



Research Paper

Factors influencing evidence-based practice among undergraduate nursing students: A cross-sectional analysis



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ABSTRACT

Objective: This study aimed to describe the current situation of evidence-based practice (EBP) among undergraduate nursing students in Thailand.

Methods: A cross-sectional study was conducted. A convenience sample of 470 third- and fourth-year undergraduate nursing students from five public universities across Thailand participated in this study from January 2021 to March 2021. All participants were invited to complete a general information questionnaire, and the Student Evidence-Based Practice Questionnaire (S-EBPQ).

Results: The overall mean S-EBPQ score was 5.29 ± 0.71 , and the four subscales, from highest to lowest, were attitudes (5.50 ± 0.93), sharing and applying EBP (5.37 ± 0.87), practice (5.18 ± 0.84), and retrieving and reviewing evidence (5.10 ± 0.81). The current situation of S-EBPQ was higher among nursing students who had higher previous EBP studies, familiarity with research methods, confidence in clinical decision-making, preparedness in practice, and access to journals ($P < 0.05$).

Conclusions: This study's findings provide valuable insights for planning strategies that can be integrated into the existing nursing curricula to enhance nursing undergraduates' EBP application in clinical settings.

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What is known?

- Nursing students are expected to apply evidence-based practice (EBP) in practice, thereby playing a crucial role in delivering quality care.
- While previous studies have explored factors associated with EBP knowledge and skills, attitudes, and practice of EBP among nurses, there are few studies on undergraduate nursing students.

What is new?

- The study found that factors influencing the current situation of EBP include had higher previous EBP studies, familiarity with

research methods, confidence in clinical decision-making, preparedness in practice, and access to journals.

1. Introduction

Evidence-based practice (EBP) is “the conscientious, explicit, and judicious use of current best evidence in making decisions about the care of the individual patient.” [1] EBP is a problem-solving approach to providing care combined with well-designed studies, clinical experience, and patients' values within a context of caring [2,3]. Existing studies have shown a strong association between the use of EBP and better outcomes such as length of stay, readmission rates, mortality [4], and patient satisfaction [5], diminishing unnecessary healthcare procedures and expenditures [6].

The Institute of Medicine, accreditation councils, and health professional bodies value EBP as a principal competency for healthcare professionals [7]. Therefore, EBP has been integrated

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into healthcare professional curricula of undergraduate, post-graduate, and continuing education programs [8]. Nurses are one group of healthcare professionals expected to employ EBP when choosing the management options that will result in the best clinical outcomes for their patients [9]. Moreover, the World Health Organization (WHO) has released guidelines to develop and promote a culture of EBP in nursing and midwifery [10]. The International Council of Nurses (ICN) states in the ICN Code of Ethics for Nurses that it serves as a framework for ethical nursing practice and decision-making, which assumes nurses take a leadership role in determining and implementing evidence-informed and acceptable clinical nursing practice standards, management, research, and education [11].

To become clinical nurses ready to work in healthcare settings with the confidence to use EBP, nurses should be cultivated to practice EBP early, beginning with their undergraduate nursing studies. Nursing educational institutions are expected to be the main stakeholders in preparing nursing students to be able to perform the fundamental EBP processes, including formulating an accountable clinical question, conducting a systematic search for the best evidence to respond to the question, critically assessing the validity of the evidence, transferring the evidence with clinical expertise and regard for the patient's preferences and values, and evaluating the effectiveness of outcomes. This period in the nursing undergraduate program is the prime time for developing EBP competency for their future career. Previous research supports that EBP knowledge, attitude, and practice during nurses' undergraduate study critically predicts EBP implementation in the clinical setting [12,13] and after graduation [14], meaning that the more EBP knowledge, attitude, and practice that nursing students have, the more they will use them in practice.

Therefore, understanding factors that predict nursing students' EBP knowledge, attitude, and practice may be one strategy for enhancing their EBP competency. Prior research has identified previous EBP studies and research methods as EBP-predicting factors [15–20]. Confidence in clinical decision-making and preparedness for clinical practice has also been recognized as factors influencing EBP knowledge, practice, and attitudes [21–23], in addition to access to the internet and nursing journals associated with improving EBP knowledge, skills, and attitudes [24–27].

EBP has been integrated into the curriculum of several nursing schools. Nursing students are expected to apply EBP as members of healthcare teams, thereby playing a crucial role in delivering quality care [28,29]. However, nursing students' knowledge and application of EBP are shaped by the clinical context they are exposed to, and as such, the country of this inquiry matters [11]. In Thailand, nurses in hospitals are expected to be competent in applying EBP in their nursing practice. Nursing schools have consequently integrated EBP into their undergraduate nursing programs to cultivate nursing students to develop essential EBP abilities. Although previous studies explored the knowledge and skills, attitude, and practice of EBP and associated factors among nurses, there are few studies on undergraduate nursing students.

Moreover, prior studies have yet to explore these factors in Thailand. Identifying these factors will provide valuable insights for initiating strategies to enhance EBP competency and implementation. Therefore, this study determined undergraduate nursing students' knowledge, skills, attitude, and practice and identified the relationships between these related factors.

2. Methods

2.1. Study design and participants

A cross-sectional design was used to survey undergraduate

nursing students between January to March 2021. The population was undergraduate nursing students in Thai public nursing schools under the authority of the Ministry of Higher Education, Science, Research, and Innovation. The inclusion criteria were third- and fourth-year nursing students who were introduced to EBP and experienced EBP in clinical practice. Power for this study was calculated using Yamane's formula [30] with a 95% confidence level and $P = 0.05$. The total sample size for nursing students was 520. These participants were recruited from five nursing schools nationwide; one nursing school was randomly selected from each of the five regions: North, Northeast, East, Center, and South.

2.2. Instruments

2.2.1. General information questionnaire

This questionnaire included two sections. The first section gathered information on demographic characteristics, including age, sex, and academic year. Other section on factors predicting EBP knowledge, skills, attitude, and practice included 1) previous EBP studies [16,36], 2) familiarity with research methods [37], 3) confidence in clinical decision-making [21], 4) preparedness in practice [21], 5) access EBP from the internet [25], and 6) access EBP from journals [25]. On a 5-point Likert scale, students reported the extent to which they agreed with factors, ranging from 'very low' to 'most' for questions 1–4 and from 'never' to 'always' for questions 5–6.

2.2.2. The Student-Evidence-Based Practice Questionnaire (S-EBPQ)

The S-EBPQ was used for evaluating nursing students' EBP competence based on the five EBP steps, which included asking questions, finding the best evidence, assessing the evidence, applying information with clinical experience and patient values, and evaluating the outcome of Sackett [3]. It has been validated in international studies [32,33]. The S-EBPQ has four subscales with a total of 21 items, consisting of 1) practice (6 items), 2) attitudes (3 items), 3) retrieving and reviewing evidence (7 items), and 4) sharing and applying EBP (5 items). All responses were recorded on a 7-point Likert scale; a higher score means better competence on that subscale. The S-EBPQ was developed from the Evidence-Based Practice Questionnaire (EBPQ), which included three subscales (practice, attitude, and knowledge and skills) [34]. Upton [31] found that retrieving and reviewing the evidence subscale and sharing and applying the EBP subscale derived from the knowledge and skills subscale of the EBPQ. In this study, the S-EBPQ was used with permission from the author. The translation based on the WHO guidelines [35] included the initial translation from English to Thai, and an expert panel reviewed the translation's appropriateness. Then, the tool was back-translated by a bilingual expert, and any differences in meaning from the original S-EBPQ were adjusted in the final version. The pilot study was performed to test reliability with 15 nursing students with similar characteristics to the study sample criteria. The Cronbach's α coefficient of this study was 0.83 for the full scale, 0.82 for the practice subscale, 0.68 for the attitudes subscale, 0.88 for the retrieving and reviewing evidence subscale, and 0.86 for the sharing and applying EBP subscale.

2.3. Data collection

Information regarding research objectives and the data collection process was shared with participating nursing school coordinators. Coordinators advertised the study via social media groups like LINE mobile application and Google Forms links. After nursing students showed interest in participating, coordinators briefed them on the study's objectives, risks, and benefits. Informed consent and questionnaires were accessed via a QR code sent to the

participants. After collecting participants' responses, surveys were checked for completeness and later used in data analysis. Of the 520 questionnaires sent to nursing students who met the criteria, 470 responded, with a 90.4% response rate.

2.4. Ethical considerations

The study was approved by the Research Ethics Review Committee (No. 2020-EXP095) and by the five schools included in this study. The cover page of the survey link shared with participants explained the study objectives, voluntary participation, data collection with anonymity, and independence to remove themselves from the study at any time without disturbing their study results. Students were only allowed to complete the questionnaires after signing the informed consent form.

2.5. Data analysis

Data analyses were performed by applying STATA/IC 14 (Stata Corp, 2015). Demographic data, related factors, mean scores of the S-EBP subscales, and overall S-EBP were first analyzed using descriptive statistics. ANOVA and *t*-tests were applied to examine the differences in EBP among demographic variables. Furthermore, a comparison among groups was conducted by post hoc command. The statistical significance level was $P < 0.05$.

3. Results

3.1. Participants characteristics

Among the 470 participants, the majority were female (88.5%), and 11.5% were male. The average age of the participants surveyed was 21.5 ± 1.04 years, and slightly more than half were in their third year of study (51.4%), while 48.5% were in their fourth year. It was observed that 45.3% of participants neutrally indicated having studied EBP previously, 58.9% had moderate familiarity with research methods, 54.0% had more confidence in clinical decision-making, and 54.0% participants demonstrated being more prepared for clinical practice. (Table 1).

3.2. Overall status and influencing factors of EBP

The overall mean S-EBPQ score was 5.29 ± 0.71 . The mean scores were as follows: the practice subscale was 5.18 ± 0.84 , the attitudes subscale was 5.50 ± 0.93 , the retrieving and reviewing evidence subscale was 5.10 ± 0.81 , and the sharing and applying EBP subscale was 5.37 ± 0.87 . There were no significant differences in the overall mean S-EBPQ, practice, attitude, retrieving and reviewing evidence, and sharing and applying EBP scores based on sex, academic year, or area of the school ($P < 0.05$). The score of overall mean S-EBPQ, practice, attitude, retrieving and reviewing evidence, and sharing and applying EBP were higher among nursing students who had higher previous EBP studies, familiarity with research methods, confidence in clinical decision-making, preparedness in practice, and access to journals ($P < 0.05$). (Table 1).

4. Discussion

Undergraduate nursing students in Thailand viewed EBP positively. Their attitudes towards EBP tended to be more optimistic than their knowledge, skills, and practice of EBP. Their scores for the retrieving and reviewing evidence subscale, which referred to the knowledge and skills subscale [31], were lower than others. These results are similar to previous EBP studies among nursing students in countries such as Colombia, Oman, Tunisia, India, Nigeria, Oman,

and Saudi Arabia [19,24,25,38,39]. The study findings contributed to a baseline assessment of nursing students' EBP competency, which will be helpful for nursing schools for monitoring and comparison in the future. No significant differences were perceived between the academic year, sex, and area of school regarding EBP knowledge, skills, and practice. The study results are consistent with Myakava [39], who found that sex did not predict EBP competency; however, they are inconsistent with Labrague [25] and Myakava [40], who found a higher EBP perception as students advanced toward their year of graduation. This may imply that nursing students in the third and fourth years have independently developed EBP competency from different courses and experiences. Both male and female nursing students from different school areas can develop EBP competency similarly.

This study's analysis shows that previous EBP and research studies influence EBP practice, attitude, knowledge, and skills. These results were supported by previous studies, which indicated that teaching EBP to undergraduate students with a multifaceted and integrative approach improves EBP knowledge and skills [16,17,20,41] and attitude [14,15,18,19]. Educational interventions, such as teaching research methods and EBP to undergraduate healthcare students, enhance a range of delivery methods and critical thinking skills applicable in clinical scenarios and promote positive attitudes and beliefs toward the values and relevance of EBP, which consequently influences positive EBP outcomes regarding attitude, skills, and knowledge [15,18,19].

The findings support nursing curriculums that foster EBP knowledge and research study and encourage EBP competence and confidence within the clinical setting. There are a variety of educational strategies for teaching EBP to undergraduate nursing students [42]. For example, the WHO identified the curriculum model at Glasgow Caledonian University, U.K., which designed EBP adoption along the study pathway [10] as effective. In these courses, students are instructed on the role and type of EBP in nursing and how to search, read, and understand global or public health articles and apply that knowledge to healthcare decisions.

This study showed that confidence in clinical decision-making and EBP preparedness was significantly associated with EBP knowledge, skills, attitude, and practice. The findings of this study are consistent with prior studies, which similarly highlighted that promoting feelings of confidence and preparedness by providing opportunities for students to master EBP skills successfully influences student intention to transfer EBP skills into their practice [21–23]. The linkage between confidence and preparedness can be cultivated from knowledge and skills in clinical teaching [21]. Moreover, the diversity of learning strategies has increased EBP scores and clinical questioning confidence [40,43]. As BSN programs in universities have included research methodology courses and EBP knowledge in the classroom and have integrated EBP through clinical practice, this could be why confidence in EBP was significantly related to learning, skills, practice, and EBP preparedness. When nursing students are placed in clinical practice, nurse educators encourage using their science skills to evaluate and critique research studies, select EBP or good clinical practice (GCP), and apply the findings to the care of their patients. This results in nursing students gaining confidence and feeling empowered within their clinical practice.

According to this study's analysis, journal access was related to EBP knowledge and skills, attitude, and practice. The study's finding of a positive correlation between journal access and EBP is similar to studies by Labrague [25], Rojjanasrirat [26], and Snow [27], which addressed that the use of EBP can be enhanced by increasing nursing students' access to journals, allowing them to conveniently attain knowledge on guidelines, practices, or evidence concerning EBP. Moreover, Labrague's study [24] on nursing students in four

Table 1
The total mean of S-EBPQ scores and subscales among undergraduate nursing students with different characteristics (n = 470).

Characteristics n (%)	S-EBPQ	t/F	P	Practice	t/F	P	Attitudes	t/F	P	Retrieving& reviewing evidence	t/F	P	Sharing & applying EBP	t/F	P	
Sex																
Female (88.5)	416	5.26 ± 0.70	6.73	0.087	5.16 ± 0.84	2.93	0.087	5.47 ± 0.94	5.10	0.238	5.08 ± 0.79	3.81	0.051	5.34 ± 0.86	5.15	0.057
Male (11.5)	54	5.52 ± 0.73			5.37 ± 0.79			5.77 ± 0.83			5.31 ± 0.91			5.62 ± 0.86		
Academic year																
3rd (51.5)	242	5.28 ± 0.70	0.04	0.838	5.16 ± 0.80	0.22	0.638	5.52 ± 0.89	0.19	0.662	5.10 ± 0.85	0.05	0.823	5.35 ± 0.86	0.22	0.639
4th (48.5)	228	5.30 ± 0.71			5.20 ± 0.88			5.48 ± 0.98			5.11 ± 0.77			5.39 ± 0.87		
Area of school																
North (21.4)	101	5.19 ± 0.68	9.29	0.052	5.03 ± 0.84	7.86	0.053	5.50 ± 0.86	5.42	0.058	5.01 ± 0.79	6.50	0.373	5.22 ± 0.88	6.35	0.438
Northeast (19.8)	93	5.49 ± 0.69			5.34 ± 0.81			5.75 ± 0.90			5.32 ± 0.77			5.54 ± 0.79		
East (20.2)	95	5.38 ± 0.64			5.35 ± 0.84			5.55 ± 0.90			5.13 ± 0.83			5.51 ± 0.79		
Center (19.6)	92	4.96 ± 0.71			4.84 ± 0.80			5.14 ± 0.96			4.80 ± 0.77			5.06 ± 0.91		
South (18.9)	89	5.44 ± 0.69			5.36 ± 0.78			5.57 ± 0.97			5.28 ± 0.79			5.55 ± 0.87		
Previous EBP studies																
Very low/low (6.2)	29	4.53 ± 0.72	39.22	< 0.001	4.43 ± 0.91	28.73	< 0.001	4.91 ± 1.08	11.91	< 0.001	4.25 ± 0.86	38.80	< 0.001	4.52 ± 0.76	27.94	< 0.001
Moderate (45.3)	213	5.14 ± 0.67			5.01 ± 0.82			5.39 ± 0.88			4.93 ± 0.77			5.23 ± 0.88		
More/most (48.5)	228	5.52 ± 0.63			5.43 ± 0.75			5.68 ± 0.92			5.37 ± 0.72			5.61 ± 0.77		
Familiarity with research methods																
Very low/low (21.3)	100	4.76 ± 0.66	63.24	< 0.001	4.67 ± 0.86	40.87	< 0.001	5.06 ± 0.98	25.08	< 0.001	4.50 ± 0.75	56.09	< 0.001	4.83 ± 0.81	38.86	< 0.001
Moderate (58.9)	277	5.32 ± 0.64			5.19 ± 0.78			5.51 ± 0.89			5.15 ± 0.72			5.41 ± 0.82		
More/most (19.8)	93	5.78 ± 0.55			5.69 ± 0.68			5.97 ± 0.75			5.61 ± 0.72			5.85 ± 0.75		
Confidence in practice																
Very low/low (4.0)	19	4.69 ± 0.66	57.48	< 0.001	4.53 ± 0.83	47.17	< 0.001	5.06 ± 0.90	17.74	< 0.001	4.44 ± 0.80	48.47	< 0.001	4.74 ± 0.89	39.24	< 0.001
Moderate (41.9)	197	5.22 ± 0.64			5.10 ± 0.78			5.44 ± 0.90			5.04 ± 0.72			5.31 ± 0.81		
More/most (54.0)	254	5.69 ± 0.60			5.62 ± 0.71			5.83 ± 0.91			5.52 ± 0.74			5.79 ± 0.76		
Preparedness in practice																
Very low/low (4.0)	19	4.53 ± 0.61	43.96	< 0.001	4.21 ± 0.87	38.02	< 0.001	5.14 ± 0.64	15.62	< 0.001	4.37 ± 0.73	34.62	< 0.001	4.41 ± 0.87	31.39	< 0.001
Moderate (41.9)	197	5.05 ± 0.67			4.94 ± 0.79			5.26 ± 0.98			4.84 ± 0.78			5.15 ± 0.83		
More/most (54.0)	254	5.53 ± 0.63			5.44 ± 0.77			5.72 ± 0.86			5.36 ± 0.74			5.62 ± 0.80		
Accessed EBP online																
Never/rarely (1.7)	8	5.09 ± 1.01	11.02	0.078	4.72 ± 1.17	14.02	0.056	5.25 ± 1.37	3.76	0.064	4.91 ± 1.15	8.08	0.082	5.47 ± 0.86	6.43	0.134
Sometimes (7.4)	35	4.77 ± 0.78			4.51 ± 0.96			5.11 ± 0.90			4.59 ± 0.85			4.87 ± 0.92		
Often/always (90.9)	427	5.34 ± 0.68			5.24 ± 0.80			5.54 ± 0.92			5.15 ± 0.79			5.41 ± 0.85		
Accessed EBP from journal																
Never/rarely (6.2)	29	4.80 ± 0.92	18.44	< 0.001	4.58 ± 1.03	18.08	< 0.001	5.10 ± 1.07	7.54	0.001	4.50 ± 1.05	15.60	< 0.001	5.01 ± 1.17	10.11	< 0.001
Sometimes (25.1)	118	5.08 ± 0.71			4.94 ± 0.77			5.31 ± 0.90			4.92 ± 0.80			5.14 ± 0.88		
Often/always (68.7)	323	5.41 ± 0.65			5.32 ± 0.80			5.61 ± 0.91			5.23 ± 0.76			5.49 ± 0.81		

Note: Data are n (%) and Mean ± SD. EBP = Evidence-based practice. S-EBPQ = the Student-Evidence-Based Practice Questionnaire.

selected countries (India, Saudi Arabia, Nigeria, and Oman) revealed a variety of open-access platforms making EBP research highly accessible to students. However, internet access was unrelated to EBP knowledge, skills, attitude, and practice. This result is inconsistent with previous studies [24–26] that found access to the internet helped nursing students obtain knowledge of research databases, given its significance for practices. Nursing students' access to the internet may be a tool to reach the evidence for training, such as guidelines or GCP, but not to enhance EBP knowledge and skills, practice, and attitudes. Information on the internet requires the skills to synthesize the evidence before applying it to clinical practice. A prior study found that nursing

students needed help with 'too much information' and 'cannot tell what is good information' when searching for evidence from the internet [21]. These results imply that technology access for nursing students needs to be accompanied by guidance from an expert on how to filter, analyze, and apply information, thereby increasing nurses' awareness and familiarity with EBP.

5. Limitations

However, some limitations should be considered. The study's cross-sectional design presented an association between variables; thus, the cause and effect of related EBP factors and knowledge and

skills, attitude, and practice may not be verified. The study sample was recruited from undergraduate nursing students in five universities with a convenience sample, which may limit the generalizability of findings. Further research should be extended to testing using a longitudinal approach and studying at multiple sites/locations.

6. Conclusions

EBP is a crucial competency for undergraduate nursing students. This study's findings serve as a baseline assessment for further evaluations and provide a basis for developing EBP-promoting strategies among nursing students. This study builds on the work of previous international studies by finding that EBP studies, research studies, confidence, preparedness, and journal access are the factors associated with EBP practice, attitude, knowledge, and skills. To enhance the EBP competency of undergraduate nursing students, the study findings reflected that integrating EBP courses and research studies into the nursing curriculum is necessary. Organizational support includes EBP learning and teaching innovation to raise students' EBP confidence and preparedness. Providing advanced technologies, human resources, a collaboration of EBP applications, and extra activities along the undergraduate nursing educational pathway are also recommended to promote students' EBP competency.

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CRediT authorship contribution statement

Apiradee Nantsupawat: Conceptualization, Methodology, Software, Data curation, Visualization, Investigation, Software, Validation, Writing- original draft preparation, Writing-reviewing and editing. **Orn-Anong Wichaikhum:** Conceptualization, Methodology, Software, Data curation, Visualization, Investigation, Software, Validation. **Kulwadee Abhicharttibutra:** Conceptualization, Methodology, Software, Data curation, Visualization, Investigation, Software, Validation. **Kedsaraporn Udkunta:** Conceptualization, Methodology, Software, Data curation, Visualization, Investigation, Software, Validation. **Lusine Poghosyan:** Writing- Original draft preparation, Writing-reviewing and editing. **Shefaly Shorey:** Writing- original draft preparation, Writing-reviewing and editing.

Data availability statement

The datasets generated during and/or analyzed during the current study are available from the corresponding author upon reasonable request.

Declaration of competing interest

The authors have declared no conflict of interest.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.ijnss.2023.06.002>.

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