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# Exploring academic and clinical nurses' perspectives on evidence-based nursing course for undergraduates from perspectives of academic-practice partnerships: a qualitative study

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## Abstract

**Aim**  To explore nurses' perceptions of evidence-based nursing courses for undergraduates through academic-practice partnerships.

**Design**  A deductive thematic analysis based on the practice-academic logic model.

**Methods**  Fifteen academic and clinical nurses were interviewed between November and December 2023, either online or through face-to-face meetings. Each interview lasted 20–30 min. The interview outline was constructed based on the practice-academic partnership logic model, which was followed during the process of recorded, analyzed, and checked.

**Results**  Themes identified include inputs (e.g., stakeholder commitment), activities (e.g., communication), outputs (e.g., nursing projects), and outcomes (e.g., improved competence). These themes highlight the various aspects and outcomes of academic-practice partnerships in evidence-based nursing courses.

**Conclusion**  Effective academic-practice partnerships are crucial for developing evidence-based nursing courses, leading to positive educational and professional outcomes.

**Impact**  Nurses' perceptions provide valuable guidelines for developing effective evidence-based nursing courses.

**Patient or public contribution**  No patient or public users participated in this study.

**Keywords**  Academic-practice partnerships, Evidence-based nursing, Undergraduate nursing students, Perceptions

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## Introduction

Evidence-based nursing (EBN) is a systematic approach to addressing clinical questions that combines research findings, clinicians' expertise, and patients' values [1]. Conducting evidence-based nursing practices (EBNP) has a significant effect on improving the quality of nursing care and reducing healthcare expenses [2–4]. Over the past decade, researchers have emphasized the importance of EBNP [5]. However, limited EBNP projects has been conducted in clinical nursing [6]. The main reason for the insufficient implementation of EBNP is the lack of EBN knowledge, competence, resources, and adherence to complete processes and pathways by nurses [7]. Conducting high-quality EBN education is a key measure to improve the EBN competence of nurses [8]. Undergraduate nursing students are the future of the nursing workforce [9, 10]. Undergraduate nursing students will have the competence to conduct EBNP projects to promote the development of nursing care towards a more professional and scientific direction [11]. American Medical Association has pointed out that conducting EBP education for undergraduate nursing students is the key to equipping them with EBN competence and enabling them to conduct EBNP [12].

Nevertheless, there is limited studies focused on developing of EBN education for undergraduate nursing students [11]. Existing studies have shown that EBN education for undergraduate nursing students mainly focuses on lectures, interactive, and blended online and offline teaching and the EBNP education for undergraduate nursing students were conducted by clinical nurses [12–14]. However, most of the clinical nurses lacked of time to provide systematic EBN theory education for undergraduate, which caused the undergraduate nursing student with low level of EBN knowledge and ability [13–17]. The separation of theory and practice is the main drawback of existing EBN education for undergraduate nursing students [13, 14]. However, theory and practice are two essential and complementary components of EBN [18].

Academic-practice partnerships (APPs) refers to the establishment of strategic relationships between academic and clinical institutions, fully utilizing the advantages of both sides, and promoting common vision in teaching, practice, and research [19]. Conducting APPs in EBN (APPs-EBN) education will overcome the key obstacle of the existing EBN education for undergraduate nursing students [12, 20]. To understand the content of APPs-EBN education, the steps of existing research of APPs-EBN training program for nursing students was shown as following [21, 22]: (1) clinical nurses to identify their needs; (2) academic nurses assigned nursing students specific topics, provide reading materials and videos; (3) nursing students formulated EBNP questions (PICOs, including participants, interventions, comparison, outcomes, and study design [23]. PICOs were the important content of EBNP questions [23].); (4) academic nurses, clinical nurses and nursing students discussed the accuracy of EBNP questions (PICOs); (5) nursing students submitted their homework and received their grades with feedback; (6) academic and clinical nurses chose a final EBNP question (PICOs) that was befitting for each student group.

Academic nurses and clinical nurses should be the core of APPs-EBN education for undergraduate nursing students, actively participating in all stages of EBN education process [22]. Moreover, conducting APPs-EBN education must be achieved through individual-level partnerships of academic nurses and clinical nurses [20, 24]. However, existing studies focused on discussing APPs-EBN practice at institutional level, with limited studies focused on the individual perspectives of APPs-EBN education, especially for the undergraduate nursing student's EBN education [19, 20, 25]. Therefore, it is crucial to understand the perceptions of academic and clinical nurses on APPs-EBN course for undergraduate nursing students to provide information for improving the quality of APPs-EBN course for undergraduate nursing students. However, there is a lack of individual-level evidence on specific perceptions of APPs-EBN course for undergraduate nursing students.

Practice-academic partnership logic model was designed for APPs program. Given the efficacy of this model has been approved in the aspect of APPs and its appropriateness for this qualitative study to deductive specific and essential content during the process of APPs, further to provide basis for researchers conduct APPs-EBN course for undergraduate nursing students [22]. This model emphasizes that having specific inputs and conducting specific activities in the process of APPs may result in corresponding outputs and outcomes (inputs and activities → outputs and outcomes). Inputs encompass the necessary investments in the APPs-EBN education program, including partnership champions, compatible philosophies, common vision, key stakeholder commitment, formalized partnership agreement, shared goals and accountabilities and dedicated time and resources [22, 26]. Activities involve specific actions or processes that must be undertaken to yield desired outcomes from the APPs, including open, ongoing communications, shared decision-making and professional development [22, 26]. Outputs are the tangible and immediate deliverables stemming from the inputs and activities, including action plans and strategic plans [22, 26]. Outcomes, both short-term and long-term, denote the changes or impacts that arise from the APPs, including successful completion of short-term (action plan) goals and successful completion of long-term (strategic)

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goals [22, 26]. Therefore, this study aimed to explore and interpret the perceptions on APPs-EBN course for undergraduate nursing students among the academic nurses and clinical nurses based on the partnership-academic partnership logic model. This study will provide a valuable information for further constructing APPs-EBN course for undergraduate nursing students.

## Methods
### Design
This qualitative study used deductive thematic analysis by using the practice-academic logic model [27]. The qualitative study was reported following the Consolidated Criteria for Reporting Qualitative Research checklist [28].

### Participants
Considering that academic and clinical nurses were the main stakeholders in APPs-EBN course for undergraduate nursing students, this study conducted qualitative interviews with these two groups of people. Inclusion criteria for academic nurses was that academic nurses had experience in teaching EBN course for undergraduate and/or graduate nursing students. Inclusion criteria for clinical nurses were as follows: (1) clinical nurses were responsible for providing direct care to patients in a hospital unit. (2) clinical nurses have the experience in EBNP.

### Data collection
The data were collected between November and December 2023. The interviews were conducted through online videoconferencing meetings or face-to-face meetings in participants' offices. Each participant underwent a single interview session, with each interview lasting approximately 20–30 min. The interviews were conducted by the corresponding author (Y.X.) who was a female master's nursing student and has completed qualitative research training.

The sampling method employed was purposive sampling, which can consciously select some participants who understand the research questions and provide rich information in the interviews [29]. The interview outline was constructed based on the practice-academic partnership logic model, which mainly includes what support did we need from both the organizational and individual levels to conduct APPs-EBN course for undergraduate nursing students? What activities could be conducted in APPs-EBN course to improve teaching effectiveness? What were the outputs of conducting APPs-EBN course for undergraduate nursing students? What were the outcomes for conducting APPs-EBN course for undergraduate nursing students?

Before conducting the formal interview, the researchers contacted the interviewees through WeChat (the social media most commonly used in China) to introduce the purpose, significance, and methods of this part of the research. After obtaining consent from the participants, the interview schedule was arranged to accommodate their availability. Before commencing the formal interviews, the researchers reiterated the research's purpose, significance, and methodologies to the interviewees, while also ensuring the protection of their privacy. Detailed explanations were provided concerning the recording procedures, and the interviewees were requested to sign an informed consent form before the interviews officially commenced, including the recording process. The semi-structured interview outline served as a comprehensive guide throughout the interview process, ensuring that the interview content remained closely aligned with the research objectives. All the interviews were recorded. Any questions that arose during the interview were promptly addressed to maintain clarity and depth of the responses.

### Data analysis
Within 24 h after the interview, two researchers (Y.X. and H.H) converted 15 interview recordings into written materials and listened to the recordings multiple times to ensure the accuracy of the transcription results. The interview transcriptions were analyzed in NVivo 12.0. The corresponding author (Y.X.) followed the following steps to code the perspectives of participants: immersing in the data, developing an initial thematic template, organizing the data based on the template, condensing data and reflecting, comparing and contrasting data within similar participant categories, and comparing and contrasting data with different participant categories [20]. After completing the initial encoding of all data, the corresponding author (Y.X.) shared and validated the encoding results with other members of the research team to form the final encoding result [30].

### Ethic considerations
This study was approved by the Ethics Committee of a nursing school in Hunan Province in March 2023 (review number: E202313). All the recorded data are only used for this study and were backed up in an encrypted computer without Internet connection.

## Results
Nine academic nurses participated in this study, two males and seven females, with an average age of (38.00±8.00) years. Among them, eight academic nurses have a doctoral degree, and one academic nurse has a master's degree. The nine academic nurses were from five different school of nursing in China and both of them have the experience in participating the APP-EBN courses for nurses or graduate nursing students. Six clinical nurses participated in this study, all of them were

females and have a master's degree, with an average age of (37.17±4.26) years. And six clinical nurses were from four different comprehensive hospital in China and three clinical nurses have the experience in participating the APP-EBN projects.

Four themes with 16 subthemes were generated based on practice-academic partnership logic model (Table 1), including inputs, activities, outputs, outcomes.

### Inputs

All participants considered the multilevel contents of inputs were the necessary investment of APPs-EBN course for undergraduate nursing students.

#### Key stakeholder commitment

A few participants noted that academic and clinical institutions needed to form formal partnership before developed APPs-EBN course for undergraduate nursing students, which was beneficial for promoting APPs-EBN course. As the opinion by one participant, *"The first step of developing APPs-EBN course is to reach a consensus and sign a partnership agreement between academic and clinical leadership, and vigorously promote developing APPs-EBN course." (Participant 14, Clinical nurse)* Developing a teaching team was one of the important aspects of achieving key stakeholder commitment of APPs. *"How to attract clinical nurses to participate in the teaching team requires the academic and clinical institutions to sign some partnership agreements." (Participant 2, Academic nurse).*

Key stakeholder commitment was an important input for developing APPs-EBN course for undergraduate nursing students and further promoting common interests in EBN education, practice, and research [31].

**Table 1** Themes and subthemes generated in this study

| Themes | Subthemes |
| --- | --- |
| (1) Inputs | (1.1) Key stakeholder commitment |
| | (1.2) Shared mission |
| | (1.3) Evidence-based nursing training |
| | (1.4) Time |
| | (1.5) Instructional design |
| | (1.6) Incentive |
| | (1.7) Mutual trust |
| | (1.8) Leadership support |
| (2) Activities | (2.1) Ongoing communication |
| | (2.2) Share decision-making |
| (3) Outputs | (3.1) Evidence-based nursing practice projects |
| | (3.2) Evidence-based nursing manuals |
| (4) Outcomes | (4.1) Improved evidence-based nursing awareness |
| | (4.2) Improved evidence-based nursing competence |
| | (4.3) Increased evidence-based nursing projects |
| | (4.4) Improved quality of nursing care |
| | (4.5) Improved professional identity |

#### Shared mission

Some participants believed that shared mission was an important input for developing of APPs-EBN course for undergraduate nursing students. As a participant mentioned, *"It is necessary to consider shared mission. For example, if the goal is to implement EBNP projects in clinical settings after the course, plans must be made to enhance these projects while developing the course." (Participant 2, Academic nurse)* Academic and clinical institution had shared mission was conducive to making the partnerships process smoother [26]. For example, *"The leadership is very important during the process of APPs. Leaderships of the academic and the nursing department of the clinical focus on a shared mission to develop this course, which may have a significant impact (on the development of APPs-EBN course for undergraduate nursing students)." (Participant 3, Academic nurse).*

#### EBN training

Participants mentioned that EBN training was necessary for academic and clinical nurses to improve their EBN competence and acquire the newest knowledge about EBN.

> *"From organizational level, it is necessary to regularly provide EBNP training opportunities for clinical nurses or provide more updates and lectures on this EBN to academic nurses." (Participant 3, Academic nurse).*
>
> *"If there is such specialized EBN training, it would be best for academic and clinical nurses to participate in systematic learning." (Participant 5, Academic nurse).*
>
> *"Regular training for academic and clinical nurses is necessary. Academic nurses primarily participate in training programs related to EBNP and teaching ability, while clinical nurses primarily participate in training programs related to teaching ability." (Participant 8, Academic nurse).*

#### Time

Developing and conducting APPs-EBN course for undergraduate nursing students required academic and clinical nurses to input a significant amount of time in communication and preparing for teaching APPs-EBN course.

> *"For some (academic and clinical) nurses, time may be the biggest problem, as building the APPs-EBN course requires partnerships between academic and clinical nurses, including spending time on partnership and individual lesson preparation." (Participant 10, Clinical nurse).*

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*"It is difficult for clinical nurses to participant in teaching APPs-EBN course for undergraduate student during their own rest." (Participant 7, Academic nurse).*

*"Developing the APPs-EBN course demands a substantial investment of time from both academic and clinical nurses. From a clinical perspective, the success of this endeavor largely hinges on the level of support from nursing leaders. If nursing leaders truly value this course, they will ensure that clinical nurses have sufficient time to contribute to its teaching." (Participant 14, Clinical nurse).*

### Instructional design

According to the characteristics of the target population (undergraduate nursing students), the development of APPs-EBN course instructional design (including learning objectives, learning contents, learning methods, and learning resources) was the cornerstone of developing and implementing EBN education [32]. *"The learning objectives is actually your initial origin of instructional design. Firstly, it is necessary to analyze what abilities undergraduate nursing students need to possess in the future clinical nursing, what kind of foundation they need nurses (academic and clinical nurses) to lay for them during their learning period, and what kind of (EBN) knowledge and skills they need to be taught." (Participant 9, Academic nurse).*

Comprehensive and systematic educational resources form the foundation for promoting the acquisition of EBN knowledge among undergraduate nursing students [33, 34]. Evidence retrieval is a crucial prerequisite for evidence implementation, and ample database resources can significantly enhance the teaching of evidence retrieval in APPs-EBN courses for these students [35]. Several participants highlighted that database resources are essential for developing APPs-EBN courses for undergraduate nursing students.

*"Provide them (undergraduate nursing students) with database resources to access relevant databases for retrieval." (Participant 8, Academic nurse).*

*"Sometimes, we use databases from other universities, because our university actually doesn't have any databases about evidence-based nursing. It is necessary for university to support more database resources." (Participant 5, Academic nurse).*

### Incentive

The participants stated that universities and hospitals provide incentives for academic and clinical nurses, which could enhance the teaching engagement of these professionals.

*"The clinical nurses who participated in this course (APPs-EBN course for undergraduate nursing students) have some corresponding incentives, including establishing some educational reform projects and funding." (Participant 5, Academic nurse).*

*"Perhaps there should be time support and performance rewards for nurses (academic and clinical nurses) to participate in this course (APPs-EBN course for undergraduate nursing students). Especially for clinical nurses, they should be provided more time support and performance rewards and honors for the engagement in EBNP education." (Participant 8, Academic nurse).*

*"It is necessary that both the academic and clinical institutions provide clear incentives. If you participate in APPs-EBN course for undergraduate nursing students, it will be beneficial for evaluating professional titles. In addition, it is basic to provide academic and clinical teachers more salary." (Participant 10, Clinical nurse).*

### Mutual trust

Mutual respect was a key condition for developing of APPs-EBN course for undergraduate nursing students [26]. As participants said that, *"It is important to establish a good relationship between academic and clinical nurses, as well as to have some communication during the teaching process." (Participant 1, Academic nurse) "Academic and clinical nurses definitely need to fully respect each other's suggestions and skills, which is actually a very important prerequisite for partnerships." (Participant 9, Academic nurse).*

### Leadership support

Leadership support was an important input in developing of APPs-EBN course for undergraduate nursing students. Academic and clinical nurses participating in teaching were more familiar with the characteristics of nursing undergraduate students. The leadership of academic and clinical institutions should provide these professionals with greater rights in developing of APPs-EBN course. *"Because this (APPs-EBN course) is intended for students (undergraduate nursing students). It is necessary for leaderships of academic and clinical institutions to provide them (academic and clinical nurses) full freedom to design or optimize this course on their own." (Participant 9, Academic nurse).*

In addition, the time for participating in the teaching of APPs-EBN course the requires the leadership-level

support. Leaders should provide academic and clinical nurses with more opportunities to conduct EBNP.

*"The support of leaders is essential. For example, if undergraduate nursing students come to a hospital for internships, nursing leaders need to provide them with sufficient support to conduct EBNP projects or participate in the application of clinical guidelines."* (Participant 8, Academic nurse).

*"It is necessary to have the support of the nursing teaching and research department, as this department could identity clinical nurses (with EBNP experience). In addition, the support of nursing leaders is also very important, they could arrange the scheduling and teaching tasks for clinical nurses."* (Participant 15, Clinical nurse).

### Activities

Participants considered activities were essential part during the process of developing of APPs-EBN course for undergraduate nursing student. The effective activities included ongoing communication and share decision-making.

#### Ongoing communication

Ongoing communications between academic and clinical teachers were beneficial for them to jointly develop and optimize the course, and clarified the teaching tasks of both sides.

*"Academic and clinical nurses need to engage in lesson preparation collaboratively. While academic nurses may primarily teach theoretical courses, clinical nurses should work with them to monitor the course's progress and integrate clinical questions into practical sessions. Both groups should discuss and coordinate to define the teaching tasks effectively."* (Participant 1, Academic nurse).

*"Academic and clinical nurses may need to discuss with both sides about how to better integrate the theory knowledge into the practical course. Firstly, partnership lesson preparation is a part of the teaching process in which both sides are aware of each other's teaching tasks...... Some partnership discussions and feedback are also important."* (Participant 9, Academic nurse).

#### Share decision-making

Academic and clinical nurses shared decision-making to each other during the teaching process of APPs-EBN course for undergraduate nursing students, which was beneficial to APPs-EBN course for undergraduate

nursing students [26]. For example, *"Clinical nurses need to provide timely feedback to academic nurses on any suggestions they may have during the implementation of the course. Academic nurses should also observe if there are some problems that effect teaching quality that require optimization. In other words, adjustments need to be made through regular discussions and feedback between both sides, in order to optimize the course in a timely manner"* (Participant 9, Academic nurse).

### Outputs

Participants described that APPs-EBN course for undergraduate nursing students may could form outputs.

#### EBNP projects

More EBNP projects could be conducted in the future. *"In the future, academic and clinical nurses could establish partnerships channels, and more EBNP projects may generated."* (Participant 1, Academic nurse).

#### EBN manuals

EBN manuals may be the important output of APPs-EBN course for undergraduate nursing students. *"If academic and clinical nurses collaborate to develop EBN course, they could create some manuals including case reports, teaching manuals or reference books to ensure teaching quality and homogeneity."* (Participant 5, Academic nurse).

### Outcomes

Almost all the participants considered that six positive outcomes were short-term and long-term goals of APPs-EBN course for undergraduate nursing students.

#### Improved EBN awareness

Improving EBN awareness among undergraduate nursing students was a crucial learning objective of APPs-EBN course for undergraduate nursing students. As a participant mentioned, *"Improving EBN awareness among undergraduate nursing students and ensuring they recognize its significance and value is crucial."* (Participant 9, Academic nurse).

Improving EBN awareness among undergraduate nursing students would be beneficial for them to conduct EBNP in future clinical nursing work. *"They (undergraduate nursing students) should understand the process of EBN. For example, they know what the meaning of evidence transformation. When they work in clinical nursing, they may encounter some clinical problems. At that time, they could conduct evidence retrieval instead of judging just based on experience."* (Participant 7, Academic nurse).

### Improved EBN competence

Undergraduate nursing students could master the basic knowledge and skills of EBP through participating in APPs-EBN course.

> "Undergraduate nursing students are able to develop PICO questions for clinical questions and conduct evidence implementation projects." (Participant 8, Academic nurse).
>
> "Through this course, students (undergraduate nursing students) will master some EBN basic knowledge and technical skills, and then be able to apply these methods and competences in practice." (Participant 2, Academic nurse).

### Increased EBN projects

The EBN knowledge and skills would be improved for undergraduate nursing students after participating in APPs-EBN course. Undergraduate nursing students may conduct more EBNP projects in clinical nursing in the future.

> "They (nursing undergraduate students) will have the skills to conduct EBNP projects in the future, especially the project of evidence implementation. This is the EBNP skill they need to possess after working in clinical nursing in the future." (Participant 9, Academic nurse).
>
> "The long-term goal is that undergraduate nursing students can conduct EBNP projects in clinical nursing in the future, and to improve their existing clinical nursing practices." (Participant 5, Academic nurse).

### Improved quality of nursing care

Participants considered that undergraduate nursing students would conduct EBNP projects in clinical nursing, which was beneficial for improving patient satisfaction and quality of nursing care.

> "Maybe these (EBNP) projects will bring some benefits to patients and improve the quality of nursing care." (Participant 9, Academic nurse).
>
> "In the long-term goal, it may be that undergraduate nursing students could apply the methods of EBN into clinical nursing in clinical nursing in the future. These results of EBNP projects may improve the quality of nursing care and patients' satisfaction." (Participant 6, Academic nurse).

### Improved professional identity

Participants mentioned that undergraduate nursing students would have professional identity improvement after conducting EBNP projects. "After conducting EBNP projects, many of undergraduate nursing students actually have a sense of feedback and value. Therefore, it may also enhance their professional identity and their own sense of value" (Participant 9, Academic nurse).

## Discussion

This study aimed to explore the academic and clinical nurses' perceptions on APPs-EBN course for undergraduate nursing students based on practice-academic partnership logic model. In this study, the specific contents of inputs, activities, outputs, and outcomes could further enriching the theoretical framework for developing APPs-EBN education and provide the details for developing of APPs-EBN course for undergraduate nursing students [22].

The specific content of inputs in this study validates and supplements the results of this scoping review (including key stakeholder commitment, shared mission, time, instructional design, mutual trust, leadership support) [22]. The results of this study indicated the significance of EBN training and incentives in facilitating the implementation of APPs-EBN course for undergraduate nursing students, which was similar with existing study conducted by Dr. Chen [20]. Notably, most academic nurses a lack of nursing care experience, leading to a limited understanding of specific process and challenges associated with EBNP projects [36]. Some clinical nurses a lack of theoretical knowledge of EBN, others were inadequately prepared to engage in teaching EBN courses [5, 31, 37–39], potentially impacting the learning outcomes of undergraduate nursing students participated in EBN courses [40, 41]. Therefore, strengthening the training of academic nurses in EBNP and clinical nurses in EBN theoretical knowledge was crucial for improving their basic knowledge, competences, and teaching quality of EBN course.

Developing and conducting of an APPs-EBN course for undergraduate nursing students requires active participation from both academic and clinical nurses in the teaching of APPs-EBN course [31, 42]. Sufficient incentives have promoting effect on the participation of academic and clinical nurses in the teaching of APPs-EBN course, which similar with the results of existing research [20, 43]. Academic and clinical institutions should develop incentives such as professional title promotion and performance rewards for academic and clinical nurses to promote partnerships in developing and implementing APPs-EBN course for undergraduate nursing students. Effective incentives may help academic and clinical nurses overcome obstacles related to develop APPs-EBN

course for undergraduate nursing students, such as lack of time [20].

The results of this study indicated that developing and conducting APPs-EBN course for undergraduate nursing students needed academic and clinical nurses conduct activities of ongoing communication and share decision making, which was consistent with the results of a scoping review [22]. Academic and clinical nurses participate in developing APPs-EBN course and conduct ongoing communication and shared decision making through meetings or group discussions during the stages of course planning, course commencement, and evaluation are crucial for refining APPs-EBN course [44]. Continuous activities between both sides can also promote partnerships between academic and clinical nurses, which may strengthen the connection between academic and clinical sides [20].

EBNP projects and EBN manuals were the outputs in this study, which was similar with the results of the EBNP quality improvement initiative from the perspective of APPs-EBN [45]. After conducting APPs-EBN course for undergraduate nursing students, academic and clinical nurses would establish stable cooperative relationships and more nursing undergraduate students have the awareness and ability to conduct EBNP projects. This may lead to more EBNP projects conducted by academic nurses, clinical nurses, and nursing undergraduate students in the future [20]. In addition, academic and clinical nurses could create EBN manuals related to APPs-EBN courses for undergraduate nursing students based on teaching experiences and insights gained from conducting this course. EBN manuals may provide a theoretical foundation, enabling more nursing schools domestically and internationally to conduct APPs-EBN course for undergraduate nursing students.

Conducting APPs-EBN course for undergraduate nursing students could yield various positive outcomes, aligning with the results of the scoping review [22]. Short-term goals of APPs-EBN course for undergraduate nursing students may include improved EBN awareness and improved EBN, as high-quality EBN education stands as a crucial measure to attain these goals [8]. Undergraduate nursing students who possess awareness of and competence in EBN are better prepared to incorporate EBN methodologies into nursing practice. This preparation is crucial for advancing long-term goals such as increasing EBN projects, enhancing the quality of nursing care, and strengthening professional identity [46, 47]. Therefore, it is recommended that nursing educators to provide comprehensive inputs and actively participate in activities when conducting APPs-EBN course for undergraduate nursing students. This approach could lead to the generation of outputs and realization of desired outcomes.

### Strength and limitation

The participants involved in this study came from four distinct regions in China, all of them with different educational features. This diversity contributes to the universality of the results of this study.

The limitation of this study was that not all participants have experience in APPs-EBN. This is primarily from the scarcity of nursing colleges in China providing EBN courses for undergraduate students. Consequently, it becomes challenging to recruit academic and clinical nurses with sufficient experience in APPs-EBN to participate in this study. In addition, all of the clinical nurses in this study have master's degree, primarily because the study was conducted in China. Most nursing schools at various universities in China have developed EBN courses only for graduate students, while undergraduate nursing students typically do not receive systematic EBN course [48]. In the future, it would be beneficial to target recruitment towards both academic and clinical nurses with adequate experience in APPs-EBN and varying education levels for further interviews. This approach aims to garner additional insights and refine the theoretical framework and specific APPs-EBN course.

In addition, the interviews were conducted through online videoconferencing meetings or face-to-face meetings due to the limitations of time and space. For the online videoconferencing meeting, we turned on the camera during the online interview and recorded it with the informed consent of the participants. However, the continuity and fluency of the interview were affected to some certain extent due to network interruption.

### Conclusions

Developing and conducting of APPs-EBN course for undergraduate nursing students involves investing inputs (Key stakeholder commitment, Shared mission, EBN training, Time, Instructional design, Incentive, Mutual trust, Leadership support) and conducting activities (Ongoing communication and Share decision-making) may lead to outputs (Educational resource) and outcomes (Improved EBN awareness, Improved EBN competence, Increased EBN projects, Improved quality of nursing care, Improved professional identity).

## Declarations

**Ethics approval and consent to participate**
This study was approved by the Ethics Committee of school of nursing of Central South university, China (review number: E202313). Detailed explanations were provided concerning the recording procedures, and the interviewees were requested to sign an informed consent form before the interviews officially commenced, including the recording process.

**Consent for publication**
Not Application.

**Competing interests**
The authors declare no competing interests.

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