Exploring barriers to evidence-based nursing practice in a developing yet promising nation: a qualitative study from China

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Exploring barriers to evidence-based nursing practice in a developing yet promising nation: a qualitative study from China

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Abstract

Background Evidence-based nursing practice (EBNP) has emerged as a key strategy for improving healthcare services across various countries. However, the effectiveness of its implementation is substantially influenced by contextual factors within the health environment. While numerous barriers have been explored within advanced healthcare systems, the situation in China, where the development of EBNP is progressing slowly despite high demand of medical services, has not been adequately examined. This study aims to identify the barriers to implementing EBNP from an integrated perspective and to provide insights that can assist policymakers in designing effective strategies for the implementation of EBNP in China.

Methods A descriptive qualitative approach was employed, utilizing in-depth semi-structured interviews. We conducted interviews with 71 participants, including educators, hospital managers, nursing directors, and nurses from 18 Chinese provinces. Content analysis was performed using an inductive approach.

Results Thirteen barriers to implementing EBNP were identified across educational, organizational, and operational levels. Key barriers include the lack of collaboration between university and hospital to establish EBNP platform, insufficient courses to obtain EBNP knowledge and skills, and lack of performance incentives for EBNP. Respondents highlighted that the gap between theoretical and clinical practice in medical education plays a fundamental role in obstructing the successful implementation of EBNP.

Conclusions This study underscores the barriers to EBNP implementation from an integrated perspective, addressing challenges at educational, organizational, and operational levels. Our findings provide valuable implications for enhancing the implementation of EBNP in China and similar contexts, offering guidance for future policy development and healthcare practices.

Clinical trial number Not applicable.

Keywords Evidence-Based nursing practice, Clinical competence, Health plan implementation, Medical education

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Background

Universal health coverage (UHC) and the health-related Sustainable Development Goals (SDGs) underscore the need for evidence-based interventions (EBIs) to enhance healthcare delivery, particularly in low- and middle-income settings [1–3]. Evidence-based nursing practice (EBNP) is pivotal in bridging the gap between theory and practice, promoting professional development, improving patient and family satisfaction, and optimizing recovery outcomes while ensuring efficient use of limited healthcare resources [4–11]. Despite these benefits, EBNP adoption remains limited in low- and middle-income contexts, where research is sparse compared to high-income contexts such as the United States [12], the United Kingdom [13], and Canada [14]. This gap highlights the urgent need to generate context-specific evidence to advance EBNP globally.

In low- and middle-income settings, integrating EBNP into routine clinical practice faces significant challenges [15]. Nurses often rely on traditional care methods and struggle with understanding and applying EBNP due to systemic barriers [16], including insufficient leadership support, limited training, and inadequate resources [17–19]. These obstacles hinder the realization of EBNP's potential to improve healthcare outcomes and exacerbate global health inequities.

China's healthcare system, characterized by a vast population, heavy medical burden, hierarchical clinical-nursing dynamics, and constrained resources [20–23], presents a unique context for studying EBNP implementation. While these factors amplify barriers, they also offer opportunities to generate insights that could inform global nursing practice. International studies, such as those in Oman and across India, Saudi Arabia, and Nigeria, have identified barriers including limited evidence awareness, lack of authority to influence care policies, delays in evidence dissemination, and time constraints in clinical settings [24, 25]. In China, research highlights additional challenges, such as language barriers, knowledge and skill deficits, and insufficient leadership support [26–29]. These findings underscore the multifactorial nature of EBNP barriers, encompassing practice environment, nurse-related factors, and patient-oriented issues [30–34].

The implementation of EBNP is inherently complex, requiring coordinated efforts among educational institutions, health organizations, and frontline practitioners [35]. Despite these insights, existing research often focused on micro-level barriers within hospitals or individual practices [28, 29], overlooking the interconnected structural and cultural factors across the healthcare system. This study addresses this gap by employing Benner's Novice to Expert Model [36] as a theoretical framework. This model conceptualizes nursing expertise as a continuum shaped by experiential learning and organizational support, providing a robust lens to examine how individual competencies and systemic factors converge to influence EBNP implementation in China.

Through a regional qualitative study, this research holistically explores the interplay of educational, organizational, and operational barriers to EBNP adoption in China's healthcare landscape. By identifying these barriers and offering context-specific insights, this study aims to inform targeted strategies for effective EBNP implementation, contributing to improved healthcare delivery in China and providing valuable lessons for global nursing practice.

Methods

The effectiveness of EBNP implementation is shaped by a complex interplay of educational, organizational, and operational factors, necessitating a holistic apporach to understanding barriers. Previous studies have often focused on a singular perspectives, such as hospital-level or individual-level perspective [28], limiting the exploration of the multifaceted nature of EBNP implementation challenges. To address this gape, this study adopted a qualitative approach, utilizing in-depth semi-structured interviews to capture the nuanced experiences of key stakeholders across educational, organizations, and operational dimensions. Qualitative methodology was chosen for its ability to explore complex, context-specific phenomena to generate rich, detailed insights into the barriers hindering EBNP in China.

Participants and setting

To ensure a comprehensive perspective on EBNP, participants were purposively selected from universities and hospitals, representing diverse stakeholder groups based on the following criteria: (1) professors engaged in EBNP teaching or academic research; (2) hospital managers or nursing directors responsible for leading EBNP implementation or developing supportive guidelines; (3) nurses actively implementing EBNP in clinical practice; (4) candidates from tertiary hospitals with established EBNP research centers; (5) participants from regions with varying medical resources availability (high, medium, and low concentration areas); (6) balanced representation across stakeholder groups, adjusted for practical constraints. Recruitment spanned18 provinces to reflect China's diverse healthcare landscapes. The sample size was determined iteratively through data saturation [37], with recruitment continuing until no new themes emerged within or across stakeholder groups. Participants were recruited via email or phone, supplemented by snowball sampling to identify additional eligible individuals.

Data collection

A semi-structured interview guide was developed through a rigorous progress to ensure its credibility and relevance. The guide was informed by a systematic literature review of EBNP, focusing on studies in low- and middle-income settings. The Consolidated Framework for Implementation Research (CFIR) [38] was used to systematically structure the guide, with its five domains (intervention characteristics, outer setting, inner setting, characteristics of individuals, and implementation process) shaping the formulation of questions to capture multifaceted influences on EBNP implementation in China. For example, questions targeting the outer setting explored policy and resource availability, while those addressing characteristics of individuals examined nurses' knowledge, attitudes, and professional development stages, aligning with Benner's model. The draft guide was reviewed by a panel of three experts in nursing research and EBNP implementation, who provided feedback on question clarity, cultural relevance, and alignment with study objectives. The guide was piloted with five participants (three nursing directors and two nurses), with revisions made to enhance clarity, comprehensiveness, and cultural appropriateness based on feedback regarding question phrasing and relevance to clinical practice. The final interview guide encompassed four main themes: (1) introduction of the interviewee and their background; (2) evaluation of EBNP implementation in China; (3) barriers to EBNP implementation in China; and (4) lessons learned from implementing EBNP in practice. The interview guide is provided in Appendix 1.

Interviews were conducted face-to-face whenever feasible, with video conferencing used to accommodate scheduling and geographical constraints. Participation was voluntary, with confidentiality and anonymity assured. After obtaining formal consent, interviews were audio-recorded and supplemented with field notes to capture contextual details. Transcripts were completed within 24 h and returned to participants for member checking to verify accuracy. Interviews, averaging 50 min, were conducted by a research team trained in qualitative methods between July 2022 and June 2023.

Data analysis

Data were analyzed using qualitative content analysis with a primarily inductive approach [39], complemented by the CFIR framework to ensure theoretically grounded theme development. The analysis followed a multi-step process to enhance depth and rigor. First, transcripts were reviewed to summarize content, followed by condensation and coding of meaningful units. Initial coding was informed by CFIR's five domains to identify preliminary themes, such as "low organizational culture" (inner setting) and "inadequate training" (characteristics of individuals). Simultaneously, an inductive approach allowed emergent themes to capture unique contextual factors, such as cultural influences on EBNP adoption.

To advance analytical rigor, constant comparative analysis was employed to iteratively compare codes within and across stakeholder groups (researchers, hospital managers, nursing directors, nurses), refining themes and identifying relationships between barriers. Data saturation was achieved when no new themes emerged [37], validated within and across stakeholder groups after 60 interview for nurses and nursing directors groups, and 68 for researchers and hospital managers, with three additional interviews confirming thematic redundancy. To enhance analytical rigor, inter-coder reliability was assessed using Cohen's kappa, achieving a minimum threshold of 0.80, indicating strong agreement between independent coders. Discrepancies were resolved through team discussions during biweekly meetings, with researcher journals maintained to ensure reflexivity and minimize bias. NVivo 12.0 software supported data management and coding. Final themes were shared with participants via member checking, receiving positive feedback on accuracy and relevance.

Rigor

The study's rigor was ensured through measures addressing credibility, transferability, dependability, and confirmability [40]. Credibility was enhanced by recruiting a heterogeneous participant group, employing rigorous recording and transcription methods, and conducting member checking to verify transcript accuracy. Iterative saturation assessment within and across stakeholder groups further strengthened credibility. Transferability was supported by detailed descriptions of sampling criteria, participant diversity across 18 provinces, and comprehensive interview protocols. Dependability and confirmability were achieved through a transparent audit trail, including detailed documentation of methodological decisions, coding processes, and researcher triangulation.These measures collectively ensure the trustworthiness of the findings. This study was conducted in accordance with the Declaration of Helsinki and approved by the Ethics Committee of Guangxi Academy of Medical Sciences (Approval No. IIT-2023-79).

Results

Sample description

Table 1 presents the demographic characteristics of the 71 interviewees. The majority of participants were female, accounting for 46 individuals (64.79%). Participants holding a master's degree constituted the largest educational group, with 35 individuals (49.30%), followed by those with a doctoral degree (26 individuals, 36.62%)

Table 1 Demographic characteristics of participants

Demographic characteristic	N	%
Gender		
Female/Woman	46	64.79%
Male/Man	25	35.21%
Degree type		
Bachelor	10	14.08%
Master	35	49.30%
Ph.D	26	36.62%
Age		
Under 30	15	21.12%
30–40	29	40.85%
41–50	18	25.35%
51–60	9	12.68%
Respondent's position		
Researcher/Professor	28	39.44%
Vice dean of hospital	12	16.90%
Nursing director	17	23.94%
Nurses	14	19.72%
Regions		
High concentration of medical resources	26	36.62%
Medium concentration of medical resources	29	40.85%
Low concentrations of medical resources	16	22.53%

and those with a bachelor's degree (10 individuals, 14.08%). Regarding regional representation, 26 participants (36.62%) were from areas with a high concentration of medical resources, including Beijing, Shanghai, Guangdong, Shenzhen, and Jiangsu. A further 29 participants (40.85%) came from medium-resource regions, such as Shandong, Anhui, Hebei, Sichuan, and Hubei. The remaining 16 participants (22.53%) were from low-resource areas, such as Guangxi, Yunnan, and Gansu.

Barriers to EBNP

The development of EBNP in China has progressed slowly, contributing to delayed clinical implementation. While existing literature has extensively examined barriers at both the hospital and individual levels, it is crucial to recognize that the successful implementation of EBNP hinges on interdisciplinary collaboration across the domains of education, management, and clinical execution, rather than on isolated efforts within any single domain. The integration of these three dimensions forms a critical triangular framework, which is essential for catalyzing meaningful breakthroughs in EBNP within a relatively short period. Therefore, a comprehensive examination of the barriers spanning these interrelated facets is necessary to advance EBNP in China. Our findings reveal a range of barriers distributed across educational, organizational, and operational dimensions, encompassing a total of 13 sub-barriers, as summarized in Table 2.

Educational dimension

Education serves as the foundation of EBNP, equipping nurses with critical thinking abilities, research literacy, and the practical skills necessary to apply scientific evidence in clinical decision-making. However, in China, the current state of EBNP education presents significant limitations that hinder the development of a competent evidence-based nursing workforce. These challenges are primarily reflected in four sub-barriers.

Lack of collaboration between university and hospital to establish EBNP platform. The relatively recent introduction of EBNP in China has resulted in underdeveloped infrastructure for experiential learning and practice. In contrast to countries such as the United States or the United Kingdom, where university-hospital partnerships support clinical placements, mentorship, and EBNP integration, Chinese universities often lack the necessary resources and networks to foster such collaborations. Several participants noted that nursing students are typically responsible for independently securing internship, as universities rarely facilitate access to hospitals with established EBNP platforms. As one participant explained:

> *In China, students must contact hospitals for internship opportunities rather than relying on universities. Few hospitals have established EBNP practice platforms, and most universities do not have resources to build cooperation with those hospitals to provide opportunities. (H11).*

This challenge is further exacerbated by the absence of a standardized national framework for EBNP implementation across healthcare institutions. Hospitals that have adopted EBNP often function in isolation, with minimal institutional or policy-driven incentives to engage with academic partners. This stands in stark contrast to models such as the Magnet Recognition Program in the United States, which actively promotes academic-clinical partnerships as a mechanism for advancing evidence-based care. The lack of such collaborative platforms denies nursing students the opportunity to observe and participate in EBNP processes, such as the development of evidence-based clinical protocols or engagement in quality improvement initiatives. Having outlined the structural limitations in EBNP training infrastructure, the subsequent sub-barrier curricular deficiencies that further higher the development of EBNP competencies among nursing students.

Insufficient courses to obtain EBNP's knowledge and skills. Undergraduate nursing programs in China rarely incorporate dedicated courses on EBNP, limiting students' exposure to foundational competencies such as

Table 2 Barriers to implementing EBNP in China

LEVEL	Sub-barriers	Explanations from the interviewees
Educational	Lack of collaboration between university and hospital to establish EBNP platform	In China, students must contact hospitals for internship opportunities rather than relying on universities. Few hospitals have established EBNP practice platforms, and most universities do not have resources to build cooperation with those hospitals to provide opportunities
	Insufficient courses to obtain EBNP's knowledge and skills	The undergraduate course is mainly based on basic nursing knowledge, and only the master course in our school involves EBNP knowledge. Skills such as literature search and academic writing, which are required for EBNP, are developed only at the master's level
	Backward evidence and theory of healthcare	Most of the medical knowledge we learn is translated from Western theories into Chinese, but this needs a process. It is no exaggeration to say that our medical knowledge and theories in books and classes are 30 years behind the advanced knowledge system of the West
	The gap between medical education and clinical practice	Much of the knowledge learned in books will not be used in clinical practice, because the textbook knowledge in nursing education is often grounded in universality and standardization to encompass the majority of situations
Organizational	Lack of performance incentives for EBNP	EBNP of each step is need to spend much personal time and effort, but our hospital did not associated it with EBNP performance or reward. For example, evidence derived from EBNP can be disseminated through academic articles, but there is no performance reword for EBNP staff in our hospital
	Low organizational culture to implement EBNP	The main responsibility of nurses is basic nursing work, and the hospital does not set a separate EBNP post. That means EBNP can only be completed by nurses voluntarily using their time outside work
	Lack of collaboration between clinical departments and nursing department	Nurses have almost no voice, even if a nurse found some problems, but would not be taken seriously by the doctor. Because doctors reject people with lower degrees to guide their specialties
	Lack of EBNP training and high-quality support	Our hospital has not carried out EBNP training programs, and if I want to participate in such training, I can only go to other hospitals to participate in the training through personal channels
Operational	Increased workloads and negative attitudes towards EBNP	The basic work of nurses is very tedious and repetitive. It costs us much energy. We deal with these basic tasks during office hours, and there is no time to do scientific research or think about clinical questions
	Lack of capability to identify clinical question	The professional knowledge of nurses is relatively weak, and many of them are not well informed about the steps of EBNP. For example, they do not know how to formulate clinical questions using PICOT format, the common paradigm for EBNP problem formulation
	Lack of capability of evidence research	I cannot read read English literature and do not know where to get the literature. When researching evidence, I can only read some Chinese literature through the a single channel
	Lack of capability of evidence transfer	When I got some new ideas based on evidence, I was confused about how to effectively communicate with patients and their families to make them understand my ideas
	Lack of capability of evidence implementation	For most nurses, it is a big challenge to achieve a complete EBNP program, because the implementation of EBNP requires a variety of comprehensive capabilities, and the vast majority of nurses do not have these capabilities

critical appraisal, literature searching, and academic writing. One respondent noted:

> *The undergraduate course is mainly based on basic nursing knowledge, and only the master course in our school involves EBNP knowledge. Skills such as literature search and academic writing, which are required for EBNP, are developed only at the master's level. (H26).*

This delay introduction to EBNP contrasts sharply with global best practices. For instance, in Australia, EBNP is embedded within undergraduate programs through courses on research methods and evidence appraisal. EBNP demands the integration of research evidence with clinical expertise, a skill set that requires consistent and early educational reinforcement. By delaying EBNP training until postgraduate education, China risks producing nursing graduates who are inadequately prepared for the evidence-based demands of modern healthcare. Beyond curriculum limitations, the reliance on outdated educational content further exacerbates the challenges of preparing nurses for EBNP.

Backward evidence and theory of healthcare. The slow pace of curricular updates in Chinese nursing education leads to the continued use of outdated medical knowledge and theoretical models. Textbooks, frequently translated from Western sources, often lag significantly behind current evidence-based standards. As one respondent observed:

> *Most of the medical knowledge we learn is translated from Western theories into Chinese, but this needs a process. It is no exaggeration to say that our medical knowledge and theories in books and classes*

are 30 years behind the advanced knowledge system of the West. (H31).

This problem is compounded by the centralized structure of curriculum development in China, which impedes institutions' ability to swiftly incorporate new evidence. In contrast, countries like Canada utilize decentralized curriculum models, allowing for the timely integration of evidence-based guidelines, such as those from the Registered Nurses' Association of Ontario. The reliance on outdated materials undermines the scientific rigor essential to EBNP and hampers graduates' readiness to manage contemporary healthcare issues, such as chronic diseases care using current protocols. While outdated content hinders theoretical preparation, the disconnect between classroom learning and clinical practice poses an additional barrier to EBNP adoption.

The gap between medical education and clinical practice. A persistent gap exists between theoretical instruction and practical application in Chinese nursing education. Curricula often prioritize standardized and generalized content that fails to reflect the dynamic and context-specific nature of clinical practice. One respondent stated:

Much of the knowledge learned in books will not be used in clinical practice, because the textbook knowledge in nursing education is often grounded in universality and standardization to encompass the majority of situations. This type of knowledge may not fully reflect the diversity and variability of the actual clinical environment. In contrast, evidence-based nursing practice occurs in diverse clinical settings, and the knowledge gained through practical experience is typically more comprehensive, covering various aspects that theoretical knowledge alone may not encompass. Hence, many nurses may learn more in one year of clinical practice than they did in three years of class. (H07).

The limited integration of EBNP into clinical training restricts students from developing the contextual judgment needed to translate evidence into practice. In contries such as the Netherlands, problem-based learning (PBL) embeds clinical scenarios into classroom instruction, effectively bridging the gap between theory and practice.

Having explored educational barriers that limit nurses' preparation for EBNP, the following section shifts focus to organizational factors that influence its implementation in clinical settings.

Organizational dimension

The organizational environment and hospital leadership play a critical role in fostering a culture conductive to EBNP. Key enablers include supportive policies, sufficient resource allocation, and interdisciplinary collaboration. However, in China, organizational constraints remain significant, despite growing recognition of EBNP's value. Four primary barriers were identified at this level.

Lack of performance incentives for EBNP. The absence of performance-based incentives for EBNP diminishes nurses' motivation to engage in its labor-intensive processes, including evidence retrieval, critical appraisal, and dissemination. As one respondent noted:

EBNP of each step is need to spend much personal time and effort, but our hospital did not associated it with EBNP performance or reward. For example, evidence derived from EBNP can be disseminated through academic articles, but there is no performance reword for EBNP staff in our hospital. (H17).

Without formal recognition or rewards, EBNP is viewed as an extraneous task rather than a core professional responsibility. In contrast, hospitals in countries like the United Kingdom incorporate EBNP achievements into performance evaluations offen linking them to promotions or financial incentives. The absence of such incentives in China reinforces a culture where EBNP is perceived as an additional burden rather than a valued professional activity. While the lack of incentives stifles motivation, the broader organizational culture further complicates EBNP adoption.

Low organizational culture to implement EBNP. The organizational culture in many Chinese hospitals prioritizes routine nursing tasks over evidence-based initiatives, impeding the adoption of EBNP. Without institutional mandates or structural support, EBNP is often relegated to an optional, extracurricular activity. As one participant noted:

The main responsibility of nurses is basic nursing work, and the hospital does not set a separate EBNP post. That means EBNP can only be completed by nurses voluntarily using their time outside work. (H61).

Another participant highlighted a lack of awareness among hospital leadership:, "Even some hospital leaders do not know what EBNP is and how to implement it. Their cognition of nursing work is a doctor's assistant undertaking basic medical service work, rather than an active participant in clinical practice." (H52).

In China, hierarchical hospital cultures and outdated perceptions of nursing as a subordinate role hinder EBNP

adoption. In contrast, hospital in countries like Australia promote EBNP through dedicated nursing research units and leadership training that prioritize evidence-based practice. The absence of such cultural and structural support in China limit nurses' autonomy and agency in advancing EBNP implementation. Beyond cultural barriers, the lack of interdisciplinary collaboration further impedes EBNP implementation.

Lack of collaboration between clinical departments and nursing department. Interdisciplinary collaboration is essential for successful EBNP, yet Chinese hospital often maintain rigid hierarchical structures where clinical departments overshadow nursing contributions. Nurses' evidence-based suggestions are frequently dismissed by physicians due to perceived differences in education or authority. As one respondent reported:

> *Nurses have almost no voice, even if a nurse found some problems, but would not be taken seriously by the doctor. Because doctors reject people with lower degrees to guide their specialties. (H13).*

Another participant recounted:

> *When I find a body of evidence gathered to determine its strength and applicability to clinical practice and shared the idea with clinical doctor, he told me that he has his judgment, please do not interfere with him. (H06).*

This dynamic reflects interprofessional silos, where rigid professional boundaries impede collaboration. In contrast, countries like Canada implement interprofessional education (IPE) programs that train nurses and physicians together, fostering mutual respect and shared decision-making. In China, the absence of such initiatives, coupled with cultural deference to physicians, marginalizes nurses' contributions to EBNP. This not only undermines evidence-based care but also perpetuates power imbalances within healthcare teams. In addition to interprofessional barriers, inadequate training resources further restrict nurses' ability to engage in EBNP.

Lack of EBNP training and high-quality support. Insufficient EBNP training and limited opportunities for professional development hinder nurses' ability to acquire the skills necessary for evidence-based practice. When training is available, it is often delivered by university professors with limited clinical experience, reducing its relevant to practical settings. One respondent noted:

> *Our hospital has not carried out EBNP training programs, and if I want to participate in such training, I can only go to other hospitals to participate in the training through personal channels. (H27).*

Another participant criticized the quality of available training:

> *The training teachers' knowledge is too theoretical and lack of clinical practice. (H31).*

This barrier underscores a gap in adult learning theory, which emphasizes the importance of experiential and context-relevant education. Effective EBNP training requires practical, clinically grounded instruction, as exemplified by programs like the Joanna Briggs Institute (JBI) in Australia, which integrates workshops with hands-on clinical projects. In China, reliance on theoretical training and limited access to ongoing professional development opportunities restrict nurses' ability to apply EBNP effectively in clinical practice.

Having delineated organizational barriers, the next section explores operational challenges that directly affect nurses' ability to implement EBNP in clinical practice.

Operational dimension

At the operational level, nurses are pivotal to the successful implementation of EBNP, directly influencing patient care quality and clinical outcomes through their proficiency and engagement. The dynamic nursing environment, marked by patient variability, resource constraints and high-pressure workloads, requires nurses to adapt evidence-based protocols to diverse clinical scenarios while maintaining alignment with EBNP standards. However, respondents in this study identified significant operational barriers that hinder effective EBNP implementation. Five key sub-barriers emerged at operational level.

Increased workloads and negative attitudes towards EBNP. Nurses in Chinese hospitals face overwhelming clinical workloads, leaving little time or energy for EBNP activities such as evidences retrieval or clinical question formulation. The voluntary nature of EBNP, often conducted outside work hours, couple with the risk of patient complaints if outcomes are suboptimal, foster negative attitudes toward its adoption. One respondent noted:

> *The basic work of nurses is very tedious and repetitive. It costs us much energy. We deal with these basic tasks during office hours, and there is no time to do scientific research or think about clinical questions. (H33).*

Another highlighted the fear of patient complaints:

> *We need to ensure the good improvement when we implement a new nursing plan. If there is any risk or*

did not improve. As a result, the patient will blame or complain to us. (H49).

This barrier aligns with the Job Demands-Resources model, which suggests that high job demands (e.g., heavy workloads) and limited resources (e.g., time, support) contribute to burnout and disengagement. In contrast, countries like Sweden allocate protected time for nurses to engage in EBNP, mitigating workload-related barriers. In China, the fear of patient complaints reinforces a risk-averse culture, discouraging innovation and EBNP adoption. Beyond workload challenges, deficiencies in critical thinking skills further impede nurses' ability to initiate EBNP.

Lack of capability to identify clinical question. Many nurses lack the awareness and skills to formulate clinical questions that drive EBNP, often adhering to physician-directed tasks without proactively questioning practices. The PICOT (Population, Intervention, Comparison, Outcome, Time) framework, a cornerstone of EBNP question formulation, remains unfamiliar to most. A respondent explained:

The professional knowledge of nurses is relatively weak, and many of them are not well informed about the steps of EBNP. For example, they do not know how to formulate clinical questions using PICOT format, the common paradigm for EBNP problem formulation. (H62).

This barrier reflects a deficiency in critical thinking skills, which, according to Bloom's Taxonomy, are essential for higher-order cognitive processes like analysis and problem formulation. In countries like the United States, undergraduate nursing programs emphasize critical inquiry, training students to use tools like PICOT early in their education. In China, the focus on rote learning and task-oriented nursing education limits nurses' ability to engage in proactive problem identification. Beyond challenges in question formulation, nurses face difficulties in accessing and evaluating evidence.

Lack of capability of evidence research. Nurses in Chinese hospitals frequently lack the skills necessary to effectively search, analyze, and evaluate external evidence, particularly from English-language academic literature. Despite most nurses holding bachelor's degrees, language barriers and unfamiliarity with research methodologies significantly restrict access to global evidence. Respondents highlighted these challenges:

I cannot read read English literature and do not know where to get the literature. When researching evidence, I can only read some Chinese literature through the a single channel. (H27).

Another respondent noted:

When I was in school, there was no course on how to read and analyze academic literature. When I have a problem, I prefer to consult an experienced nurse rather than read the literature. (H31).

This barrier underscores a critical deficiency in information literacy, a cornerstond of EBNP as outlined by the Melnyk and Fineout-Overholt EBNP model. In contrast, nurses in the United Kingdom receive training during their education to navigate databases such as CINAHL and PubMed, enabling access to diverse, high-quality evidence. In China, limited exposure to research training and a reliance on informal knowledge-sharing perpetuate this gap, hindering nurses' ability to engage with global evidence-based resources. Even when evidence is accessed, challenges in communicating findings further impede effective EBNP implementation.

Lack of capability of evidence transfer. Nurses often struggle to communicate evidence-based findings effectively, whether by articulating clinical problems using internal evidence, explaining care plans to patients in accessible language, or collaborating with colleagues. Respondents shared the following insights:

When I got some new ideas based on evidence, I was confused about how to effectively communicate with patients and their families to make them understand my ideas. (H21).

Another respondent commented:

The current situation is that there is rarely communication between colleagues to discuss evidence-based experience, but it seems that group work is more conductive to evidence transfer and implementation of EBNP. (H11).

This barrier aligns with the concept of knowledge translation, which emphasizes the need to adapt evidence for specific audiences. In countries such as Canada, nurses are trained in patient-centered communication and interprofessional collaboration, which facilitates evidence transfer. In contrast, in China, hierarchical workplace dynamics and limited team-based structures hinder effective communication, thereby diminishing the impact of EBNP initiatives. Furthermore, challenges in applying and evaluating evidence add to the operational challenges to EBNP.

Lack of capability of evidence implementation. Implementing and evaluating evidence in clinical practice remains a significant challenge, as nurses often lack the comprehensive skills required to a full EBNP cycle,

encompassing the application of evidence to specific clinical scenarios, assessment of outcomes, and refinement of practices. Respondents explained:

> *For most nurses, it is a big challenge to achieve a complete EBNP program, because the implementation of EBNP requires a variety of comprehensive capabilities, and the vast majority of nurses do not have these capabilities. (H56).*

Another respondent stated:

> *To be honest, the nursing director tasked me to do the EBNP project. In the process of implementing EBNP, I do not know how to apply the evidence to clinical practice. (H32).*

This barrier reflects a gap in experiential learning, as articulated by Kolb's Experiential Learning Theory, which emphasizes learning through practice and reflection. In countries such as Australia, clinical preceptorships assist nurses in applying EBNP, bridging the gap between theory and practice. In China, the lack of structured support for implementation and insufficient training in evaluation limit nurses' ability to effectively complete the EBNP cycles.

Discussion

To our knowledge, this is the first regional cross-sectional qualitative study in mainland China to explore barriers to EBNP implementation from an integrative perspective. By employing qualitative methods and conducting in-depth interviews with 71 stakeholders across 18 provinces, this study offers a comprehensive framework encompassing educational, organizational, and operational dimensions, identifying 13 sub-barriers to effective EBNP adoption. These findings advance the understanding of EBNP implementation challenges in China, providing insights applicable to other low- and middle-income contexts.

Previous research has frequently examined barriers to EBNP from singular perspectives, such as hospital-level or individual-level factors [29, 41, 42], resulting in fragmented insights that fail to capture the interconnected nature of EBNP implementation challenges. In contrast, this study extends previous findings by adopting an integrated perspective that encompasses educational, organizational and operational dimensions. By doing so, it addresses a critical gap in the literature and a more holistic understanding of the multifaceted challenges to EBNP in China. Consistent with prior research [16, 28, 30], our findings confirm barriers such as insufficient leadership support, a lack of EBNP culture, and inadequate organizational incentives at the hospital level, alongside individual challenges including limited motivation, knowledge deficits, heavy workloads, and low confidence in implementing change. These alignments underscore the persistence of systemic and individual barriers in China's healthcare context, while our integrative lens highlights how these factors interact to impede EBNP, offering a foundation for targeted interventions.

Our findings highlight significant educational barriers, including limited collaboration between universities and hospitals, insufficient EBNP curricula, outdated teaching materials, and a disconnect between theoretical education and clinical practice. These barriers stem from China's centralized education system, which delays curriculum updates, and the historical underinvestment in nursing education compared to medical training [43]. For instance, the reliance on outdated, translated textbooks reflects systemic delays in integrating global evidence, a challenge exacerbated by language barriers and limited access to English-language resources [28]. This aligns with Benner's model, which posits that progression from novice to expert requires experiential learning opportunities, such as clinical placements, which are scarce in China due to weak university-hospital partnerships. Unlike countries like Australia, where EBNP is embedded in undergraduate curricula, China's relegation of EBNP training to postgraduate levels limits nurses' early exposure to critical skills like evidence appraisal. This educational gap hinders the development of competent EBNP professionals, perpetuating a cycle of underpreparedness. Future research should explore strategies to integrate EBNP into undergraduate programs, drawing on international models like problem-based learning to bridge theory and practice.

At the organizational level, barriers such as inadequate leadership support, lack of performance incentives, low EBNP culture, and limited interdepartmental collaboration reflect China's hierarchical healthcare system and traditional perceptions of nursing as a subordinate role. The CFIR framework's inner setting domain highlights how organizational culture shapes EBNP adoption [38]. In China, hospital leaders often prioritize routine tasks over evidence-based initiatives, viewing nursing as ancillary to medical practice. This cultural norm, rooted in historical power imbalances, discourages nurses from engaging in EBNP, as their evidence-based suggestions are frequently dismissed by physicians [30]. The absence of incentives further demotivates nurses, contrasting with systems like the UK's, where EBNP contributions are rewarded through performance appraisals. These findings suggest that organizational change requires cultural shifts, such as leadership training to elevate nursing's role and policies to integrate EBNP into hospital workflows. Comparative studies with countries like Canada, where interprofessional education fosters collaboration, could

inform strategies to dismantle interprofessional silos in China.

Operationally, nurses face challenges including heavy workloads, negative attitudes toward EBNP, and deficiencies in core competencies (e.g., clinical question formulation, evidence research, transfer, and implementation). These barriers are driven by high job demands and limited resources, as described by the Job Demands-Resources model [44], which links excessive workloads to burnout and disengagement. In China, nurses' risk-averse attitudes, driven by fear of patient complaints, further hinder EBNP adoption, reflecting a broader cultural emphasis on error avoidance over innovation. From Benner's perspective, these competency gaps indicate that most Chinese nurses remain at novice or advanced beginner stages, lacking the experiential learning needed to develop advanced EBNP skills. Unlike countries like the US, where tools like the PICOT framework are taught early, Chinese nurses' limited training in critical inquiry restricts their ability to engage in EBNP cycles. This underscores the need for targeted training programs, such as those offered by the JBI, to build practical competencies through hands-on clinical projects.

Implementations for policy and practice

Our findings offer actionable implications for policymakers and stakeholders to advance EBNP implementation in China. First and foremost, to address educational barriers, universities and hospitals should establish structured EBNP platforms through a three-step process: (1) Form multidisciplinary task force, including hospital administrators, nursing directors, and university researchers, to define platform objectives (e.g., training, resource sharing) within three months; (2) Develop pilot programs within 6–12 months, integrating EBNP curricula with hospital-based training, supported by online tools for rural access; (3) Scale up platforms with funding from hospital budgets or provincial health grants, with annual evaluations to ensure sustainability. In resource-limited rural hospitals, partnerships with urban universities can provide virtual training to address regional disparities.

Secondly, to cultivate ENBP professionals, universities should implement a two-tiered system: (1) Develop four-year undergraduate EBNP programs with modules on evidence synthesis and implementation, targeting 50–100 students per cohort, incentivized by grants for curriculum development; (2) Offer 3-6-month short-term training courses for practicing nurses, using blended learning to accommodate rural participants, with completion linked to career advancement (e.g., promotions or certifications). Hospitals can collaborate with universities to fund these initiatives, ensuring accessibility across regions.

Thirdly, hospitals must prioritize by: (1) Incorporating EBNP metrics into performance evaluations, assigning a 20% weight to EBNP activities (e.g., completed projects); (2) Allocating protected time (e.g., four hours weekly) for EBNP, funded by reallocating training budgets; (3) Introducing incentives like bonuses or certification credits, tailored for urban (financial rewards) and rural (subsidized training) contexts. These measures can foster a supportive organizational culture, aligning with CFIR's emphasis on inner setting factors.

Finally, to enhance interdisciplinary collaboration, hospital should adopt the JBI model by: (1) Forming EBNP teams of 5–7 members, including a head nurse, researcher, and staff nurses, within three months; (2) Training team members in JBI's four-step process (evidence generation, synthesis, transfer, implementation) via two-month workshops with university support; (3) Implementing pilot projects (e.g., updating clinical protocols) within six months, with biweekly meetings to monitor progress. Rural hospitals can leverage teleconferencing for researcher support to overcome resource limitations. This team-based approach addresses the complexity of EBNP, particularly in China, where late adoption and limited nurse proficiency necessitate collaborative efforts.

Limitations and future research

Despite its valuable contributions, this study has several limitations that warrant consideration and offer opportunities to future research. First, participant selection was confined to tertiary hospitals with established EBNP centers, as these institutions lead EBNP development in China. This focus enabled an in-depth exploration of advanced clinical settings but may not fully reflect the challenges faced by secondary hospitals and primary healthcare facilities, where resources and EBNP adoption may differ significantly. This limitation arises from the prioritization of settings with existing EBNP infrastructure to capture mature practices, yet it risks overlooking the diverse realities of less-resourced facilities. Future studies should include secondary and primary healthcare settings to provide a more comprehensive understanding of EBNP barriers, informing inclusive strategies tailored to China's varied healthcare landscape. Second, as a regional cross-sectional qualitative study conducted across 18 Chinese provinces, the findings may not be full generalizable to other similar settings due to variations in healthcare infrastructure, culture attitudes, and resource availability. These contextual differences, rooted in China's unique healthcare system and centralized policy framework, may limited the applicability of our conclusion elsewhere. To address this, researchers in other regions should conduct complementary studies to validate or expand our findings, fostering a global

perspective on EBNP challenges and solutions. Third, the reliance on semi-structured interviews, while effective for capturing individual perspectives, may have constrained the exploration of collaborative dynamics among stakeholders. Focus group discussions, which facilitate interaction and reveal collective insights or consensus, were not utilized due to logistical constraints, such as scheduling and geographical dispersion. This methodological choice may have limited the depth of understanding regarding team-based perspectives critical to ENBP. Future research should incorporate focus group discussions alongside interviews to capture shared experiences and divergent viewpoints, enhancing insights into interdisciplinary collaboration and collective problem-solving in EBNP implementation. Finally, although this study proposes the formation of EBNP teams as a strategy to overcome implementation barriers, it does not evaluate the practical practical impact. The effectiveness of such teams in improving patient outcomes, nurse competencies, or organizational adoption remains untested, as this study focused on identifying barriers rather than assessing interventions. Future research should employ longitudinal or experimental designs to evaluate EBNP team efficacy, measuring outcomes such as protocol adoption rates, nurse skill development, and patient care quality. Such studies could provide empirical evidence to guide the scaling of EBNP initiatives in China and beyond.

Conclusion

The global adoption of EBNP has accelerated in recent years, yet its implementation remains suboptimal in many settings, prompting calls for research to identify barriers and inform effective strategies. Through a regional cross-sectional qualitative study in China, this research elucidates barriers to EBNP implementation from an integrated perspective, encompassing educational, organizational and operational dimensions. Our findings highlight that targeted education is a critical prerequisite for EBNP, requiring curriculum reforms to bridge theoretical and clinical learning. Organizational support, shaped by leadership prioritization and cultural shifts, is pivotal in fostering EBNP adoption, particularly within China's hierarchical healthcare system. Furthermore, operational challenges, such as nurses' limited competencies and heavy workloads, underscore the need for interdisciplinary collaboration to navigate the complex stages of EBNP, from evidence generation to implementation. These findings contribute to the global discourse on EBNP by offering a comprehensive framework for understanding implementation barriers in a low- and middle-income context. Ultimately, this research underscores the transformative potential of EBNP to improve healthcare quality and equity, offering lessons for global health systems striving to EBNP effectively.

Supplementary Information

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Supplementary Material 1

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Author contributions
H.W wrote and critical reviewed the manuscript, and coded the results. L.S contributed to methodology and code the results. L.D contributed to write the manuscript and code the results. Y.T contributed to extract the results and invite the participants. X.X contributed to conceptualization and design this study. All authors read and approved the final manuscript.

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Data availability
The data are available from the corresponding author on reasonable request.

Declarations

Ethics approval and consent to participate
This study was conducted with the approval of the Ethics Committee of Guangxi Academy of Medical Sciences (IIT-2023-79). Participation in this study was fully anonymous and voluntary, and all participants signed a written informed consent form. All interviews were performed in accordance with relevant guidelines and regulations.

Consent for publication
Not applicable.

Competing interests
The authors declare no competing interests.

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