

Effect of a Training Program on Evidence Based Practice Profiles and Skills among Master Nursing Students

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Abstract:

Background: Master nursing students are strategically positioned to influence adoption of evidence based practice within the nursing profession. Educating master nursing students with core knowledge and skills for evidence based practice may be an effective strategy to increase their future use of evidence in their nursing practice to deliver high quality care and improve patient health status in a cost effective approach. **Aim:** Examine the effect of a training program on evidence-based practice profiles and skills among students enrolled in the Master of Science in nursing program. **Design:** A quasi-experimental design. **Setting:** The study was conducted at the Faculty of Nursing, Zagazig University. **Tools of data collection:** Two tools were used in this study the Evidence-Based Practice Profile Questionnaire (EBP2) and the Fresno Test of Evidence-Based Medicine. **Results:** A total of 45 master nursing students participated in the program and data collection. Less than 10% of participants had previous training about evidence based practice. Overall, scores were significantly increased. However, a sub score related to appraising evidence did not change and had a mean of 0 at both time points. Our 15-hour program with six hours of lecture and nine hours of small group exercises was effective at increasing knowledge of terminology, identifying clinical questions, searching for evidence, identifying the design and relevance of studies, and improving attitudes and confidence related to evidence based practice. Building skills for appraising evidence may need additional time or a different format for this group of participants. **Conclusion:** The training program was an effective strategy in making significant improvements in all domains of evidence based practice profiles and most skills related to evidence based practice inquiry among master nursing students. **Recommendations:** Further evaluation is needed to determine retention of the skill set and association of evidence based practice knowledge and skills on patient outcomes.

Key words: Evidence based practice, nursing students, graduate nursing education

Introduction:

Nursing students are strategically positioned to influence adoption of evidence-based practice (EBP) within the nursing profession.⁽¹⁾ Educating nursing students with core knowledge and skills associated EBP may be an effective strategy to increase their confidence and, in turn, their future use of evidence in their nursing practice to deliver high quality care that will have positive impact on patient health status.⁽²⁾ Graduate nursing education expands knowledge and refines practice by placing an increased emphasis on the application of research

and other types of evidence to influence or change nursing practice.⁽³⁾ Therefore we undertook to develop content about the knowledge and skills associated with EBP in our students enrolled in the Master of Science in nursing (MSN) curriculum and determine if a brief educational program was effective in increasing EBP inquiry in this sample.

EBP has been defined as the conscientious, explicit and judicious use of theory-derived, research-based information combined with clinical expertise while considering resources,

individual needs and preferences to make clinical decisions.⁽⁴⁾ EBP involves making clinical decisions informed by the most relevant and valid evidence available through integration of clinical expertise and patient preferences. Clinical expertise includes practitioner knowledge, skills and past experience in accurately assessing diagnosing and managing an individual patient health needs. Patient preferences refer to values, needs, concerns, expectations, and health status of the client. The integration of these elements increases the potential for positive health outcomes.⁽⁵⁾

Finding appropriate evidence requires asking a precise, searchable and answerable clinical question followed by methodically and systematically searching the medical, nursing and allied health databases to acquire the most pertinent evidence.⁽⁶⁾ The clinical question should be clear and focus on outcomes that are important in practice.⁽⁷⁾ The important elements in a clinical question are summarized in the acronym PICOT which stands for patient population (P), intervention or issue of interest (I), comparison intervention or issue of interest (C), and outcome(s) of interest (O) and time (T).⁽⁸⁾ The individual elements of the questions guide the development of the strategy for searching the literature.⁽⁹⁾

Assessing the quality of evidence is the next step in EBP and involves appraising the evidence for its reliability and validity. Next, the existing evidence is considered for its usefulness when implemented into routine practice. Finally, it is necessary to evaluate the effectiveness of the practice decision or changes based on outcomes. Ideally, dissemination of the process and outcomes is the final step in EBP.^(10,11)

Implementing EBP in nursing is theorized to benefit both patients and

healthcare systems. It enhances patients' access to information about effective treatment and promotes their satisfaction.⁽¹⁰⁾ EBP can facilitate consistent decisions about management and promote cost savings.⁽¹²⁾ Nurses who are involved in EBP have expressed a sense of professionalism and enhanced professional identity.^(13,14)

The absence of EBP training or course work in nursing curriculum has been viewed as a barrier to the use of evidence in nursing practice at all levels of education^(15,16). Graduate nursing students do not always possess adequate knowledge and skills necessary to find the evidence on which to base their practice, especially in the developing countries.^(17,18,19)

Significance of the study:

There are many international studies conducted on EBP in the field of nursing that examine clinical or academic factors that influence the acquisition of EBP skills and implementation of EBP. Few studies have been done in Egypt in general and there are no studies completed with MSN students as the sample in faculty of nursing Zagazig University. At our university, graduate courses offer high quality, effective, and relevant education in nursing and prepare nurses for leadership in research, teaching and clinical practice. However, neither class time, nor coursework has a focus that used or integrates the principles of EBP. We identified an urgent need to cultivate and inspire a culture of EBP especially among MSN students to equip them with the knowledge and skills necessary to facilitate their evolution as active and discerning consumers of research. Nearly 50% of our MSN graduates become faculty members and their influence on the education of nurses as well as the delivery of

nursing care requires the ability to apply EBP principles.

Aim of the study:

The aim of this study was to examine the effect of a training program on evidence-based practice profiles and skills among students enrolled in the Master of Science in nursing program.

Research Hypothesis:

- There is a difference in EBP profiles obtained before and immediately after implementation of the training program.
- There is a difference in skills related to EBP before and immediately after implementation of the training program.
- There is a relationship between the change scores obtained in EBP profiles and skills scores obtained at the end of the program.

Subjects and methods:

Design:

A quasi-experimental design was used.

Setting:

The study was conducted at the Faculty of Nursing, Zagazig University. Zagazig University was founded in 1974 as a governmental university to create and transfer knowledge that will shape citizens who contribute to their communities and lead their professions in a global society (www.zu.edu). The Faculty of Nursing consists of seven academic departments: Nursing Administration, Community Health Nursing, Pediatric Nursing, Medical Surgical Nursing, Psychiatric and Mental Health Nursing, Obstetric and Gynecological Nursing, and Geriatric Nursing. About 100 students are currently enrolled in the MSN program and typically about 57 new students begin in the first semester (fall).

Sample:

All 57 students enrolled in the MSN curriculum for academic year 2012-2013 University were invited to participate; all students had completed one semester (about 9 credits in the program). Only 45 students agreed to participate. There were no exclusion criteria.

Tools of data collection:

Two tools were used in this study: the Evidence-Based Practice Profile Questionnaire (EBP2) and the Fresno Test of Evidence-Based Medicine.

1- The Evidence-Based Practice Profile Questionnaire:

was developed by Mc Evoy, Williams and Olds⁽²⁰⁾ to measure knowledge, behavior, and attitudes related to EPB. The tool consists of two parts. The first part is personal data of participants; age, marital status, work setting, years of experience, academic specialty, and previous exposure to EBP training. The second part consists of 74 items each with a 5-point Likert scale. The first 58 items create a profile of five self-reported domains relating to EBP: (1) relevance (14 items) refers to the value, emphasis and importance placed on EBP; (2) sympathy (7 items) refers to the individual's perception of the compatibility of EBP with professional work (relevance and sympathy are considered measures of attitude by the authors); (3) terminology (17 items) refers to the understanding of common research terms and is interpreted as knowledge of EBP; (4) behaviors (9 items) refers to the use of EBP in clinical situations; and (5) confidence with professional work (11 items) refers to the perception of an individual's abilities with EBP skills. This tool contains an additional 16 non domain items (no scores) to

identify environmental and personal characteristics that might act as barriers or facilitators to EBP.

The range in scores for the EBP2 over all is 0-290. Each domain has a range of scores from zero up to 85 (i.e., 5 points for each terminology item). The range in scores for each domain of the EBP2 is listed in Table 2 with results.

The EBP2 has demonstrated good to very good test-retest reliability. Interclass correlation coefficients (ICCs) for domain scores ranged from 0.70 to 0.94 and the authors of the tool report an overall Cronbach's alpha value of 0.96.⁽²⁰⁾

2. The Fresno Test of Evidence-Based Medicine: was developed by Ramos, Schafer and Tracz⁽²¹⁾ and modified by Morris and Maynard⁽²²⁾ to measure skills related to EBP. It consists of two clinical scenarios. One scenario is used in the pre-test and the other scenario is in the post-test. Each scenario has seven short-answer questions that address EBP competencies. The range of scores is 0-156, overall, with each question having a maximum score of 24, except for question 1 that has a maximum score of 12⁽²²⁾. The Fresno Test of Evidence Based Medicine demonstrated good to excellent test-retest reliability and ICC range from 0.62 to 1.0 between items.⁽²¹⁾

The evaluations of each question on the Fresno Test were based on grading rubrics of Ramos, Schafer and Tracz.⁽²¹⁾ Little modifications were done on the grading rubrics by the first two authors (Appendix A). Accordingly, each response is assigned one of four levels: excellent, strong, limited, and not

evident. For example, the first question asks the respondent to construct a focused clinical question based on the scenario and the ideal answer includes the four components of PICO: patient population, intervention, comparison intervention, and outcome. If the student has all four components in the answer, the response is scored at excellent (12 points, maximum) while a response with only three components is scored at strong (9 points), two components yields a "limited" scores (6 points) and one component results in a score of 3 points.⁽²¹⁾

Content validity:

Before data collection, content validity was established for the tools by asking five faculty members at the Zagazig University, Faculty of Nursing to evaluate each item using a structured form addressing readability, clarity, and congruence with the definitions of the constructs and acceptability. Their comments, generally around selection of vocabulary and sentence construction, were used to revise the tools.

Field work:

The tools of data collection are in English, a shared language among faculty and students in this setting and were not translated.

Information about the program was distributed to students two weeks before the class. The program was scheduled at a time that would not conflict with the MSN courses. The program was in English, commonly used for nursing Faculty instruction at Zagazig University. Information about the program included date and time, place, topics, and duration of each session.

On the first day of the EBP program, the researchers explained the purpose of the study to the participants. Each participant received a packet with the research tools before instruction began. Tools were colored coded as a pre-program and post-program; participants were asked not to refer to their responses from their pre-program tools when completing the post-program tools. Students who did not wish to participate in the study were instructed to hand in blank tools or write "Do not include" on the first page. Thus, even the faculty conducting this research would not know if a specific student did or did not participate.

The intervention was a three day training program titled "Evidence Based Practice." The program consisted of three lectures, each followed by practice sessions (Appendix B). The entire program occurred over 15 hours (i.e., a total of 6 hours of lecture and 9 hours of practice) and 3 contiguous days (January 28-30). The program was implemented in a classroom that allowed students to work on computers with an internet connection.

Students were divided into groups of 5 to work on practice activities together. Practice activities were:

- formulating a precise clinical question, using the Patient-Intervention-Comparison-Outcome-Time frame (PICOT) format,
- developing a search strategy to include identifying the keywords and suitable databases and then conducting the search using computers provided in the lab, and
- Conducting a critical appraisal of the evidence found and answering the clinical question. For example, we provided a checklist⁽²³⁾ to use in the appraisal of randomized

controlled trials (RCT) study during lecture and encouraged students to use the checklist on at least one RCT during the practice sessions.

The teaching aids included power point slides, flip charts, handouts, and a list of sources referenced in the morning sessions along with sources for additional content. After the last activity on day 3, we summarized content and asked students to present results of their small group activity.

Pilot study:

A pilot study was carried on five MSN students and asked for feedback using the same structured tool; no further modification was suggested. Their timed response to complete the tools was 30-45 minutes. As these five MSN students attended the training program subsequently, we incorporated their data in our study as pre-program scores.

Administrative and ethical considerations:

A review of the study was obtained from the Dean of the Faculty of Nursing- Zagazig University and permission was granted to conduct the study. Students were informed of the purpose of the study and allowed to complete tools without faculty supervision. The participants were informed that their participation in the study was completely voluntary and there was no harm if they choose not to participate. Participants were assured that no individual information would be shared with faculty or others.

Statistical analysis:

The statistical package for social sciences (SPSS; www.spss.com) version 17 software was used to build a database and for all analyses. An alpha of .05 was selected as significant.

Continuous variables were summarized by means with standard deviations (SD) and categorical variables were summarized by frequencies. Paired sample t-tests were used to answer the first and second research questions. Pearson r was used to answer the third research hypothesis.

Results:

Table (1): Illustrates the characteristics of the participants. All 45 first year MSN students agreed to participate in the study and there was no attrition. The students were all women, with mean age of 28.5 years (SD 3.9). The majority were working in the educational setting. The highest percentage of participants were married and had not attended training courses about EBP (84.4 % & 91.1) respectively. The average years of nursing experience at the time of the program for participants was 8.8 years (SD 3.61) Students were fairly evenly distributed among the specialty programs in the School of Nursing with the exception of Psychiatric and Mental Health Nursing that had one student-participant enrolled. The distribution of study participants reflects the distribution of MSN enrollees in our setting.

Table (2): Shows the total and domain scores from the EBP2 tool. Because the range of domain scores is not consistent between domains we examined change scores as well. Change scores proportionately increased by a third or more in all domains, with the greatest proportion of change occurring in the domains of behaviors (45% increase) and confidence (43% increase) The table also has the results of the paired t-test values; the differences in scores from pre-program to post-program were all significant. The overall scores increased over 120 points from

baseline. Although the EBP2 is not “graded”, the score of 231 at the end of the program indicated an overall score of 80% correct responses.

Table (3): Shows the total mean scores from the Fresno Test of Evidence-Based Medicine. Before the program, the highest mean scores were in skills related to study design (3.93 or 16% of the total domain score) and searching for sources of information (3.13 or 13% of the total domain score). Scores in each category except magnitude and significance of the findings increased significantly after the program. The overall score also increased significantly; paired t-values and p values are also in Table 3. The final Fresno scores increased 73.47 points, an increase of 55% from baseline. While the Fresno tool is not graded, an achievement of 83.29 points in the post test indicates an overall score of 62% correct responses (i.e. 83.9, the achieved score, divided by 132, the maximum score).

For the third research hypothesis we examined the correlation between the final change scores of the two tools used in this study. Specifically we examined whether the increase in EPB2 score was related to the increase in the overall Fresno score. The Pearson’s r did not reach significance ($r = .19$; $p = .09$).

We also examined correlations between participant characteristics and change scores, finding significant, moderate positive associations between higher age and increases in the change score for the EBP2 ($r = .254$, $p = .03$ respectively). Correlations for characteristics of years of experience were not significant and all results are in **table 4**.

Using Kendall’s tau, we examined correlations between the presence of previous EBP training (categorized as present/absent) and the setting in

which the respondent practiced prior to enrollment in the MSN curriculum and the change score in the Fresno skills acquisition tool. Previous training was moderately positive ($\tau = .073$, $p = .32$). The association between the setting and change scores were also significant and indicated that a practice setting was correlated with the a greater change in scores

Discussion:

The healthcare sector worldwide is experiencing an increase in the volume of research-generated knowledge. High quality care is based on evidence and performed by knowledgeable, skilled professionals.⁽²⁴⁾ Educating nursing students with core EBP knowledge and skills may be an effective strategy to increase their ability to use best practices after graduate education.⁽²⁾ The aim of this study was to identify the effect of a brief, structured program on EBP profiles and skills among MSN students.

The results of this study included significant gains in the profile and skill set of participants who attended a brief EBP training program. However, only the EBP2 scores overall achieved 80% of the maximum score. The improvement in scores indicated that the program was a successful strategy to increase knowledge, attitude, and selected skills but that further effort is needed to achieve core skill competence, particularly EBP skills measured by the Fresno tool. Our results agreed with findings by Flores-Mateo and Argimon⁽²⁵⁾, Sabus⁽²⁶⁾, and Stern⁽²⁷⁾ all of whom reported moderate effects across the domains of knowledge, confidence, and attitudes among medical post-graduate students after exposure to EBP training. Long et al.⁽²⁸⁾ found significant changes in all domains of EBP profiles and the skills of EBP among physiotherapy students after exposure to an EBP program and

these findings were repeated by McEvoy et al.,⁽²⁹⁾ in physiotherapy students who increased scores in relevance, sympathy, terminology, practice, and confidence after exposure to EBP training. Manspeaker et al.,⁽³⁰⁾ demonstrated a significant increase in student knowledge and confidence in use of EBP skills following a evidence-based model of teaching. Similar to our study population, Wong et al.,⁽³¹⁾ who found that there were improvements in graduate nursing students EBP knowledge, skills, and confidence following EBP training.

Others have reported no effects from education about EBP. Brancato⁽³²⁾ indicated there were no changes in attitudes and behaviors of nursing students toward EBP after exposure to academic and clinical education. Mollon et al.,⁽³³⁾ reported no statistically significant changes in practice, attitudes, and knowledge/skills of staff nurses after an educational intervention.

It may be the previous exposure of the participants to courses in statistics and nursing research taught in the first semester of the MSN curriculum contributed to positive findings, but given the low scores existent before the EPB program, prior exposure to statistics or research was not a useful strategy to promote EBP knowledge and skills in our students. While previous training in EBP appeared to have a positive, moderate correlation with the change score, the number of participants with previous exposure to EBP content was small. Nonetheless, this study support the usefulness of a specific EBP program to develop the knowledge, attitudes, and skills of graduate nursing students necessary to practice in today's environment worldwide.

Brown et al.,⁽¹⁷⁾ and Chism⁽³⁴⁾ identified several barriers to use of the EBP process which include time in

searching for evidence, available resources, and agreement with class information, lack of experience/knowledge of research processes and lack of knowing how to use research. Our respondents were also able to identify barriers with an acceptable post-program score of 65/80 (81%).

Unlike McEvoy et al.,⁽³⁵⁾ who reported the biggest change score in the domain of terminology, we found the greatest change scores occurred in behaviors and confidence. However, terminology did increase 41% over baseline, an increase very close to values in behaviors and confidence. Our findings contrast with Long et al.,⁽²⁸⁾ who found that the physiotherapy students reported their highest mean score of EBP domains was related to relevance.

Taylor et al.,⁽³⁶⁾ did not find a change in sympathy domain for clinicians toward evidence based medicine after a stand-alone course. Our findings of increased scores in the domains of relevance and sympathy toward EBP are supported by Dawes et al.,⁽³⁷⁾ who suggested that sympathy (attitudes) towards EBP are 'caught' rather than 'taught', as part of immersion in the professional culture. It may be that having an intense weekend exposure to this content rather than a typical weekly academic class approach benefited participants.

Pre-program scores were highest in student design and sources of information. However, for these pre-program score, the average was less than 20% for each domain in the Fresno tool. These results were concerning, particularly as study participated in semester long research course prior to the EBP weekend program. Post program scores were only 67% of the total for Design and 58% of the total for Information Sources. We suggest this content must

be particularly difficult to master and that faculty and educators in EBP may want to focus additional time and effort in promoting mastery of these skills in graduate students. While other educators have reported similar gains in the ability to identify the study design and sources of information after EBP program^(38, 39), we note that these gains may not be sufficient to achieve competence.

While none of MSN students had the skills to identify the relevance of the study characteristics, internal validity of the study, and magnitude & significance of findings before the EBP program, there were improvements in these scores after implementation of the program with the exception of skills related to magnitude & significance of findings (i.e., the score remained at zero) Students may need more time or more practice to adopt skills related to critical appraisal. Our results agree partially with findings from Morris and Maynard⁽³⁹⁾ who reported that none of the nursing students had the skills for determining the relevance of study characteristics, magnitude & significance of findings at baseline. Unlike Morris and Maynard, our students did not improve in determining the magnitude and significance of findings after education about EBP. We suggest adding a specific exercise with group and individual feedback that addresses the magnitude and significance of findings. Developing mastery of this content will clearly improve the overall Fresno score.

Our study showed no significant correlations between the overall change scores of EBP profiles and skills among MSN students before and after implementation of the program. The lack of correlation between the two tool total scores may be that these tools measure unique constructs related to EBP and that both are necessary to

evaluate gains in knowledge and attitude (EBP2) and skills (Fresno). As suggested by McEvoy et al.,⁽²⁹⁾, teaching about evidence based practice (e.g., searching and retrieving relevant literature as well as critically appraising and disseminating the findings) does not necessarily bring about a change in practice (behavior). Perhaps re-evaluating students after an opportunity to practice EBP in the classroom (e.g., a clinical course) or in a practice setting as a course-related assignment would further change behavior and improve Fresno scores.

Conclusion and Recommendations:

The EBP program demonstrated the effectiveness of increasing knowledge, attitudes and skills related to EBP in the sample when content was delivered as a brief program. While a brief program increased scores in sub-categories and overall, further study is needed to determine what scores reflect competency and whether these changes scores persist after the program and result in practice changes. Based on the discussion and our findings, we suggest that nursing faculty who wish to integrate concepts of EBP into the graduate curriculum to prepare students in EBP knowledge, attitude and skill can consider a brief educational program. Further evaluation is needed to determine retention of the skill set and association of EBP knowledge and skills on patient outcomes. Ongoing programs or incorporation of learning activities in established courses should be considered to further develop competency in MSN students to establish and maintain competency in EBP.

Limitations of the study:

The use of small sample size in only one setting may limit the generalization of this study.

Table (1): Characteristics of Participants (n=45)

Item	Number	Percent
Age in years:		
▪ 20-	16	35.6%
▪ 25-	15	33.3%
▪ 30+	14	31.1%
Mean ±SD	28.5 ±3.9	
Work setting:		
▪ Educational setting	25	56%
▪ Hospital setting	20	44%
Marital status:		
▪ Single	7	15.6%
▪ Married	50	84.4
Years of experience :		
▪ <5	6	13.3%
▪ 5-	19	42.2%
▪ ≥10	20	44.5%
Mean ±SD	8.8 ± 3.61	
Attended Training courses about EBP previous to this education;		
▪ Yes	4	8.9%
Academic Nursing Specialty		
▪ Psychiatric and Mental Health	1	2.3 %
▪ Administration	15	(33.3%
▪ Community Health	10	(22.2 %
▪ Obstetric and Gynecological	9	20.0 %
▪ Pediatrics	5	11.1 %
▪ Medical surgical	5	11.1 %

Table (2): The changes in domains of EBP profiles mean scores among Master of Science in nursing (MSN) students throughout the program (n=45)

Domains of EBP profiles	Pre-program (n=45)			Post program (n=45)			Change in score	Difference scores Paired t -test values	P-value
	Mean	±	SD	Mean	±	SD			
1-Relevance									
Range of potential scores 0-70	26.84	±	5.05	55.08	±	6.56	+ 28.2 (32%)	23.13	<0.001**
2-Sympathy									
Range of potential scores 0-35	13.64	±	2.31	27.08	±	2.66	+13.4 (38%)	29.50	<0.001**
3-Terminology									
Range of potential scores 0-85	32.31	±	5.64	67.40	±	5.42	+35.0 (41%)	31.03	<0.001**
4- Behavior (Practice)									
Range of potential scores 0-45	17.22	±	6.88	37.33	±	4.45	+20.1 (45%)	18.39	<0.001**
5- Confidence									
Range of potential scores 0-55	21.51	±	4.99	45.02	±	4.29	+23.5 (43%)	25.80	<0.001**
Total mean score	111.53	±	15.4	231.97	±	15.40	+120 (42%)	38.44	<0.001**
6- Barriers and facilitators to EBP									
	32.91	±	4.75	65.57	±	6.83		29.79	<0.001**

Abbreviations: SD = standard deviation; EBP = Evidence Based Practice

Table (3): Results of Fresno Test of Evidence-Based Medicine scores among MSN students (n=45)

Skills Items	Pre-program (n=45)			Post program (n=45)			Paired t- test	p -value
	Mean	±	SD	Mean	±	SD		
1-Writing a focused clinical question (maximum score = 12)	1.60	±	2.27	9.80	±	2.43	-19.04	<0.001**
2-Source of information (maximum score = 24)	3.13	±	3.83	16.20	±	3.60	-16.98	<0.001**
3-Study design (maximum score = 24)	3.93	±	3.82	14.73	±	4.09	-14.11	<0.001**
4-Search strategy to retrieve evidence(maximum score = 24)	1.75	±	3.3	16.07	±	3.74	-20.64	<0.001**
5-Relevance of study characteristics (maximum score = 24)	0.00	±	0.00	11.37	±	9.568	-7.977	<0.001**
6-Internal validity of the study (maximum score = 24)	0.00	±	0.00	12.02	±	8.812	-9.152	<0.001**
7-Magnitude & significance of findings (maximum score = 24)	0.00	±	26.48	0.00	±	17.73	-10.02	<0.001**
Total mean score								
Maximum score = 132	9.8222	±	10.46	83.29	±	19.48	-23.32	<0.001**

Abbreviations: SD = standard deviation

Table (4): Correlation between change scores and characteristics of the participants

Participant Characteristic	Correlation with EBP2 total score		Correlation with Fresno total score	
	r	p	r	p
▪ Age	r = .254	p = .03	r = -.091	p = .27
▪ Years of experience	r = .207	p = .08	r = -.117	p = .22
▪ Setting	.144	P=.17	-.348	P= .01
▪ Previous training	.275	P=.03	.073	P= .32

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Appendix A

The adapted grading rubrics of Ramos *et al.* (2003)

	Not evident (0)	Limited (3)	Strong (6)	Excellent (8)
Question two:				
Sources (8scores)	non	Write one type	write two types	Write at least four types of sources
Advantage (8scores)	non	write one	write two types	Write more than three
Disadvantage (8scores)	non	write one	write two types	Write more than three
Question four				
Terms (8scores)	non	Write one term	Write two terms from PICOT	Write three or more terms
Field (8scores)	non	Write not applicable fields	Name one or more fields	Discuss one or more fields
Limit (8scores)	non	Write not applicable methods	Describe only one common method	Describe more than one approach to limit search

Question 3

	Not evident (0)	Limited (6)	Strong (9)	Excellent (12)
Study design (12 scores)	non	Describe or name less desirable study design	Describe a desirable study design but does not call by name	Name one of the best sources
Rational (12 scores)	non	Little justification	Justification is present	Well-reasoned justification
Question7				
Statistical significance (12 scores)	non	Name only one concept related to statistical significance	List more than one concept with insufficient or absent discussion	Response must clearly discuss both; definition of statistical significance and examples
Magnitude(12 scores)	non	Response suggests only consideration of clinical significance	Response discuss one but not both	Response must clearly discuss both; definition of clinical significance and examples

	Not evident (0)	Limited (10)	Strong (18)	Excellent (24)
Question five (24 scores)	No discussion	Response implies consideration of how well the study address the question at hand, but offer little discussion	Less thoughtful discussion of the relevance of the independent and dependent variables	Well-reasoned and thoughtful discussion of the relevance of the independent and dependent variables including examples
Question six (24 scores)	non	Identify 2 specific issues	Identify 3-4 specific issues	List or describe at least 5 issues important to internal validity

Appendix B

Content		Date	Time	Place	Duration of session
Theoretical part	Practical part				
<ul style="list-style-type: none"> -Introduction to evidence based practice. -Definition of the evidence based practice. -Benefits of use evidence based practice in nursing. -Barriers & facilitators to applying the evidence based practice. -Steps of evidence based practice process. 	Formulating a precise clinical question, using the Patient-Intervention-Comparison-Outcome-Time frame (PICOT) format	28-1-2013	09-11 Theoretical part	Graduate classroom - faculty of nursing- Zagazig university (3 rd floor)	5 hours
<ul style="list-style-type: none"> -Methods of how to accessing and searching databases for evidence. -Advantage and disadvantages of each source of information. 	Developing a search strategy to include identifying the keywords and suitable databases and then conducting the search using computers provided in the lab	29-1-2013	11.30-2.30 practical part		5 hours
<ul style="list-style-type: none"> Research designs -Definition& purpose of research design -Classification of clinical study design -Advantage and disadvantages of each types of design -Definition& types of validity -Issues important to internal validity -Definition of reliability -Different between statistical significance & clinical Significance. 	Conducting a critical appraisal of the evidence found and answering the clinical question.	30-1-2013			5 hours

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