Effect of an Evidence Based Practice Program on Nurse's Knowledge and Practice

Samah Hassan Abdel-Aziez [(1)], **Salwa Abbas Ali** [(2)] **Fatma Gouda Metwally** [(3)] **& Wafaa Mooustafa Mohammed**[(4)]

[(1)]Teaching Specialist of Nursing Sciences, Zagazig Technical Institute, [(2)] Professor of Community nursing, Faculty of Nursing, Zagazig University, [(3)] Lecturer of nursing Administration, Faculty of Nursing, Zagazig University, [(4)]Lecturer of nursing Administration, Faculty of Nursing, Zagazig University.

Abstract

Background: Increasing demand for patient safety and quality healthcare requires translation of best evidence into practice. **Aim of the study:** To investigate the effect of an educational program on nurse's knowledge, and implementation of EBP. **Subjects and Methods: Research Design:** A quasi-experimental design was used to evaluate the effect of the program. **Setting:** the study was conducted at Al-Ahrar General Hospital. **Subjects:** a purposive sample of 46 supervisor nurse. **Tools of data collection:** A structured interview questionnaire covering nurses' demographic characteristics, knowledge, readiness, and implementation about EBP. An educational program developed based on literature and identified needs was implemented and its effect was evaluated through immediately post- test and other one three months later. **Results:** Pre-program, the study revealed 87% of poor nurse's knowledge, low readiness toward EBP with absence of its implementation, while immediately post-test nurses showed high knowledge among 70% of the studied nurses and 82% of them practiced EBP moderately. Statistically significant relations were found between nurses' general characteristics and total knowledge, readiness, and implementation of EBP. With significant correlations between total mean scores of nurses' knowledge, readiness, and implementation. **Conclusion:** implementation of the educational program had a positive effect on nurses' knowledge, readiness, and implementation toward EBP. **Recommendations:** EBP skills must be learned to clinical nurses and the problem-based learning strategy and practice-based small group (PBSG) learning approaches should be used. Further studies in other hospitals to assess nurses knowledge and practice for EBP.

Key words: Evidence Base Practice, Research, Nurses, Educational Program.

Introduction:

Evidence based nursing practice (EBP) is an approach that enables nurses to provide the highest quality care based on the available best evidence, which in turn, positively affects the outcome of nursing interventions, to improve patient outcomes currently and in the future. It is important that an evidence-based approach of nursing care be incorporated into clinical practice settings. Thus, it is necessary to prepare nurses with competencies and key concepts of EBP [(1).]

Two factors have created the urgency for nursing to be engaged in EBP. The first is the priority place of EBP in current health policy in the advanced countries as a mean of delivery of effective and efficient health care. Another factor is that other health professions are becoming more accomplished at using evidence in their decision making. If nurses do not get involved in EBP, they will find themselves increasingly isolated and powerless [(2)].

Nurse leaders can develop, coordinate, and mobilize task forces to assure a smooth transition and adaptation of nurses to technological

advancements that will impact nursing practice. Nurse leaders are also responsible for bridging the gap between strategy decisions and the reality of implementing the changes within the structure and workforce of the organization [3].

Educational strategies have an important role to educate nurses about EBP, a problem-based learning strategy in the clinical setting, used as a cornerstone in teaching EBP to make it more reality-based and overcome some of the barriers to EBP implementation. This need for EBP education comes at a time when there is a demand for safety and increasing quality in patient care [4].

Significance of the study:

Although, Evidence Based Practice is of high importance to nurses, they often fail to incorporate current research findings into their practice. This lack of evidence use contributes to patients receiving care. According to current scientific evidence some of patients, usually between (20 - 25%) who receive care that is not based on research findings, receive potentially harmful care [5].

Aim of the study:

The aim of the current study was to investigate the effect of an educational program on nurse's knowledge, readiness, and implementation of evidence based practice at Al-Ahrar General Hospital

Research design:

A quasi-experimental design was utilized in this study.

Study setting:

The present study was conducted in the continuing educational unit at Al-Ahrar General Hospital.

Study subjects:

A convenience sample of 46 nurses with the following inclusion criteria:

- Minimal qualification was a baccalaureate degree in nursing.
- Their experience more than one year in their current position.
- Agreed to participate in the study.

Tools of data collection:

Three different tools were used to collect data for the present study that developed by three different reviews and adapted by the researcher.

Tool I: Stevens Academic Center for Evidence-Based Practice (2005) [6]: that contains three different forms of self-reported questionnaires:

- The first one: personal characteristics of the studied sample as "age, marital state, education, and etc...."
- The second measures the level of knowledge among the studied sample about evidence based practice "10 items".
  Scoring system: The responses were two score for correct answers, one score for correct incomplete answers, and zero for incorrect answers. The total score was "30 marks"; scores of each nurse were calculated and converted into percent score by dividing the nurse's total score by the maximum possible score. Scoring system represents knowledge levels of nurses' ranging from poor (<50%), average (50-<75%) to good (≥75%).
- The third questionnaire form that measures self-reported confidence in EBP competencies "20 items" Likert-type scale among the studied sample.
  Scoring system: The responses of the participants were measured on three-point ratings as a great extent, moderate extent, and a little extent scored as 3, 2 and 1. The total score was "60 marks" score of

each nurse was calculated and converted into percent score by dividing the nurse's total score by the maximum possible score. Scoring system represents nurses' confidence toward EBP ranging from low (16-30), moderate (31 - <46) to high (≥47).

Tool II: developed by **Melnyk and Fineout-Overholt (2008**) [7], and contains two separate questionnaires for the advancement of EBP as:
Evidence-based practice implementation scale (EBPI), is a self-reported 18-item scale that measures the extent of actual EBP implementation by the respondents. It allows the participants to respond to each of the statements on a 5 point frequency scale by indicating how often in the past 8 weeks they performed the item.
Scoring system: The response alternatives were fulfilled into three categories, namely "0 times", "1 to 5 times" and "6 times or more". The total score was "54 marks"; scores of each nurse were calculated and converted into percent score by dividing the nurse's total score by the maximum possible score.

Evidence-based practice belief scale (EBPB), is a self-report 16-item scale that measures the degree of belief in EBP by the respondents.
Scoring system: The responses of the participants were measured on three-point ratings as "agree, neutral, and not agree" scored as 3, 2 and 1. The total score was "48 marks" score of each nurse was calculated and converted into percent score by dividing the nurse's total score by the maximum possible score. Scoring system represents that nurses' beliefs regarding EBP ranging from negative (16-30), neutral (31 - <40) to positive (≥41).

Tool III: The Evidence-Based Practice Attitude Scale (EBPAS) that developed by **(Aarons, G.A. 2004)** [8], that contains 7 items measuring the attitude of participants to share in EBP implementation.
Scoring system: The responses of the participants were measured on three-point ratings as a great extent, moderate extent, and a little extent scored as 3, 2 and 1. With a total score of (21 marks), the total score for each nurse was calculated and converted into percent score by dividing the nurse's total score by the maximum possible score. Scoring system represents nurses' attitude toward EBP ranging from negative (6-10), neutral (11 - <16) to positive (≥17).

Content validity and reliability:

Face and content validity were done for the tools by five expertises in the field of nursing administration, and necessary modifications were done. The reliability of the tool was tested using the internal consistency method. It proved to be high with Cronbach's alpha reliability coefficients 0.902.

Work field:
The researcher started to collect data through the following phases:

Preparatory phase: A review of related literature and theoretical knowledge of various aspects of the study; using books, articles, internet, periodicals, and magazines were done, to develop the structured interview questionnaire, for nurses' knowledge, readiness and implementation of EBP. An educational program had been developed for nurses based on actual assessment of their needs after testing of their knowledge and practice regarding EBP. The objective of the program was to improve the nurses' knowledge and practice about EBP.

Total duration of the program was 16 hours, divided into (6) hours theory and (10) hours for practice (that included searching on the internet).

Assessment phase: this was the first phase in the program, where the needs in knowledge and practice were identified in (pre-test) through the collection and analysis of the baseline data from the filled tools.

Planning phase: For planning the program, the following were taken into consideration; identifying the important needs of nurses, set priories, goals, and objectives which should reflect nurses' knowledge, readiness, and implementation of evidence based practice.

Implementation phase: the educational program designed for this study has been implemented through 8 sessions. These sessions lasted for 16 hours; 6 hours of theory (two hours for each theoretical session), and 10 hours of practices (two hours for each practical session). It was difficult to take the whole number of subjects at the same time; the nurses were divided into three groups "in days off from emergency within the hospital, so the workloads become less".

Evaluation phase: This focused on estimating the effect of the educational program on the nurse's knowledge and practice about EBP by applying the same tools used in the pre-program assessment. The program evaluation was applied two times for nurses, after the program one occurred immediately after completion of the educational program and the other was done three months later.

Pilot study: A pilot study was carried out on 5 nurses who met the study criteria.

Administrative & Ethical considerations:

An official letter was sent from the Faculty of Nursing to the responsible authorities of the study setting to obtain their permission for data collection. The oral consent was obtained from subjects who agreed to participate in the study and assured about confidentiality and anonymity of the study.

Statistical design:

Data entry and statistical analysis were performed using computer software, the statistical package for social sciences (SPSS), version 14. Suitable descriptive statistics were used such as; frequency, percentage, median, range, mean and standard deviation. One-way analysis of variance (ANOVA) test was used to detect the relation between the variables. In addition, correlation coefficient (r) test was used to estimate the closeness association between variables. For all the tests used, statistical significance was considered at p–value < 0.05.

Results:

Table (1) described that, the majority of the studied sample (84.8%) aged between 25-45 years and the most of them (91.3%) were married. About three quarters of participants had a bachelor degree in nursing, while 26% of them had a master degree in nursing, 54.3% of the studied sample had more than ten years of experience, and 82.6% of them worked as clinical supervisors.

Figure (1) demonstrated that 87% of the studied nurses pre-program had poor knowledge regarding EBP, while immediately post-program 70% of nurses had good knowledge about EBP, decreased after three months to reach 33% and 50% of them had moderate knowledge, and only 17% had poor knowledge.

Figure (2) portrays that pre-program 63% of the study nurses had

moderate self-reported confidence about EBP and 28.3% had low confidence, but immediately post-program 47.8% of nurses reported high confidence about EBP and half of them showed moderate confidence. At the follow-up phase the high percent decreased to reach 10.9%, while the moderate confidence toward EBP reached 82.6%.

Figure (3) showed that half of nurses had a positive belief about EBP pre-program, while immediately post-program this percent increased to reach 74%, and decreased in follow-up phase to reach 54.3%.

Figure (4) revealed that 65.2% of nurses expressed neutral attitude toward EBP and 21% of them expressed negative attitude toward EBP pre-program implementation, but immediately post-program the nurses' attitude became positive as reported by 67.4% of the study nurses and continue to increase after three months reaching to 91.2%.

Figure (5) indicated that pre-program all of the study nurses didn't implement EBP, while post-program 82.6% of them had moderate implementation of EB related activities. While 15.2% were more frequently practicing EB activities. At the follow-up phase, 60.9% of nurses moderately applied EBP and 34.7% of them applied EBP more frequently. Most of these activities belonged to the beginning level of EB implementation.

Table (2) clarified that the most frequent EBPI activities among the study subjects were "collected data on patient problems, generated a PICO question about clinical practice, informally discussed evidence from a research study with a colleague, shared an EBP guideline with a colleague, accessed the Cochrane database of systematic reviews, and promoted the use of EBP with colleagues" as (80.4%, 54.3%, 41.3%, 36.9%, 36.9%, 36.9% respectively).

Table (3) illustrated the relation between the general characteristics of the study nurses and their knowledge about EBP. The results revealed the presence of statistically significant relation between nurses age, qualification, job title, and their knowledge about EBP ($P<0.042$, $P<0.001$, and $P<0.045$ respectively). also, nurses readiness toward EBP thus revealed statistically significant relations between nurse's confidence about EBP and their qualification and years of experience ($P< 0.001$, $P< 0.011$), nurses belief in EBP and their qualification ($P< 0.020$), and nurses attitude toward EBP and their age ($P< 0.050$).

Table (4) indicated that the total mean score for nurses' knowledge, readiness, and implementation of EBP increased immediately post-program with a slight decrease at three months later, except for nurse's attitude toward evidence that increased at three months later than immediately post-program. The table showed statistically significant relation between nurses' knowledge, readiness "confidence, beliefs, attitude" and implementation of EBP as ($P=0.001$, 0.001, 0.011, 0.002, 0.001 respectively).

Discussion:

Among the study sample, about three quarters of them had only a baccalaureate degree in nursing, and the remaining quarter had the Master degree. This may be due lack financial or moral support by the hospital administration to nurses who had gotten Masters and Doctorates in the same line *Hassan* [9] in Egypt and *Polit & beck* [10] determined the shortage of appropriate role model nurses is a

major barrier to bridge the research practice gap. *Mehrdad and Salsali* [5] Also stated that many organizations have failed to motivate or reward nurses resulting in the absence of role model that may stimulate nurses to participate in research activities.

The current study showed that the majority of the study nurses had poor knowledge about EBP pre-program. This revealed ineffective in-service training programs within the study setting. As found the study conducted by ***Ezz-Elarab*** [11] in Egypt that 20% of subjects in their study didn't learn about EBP anywhere. They considered this an increased percent and the cause may be ineffective in-service training within Egypt, which is commonly limited to practical training only. Another possible explanation for this finding was stated also by ***Hulme*** [12] who referred the cause to that integration of EBP content in the curriculum of nursing programs was conducted only during the last few years, leading to low level of nurses' knowledge regarding EBP.

This was also supported by *Tamim* [13] who indicated that integrating EBP was faced with a number of challenges, some of them are related to the insufficient previous educational preparation. Moreover, *Schmidt & Brown* [14] also saw that nurse educators may be simply teaching nursing students to be passive recipients of EBP content rather than active users and adopters of EBP. They noted that many of the teaching strategies identified are only academic exercises failed to help students translate EBP into practice changes.

On the other hand, the results of this study revealed a statistically significant increase in total nurses' knowledge score regarding EBP immediately post educational program relative to pre-program as; 22% of nurses showed an average level of knowledge and 70% of them revealed high knowledge level post program. This finding was in agreement with *Clarke* [15] who found that health careers' knowledge of services and participation increased as a result of an educational program. As well, *Tyson and York* [16] who stated that significant improvement in nurses' knowledge after attending an educational program emphasized the need of hospital nurses to attend more educational opportunities to strengthen their skills, update their knowledge, and improve the quality of care provided to patients.

Concerning the relation between nurses general characteristics and their knowledge about EBP, the present study found a statistically significant relation between total nurses' knowledge score and their age ($P<0.042$) and job position ($P<0.045$). This was also observed in the study conducted by *Ez elarab* [11] in Egypt, and *Koehn* [17] in Australia. Moreover the present study found a statistically significant relation between total nurses' knowledge score and their qualification ($P<0.001$), this this result was in accordance with *Mollon* [18] in San Diego State University, USA.

Regarding implementation of EBP, the results of the present study revealed absence implementation of EBP among all of the study nurses before carrying out the educational program, this may be due to numerous reasons as: lack of knowledge regarding evidence-based strategies, misperceptions about research and evidence-based care, lack of skills about how to search for and appraise evidence, demanding patient workloads, fears about practicing differently than peers, this result was

in the same line with *(Leufer and Cleary-Holdforth, [19] Llasus SM, [4] and Stokke [20]* in UAS and Norway.

Moreover the results of the present study revealed a significant increase in total nurses' implementation of EBP scores immediately post-program relative to pre- program at 82.6% of nurses showed frequent engaging in EB activities with 15.2% of nurses practiced EB activities more frequently. The respondents showed a satisfied level of implementation of EBP, as this was the first time they learn and apply EBP. The respondents performed the beginning activities for EBP. The most common activities of EBP implemented by nurses were "collected data on patient problem in generated a PICO question about clinical practice in a little more than half of them, informally discussed evidence from a research study with a colleague in 41.3%, and around a third had "shared an EBP guideline with a colleague, accessed the Cochrane database of systematic reviews, and promoted the use of EBP with colleagues". These results were consistent with *Stokke [20],* in Norway.

Moreover, about three quarters of nurses in this study indicated an above average level of confidence in their EBP competencies immediately post-program. The most of participants in the study felt confident that they could define EBP in terms of evidence, expertise, and patient values. These findings indicated the participants' readiness to be engaged in EBP as cited by *Hart [21]*. Furthermore, nurses who had longer experience in nursing within the present study were likely to be more confident in implementing EBP, the finding was supplied by *Ferguson and Day, [22] & Majid [23]* from UAS and Singapore, who reported that new nurses, due to limited practical knowledge and experience, felt less confident and willing to engage in EBP.

Half of the study subjects had positive beliefs about EBP pre-program while 41.3% of them were neutral toward EBP, this may be due to lack of their knowledge about EBP with absence of implementation for any of its related activities. As stated by *Melnyk and Fineout [24]* that individual's belief in EBP is related to the extent to which they carry out EBP. This could give nurses more positive beliefs and motivation to learn about and engage in evidence-based work.

Regarding the attitude toward EBP, the total score of nurses' attitude toward EB pre-test was neutral in (65.2) of the study subjects and only 13% of them showed positive attitude toward EBP. This might be due to their lack of research abilities as they did not attend any previous research courses or training, which in turn might make them feel anxious about the unknown. Post-program most of nurses showed a positive attitude toward EBP in this was consistent with *Weng [25],* in Taiwan, their results demonstrated that a majority of the study sample had favorable attitudes toward EBP. These findings were in accordance with previous studies by *(Lai NM. [26], Kajermo [1] Zahran & Taha, [27] Llasus, [4] and Stokke [20].*

The findings of this study revealed statistically significant positive correlations between total knowledge, implementation, and readiness scores toward EBP throughout the program phases. This may be due to utilization of more advanced methods of teaching about EBP during the program, thus traditional teaching methods can lead to misperception of EBP, plus the direct application from participants with correction of mistakes

from the researcher. This was supported by *Stevens* [28] in USA and *Llasus* [4] in University of Nevada, Las Vegas, USA.

Conclusion:

Implementation of the designed educational program had a positive effect on nurses' knowledge, readiness, and implementation of evidence based practice immediately post program with a slight decrease at follow-up phase (three months later).

Recommendations:

- Sustain an EBP team that enables individuals to review their habits and ways of thinking to work together toward positive change.
- Professional development courses by the organizations for nurses on evidence-based nursing and research inquiry courses can assist nurses in critically examining evidence directly related to current clinical issues.
- Reassessment for the strategic plan of the organization to move toward EBP and to identify the best strategies for implementing EBP.
- The problem-based learning strategy and a practice-based small group (PBSG) learning approach in the clinical setting should be used as a cornerstone in teaching EBP.

Table (1): General characteristics of the study sample (n=46):

General characteristics	***No***	***%***
Age (years):		
▪ 25-	15	32.6
▪ 35-	24	52.2
▪ 45-60	7	15.2
Range	**24-45**	
Mean ± SD	**33.4 ± 5.2**	
Marital status:		
▪ Married	42	91.3
▪ Unmarried	4	8.7
Qualification:		
▪ Bachelor	34	74
▪ Master	12	26
Job position:		
▪ Administrator	4	8.7
▪ Supervisor	38	82.6
▪ Trainer	4	6.7
Years of experience:		
▪ < 5 years	4	8.7
▪ 5-	12	26.1
▪ 10-	25	54.3
▪ 15+	5	10.9

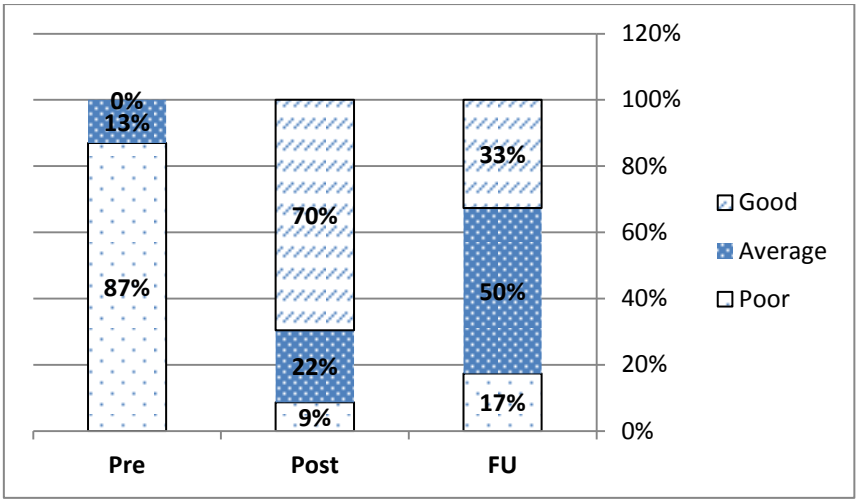

Figure (1): Nurses' knowledge about EBP throughout the program phases (n=46)

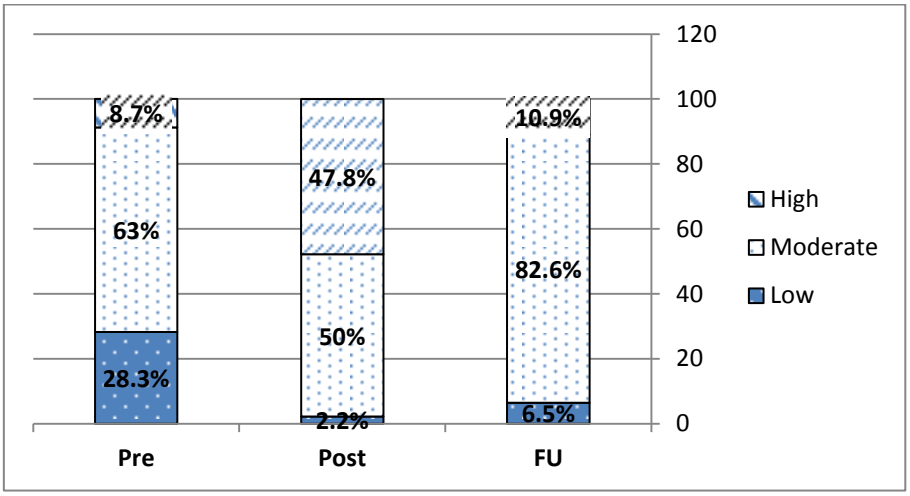

Figure (2): Self-reported confidence about EBP among the study nurses throughout the program phases (n=46):

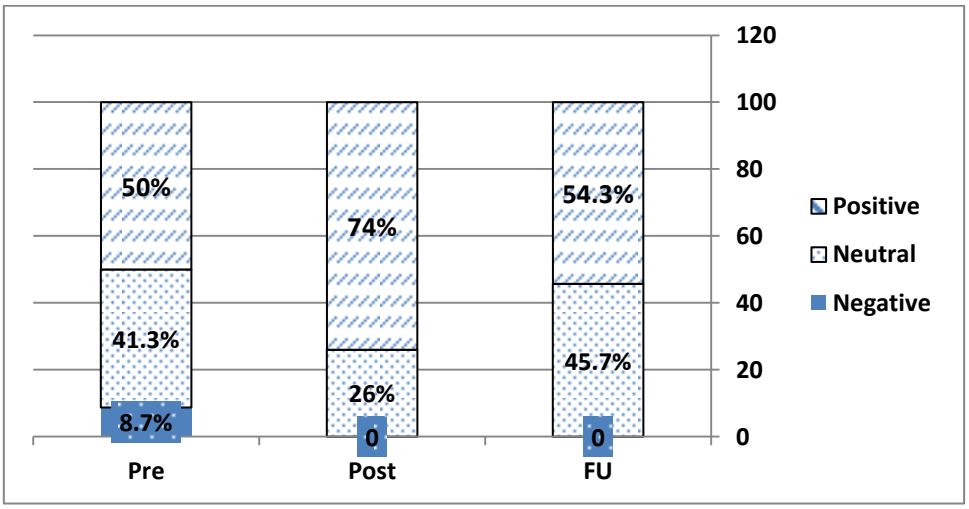

Figure (3): Nurses' belief in EBP throughout the program phases (n=46)

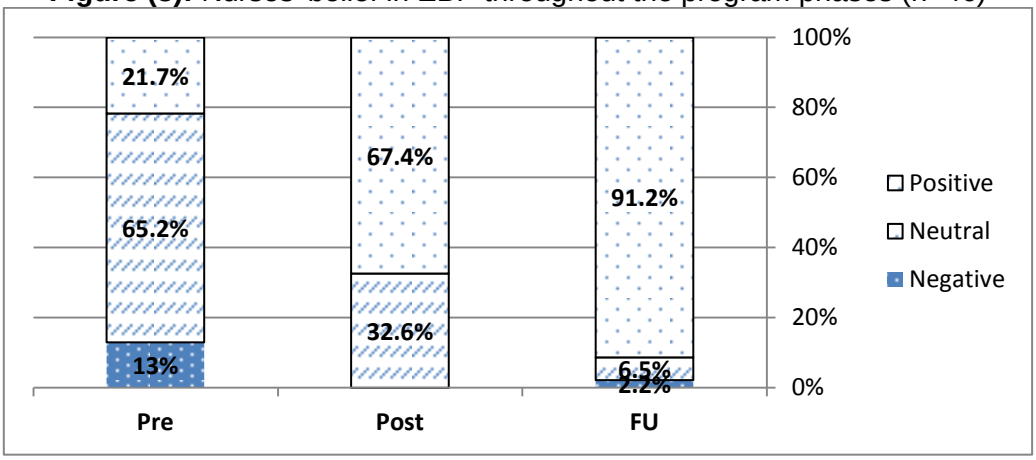

Figure (4): Nurses' Attitude toward EBP throughout the program phases (n=46):

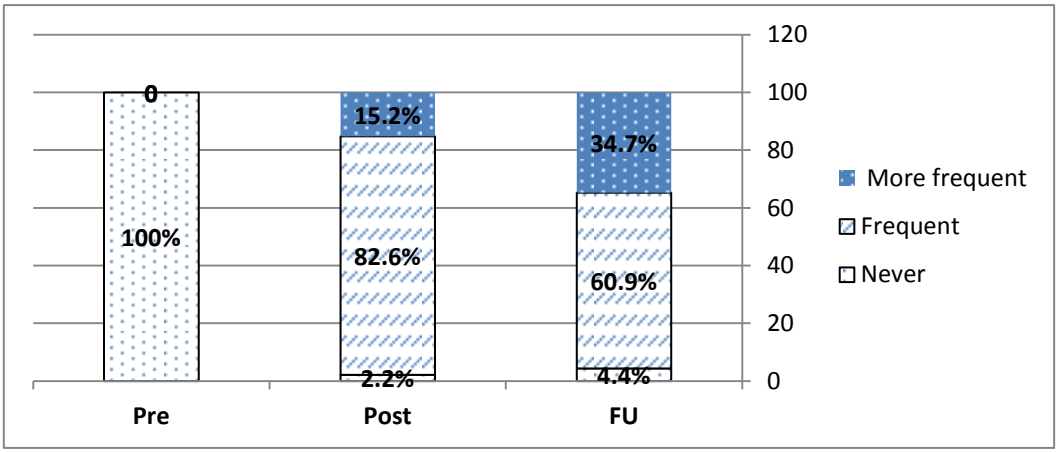

Figure (5): Implementation of evidence among the study nurses' throughout the program phases (n=46)

Table (2): Distribution of study nurses by the most common activities of EBP implementation in ranking order (n=46):

	Items	*N*	*%*
1	Collected data on patient problem	37	80.4%
2	Generated a PICO question about clinical practice	25	54.3%
3	Informally discussed evidence from a research study with a colleague	19	41.3%
4	Shared an EBP guideline with a colleague	17	36.9%
5	Accessed the Cochrane database of systematic reviews	17	36.9%
6	Promoted the use of EBP to my colleagues	17	36.9%

Table (3): Distribution of the study nurses' by their general characteristics and their level of knowledge and self-reported confidence about EBP immediately post-program (n=46):

General characteristics	**P-Value**			
	Knowledge	***Confidence***	***Belief***	***Attitude***
Age (years)	0.042*	0.199	0.505	0.050*
▪ 20-				
▪ 30-				
▪ 40-60				
Qualification	0.001*	0.001*	0.020*	0.950
▪ Bachelor				
▪ Master				
Job title	0.045*	0.994	0.273	0.880
▪ Administrator				
▪ Supervisor				
▪ Trainer				
Experience years	0.122	0.011*	0.272	0.392
▪ < 5 years				
▪ 5-				
▪ 10-				
▪ 15+				

(*)Statistically significant at < 0.05

Table (4): Correlation between total mean scores of nurses' knowledge, implementation, and readiness throughout different study phases (n=46):

Items	*Total mean scores*			*R*	*P value*
	Pre-program	Post-program	Three months later		
Knowledge	11.7 ± 5.2	29.1 ± 3.2	23.4 ± 3.1	18.6	0.001*
Readiness					
• Confidence	53.9 ± 12.4	70.9 ± 12.6	58.7 ± 7.1	20.3	0.001*
• Beliefs	54.0 ± 8.7	60.5± 6.9	55.7 ± 4.6	5.7	0.011*
• Attitude	27.7 ± 4.2	30.7 ± 2.7	37.4 ± 2.9	10.2	0.002*
Implementation	0.0 ± 0.0	29.2± 12.8	21.3 ± 7.2	22.7	0.001*

(*)Statistically significant at < 0.05

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