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EFFECTIVENESS OF EVIDENCE-BASED PRACTICE TRAINING AMONG NURSES TO IMPROVE CLINICAL DECISION-MAKING SKILLS: A QUASI-EXPERIMENTAL RANDOMIZED STUDY

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ABSTRACT

Background: Evidence-based practice in nursing involves providing high-quality care grounded in current research, rather than relying on tradition, peer advice, or personal beliefs. Effective clinical decision-making depends on integrating evidence with clinical reasoning.

Objective: To evaluate the impact of EBP training on clinical decision-making skills among nurses in a hospital setting.

Methods: This quasi-experimental randomized controlled study was conducted in 2023 at Khorfakkan Hospital. A total of 160 nurses were recruited using convenience sampling and randomly allocated to intervention (n = 80) and control (n = 80) groups. Data was collected before and one month after the intervention using a demographic questionnaire and the Lauri and Salantera Clinical Decision-Making Questionnaire (LSCD-MQ). Nurses in the intervention group received six sessions of EBP education, while the control group received no intervention.

Results: Of the 159 nurses who completed the study, most were female (88.7%) and over 40 years of age (56.0%), with 72% having more than 10 years of experience. Prior EBP training was reported by 36.5% of participants. Post-intervention results showed a statistically significant improvement in clinical decision-making scores in the intervention group compared with the control group, indicating a positive effect of EBP training on decision-making skills.

Conclusion: EBP training significantly enhances nurses' clinical decision-making skills. Implementing structured EBP education can improve nursing practice, support evidence-informed patient care, and strengthen professional competencies.

Keywords: *Evidence-Based Practice, Clinical Decision-Making, Nursing Education, Randomized Controlled Trial, Professional Competency, Hospital Nursing.*

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INTRODUCTION

Evidence-Based Practice in nursing refers to the provision of comprehensive, high-quality care that integrates the best available research evidence with clinical expertise and patient preferences. This approach moves beyond reliance on tradition, peer advice, or personal beliefs. Clinical decision-making, a key component of nursing practice, involves selecting the most appropriate interventions based on clinical reasoning and the available evidence. By providing healthcare professionals with current and scientifically validated information, EBP strengthens clinical decision-making and contributes to improved patient outcomes.

EBP follows a systematic process of reviewing, critically appraising, and translating scientific evidence into clinical practice. It incorporates research findings, professional expertise, and patient values to support informed decisions about patient care (Dang et al., 2022). Decisions grounded in rigorously appraised evidence from multiple sources are more effective than those based solely on expert opinion or single-source information. Through the promotion of inquiry and problem-solving, EBP empowers nurses to serve as change agents and enhances overall healthcare quality.

Despite widespread acknowledgment of its importance, many nurses still encounter difficulties in applying EBP principles in everyday clinical practice. Common barriers include limited formal training, low confidence in critical appraisal skills, restricted time, and inadequate institutional support. Although EBP training programs are increasingly implemented, there remains limited evidence regarding their effectiveness in enhancing nurses' clinical decision-making within specific healthcare settings. It is therefore necessary to evaluate whether structured EBP training produces measurable improvements in nurses' ability to apply evidence in real-time clinical situations.

Identifying the effectiveness of EBP training programs is essential for guiding resource allocation, strengthening professional development initiatives, and ultimately improving patient outcomes. Accordingly, the purpose of this study is to evaluate the impact of an Evidence-Based Practice training program on nurses' clinical decision-making skills.

BACKGROUND OF THE STUDY

Evidence-based practice is essential for clinical decision-making, improving care, reducing costs and achieving optimal patient outcomes. The Evidence-based Practice Mentorship Program (EBPMP) is a flexible programme. EBPMP can improve participants' knowledge and implementation of EBP in an environment that values EBP. (Ethan Schuler, et al.2021) The best available evidence should be used in decision-making on a regular basis rather than in the impromptu way that is presently frequently used, as this improves the quality of care. (Elaine Lehane, et.al.2019)

Internationally, evidence-based practice is recognised as a foundational element of healthcare professional education.(Elaine Lehane,et.al.2018) Promoting evidence-based practice has been identified by the World Health Organization as a priority area of action to strengthen the contribution of nurses to the health of people (World Health Organization.2017).Introduction of the EBP unit and its policy include increase research utilization and accelerated adoption of new evidence, increase the quality of care provided, increase patient, staff, and managers satisfaction, and decrease staff workload by reducing complications associated with medical errors and outdated interventions.(Mohammad Alzaatreh, et.al. 2021).

An individualized small-group EBP education intervention can boost AHPs' confidence in their ability to formulate pertinent questions, conduct literature searches, and analyse, apply, and evaluate study evidence4. Allied health professionals can increase their capacity and motivation to use research evidence to possibly improve clinical practice by engaging in these behaviours and sharing new knowledge with their peers. (Sharon Mickan, et.al.2019). A beneficial change in undergraduate curricula is deemed nursing education mediated by critical thinking-stimulating tactics. (Diana P S R P Carvalho, et.al.2017).

Many factors, which included educational level, participation in EBP education, and experience conducting research, and work-environment factors, such as resources and organizational support for EBP, were related to the knowledge and skills of EBP among nurses. (Hideaki Furuki, et.al. 2023). Multidimensional educational intervention helped to improve the nurses critical thinking skills. (Meiling Liu, et.al.2021). The majority of healthcare professionals are nurses, and they play a crucial part in determining the clinical status of their patients. Therefore, it is advised that nurses use evidence-based educational strategies to raise their level of clinical decision-making. (Parisa Ghodsi Astan, et.al.2022).

The ability to make decisions is improved by training and multimodal therapies that also include cognitive training and mindfulness practices. (Christopher E. Zwilling, et.al.2019). In every career, choosing the proper choice requires a variety of skills, but critical thinking is one of the most crucial. Evidence-based practice has the potential to strengthen practitioners' critical-thinking abilities. Promoting the critical thinking abilities of medical librarians through the study of evidence-based information practice could be useful. (Sima Esmaeilzad.et.al.2022).

Critical thinking skills are not learned spontaneously. Higher education system should strengthen critical thinking skills of learners by integrating critical thinking skills into educational programs. Designing effective educational interventions in the fields of teaching and assessment methods lead to strengthening learners' critical thinking skills. (Vahideh Zarea Gavgan, et.al.2021).

Munn et al. (2018) - This study focused on the barriers to implementing EBP among nurses. It highlighted that EBP education reduces these barriers and improves nurses' clinical decision-making skills by providing them with the tools needed to apply evidence effectively.

Ben Natan et al. (2020) This study evaluated how EBP training affected nurses' clinical decision-making skills in psychiatric settings. Significant gains in decision-making abilities were demonstrated by the results, demonstrating the usefulness of EBP across a range of nursing specializations. he results demonstrated significant improvements in decision-making competencies, illustrating the importance of EBP across various nursing specialties.

Hutchinson et al. (2020) stated that the effect of EBP training on nurses' decision-making and professional development was assessed in this study. Results supported the importance of evidence-based practices in nursing practice by showing that EBP training enhanced critical thinking abilities and produced superior clinical results.

Bagnasco et al. (2016) stated that examining the connection between clinical decision-making and EBP knowledge, this study found that nurses with greater EBP knowledge levels were able to make far better decisions, which improved the quality of patient care.

Schmidt et al. (2015) stated that the long-term impacts of EBP instruction on nursing practices were investigated in this research. The results highlighted the long-term advantages of such educational interventions by showing that nurses who received EBP training demonstrated improvements in clinical decision-making and patient care quality over time.

So various research studies from various sources suggest that EBP training will improve Clinical Decision Making.

AIMS AND OBJECTIVES:

To identify the effect of EBP training in improving the clinical decision-making skills among nurses in Khorfakkan Hospital.

Primary Objective

To evaluate the effectiveness of EBP training for nurses to improve clinical decision-making skills.

Secondary Objectives

1. To develop and administer a questionnaire to registered nurses to assess their level of clinical decision-making skills.
2. To assess the pre-and-post levels of clinical decision-making skills.
3. To compare the pre and posttest levels of clinical decision-making skills among nurses.
4. To associate the mean differed effect of EBP training for nurses to improve the clinical decision-making skills.

RESEARCH HYPOTHESES:

1. **H_1:** Evidence-based practice training will significantly improve the clinical decision-making skills of nurses in Khorfakkan Hospital compared to their pre-training levels.
2. **H_2:** There will be a significant difference between the pre-test and post-test clinical decision-making scores of nurses after EBP training.
3. **H_3:** There is a significant association between selected demographic variables (age, experience, education, etc.) and the mean difference in clinical decision-making scores after EBP training.

RESEARCH METHODOLOGY:

Study Design, Setting, and Sampling

This study employed a quasi-experimental randomized controlled design to evaluate the effectiveness of Evidence-Based Practice training on nurses' clinical decision-making skills. The study was conducted in 2023 at Khorfakkan Hospital, Sharjah, United Arab Emirates. A total of 160 registered nurses meeting the inclusion and exclusion criteria were selected through purposive sampling, ensuring that only eligible participants with adequate experience and availability were included.

Following recruitment, participants were randomly assigned to either the intervention group (n = 80) or the control group (n = 80) using a simple lottery method. Each participant's name was written on identical slips of paper and drawn randomly to ensure unbiased allocation. The intervention group received six structured EBP training sessions, while the control group did not receive any training during the study period. This design allowed for a direct comparison of clinical decision-making outcomes between trained and untrained nurses.

Instrumentation

Two instruments were used for data collection:

Demographic Questionnaire

This questionnaire collected essential participant information, including age, gender, years of experience, educational status, and previous exposure to EBP training. These variables helped contextualize the findings and explore associations between demographic factors and clinical decision-making skills.

Lauri and Salantera Clinical Decision-Making Questionnaire (LSCD-MQ)

The LSCD-MQ is a validated instrument designed to assess nurses' clinical decision-making abilities. It contains 24 items rated on a 5-point Likert scale (1 = Never to 5 = Always), with total scores ranging from 24 to 120. Score interpretation is as follows:

Below 68 → Analytical (Level 1) decision-making

68–78 → Intuitive-analytical (Level 2)

Above 78 → Intuitive (Level 3)

The tool assesses four stages of the decision-making process:

(a) Data collection

(b) Information review and problem identification

(c) Planning and implementation

(d) Follow-up and evaluation

Permission to use the LSCD-MQ was obtained via email from its original developers. Participants completed the LSCD-MQ before the training and one month after the intervention.

Participants

The participants involved in this study were Nurses who are working in the Khorfakkan Hospital. Purposive sampling method was used to select the samples. Samples were selected based on the inclusive and exclusive criteria.

Random sampling technique was used to divide the group into Intervention and Control group.

Inclusion and Exclusion Criteria:

Inclusion Criteria

1. Registered Nurses who are willing to participate in the research.
2. Registered Nurses who are available during the study period.
3. Having at least 1 year of experience in the current position.
4. Registered nurses age ranges from 25- 55 years.

Exclusion Criteria

1. Who are not willing to participate in the study
2. Who is missing the training sessions.
3. Who are not willing to complete the questionnaire.

SAMPLE SIZE:

Total of 160 samples will be selected for the research. 80 samples for study group and 80 samples for control group.

SAMPLE SIZE CALCULATION

The sample size was calculated to detect a medium effect size (Cohen's d = 0.5) in nurses' clinical decision-making scores between the intervention and control groups, using a statistical power of 80% and a significance level of 0.05. Based on these parameters, a minimum of 64 participants per group was required. To account for potential attrition or non-compliance, 80 participants were recruited for each group, resulting in a total sample of 160 nurses.

DATA COLLECTION

Data were collected using a demographic questionnaire and the Lauri and Salantera Clinical Decision-Making Questionnaire (LSCD-MQ). The demographic questionnaire included items on age, gender, marital status, educational status, and work experience in hemodialysis wards. The LSCD-MQ was first developed by Lauri and Salantera to evaluate nurses' decision-making ability. This tool consists of 24 items on clinical decisions and is scored on a 5-points Likert-type scale from "Always = 5" to "Never = 1". Accordingly, the overall score of this tool ranges from 24 to 120. The scores below 68 indicate analytical (first level) decision-making, the scores of 68–78 indicate intuitive-analytical (second level) decision-making, and the score above 78 indicates intuitive

(third level) decision-making. This tool has been developed based on four stages of the decision-making process, including (a) data collection, (b) information review and problem identification, (c) planning and implementation, and (d) follow-up and evaluation.

The tool is already validated and got approval to use in our study by email confirmation from the creator of this tool.

ETHICAL CONSIDERATION

Ethical approval was obtained from the Research Ethics Committee of the Ministry of Health, Dubai, prior to data collection. Written informed consent was obtained from all participants after they were fully informed about the purpose and procedures of the study. Participants were assured that their involvement was voluntary and that they could withdraw at any time without consequences. Confidentiality and anonymity were maintained throughout, with data accessible only to the investigators.

INTERVENTIONS

Sampling began after approval from the Khorfakkan Hospital Nursing Administration. All registered nurses working at Khorfakkan Hospital constituted the target population. A list of nurses who met the inclusion criteria was prepared, and 160 individuals were randomly selected. If a nurse declined participation, another eligible nurse was selected as a replacement.

Participants were then randomly assigned to the intervention or control group. The intervention group was further divided into eight subgroups of ten nurses each to facilitate interactive, dialogue-based learning. Nurses in the intervention group received six sessions of theoretical and practical EBP training, each lasting 60 minutes and delivered once per week for six weeks. Training sessions were conducted in a lecture room equipped with internet-connected computers, using a problem-solving-based instructional method.

Training content covered:

- Fundamentals of the research process
- Identifying credible sources of evidence
- Searching electronic databases
- Using the PICO (Population, Intervention, Control, Outcomes) framework to formulate questions
- Critical appraisal of research articles
- Applying research findings to clinical practice

The control group received no training during the study period; however, the same educational material was provided to them in the form of lectures after data collection was completed.

One month after the intervention, nurses in both groups completed the LSCD-MQ again. During the intervention period, one nurse in the intervention group withdrew due to non-attendance and unwillingness to continue. Thus, data from 159 participants were included in the final analysis (intervention = 79, control = 80).

DATA ANALYSIS

Data was analyzed using SPSS for Windows. The Shapiro–Wilk test was used to assess the normality of data distribution, and Levene's test evaluated the homogeneity of variances. A paired t-test was conducted to assess the impact of EBP training on clinical decision-making skills among the 79 nurses in the intervention group. Additional group comparisons were performed to examine differences between the intervention and control groups.

RESULTS

This study included 159 nurses after one participant from the intervention group withdrew. Demographic characteristics (Table 1) revealed considerable diversity. More than half of the participants (56.0%) were aged above 40 years, indicating a large proportion of experienced professionals. The sample was predominantly female (88.7%), with males representing 11.3% of the participants. A substantial majority (72%) had more than ten years of work experience. Additionally, 36.5% of participants reported having previously attended Evidence-Based Practice training.

Table 1: Demographic Characteristics of Study Participants

VARIABLE	FREQUENCY (N)	PERCENTAGE (%)
AGE		
≤40 Years	70	44.0
>40 Years	89	56.0
GENDER		
Male	18	11.3
Female	141	88.7
EDUCATION		
Diploma/Bachelors	145	91.2
Masters	14	8.8
WORK EXPERIENCE		
≤10 Years	44	27.7
>10 Years	115	72.3
ANY EBP TRAINING TAKEN BEFORE		
Yes	58	36.5
No	101	63.5
EBP		
Yes	79	49.7
No	80	50.3

The independent-samples t-test was employed to examine potential differences in pre-test level scores concerning demographic variables within the study population. Prior to conducting the t-test, the normality assumption was rigorously assessed using the Shapiro-Wilk test which is found to be $p > 0.05$. To ensure homogeneity of variances, Levene's Test for Equality of Variances was performed. However, the test revealed heterogeneity, Welch-Satterthwaite correction is used. Subsequent analysis of pre-test level scores across various demographic factors(table:2), including age, gender, education, prior EBP training, and work experience, exhibited no statistically significant differences ($p > 0.05$). This implies that, at the baseline, participants demonstrated comparable levels of clinical decision-making skills irrespective of these demographic variables

Table 2: Comparison of Pre-test Level Scores Across Demographic Variables

VARIABLE	MEAN	STANDARD DEVIATION	MEAN DIFFERENCE	P VALUE
AGE			0.048	0.955
≤40 Years	63.01	5.27		
>40 Years	62.97	5.42		
GENDER			-0.424	0.752
Male	62.61	5.94		
Female	63.03	5.27		
EDUCATION			-0.327	0.828
Diploma/Bachelors	62.96	5.24		
Masters	63.29	6.47		
WORK EXPERIENCE			-0.769	0.936
≤10 Years	62.93	5.39		
>10 Years	63.01	5.34		
ANY EBP TRAINING TAKEN BEFORE			0.495	0.575
Yes	62.67	5.35		
No	63.17	5.34		
PRE AND POST SCORE			-0.276	0.745
Yes	62.85	5.34		
No	63.15	5.36		

The paired t-test was employed to assess the impact of Evidence-Based Practice training on clinical decision-making skills among a randomly selected group of 79 nurses. The post-training scores demonstrated a

substantial increase from an initial mean of 62.84 ± 5.34 to a significantly higher mean of 75.76 ± 5.26. The paired t-test revealed a notable mean difference of 12.91, indicating a substantial improvement in clinical decision-making skills following the EBP training intervention. Statistical analysis confirmed the robustness of these findings, with the observed difference being highly statistically significant ($p < 0.001$). This suggests that the EBP training had a substantial positive impact on enhancing the clinical decision-making skills of the nurses in the study group. The results underscore the effectiveness of the training program in fostering improvements in the targeted skill set among the participants.

Table 3: Paired T-Test Analysis: Comparing Pre-Test and Post-Test Scores

Score	Mean	Standard Deviation	Paired Mean Difference	p-value
Pre-test	62.84	5.34		
Post-test	75.76	5.26	12.91	< 0.001

This study delves into the impact of Evidence-Based Practice training on the clinical decision-making skills of nurses. The results align with existing research, demonstrating a substantial and statistically significant improvement in decision-making scores post-training (mean difference of 12.91, $p < 0.001$).

Table 4: Comparison of Post-Test Scores Between Intervention and Control Groups

Group	N	Mean	SD	Paired Mean Difference	P value
Intervention	79	75.76	5.26	8.24	<0.001
Control	80	67.52	5.41		

To evaluate the effectiveness of the Evidence-Based Practice (EBP) training, a between-group comparison was conducted between the intervention and control groups after the intervention using an independent-samples t-test. The results demonstrated that nurses in the intervention group achieved significantly higher post-test scores compared with those in the control group. This indicates that the EBP training program contributed to a meaningful improvement in clinical decision-making skills beyond any changes observed in the control group.

The difference in post-test scores between the two groups was found to be statistically significant ($p < 0.05$), supporting the effectiveness of the intervention. These findings confirm that the observed improvement in the intervention group cannot be attributed solely to time or external factors but is associated with the EBP training provided during the study.

The absence of statistically significant baseline differences across demographic factors strengthens the conclusion that the observed improvement is attributed to the EBP training itself. This aligns with the broader literature emphasizing the universal effectiveness of EBP training, regardless of individual characteristics.

Future research directions could explore larger and more diverse samples, assess the long-term sustainability of improvements, and investigate the influence of specific training content and delivery methods on outcomes.

DISCUSSION:

Impact of Evidence-Based Practice (EBP) Training

The findings of this study reveal a significant improvement in nurses' perceived clinical decision-making ability following EBP training. The substantial increase in post-training LSCD-MQ scores (mean difference of 12.91, $p < 0.001$) underscores the effectiveness of the training program in enhancing nurses' confidence and self-reported competence in clinical decision-making. These results are consistent with previous research highlighting the positive influence of EBP education on nurses' knowledge, attitudes, and readiness to integrate evidence into practice (Melnyk et al., 2014; Titler, 2018).

The observed improvement reinforces the value of EBP training programs in bridging the gap between evidence and practice. By equipping nurses with the tools and techniques needed to evaluate and apply research evidence, these programs may contribute to improved professional development and more evidence-informed care delivery.

Baseline Comparisons

Another significant finding of this study was the lack of statistically significant differences in pre-test scores across demographic factors such as age, gender, education, work experience, and prior EBP training. This absence of differences suggests that, at baseline, participants reported comparable levels of perceived decision-making ability regardless of these variables.

This finding is important because it indicates that the improvements observed are more likely attributable to the EBP training rather than pre-existing disparities among participants. While prior research has demonstrated

variability in EBP knowledge and application based on demographic characteristics (Baker et al., 2018), the present study suggests that structured EBP education can be beneficial across diverse nursing populations.

Alignment with Existing Literature

The results of this study align with existing research emphasizing the beneficial effects of EBP training on nursing practice. The substantial improvement in LSCD-MQ scores post-training is consistent with previous findings, further validating the importance of EBP education in strengthening nurses perceived decision-making competence and confidence in applying evidence-based approaches.

Implications for Nursing Practice

The significant improvement in nurses perceived clinical decision-making competence following training has important implications for nursing practice. Increased confidence in decision-making may support nurses in aligning care with current best evidence and enhancing professional accountability.

Healthcare organizations may benefit from integrating EBP training into regular professional development programs, as such initiatives can foster a culture of continuous learning and evidence-based practice among nursing staff.

Study Limitation

This study has several limitations that should be considered when interpreting the findings. First, clinical decision-making was assessed using the LSCD-MQ, a self-reported instrument that measures perceived competence rather than directly observed clinical behaviors. As such, the results primarily reflect improvements in nurses' confidence and perceived decision-making ability, which may not necessarily translate into measurable changes in actual clinical performance or patient outcomes. Self-reported measures are also subject to social desirability bias and response bias, potentially leading participants to report more favorable outcomes following training.

Second, the follow-up period was relatively short, with nurses evaluated approximately one month after completion of the training program. This limited timeframe does not allow for assessment of long-term retention of knowledge or sustained behavioral changes in clinical practice. Longer follow-up periods would provide stronger evidence regarding the durability of training effects.

Third, the use of convenience sampling may have introduced selection bias. Nurses who agreed to participate may have been more motivated, interested in professional development, or more receptive to EBP concepts than those who did not participate. This may limit the generalizability of the findings to the broader nursing population.

Finally, lack of blinding represents another limitation. Both the researchers and participants were likely aware of the training intervention, which may have influenced participants' responses or behaviors (Hawthorne effect) and potentially contributed to inflated post-intervention scores. The absence of blinding increases the risk of performance and detection bias.

Future studies should incorporate objective outcome measures such as simulation-based assessments, structured observational evaluations, or patient outcome indicators, use randomized sampling methods where feasible, apply blinding strategies when possible, and include longer follow-up periods to strengthen the validity and reliability of findings.

Future Research Directions

This study provides a foundation for future research in several key areas. First, future studies could explore larger and more diverse samples to validate the generalizability of these findings across different healthcare settings and regions.

Second, longitudinal studies are needed to assess the long-term sustainability of improvements in perceived decision-making competence. While the current study demonstrates immediate benefits, it remains important to determine whether these improvements persist over time or require reinforcement.

Finally, future research could investigate the impact of specific EBP training content and delivery methods. Comparing modalities such as in-person workshops versus online learning may help identify the most effective strategies for delivering EBP education.

CONCLUSION

In conclusion, this study contributes valuable insights to the growing body of evidence supporting the effectiveness of EBP training in improving nurses' clinical decision-making skills. By enhancing nurses' ability to critically appraise evidence and apply it to patient care, EBP training holds promise for improving healthcare

quality and patient outcomes. The substantial and statistically significant improvement in post-training scores highlights the potential of EBP training as a key strategy for enhancing nursing practice. By demonstrating that EBP training can benefit nurses across various demographic backgrounds, this study underscores the importance of investing in such educational programs to improve patient care outcomes.

The results encourage continued support for EBP training initiatives and suggest several avenues for future research to further explore and refine these educational interventions.

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