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### Effects of Implementing a Two-Year Training-Supportive Plan on Acquisition of the Evidence-Based Practice Competency by the Nursing Students

**Background:** Teaching evidence-based practice in undergraduate nursing students is limited and requires a complex and step-by-step approach. The aim of this study was exploring the effect of a two-year educational-supportive intervention on undergraduate nursing students, evidence-based practice competency.

**Method:** This semi-experimental single-group study was conducted in Amol Nursing School from June 2017 to July 2019. Sixty-two undergraduate nursing students who were entered in same academic year, participated in this study as a census. After assessing the evidence-based practice competency, a two-year educational-supportive intervention was conducted. In the third year, students were taught how to design clinical questions and critique the use of its results in responding. In the fourth year, students performed the above activities under the supervision of faculty members. At the end of the course, the competency level of evidence-based practice was considered as one of the seven test stations, as a post-test.

**Results:** The average age of the students was  $20.46 \pm 0.92$  years and most of them (51.61%) were women. The evidence-based practice competency score of the students before and after the intervention was  $13.71 \pm 2.31$  and  $34.71 \pm 5.19$ , respectively, and this difference was statistically significant ( $P < 0.001$ ). Comparison of evidence-based practice competency scores based on gender did not show any statistical difference ( $P > 0.05$ ).

**Conclusions:** The findings showed that the educational-supportive intervention implemented to improve evidence-based practice competence of undergraduate nursing students was effective. Therefore, nursing education practitioners and planners can use this model to nursing education.

**Keywords:** Evidence-based practice, Competency, Nursing students

### آثار تنفيذ خطة التدريب الداعمة لمدة عامين على اكتساب طلاب التمريض كفاءة الممارسة المهنية على الأدلة

**الخلفية:** تدريس الممارسة القائمة على الأدلة في طلاب التمريض الجامعيين محدود ويتطلب نهجاً معقداً وخطوة بخطوة. كان الهدف من هذه الدراسة هو استكشاف تأثير التدخل التعليمي الداعم لمدة عامين على طلاب التمريض الجامعيين، وكفاءة الممارسة القائمة على الأدلة.

**الطريقة:** أجريت هذه الدراسة شبه التجريبية على مجموعة واحدة في مدرسة أمول للتمريض من يونيو ٢٠١٧ إلى يوليو ٢٠١٩. وشارك في هذه الدراسة ستون طالباً جامعياً من طلاب التمريض الذين التحقوا في نفس العام الدراسي. بعد تقييم كفاءة الممارسة القائمة على الأدلة، تم إجراء تدخل داعم تعليمي لمدة عامين. في السنة الثالثة، تم تعليم الطلاب كيفية تصميم الأسئلة السريرية ونقد استخدام نتائجها في الاستجابة. في السنة الرابعة، قام الطلاب بتنفيذ الأنشطة المذكورة أعلاه تحت إشراف أعضاء هيئة التدريس. في نهاية الدورة، تم اعتبار مستوى كفاءة الممارسة القائمة على الأدلة كواحدة من محطات الاختبار السبعة، كاختبار لاحق.

**النتائج:** كان متوسط عمر الطلاب  $20.46 \pm 0.92$  سنة ومعظمهم (٥١.٦١٪) من النساء. كانت درجة كفاءة الممارسة القائمة على الأدلة للطلاب قبل التدخل وبعده  $13.71 \pm 2.31$  و  $34.71 \pm 5.19$ ، وكان هذا الاختلاف ذا دلالة إحصائية ( $P < 0.001$ ). لم تظهر مقارنة درجات كفاءة الممارسة القائمة على الأدلة على أساس الجنس أي فرق إحصائي ( $P > 0.05$ ).

**الاستنتاجات:** أظهرت النتائج أن التدخل التعليمي الداعم الذي تم تنفيذه لتحسين كفاءة الممارسة القائمة على الأدلة لطلاب التمريض الجامعيين كان فعالاً. لذلك، يمكن لممارسي ومخططي تعليم التمريض استخدام هذا النموذج لتعليم التمريض.

**الكلمات المفتاحية:** الممارسة المسندة بالبيئة، الكفاءة، طلاب التمريض

### تأثير اجراء برنامج اموزشى-حمائى دو ساله بر كسب شايستگى عملكرد مبتنى بر شواهد توسط دانشجويان پرستارى

**زمينه و هدف:** اموزش عملكرد مبتنى بر شواهد در دانشجويان كارشناسى پرستارى محدود بوده و نیازمند رویکردی پیچیده و گام به گام است. هدف از این مطالعه بررسی تأثیر یک مداخله آموزشی-حمایتی دو ساله بر شایستگی عملکرد مبتنی بر شواهد دانشجویان کارشناسی پرستاری بود.

**روش:** این مطالعه نیمه تجربی تک گروهی در دانشکده پرستاری امل از خرداد ۱۳۹۶ تا تیر ۱۳۹۸ انجام شد. ۶۲ دانشجوی کارشناسی پرستاری به صورت سرشماری در این مطالعه شرکت کردند. پس از سنجش شایستگی عملکرد مبتنی بر شواهد، یک مداخله آموزشی-حمایتی دو ساله انجام شد. در سال سوم نحوه طراحی سوالات بالینی و نقد استفاده از نتایج آن در پاسخگویی به دانشجویان آموزش داده شد. در سال چهارم، دانشجویان با نظارت اعضای هیات علمی فعالیت های فوق را انجام دادند. در پایان دوره، سطح شایستگی عملکرد مبتنی بر شواهد به عنوان یکی از هفت ایستگاه آزمون، به عنوان پس آزمون در نظر گرفته شد.

**یافته ها:** میانگین سنی دانشجویان  $20.46 \pm 0.92$  سال بود و بیشتر آن ها زن (۵۱.۶۱٪) بودند. نمره شایستگی عملکرد مبتنی بر شواهد دانشجویان قبل و بعد از مداخله به ترتیب  $13.71 \pm 2.31$  و  $34.71 \pm 5.19$  بود که این تفاوت از نظر آماری معنی دار بود ( $P < 0.001$ ). مقایسه نمرات شایستگی عملکرد مبتنی بر شواهد بر اساس جنسیت تفاوت آماری نشان نداد ( $P > 0.05$ ).

**نتیجه گیری:** یافته ها نشان داد که مداخله آموزشی-حمایتی اجرا شده برای بهبود شایستگی عملکرد مبتنی بر شواهد دانشجویان کارشناسی پرستاری موثر بوده است. بنابراین، دست اندرکاران و برنامه ریزان آموزش پرستاری می توانند از این مدل برای آموزش پرستاری استفاده کنند.

**واژه های کلیدی:** عملکرد مبتنی بر شواهد، شایستگی، دانشجویان پرستاری

### نرسنگ طلباء كے ذريعہ ثبوت پر مبنی پريكس كى اہليت كے حصول پر دو سالہ تربيتي معاون منصوبہ كو نافذ كرنے كے اثرات

**پس منظر:** انڈرگریجویٹ نرسنگ طلباء میں ثبوت پر مبنی پریکس کی تعلیم دینا محدود ہے اور اس کے لیے ایک پیچیدہ اور مرحلہ وار نقطہ نظر کی ضرورت ہے۔ اس مطالعہ کا مقصد انڈرگریجویٹ نرسنگ طلباء، ثبوت پر مبنی پریکس کی قابلیت پر دو سالہ تعلیمی معاون مداخلت کے اثر کو تلاش کرنا تھا۔

**طریقے:** یہ نیم تجرباتی سنگل گروپ مطالعہ امول نرسنگ اسکول میں جون ۲۰۱۷ سے جولائی ۲۰۱۹ تک کیا گیا تھا۔ ۶۲ انڈرگریجویٹ نرسنگ طلباء جو ایک ہی تعلیمی سال میں داخل ہوئے تھے، نے مردم شماری کے طور پر اس مطالعہ میں حصہ لیا۔ شواہد پر مبنی پریکس کی قابلیت کا اندازہ لگانے کے بعد، دو سالہ تعلیمی معاون مداخلت کی گئی۔ تیسرے سال میں، طلباء کو یہ سکھایا گیا کہ کس طرح طبی سوالات کو فیژائین کیا جائے اور جواب دینے میں اس کے نتائج کے استعمال پر تنقید کی جائے۔ چوتھے سال میں طلباء نے مذکورہ سرگرمیاں فیکلٹی ممبران کی نگرانی میں انجام دیں۔ کورس کے اختتام پر، ثبوت پر مبنی مشق کی قابلیت کی سطح کو سات ٹیسٹ سیشنوں میں سے ایک کے طور پر، پوسٹ ٹیسٹ کے طور پر سمجھا جاتا تھا۔

**نتائج:** طلباء کی اوسط عمر  $20.46 \pm 0.92$  سال تھی اور ان میں سے زیادہ تر (۵۱.۶۱٪) خواتین تھیں۔ مداخلت سے پہلے اور بعد میں طلباء کا ثبوت پر مبنی پریکس قابلیت کا سکور بالترتیب  $13.71 \pm 2.31$  اور  $34.71 \pm 5.19$  تھا، اور یہ فرق شماریاتی لحاظ سے اہم تھا ( $P < 0.001$ )۔ جنس کی بنیاد پر شواہد پر مبنی پریکس کی قابلیت کے اسکورز کے موازنہ نے کوئی شماریاتی فرق نہیں دکھایا ( $P > 0.05$ )۔

**نتائج:** نتائج نے ظاہر کیا کہ انڈرگریجویٹ نرسنگ طلباء کی ثبوت پر مبنی پریکس کی اہلیت کو بہتر بنانے کے لیے تعلیمی معاون مداخلت مؤثر تھی۔ لہذا، نرسنگ ایجوکیشن پریکٹیشنرز اور منصوبہ ساز اس ماڈل کو نرسنگ کی تعلیم کے لیے استعمال کر سکتے ہیں۔

**مطلوبہ الفاظ:** ثبوت پر مبنی مشق، قابلیت، نرسنگ طلباء

## INTRODUCTION

Evidence-based practice is a problem-solving approach to health care delivery. Based on EBP, the best relevant studies are integrated with clinical expertise and patient values and lead to effective decision making (1). In fact, evidence-based practice is a new care model in nursing that uses new advances in clinical care, research methods, and information technology to make scientific and optimal decisions (2). In this method, HCWs avoid personal opinion in patient care (3) and improve the quality of care (4,5).

Evidence-based practice includes steps that include: converting the clinical situation into a answerable question, tracking down the best evidence through which to answer that question, critically appraising that evidence for its validity, impact, and applicability, and finally, integrating the critical appraisal with the present clinical expertise and with patient's unique biology, values and circumstances (6,7). Today, the use of evidence in nursing is not only a duty, but also a responsibility and professional behavior. Meanwhile, evidence-based practice is very negligible among nurses and nursing students (8). It is expected that health care system are based on scientific evidence, methods and decisions. However, many health cares are based on traditional trends, guesses, hypotheses, individual skills and unorganized clinical observations (9).

Quality of nurses' education and training can be one of the reasons for the lack of EBP. The difference in the education quality causes different level of the knowledge, skills and views of nurses, and ultimately their evidence-based practice is not the same (10). Although providing evidence-based practice is the foundation of high quality nursing care; some obstacles have been reported in Iran. These barriers include lack of sufficient skills, time and English language skills (11). Since the level of nurses' knowledge and skill has an effect on their EBP; so it is necessary that nursing students learn the skills of applying research findings in practice (12). But learning of EBP is a challenge for many nursing students, and teaching this skill requires a complex and step-by-step approach. The reasons for these challenges can be complexity of the patient's clinical condition, the theory – practice gap, and anxiety (13). However, teaching of EBP to undergraduate nursing students is very limited (14); some universities implement it in a traditional, teacher-oriented and limited way. While various teaching methods have been recommended for teaching of EBP (15). In a review study, it was shown that lectures, group activities with small group discussions, project supervision, practical training are the most common methods for teaching of EBP (16). Since the use of diverse learning approaches of EBP training is useful to increase students' interest and skill (17), therefore, the integration of different educational methods should be used to teach EBP skills (18).

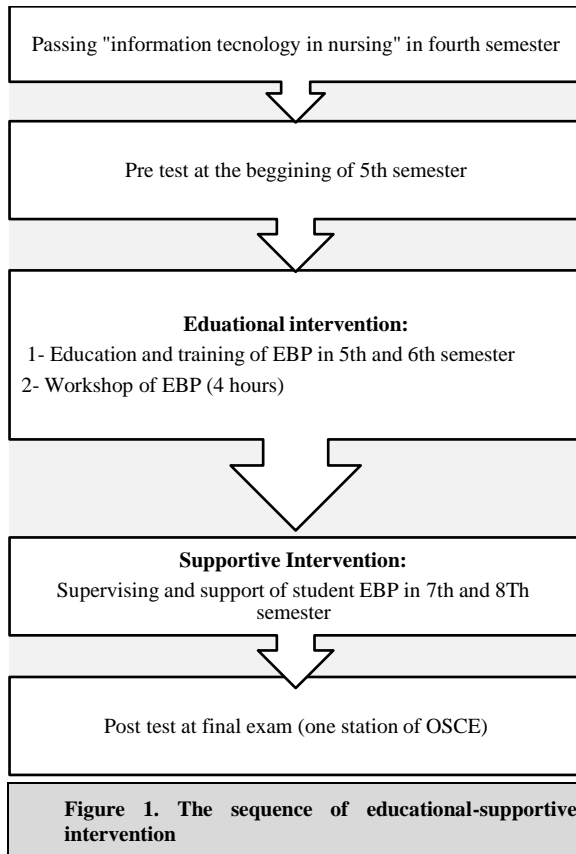
Therefore, the present researchers decided to design and implement a program for teaching of EBP skill in undergraduate nursing students based on a multi-faceted approach, and this study was conducted with the aim of investigating, the effect of a two-year educational-supportive intervention on EBP competency in undergraduate nursing students.

## METHODS

This study is a single group semi-experimental study that was conducted from 2018 to 2020 at Amol Nursing School. The participants were 62 undergraduate nursing students who entered the study after the end of the fourth academic semester, since in their faculty, "information technology in nursing" course is offered in the fourth academic semester of the Bachelor Nursing students. In this course, databases and search strategies are taught to students. The inclusion criteria was passing this course in the Amol Faculty with same teacher. Therefore, the transferred students to this faculty and students who came to this faculty after their fourth semester were excluded. In this way, two students were excluded.

At the beginning of the fifth semester, the level of EBP competency was measured using a checklist as pre-test. This checklist measured level of EBP competency with 6 items on a 7-point Likert scale. These six items included extraction of clinical question, determination of key words, best strategy of search, selecting an article, criticism of the article, and answering the clinical question based on the article. The EBP competency score was obtained by summing the scores of 6 items (0-42). Higher score was considered as better EB practice. This checklist is based on evidence-based nursing competency rating scale, dimension of searching for evidence, and criticism (19). This scale was translated by the study team and approved by the experts. Then a two-year educational-supportive intervention was carried out. All students participated in the evidence-based care workshop. This workshop was held by one of the faculty members in 4 hours. In addition, EBP competence placed in the portfolio of clinical training. According to the EBP section of portfolio, students were required to write a PICO clinical question in each clinical course and find the best evidence to answer their clinical questions with the appropriate keywords from appropriate databases. Students were attached related documents to their portfolio. These documents were approved by the direct instructor in the first year of the intervention (the third education year of the student) and group manager in the second year of the intervention (the fourth education year). Trained clinical instructors taught EBP to students in the third education year. This education included extraction of clinical questions, determination of key words, search strategy, select articles and critique of its results in answering to clinical questions (educational intervention). In the fourth education year (internships in the field), students practiced the above activities with the supervision and support of nursing faculty members (supportive intervention). At the end of BS education period, the EBP competency was placed as one of the 7 stations of the end-of-course exam. The present researchers then provided a computer system connected to the internet and the possibility of accessing valid databases and a clinical scenario to the students in this station. The students were required to specify the components of PICO; Write keywords and search in the database and choose the right article after reading the scenario. A faculty member was also present at the station as an evaluator. She evaluated the student's

practice at this station using a checklist. This checklist was the same pre-test checklist. The duration of this station was 7 minutes like other stations. The score obtained at this station was considered as a post-test and was compared with the pre-test. The work sequence is shown in the Figure 1. According to the EBP, the level of students' satisfaction with this educational-support program was also measured at the end of the course. For this purpose, a four-item questionnaire on a 5-point Likert scale was used. The student's satisfaction level was measured based on 20. The data was analyzed in SPSS-20 software using descriptive statistics and paired t-test.



**RESULTS**

The results showed that 32 students (51.61%) were female and 30 of them (48.39%) were male. The average age of the subjects was equal to 20.46(0.92) years old.

The comparison of students' EBP skill scores showed a significant increase both in the total score and in different dimensions (Table 1).

Also, according to our results, 48 students (77.42%) at the EBP station (end of the course) had good and very good scores (30-42), 12 students (19.35%) had average scores (18.99-29) and only 2 students (3.23%) had low scores. The average score of EBP was 18-30.

The comparison of the EBP skill score and the satisfaction of the students by gender showed that although the EBP score was significantly higher in women than in men, the difference in their level of satisfaction was not significant (Table 2).

**DISCUSSION**

This study was conducted with the aim of investigating the effect of a two-year educational-supportive intervention on EBP competency in undergraduate nursing students. The results showed that the EBP competency score of the students was statistically and significantly higher after the intervention than before the intervention. This result indicates that the intervention led to the improvement of EBP skills in nursing students. The effectiveness of the educational-supportive intervention used in this research may be related to its four characteristics. These four features included the use of a multiple teaching-learning approach,

**Table 1. Comparison of mean and standard deviation of EBP skill score and satisfaction of students according to their gender**

Variable	Gender	Mean(SD)	P value
EBP skills	Male	33.18(5.71)	0.015
	Female	36.33(4.07)	
Level of Satisfaction	Male	16.78(3.15)	0.499
	Female	17.27(2.43)	

**Table 1. Average and standard deviation of students' scores in different dimensions of EBP skill before and after supportive educational intervention**

Components of the evidence-based care (in base 7)	Before intervention	After intervention	P value	Cohen's d
	Mean(SD)	Mean(SD)		
Specifying the PICO components	1.66 (0.47)	6.34(0.70)	0.001<	7.850
Writing a clinical question using the PICO model	1.85(0.39)	6.35(0.85)	0.001<	6.805
Selecting the appropriate keywords	2.48(0.62)	5.26(1.16)	0.001<	2.989
Selecting the appropriate data source to search	2.55(0.67)	5.66(1.19)	0.001<	3.221
How to use the search operators	2.55(0.62)	5.63(1.30)	0.001<	3.024
Selecting the appropriate paper	2.61(0.66)	5.46(1.25)	0.001<	2.851
Total score	13.71(2.31)	34.71(5.19)	0.001<	5.353

holding an educational workshop, using portfolio, and training students in a supportive platform.

Therefore, the main findings of the study according to these characteristics were discussed. In the present study, two-year educational and supportive interventions were used, mainly a multiple teaching-learning approach, to improve students' evidence-based practice skills. This multiple approach was able to significantly improve the EBP skill score compared to before the intervention, although Visconti et al. does not recommend the use of the multiple method for undergraduate students due to insufficient cognitive maturity (20); however, the systematic review conducted by Yang et al showed that multiple interventions more than one intervention or no intervention led to improvement of students' knowledge, attitudes and skills in evidence-based practice (14). In line with this result, the experimental study conducted by Oh et al on nursing students also showed that conducting educational interventions including lectures, Team based learning, computer-based learning, and group projects along with students' presentations leading to the improvement of practice skills was based on evidence in them (17). The research results of Ruzafa (2013) and Kim (2019) have also stated that the use of integrated educational programs can lead to the improvement of knowledge, attitude, competence and skills of undergraduate nursing students (21, 22). The reason for these results may be that using multiple learning approaches helps students to integrate theory, research, and practice (17).

The second feature of the present intervention was holding training workshops in order to promote EBP. The results of other studies also showed that the use of training workshops is the most used method for teaching EBP (23, 24). For example, in the study of Hornvet (2018), educational workshops and small groups were used to improve EBP (25). Perhaps educational workshops can cause better learning due to the creation of small learning groups and practical involvement of students in work and forcing students to use theory in practice.

Another feature of our educational-supportive intervention is the use of portfolios in internships and the inclusion of EBP documentation as part of the portfolio. Portfolios is one of active learning strategies. Students provide evidence of their clinical learning activities using this written assignment (26). In the present study, the portfolio was used both as a way to learn and evaluate students, so that a part of it can be dedicated to EBP to provide an opportunity for the student to practice EBP in the section by doing the assigned task and getting the support and guidance of the instructors. In line with the results of the present study, other studies mentioned the usefulness of using portfolio to improve reflexivity, active learning, increasing student

participation, increasing satisfaction, and their academic progress (27-29).

In general, the results of this study showed the usefulness of training to improve EBP skills, which is in line with the results of some other studies (23, 25, 30). But the study conducted by Mena (2018) was contrary to the findings of the present study. Their findings showed that although the students' attitude and knowledge score increased, the skill score did not change (31). The reason for this difference can be that in the current study, final year nursing students were included. These students had completed all theoretical and clinical courses and also could improve this skill through the exercises in the portfolio under the support of their professors. Probably, the presence of more students in clinical environments and participation and cooperation with nurses has led to the improvement of their EBP (32, 33). On the other hand, the research was conducted on second-year students who had not completed the process of theoretical and clinical education. Also, the impact of clinical instructors, their communication with students, as well as their lack of evidence-based knowledge and practice skills were among the things that the author of the article mentioned (31).

Another finding of the present study was that most of the nursing students participating in the study were satisfied with the evidence-based training and practice evaluation process. Korean undergraduate nursing students who participated in the 4-week EBP training program also reported very high satisfaction (21). The reason for the students can be the multiple approach used for education, which gives students the ability to respond to clinical questions up-to-date.

The two-year educational-supportive program designed for undergraduate nursing students in this study was effective for improving EBP skills and improving their satisfaction. Therefore, it is suggested that this program be used for undergraduate nursing students and that students be supported for EBP at the bedside. Paying more attention to the educational approaches of evidence-based care in the nursing profession can be a valuable resource for improving the quality of nursing clinical services.

#### Ethical Considerations:

This study was approved by the Medical Ethics Committee of Mazandaran University of Medical Sciences with No: IR.MAZUMS.REC.1399.504

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**Conflict of Interest:** The authors declared no conflict of interest.

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