, teaching skills (Chen et al., 2023), as well as being able to bring the team together, having the ability to empathize and call on others, being able to collaborate with other health workers, communicating well ("For all of the PHNs, you have to, you have to have good communication skills or it doesn't work because the whole job is about communication (Li, 2023).")

Category VI: Cultural and educational competencies

The different cultural contexts that lie behind public health nursing in different countries and regions require PHNs to effectively use the determinants of health and apply them when working with diverse individuals, families, and groups, to provide cultural interventions and education to communities and populations, and to ensure that diversity in organizational structures is recognized and respected. The dynamic nature of being able to support a diverse workforce and the need to continuously cope with the changing needs of diverse populations (Campbell et al., 2019). This requires cultural understanding and sensitivity while adding to the difficulty and complexity of universalizing and educating public health ("There are many solutions for different families. This is not a recipe for making things better. Some families have traditions of solving problems like this, and other families have things like this (Li, 2023).")

Category VII: Attitudes, values, and ethical competencies

PHNs develop close relationships with individuals and families as they care for them while providing services to community groups or community members. Therefore, it is common for PHNs to encounter not only ethical conflicts with clients and families, but also ethical dilemmas related to the allocation of resources and conflicts between choices based on the needs of individuals and community members (Asahara et al., 2015). Only good professional ethics and values can lead to ethical practice, a competency necessary for PHNs in all countries and an important part of the comprehensive competency assessment (Hao, 2018).

3.4.3 Integration Finding 3: Differences in the structure and scope of levels of public health capacity evaluation

Category VIII: Competencies required for the post or special circumstances

The competencies focused on PHNs in different areas vary. The community dimension of PHN practice skills in the community focuses on assessing and developing connections and relationships within the community, maintaining and advancing partnerships and community engagement, negotiating the use of community assets, defending public health policies and plans, and evaluating and improving the effectiveness of community engagement (Campbell et al., 2019). Furthermore, PHNs solve public health surge events requiring extensive practical knowledge and skills about pandemic outbreaks, bioterrorism, etc. ("Public health nurses bring a wide range of knowledge and skills to emergency planning and response (Polivka et al., 2008).") PHNs practicing tobacco control have a greater need for healthcare competencies, with skills in "positioning tobacco control as a policy issue based on regional and social conditions" and "creating organizational systems for tobacco control" leveraging the PHN's position in administration (Michibayashi et al., 2020). PHNs administering family planning need universal sex education and health literacy, and Title X of the Public Health Service Act is dedicated to providing comprehensive family planning and related preventive health services to individuals, especially underserved communities and adolescents (Hewitt et al., 2014).

The competencies required for PHNs in different positions are different (Gwon et al., 2023). PHN managers place more importance on having the ability to lead, plan, evaluate, and develop a scientifically feasible implementation strategy, while PHNs working in frontline clinical settings place more emphasis on practical skills and scientific and cultural knowledge. It was also found that PHNs with higher degrees had more well-developed competencies and were better able to handle public health services in different contexts (Wang et al., 2024).

3.5 ConQual summary of integrated results

The ConQual ratings and a summary of the synthesized findings are presented in Table 3. Of the three final synthesized findings, two were rated as high-quality evidence, while one was rated as medium-quality evidence according to the ConQual assessment.

Table 3
Results of the quality evaluation of the Meta-integrated evidence.

Integrated result	Type of Research	Dependability	Credibility	ConQual Score	comment
"Technical competencies" of public health care	Qualitative	Not downgraded	Not downgraded	Middle	The majority of studies contained 4 "yes", not downgraded 1); there are 16 clear results and 1 ambiguous results 2).
"Non-technical competencies" of public health care	Qualitative	Not downgraded	Not downgraded	High	The majority of studies contained 4 "yes", not downgraded 1); the 22 results and conclusions included were clear 3).
Differences in the structure and scope of levels of public health capacity evaluation	Qualitative	Not downgraded	Downgrade one level	High	The majority of studies contained 4 "yes", not downgraded 1); the 3 results and conclusions included were clear 3).

1) High dependability; 2) Medium credibility; 3) High credibility.

4. Discussion

This meta-synthesis identified three overarching dimensions of public health nursing competence—technical expertise, practical competence, and humanistic qualities—which together provide a comprehensive understanding of what constitutes effective public health nursing practice (Bian et al., 2021). These findings align with, yet also extend, previous national and international studies, offering new insights into how competency frameworks should be strengthened in future development.

A consistent pattern across the included studies is the emphasis on technical expertise as the foundation of PHN competence. Existing frameworks from Canada, Japan, Norway, and the United States similarly highlight theoretical knowledge (Lin et al., 2021), epidemiological literacy, and the application of public health science as core elements of PHN practice. This reflects the inherently multidisciplinary nature of public health nursing and the need for PHNs to integrate nursing science with population-based approaches. The strong focus on expertise across studies likely stems from the increasing complexity of public health emergencies and the demand for PHNs to interpret surveillance data, identify risks, and implement evidence-based interventions. Therefore, future competency frameworks should continue to incorporate these strengths, ensuring that theoretical and analytical capacities remain central components of PHN training and evaluation.

Beyond expertise, this meta-synthesis found that many studies place considerable emphasis on practical competence, particularly in assessment, emergency response, project implementation, and community

engagement. This finding resonates with literature describing PHNs as frontline practitioners who operate across clinical, community (Wang et al., 2022), and systems levels. However, the tendency to overemphasize emergency response skills in several Chinese studies reflects contextual priorities, such as the national experience with COVID-19 and the rapid expansion of public health infrastructure. While this emphasis is understandable, future frameworks should balance emergency skills with long-term competencies in prevention (Tang and Xu, 2022), health promotion, and intersectoral collaboration to avoid overly crisis-centered training.

An important contribution of this meta-synthesis is the identification of humanistic qualities and professional ethics (Vickers and Green, 2024) as indispensable but often underdeveloped components of PHN competence frameworks. Several included studies underscore the importance of professional attitudes, ethical responsibility, cultural sensitivity, and emotional resilience. These aspects are crucial for sustaining high-quality public health services and maintaining trust with communities. Yet many existing frameworks give limited attention to the emotional burden and psychosocial stress experienced by PHNs—especially during emergencies. Strengthening leadership support, emotional management training, and organizational resilience should therefore be considered essential in future competency development.

During the synthesis process, several strengths and gaps in previous research became evident. A notable strength is the consistent recognition of multidisciplinary collaboration and community-centered practice, which reflects the global movement toward integrated public health systems. Additionally, a few studies uniquely highlight competencies related to policy advocacy, interprofessional communication, and the use of public health assets—areas that deserve broader incorporation in competency models. Conversely, several limitations were observed. Many studies lacked consideration of system-level competencies, such as policy implementation, health equity advocacy, and digital public health skills. Moreover, emotional well-being (Hong et al., 2022; Huang et al., 2024), leadership capacity, and reflective practice were underrepresented despite their relevance to sustainable public health nursing.

Based on these findings, future nursing education reform should adopt a competency-based, culturally adaptable, and developmentally progressive approach. Priority should be given to validating competencies across different healthcare systems, incorporating more precise and measurable indicators, and examining how competencies evolve throughout PHNs' career trajectories. Furthermore, research should address the emotional and organizational factors influencing PHNs' performance, ensuring that future frameworks capture not only what PHNs must be able to do, but also the support conditions needed for them to perform effectively.

In summary, this meta-synthesis contributes to a deeper understanding of the multifaceted competencies required of PHNs and their translation into nursing education practice. By integrating technical expertise, practical capability, and humanistic qualities into actionable educational strategies, the findings provide a more balanced and comprehensive foundation for nursing education reform. These insights can guide the future development of training curricula, assessment tools, and policy strategies aimed at strengthening the public health nursing workforce and improving population health outcomes through targeted education.

5. Limitations

This review has several limitations. Only studies published in English and Chinese were included, which may have introduced language bias and excluded relevant evidence from other regions. Most included studies originated from countries outside China, creating potential contextual and cultural bias and limiting the generalizability of the

findings. In addition, the small number and methodological heterogeneity of the studies may have affected the consistency of the synthesized results. Finally, the proposed competency framework and corresponding educational strategies have not yet been widely validated in practice, and their applicability may vary across educational settings. Future research should incorporate studies in more languages, include diverse educational contexts, and conduct empirical validation of the proposed educational strategies to strengthen the robustness of public health nursing education reform.

6. Conclusion

This meta-synthesis identified three key dimensions—the "technical competencies" of public health nursing, the "Non-technical competencies" of public health nursing, and differences in the structure and scope of levels of public health capacity evaluation—that together provide a concise and comprehensive framework for evaluating the capabilities of PHNs. More importantly, this study translates these competency requirements into specific nursing education strategies: curriculum modularization, teaching method innovation, competency-based assessment, and hierarchical training. Effective public health nursing education should integrate professional knowledge, practical skills, ethical practice, cultural competence, and emotional well-being support, providing a targeted basis for enhancing PHNs' overall competence via education reform.

Declarations

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Ethical approval

None.

Copyright conflict

None.

Declaration of competing interests

The authors declare no potential conflicts of interest in respect to the research, authorship and/or publication of this article.

References

1. American Public Health Association - Public Health Nursing Section. 2013. The definition and practice of public health nursing: A statement of the public health nursing section[EB/OL]. American Public Health Association. <https://www.apha.org/~media/files/pdf/membergroups/phn/nursingdefinition.ashx>
2. Asahara K, Kobayashi M, Ono W. Moral competence questionnaire for public health nurses in Japan: scale development and psychometric validation. Japan J Nurs science: JJNS. 2015;12:18–26. <https://doi.org/10.1111/jjns.12044>.

3. Atherton IM, Lasater K, Richards EA, Mathews LR, Simpson V, Kyle RG. Population health and nurse education - time to step-up. *Nurse Educ Today*. 2017;51:117–9. <https://doi.org/10.1016/j.nedt.2016.08.002>.
4. Best NC, Oppewal S, Travers D. Exploring School Nurse Interventions and Health and Education Outcomes: An Integrative Review. *J Sch Nurs*. 2018;34:14–27. <https://doi.org/10.1177/1059840517745359>.
5. Bian H, Yu P, Liu H. The construction of nurse competency indicators in public health emergencies based on the iceberg model. *Chin J Practical Nurs*. 2021;37:2122–7. <https://doi.org/10.3760/cma.j.cn211501-20201025-04297>.
6. Campbell LA, Harmon MJ, Joyce BL, Little SH. Quad Council Coalition community/public health nursing competencies: Building consensus through collaboration. *Public Health Nurs*. 2019;37:96–112. <https://doi.org/10.1111/phn.12666>.
7. Chen C-c, Hu X, Jiang W. Characteristic elements of nursing crisis leadership in infectious public health emergencies:a qualitative study. *J Nurs Sci*. 2023;38:77–81. <https://kns.cnki.net/dm8/manage/export.html>.
8. Cross S, Block D, Josten L, Reckinger D, Keller O, Strohschein L, Rippke S, Savik M, K. Development of the public health nursing competency instrument. *Public Health Nurs*. 2006;23:108–14. <https://doi.org/10.1111/j.1525-1446.2006.230203.x>.
9. Dahl BM, Glavin K, Teige AM, Karlsen AG, Steffenak AKM. Norwegian public health nurses' competence areas. *Public Health Nurs*. 2022;39:1048–57. <https://doi.org/10.1111/phn.13083>.
10. Gao Y-y, Liu F, Liu W-w. Competency characteristics of public health nurses: a qualitative study. *J Nursing(China)*. 2023;30:23–8. <https://doi.org/10.16460/j.issn1008-9969.2023.04.023>.
11. Gebbie KM, Hwang I. Preparing currently employed public health nurses for changes in the health system. *Am J Public Health*. 2000;90:716–21. <https://doi.org/10.2105/ajph.90.5.716>.
12. Gwon SH, Thongpriwan V, Kett P, Cho Y. Public health nurses' perceptions and experiences of emergency preparedness, responsiveness, and burnout during the COVID-19 pandemic. *Public Health Nurs*. 2023;40:124–34. <https://doi.org/10.1111/phn.13141>.
13. Hao N. The influence of nurses' quality and nursing ethics on nursing quality. *Electron J Clin Med Literature*. 2018;5:184. <https://doi.org/10.16281/j.cnki.jocml.2018.39.158>.
14. Hewitt CM, Roye C, Gebbie KM. Core competency model for the family planning public health nurse. *Public Health Nurs*. 2014;31:472–9. <https://doi.org/10.1111/phn.12133>.
15. Hong E, Jung A, Woo K. A cross-sectional study on public health nurses' disaster competencies and influencing factors during the COVID-19 pandemic in Korea. *BMC Public Health*. 2022;22:731. <https://doi.org/10.1186/s12889-022-13091-2>.
16. Huang WM, Chen JY, Zheng LJ, Shi G, Feng YY. Factors affecting nurses' emergency competencies in public health emergency: A cross-sectional study based on the stress-coping adaptation model. *Public Health Nurs*. 2024;41:617–25. <https://doi.org/10.1111/phn.13309>.
17. Koshida M, Morita T. Japanese development and testing of the Network Establishment Practices Scale for Community and Public Health Nurses. *Nurs Health Sci*. 2013;15:22–30. <https://doi.org/10.1111/j.1442-2018.2012.00714.x>.
18. Larsen R, Reif L. Leveling the core competencies of public health nursing to evaluate senior baccalaureate nursing students. *Public Health Nurs*. 2019;36:744–51. <https://doi.org/10.1111/phn.12636>.
19. Li J. Construction of evaluation index system for core competence of public health nurses. *Chin J Nurs*. 2023. <https://doi.org/10.27003/d.cnki.gojyu.2023.000401>.

20. Lin Y, Zhu X, Chen Y. Construction of an emergency rescue competence index system for public health emergency among community nurses. *Chin J Nurs*. 2021;56:1158–64. <https://doi.org/10.3761/j.issn.0254-1769.2021.08.006>.
21. Lockwood C, Porritt K, Munn Z, Rittenmeyer L, Salmond S, Bjerrum M, Loveday H, Carrier J, Stannard D. 2024. Systematic reviews of qualitative evidence. <https://doi.org/10.46658/jbimes-24-02>
22. Michibayashi C, Omote S, Nakamura M, Okamo R, Nakada AI. Competency model for public health nurses working on tobacco control in local governments in Japan: A qualitative study. *Japan J Nurs Sci*. 2020;17. <https://doi.org/10.1111/jjns.12288>.
23. Munn Z, Porritt K, Lockwood C, Aromataris E, Pearson A. Establishing confidence in the output of qualitative research synthesis: the ConQual approach. *BMC Med Res Methodol*. 2014;14:108. <https://doi.org/10.1186/1471-2288-14-108>.
24. Nabizadeh-Gharghozar Z, Alavi NM, Ajorpaz NM. Clinical competence in nursing: A hybrid concept analysis. *Nurse Educ Today*. 2021;97:104728. <https://doi.org/https://doi.org/10.1016/j.nedt.2020.104728>.
25. Nie M-q, Dai X-y, Guo Y, Zheng M-m, Wang Z-h, Zhang Y-t, Wu G-c. Psychometric properties of public health nursing competency assessment tools: A systematic review. *Nurse Educ Pract*. 2026;90:104644. <https://doi.org/https://doi.org/10.1016/j.nepr.2025.104644>.
26. Polivka BJ, Stanley SAR, Gordon D, Taulbee K, Kieffer G, McCorkle SM. Public Health Nursing Competencies for Public Health Surge Events. *Public Health Nurs*. 2008;25:159–65. <https://doi.org/10.1111/j.1525-1446.2008.00692.x>.
27. State Council of the People's Republic of China. Regulations of the People's Republic of China on Emergency Response to Public Health Emergencies, *Chinese Journal of Rural Medicine and Pharmacy*. Beijing: State Council; 2003.
28. Tang H, Xu J. Construction of core index system for the development of nurse professional competency in major public health emergencies. *J Navy Med*. 2022;43:494–8. <https://doi.org/10.3969/j.issn.1009-0754.2022.05.012>.
29. Vickers N, Green C. Mapping Public Health Nursing competencies: A comparative document analysis of competency frameworks and practice standards in the USA and Ireland. *Public Health Nurs*. 2024;41:1562–70. <https://doi.org/10.1111/phn.13399>.
30. Wang Q, Zhao T, Zeng J. Nursing Managers' Professionalization Status and Countermeasures Research in Public Hospitals under the Background of High-quality Development. *Health Vocat Educ*. 2024;42:132–5. <https://doi.org/10.20037/j.issn.1671-1246.2024.15.37>.
31. Wang X, Fang Q, Hu J. The construction of the competency index system of the Nursing Reserve Team for Emergency response to public Health emergencies. *Chin Health Resour*. 2022;25:332–8. <https://doi.org/10.3969/j.issn.1007-953X.2022.03.013>.
32. Zhang Y, Shi Y, Xue S. The development process and enlightenment of public health nurses. *Chin J Nurs*. 2021;56:310–4. <https://doi.org/10.3761/j.issn.0254-1769.2021.02.027>.
33. Zhou P, Deng R. 2025. Systematic evaluation of the effect of core competence development of practicing nursing students based on OBE concepts. *Journal of Modern Medicine & Health*, 1–16. <https://link.cnki.net/urlid/50.1129.R.20250319.1119.027>

Figures

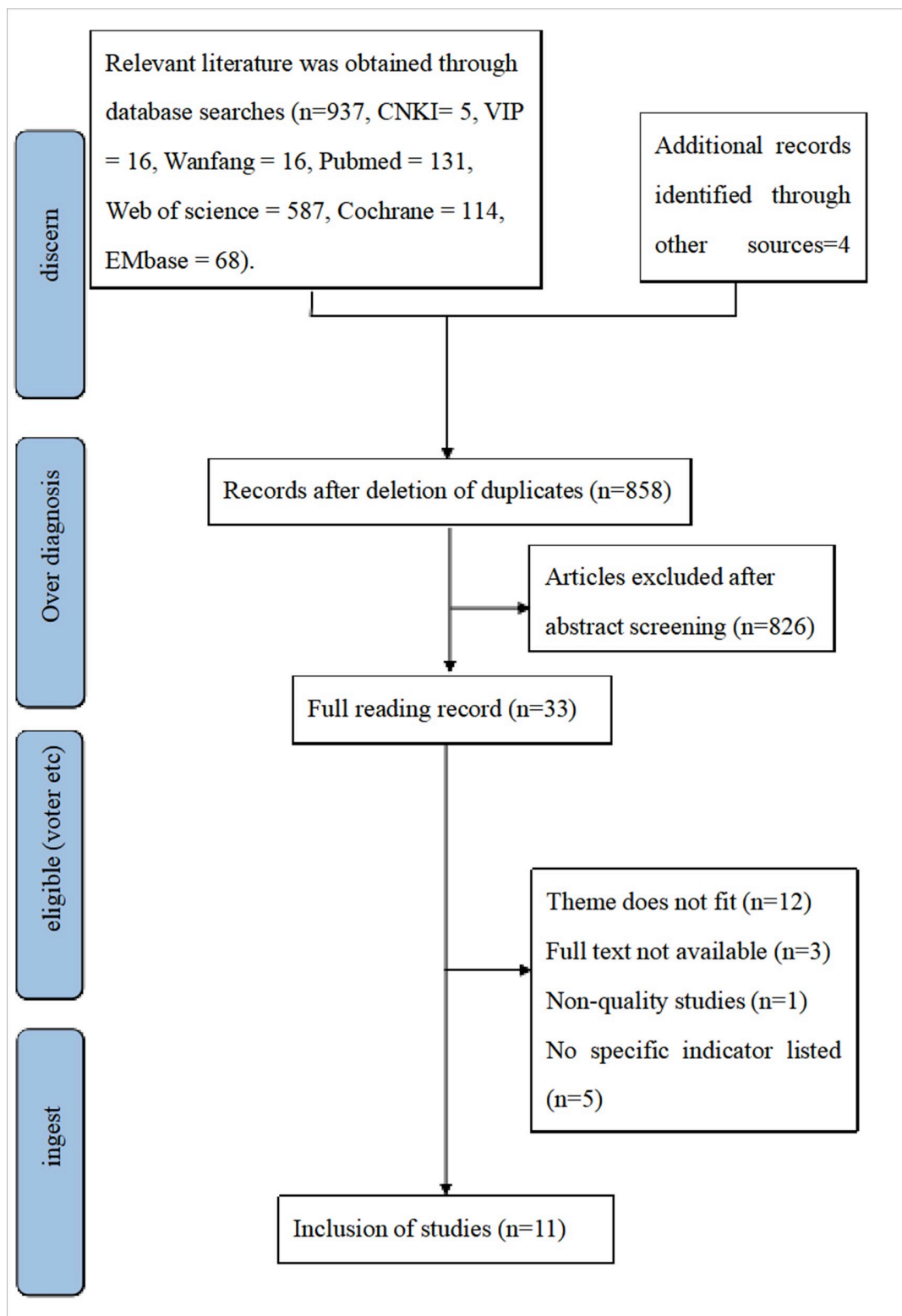


Figure 1

Flow chart for the study screening process

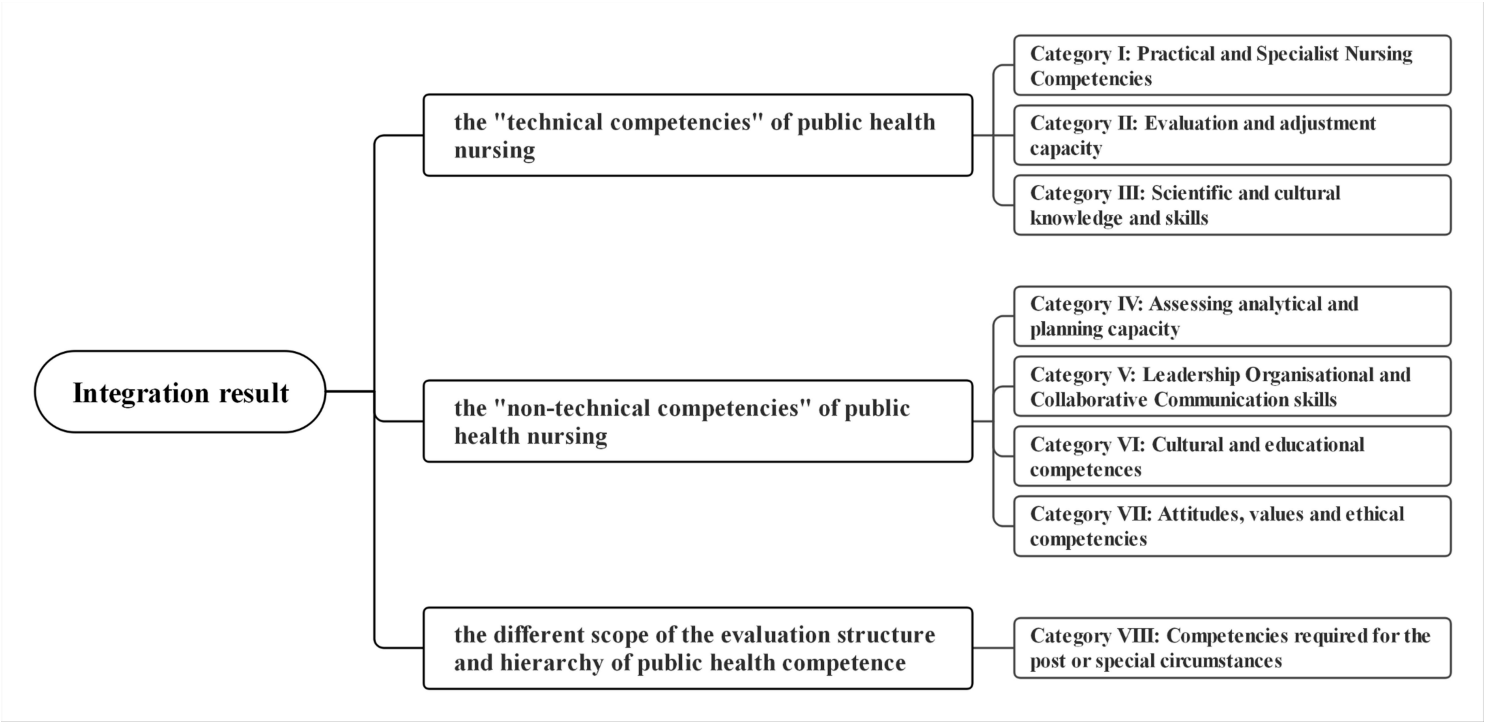


Figure 2

Meta-integration results relationship diagram

Supplementary Files

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- [AppendixA.Supplementarydata.docx](#)