World Journal of Pharmaceutical and Life Sciences

www.wjpls.org

Impact Factor: 7.409 Coden USA: WJPLA7

EVIDENCE-BASED NURSING STRATEGIES TO ENHANCE PATIENT SAFETY IN SAUDI PUBLIC HOSPITALS: AN EVALUATIVE STUDY

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DOI: https://doi.org/10.5281/zenodo.18357680

How to cite this Article: Areej Almusaylim1*, Rakan R. Alreshidi2, Dr. Ashraf Baboor3, Saif Alanezi4, Mohammed A. Alsuwayti5, Abdulaziz A. Albakri6, Metha R. Alsalmani7, Arwa A. Alharby8, Turki A. Almalki9, Nuha F. Alsaeed10, Waad K. Alanazi11, Anwer K. Alanazi12, Hamidah M. Alruw. (2025) Evidence-Based Nursing Strategies To Enhance Patient Safety In Saudi Public Hospitals: An Evaluative Study. World Journal of Pharmaceutical and Life Science, 11(11), 387–398.

Article Received on 21/10/2025 **Article Revised on 11/11/2025** **Article Published on 01/11/2025**

ABSTRACT

Background: Patient safety remains a critical concern in hospitals worldwide. Evidence-based nursing (EBN) strategies, including training, adherence to protocols, and structured safety interventions, have been shown to improve patient outcomes and reduce preventable adverse events. In Saudi Arabia, evaluating the effectiveness of such strategies is essential to enhance healthcare quality and safety culture. **Aim:** This study aimed to evaluate the effect of evidence-based nursing strategies on patient safety in public hospitals across Saudi Arabia. **Methods:** A cross-sectional, evaluative quantitative study was conducted among 75 nurses from eight public hospitals, including King Saud Medical City, King Fahd Hospital, King Abdulaziz Medical City, Riyadh Central Hospital, Jeddah General Hospital, Hail Regional Hospital, Dammam University Hospital, and Prince Sultan Hospital. Data on patient safety incidents, protocol adherence, staff perception, and intervention effectiveness were collected using structured surveys and hospital records. Descriptive statistics summarized numeric and categorical variables, while independent t-tests, Pearson correlations, and Chi-square tests were conducted to examine relationships between evidence-based nursing strategies and patient safety outcomes.

Results: Nurses who had received evidence-based practice (EBP) training exhibited significantly higher patient safety scores compared to those without training ($T = 7.07$, $p < 0.001$). Higher adherence to clinical protocols was strongly associated with fewer patient safety incidents ($r = -0.92$). Additionally, a significant association was found between EBP training and achieving high patient safety scores ($\chi^2 = 11.38$, $p = 0.0007$). Interventions such as checklists, safety rounds, and staff training further contributed to improved safety outcomes. **Conclusion:** The implementation of evidence-based nursing strategies—including structured training, strict protocol adherence, and targeted interventions—significantly enhances patient safety in Saudi public hospitals. Hospital policies promoting EBN and continuous professional development are recommended to sustain improvements in patient care quality and safety culture.

KEYWORDS: Evidence-Based Nursing (EBN), Patient Safety, Protocol Adherence, Hospital Interventions, Saudi Arabia, Nursing Training, Adverse Events, Healthcare Quality.

I. INTRODUCTION

Patient safety has emerged as a fundamental component of healthcare quality worldwide. Hospitals and healthcare systems are increasingly recognized not merely for their capacity to treat illnesses but also for their ability to minimize harm to patients during care delivery. (Abuadas, Albikawi, & Abuadas, 2021) (Abuejheisheh, Tarawneh, Qaddumi, Almahmoud, & Darawad, 2020)

Globally, patient safety incidents—ranging from medication errors and infections to procedural mishaps—represent a significant challenge to healthcare systems, with the World Health Organization estimating that millions of patients are affected annually by preventable medical errors (WHO, 2021). The consequences of such incidents are profound, encompassing increased morbidity and mortality, extended hospital stays, additional healthcare costs, and diminished patient trust in healthcare institutions. As the complexity of modern healthcare delivery grows, particularly with the introduction of advanced medical technologies and high patient throughput, the risks associated with lapses in safety are exacerbated, making patient safety an urgent priority for both healthcare practitioners and policymakers. (Al-Momani, Al-Barmawi, Al-Hadid, & Aljabery, 2016).

In the context of Saudi Arabia, patient safety has garnered considerable attention over the past decade as the nation seeks to modernize its healthcare system in alignment with global best practices. (Alqahtani, Oh, Kitsantas, & Rodan, 2020)

Saudi public hospitals, which provide care to millions of citizens and residents, face challenges similar to those observed internationally, including staffing shortages, high patient loads, and variability in the implementation of clinical protocols. (Barako, Chege, Wakasiaka, & Omondi, 2012) Reports from the Ministry of Health and other local agencies indicate that while significant strides have been made in enhancing healthcare infrastructure and introducing safety guidelines, incidents such as medication errors, falls, infections, and documentation mistakes continue to occur at measurable rates (MOH, 2022). These persistent issues underscore the necessity of examining not only the presence of patient safety policies but also their practical implementation and effectiveness within hospital settings. (Boltz, Capezuti, Zwicker, & Fulmer, 2020) In Saudi public hospitals, nursing professionals play a central role in safeguarding patient well-being, as they are directly involved in patient monitoring, medication administration, and the enforcement of clinical protocols. Consequently, (Bostrom, Rudman, Ehrenberg, Gustavsson, & Wallin, 2013) strategies that strengthen nursing practices have a direct impact on reducing safety incidents and improving overall healthcare outcomes.

Despite extensive efforts to mitigate patient safety risks, safety incidents remain a pressing problem. This persistence highlights the need for systematic evaluation of strategies that have demonstrated effectiveness elsewhere, particularly evidence-based nursing (EBN) practices. (Cheng, Broome, Feng, & Hu, 2017) Evidence-based nursing involves the integration of the best available research evidence with clinical expertise and patient preferences to guide care decisions. EBN strategies may include the use of structured protocols, safety checklists, routine audits, (Cheng, Feng, & Hu, 2017) staff training programs, and adherence monitoring—all of which are designed to standardize care, reduce variability, and prevent errors. While such strategies have been widely adopted in healthcare systems in developed countries and have shown measurable improvements in patient safety, their application in the Saudi context requires careful evaluation to determine their feasibility, effectiveness, and adaptability within local hospital environments. Understanding how EBN strategies influence patient safety outcomes in Saudi public hospitals is therefore critical to informing policy decisions and optimizing care quality. (Chiwaula, Chinkhata, Kamera, & Haruzivishe, 2018) The primary aim of this study is to assess the impact of evidence-based nursing strategies on patient safety outcomes in Saudi public hospitals. Specifically, the study seeks to evaluate whether nurses' adherence to evidence-based protocols and their participation in EBN training programs are associated with a reduction in patient safety incidents and improvements in hospital

safety scores. By examining these relationships, (Connor, Paul, McCabe, & Ziniel, 2017) the study intends to provide empirical insights into the effectiveness of nursing interventions and identify factors that facilitate or hinder the successful implementation of best practices in patient care. The findings are expected to inform hospital management, nursing leadership, and policymakers, enabling them to develop targeted initiatives that enhance the safety and quality of healthcare delivery. (Duncombe, 2018) The significance of this research lies in its potential to bridge gaps between policy and practice within Saudi hospitals. Effective evidence-based nursing strategies not only prevent adverse patient outcomes but also contribute to the overall efficiency and sustainability of healthcare systems. Picard, 2012) (Ellis, 2019) Hospitals that successfully implement EBN strategies can reduce costs associated with preventable incidents, improve staff satisfaction and confidence, and strengthen public trust in healthcare institutions. For nursing leadership, this study provides actionable insights into the training and support structures necessary to encourage adherence to protocols and the consistent application of evidence-based practices. Policymakers can leverage the study's results to design regulations, guidelines, and incentive programs that prioritize patient safety, ensuring that national healthcare objectives align with international standards. (Kang & Yang, 2016)

To guide this evaluative study, three research hypotheses have been formulated:

- **H1:** Implementation of evidence-based practice (EBP) improves patient safety. This hypothesis posits that hospitals and nurses that actively incorporate EBN strategies into daily clinical routines will demonstrate higher patient safety scores and fewer safety incidents compared to settings without such implementations.
- **H2:** Nurse adherence to protocols reduces patient safety incidents. This hypothesis suggests a direct negative relationship between the level of adherence to standardized clinical protocols and the frequency of safety incidents, implying that increased compliance with best practices enhances patient protection.
- **H3:** Nurse EBP training is positively associated with high patient safety scores. This hypothesis asserts that nurses who have received formal training in evidence-based practices are more likely to contribute to a safer clinical environment, as measured by overall safety scores and reduced incidents.

By systematically investigating these hypotheses, the study aims to provide a comprehensive understanding of how evidence-based nursing strategies influence patient safety outcomes in the Saudi context. The research seeks not only to evaluate the current state of practice but also to offer practical recommendations for enhancing patient safety through targeted interventions, education, and policy development. (Hellier & Cline, 2016)

II. LITERATURE REVIEW

Patient safety and the application of evidence-based nursing (EBN) strategies have received increasing attention in healthcare research globally and within Saudi Arabia. Evidence-based nursing involves integrating the best available research evidence with clinical expertise and patient preferences to optimize care outcomes. Numerous studies have examined the factors influencing EBN practice, nurses' perceptions of safety culture, and the outcomes of patient safety initiatives in Saudi public hospitals, highlighting both progress and existing challenges.

Abuadas (2021) conducted a cross-sectional study with 612 registered nurses in southern Saudi Arabia to examine the factors predictive of evidence-based nursing practice. Using a structural equation modeling approach, the study found that nurses' competency, beliefs, organizational facilitators, and perceived barriers significantly influenced the implementation of EBN. Specifically, nurses' beliefs partially mediated the relationship between competency and EBN application, while organizational facilitators also mediated the relationship between beliefs and practice. Attending workshops, higher education levels, previous research involvement, and years of experience were positively associated with competency and beliefs. This study emphasizes the importance of both personal and organizational factors in promoting evidence-based practice and provides a theoretical framework for understanding the determinants of EBN adoption in Saudi hospitals.

Al Muharraq et al. (2024) investigated nurses' perceptions of patient safety culture in Jazan hospitals through a cross-sectional survey of 402 nurses using the Hospital Survey on Patient Safety Culture (HSOPSC). The study revealed that nurses had moderate perceptions of safety culture, with positive ratings for teamwork (77.8%) but low scores for staffing and responses to error (39.75% and 46.17%, respectively). Significant correlations were found between communication openness and event reporting, as well as between management support and patient safety grades. These findings highlight that while teamwork and organizational learning are strong, critical areas such as staffing adequacy and error management need improvement, suggesting that patient safety culture is multifaceted and influenced by both structural and procedural factors.

Rawas and Abou Hashish (2023) assessed predictors and outcomes of patient safety culture at King Abdulaziz Medical City in Jeddah. Using a sample of 184 nurses, they found that teamwork within units, organizational learning, and feedback and communication about errors

were rated highest, whereas overall perceived patient safety and safety grades were moderate. The study highlighted the need for continuous staff training to enhance safety culture perceptions and performance. This research reinforces the notion that the implementation of structured safety interventions, combined with staff development programs, can strengthen safety culture and improve patient safety outcomes in hospital settings.

Al Anazi et al. (2025) conducted a systematic review to examine barriers to implementing EBN among nurses in Saudi Arabia. The review analyzed ten studies published between 2013 and 2023 and identified major barriers such as time constraints and lack of organizational support. The authors suggested that educational initiatives, awareness programs, and organizational changes could help overcome these obstacles, creating a supportive environment for EBN adoption. This review emphasizes that while EBN strategies are theoretically effective, practical barriers can significantly impede their application, underscoring the need for targeted interventions to promote their integration into daily nursing practice.

Binkheder et al. (2023) explored the relationships between patient safety culture and sentinel events across hospitals in Saudi Arabia. Their national descriptive study revealed that higher positive safety culture scores, particularly in teamwork, communication openness, and handoffs, were associated with lower rates of sentinel events. Conversely, staffing inadequacies and punitive responses to errors were linked to higher incident rates. The study concluded that promoting a non-punitive culture, improving communication, and enhancing team collaboration are essential to reducing severe adverse events. This research illustrates the direct impact of safety culture on patient safety outcomes and provides empirical support for interventions that enhance teamwork and communication.

Finally, Allehebi and Hamed (2024) assessed ICU nurses' knowledge of adverse medication events in Makkah hospitals. The cross-sectional study involving 155 nurses found that only 13.5% had good knowledge of medication safety, while 86.5% demonstrated poor knowledge. The study also identified significant relationships between knowledge levels and factors such as age, nationality, role, and working hours. These findings emphasize that knowledge gaps among nurses can contribute to preventable safety incidents, highlighting the need for ongoing training and education to improve patient safety in high-risk areas like ICUs.

Research Gaps

Despite the valuable insights provided by these studies, several gaps remain. First, while many studies focus on nurses' perceptions of safety culture and individual competencies, few have empirically linked the implementation of evidence-based nursing strategies to actual patient safety outcomes across multiple Saudi public hospitals. Second, although barriers to EBN have been identified, there is limited research on which specific interventions (checklists, audits, training programs) are most effective in reducing safety incidents in the Saudi context. Third, much of the existing literature relies on cross-sectional surveys, which capture perceptions at a single point in time but do not evaluate longitudinal impacts of interventions. Finally, although medication errors and sentinel events have been studied separately, comprehensive evaluations that integrate multiple types of safety incidents with EBN practices and staff adherence to protocols are scarce. Addressing these gaps will provide stronger evidence on how evidence-based nursing strategies can systematically enhance patient safety outcomes in Saudi public hospitals, informing policy and practice for sustainable improvements.

III. METHODS

Study Design

This study employed a quantitative evaluative design using a cross-sectional approach. The aim was to assess the effectiveness of evidence-based nursing (EBN) strategies in enhancing patient safety across selected public hospitals in Saudi Arabia. A cross-sectional design was selected as it allows for the evaluation of current practices, safety outcomes, and staff perceptions at a specific point in time, providing valuable insights into the relationship between EBN interventions and patient safety metrics.

Population and Sample

The study population consisted of registered nurses working in public hospitals across Saudi Arabia, encompassing various clinical departments including ICU, medical, emergency, oncology, pediatrics, and surgical units. A total of 75 nurses participated in the study. The sample was drawn from eight major public hospitals in Saudi Arabia using a convenience sampling method, which ensured representation from hospitals across different regions. The selected hospitals and their respective locations are as follows:

King Saud Medical City, Riyadh
King Fahd Hospital, Jeddah
King Abdulaziz Medical City, Riyadh
Riyadh Central Hospital, Riyadh
Jeddah General Hospital, Jeddah
Hail Regional Hospital, Hail
Dammam University Hospital, Dammam
Prince Sultan Hospital, Riyadh

The sample included nurses with varying levels of clinical experience, education, and training in evidence-based practice (EBP), ensuring a diverse representation of the nursing workforce.

Data Collection

Data were collected through a combination of hospital records and structured questionnaires administered to participating nurses. The following types of data were obtained:

Patient Safety Incidents: Data on reported safety incidents, such as medication errors, patient falls, documentation errors, infection events, and equipment failures, were collected from hospital incident reporting systems.

Protocol Adherence: Nurses' adherence to evidence-based clinical protocols was measured using a Likert-scale survey, assessing the frequency and consistency of following established procedures.

Staff Perception and Intervention Effectiveness: Structured questionnaires were used to evaluate nurses' perceptions of patient safety culture, the effectiveness of EBN interventions, and their training in evidence-based practices.

All instruments used were validated and demonstrated good reliability in previous studies, ensuring that the collected data accurately reflected nurses' practices and perceptions.

Variables

The study included both dependent and independent variables:

Dependent Variable

Patient safety outcomes, operationalized as patient safety scores and the number of reported safety incidents per nurse/unit.

Independent Variables

EBP Training: Participation in formal evidence-based practice training programs (Yes/No).

Protocol Adherence: Degree to which nurses consistently followed established clinical protocols.

Interventions Implemented: Specific strategies aimed at improving patient safety, including checklists, safety rounds, staff training, hand hygiene protocols, and audit & feedback measures.

Statistical Analysis

Data were analyzed using descriptive and inferential statistical techniques to evaluate relationships between nursing interventions and patient safety outcomes:

Descriptive Statistics: Computed for numeric variables (mean, standard deviation, minimum, maximum) and categorical variables (frequencies and percentages) to summarize the study sample characteristics and observed patient safety outcomes.

Independent t-tests: Used to compare patient safety scores between nurses who had received EBP training and those who had not, testing Hypothesis 1.

Pearson Correlation Analysis: Performed to examine the relationship between protocol adherence and the number of patient safety incidents, addressing Hypothesis 2.

Chi-square Tests: Conducted to determine associations between categorical variables such as EBP training and high patient safety scores, testing Hypothesis 3.

All statistical analyses were conducted using SPSS version 27, with a significance level set at $p < 0.05$. This combination of descriptive and inferential analyses allowed for a comprehensive evaluation of the impact of evidence-based nursing strategies on patient safety across multiple hospitals and departments in Saudi Arabia.

IV. RESULTS

Descriptive Statistics

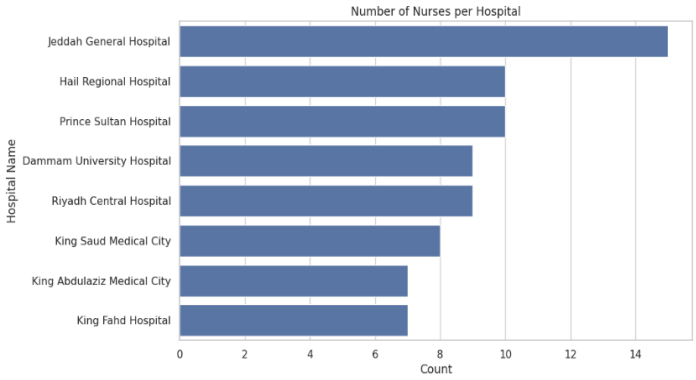
The study included 75 nurses from eight public hospitals in Saudi Arabia. The mean years of experience among participants was 16.32 ± 8.75 years, with a range of 1 to 30 years. The average protocol adherence score was 3.35 (SD = 1.27), indicating moderate adherence to clinical protocols. Nurses reported an average of 2.20 ± 1.22 patient safety incidents, ranging from 0 to 5 incidents. The intervention effectiveness score averaged 3.31 ± 1.33, while the overall patient safety score was 76.84 ± 13.56, ranging from 60 to 100. Staff perception of patient safety averaged 3.19 ± 1.43. These descriptive statistics suggest variability in experience, protocol adherence, safety outcomes, and perception of safety measures among the sample.

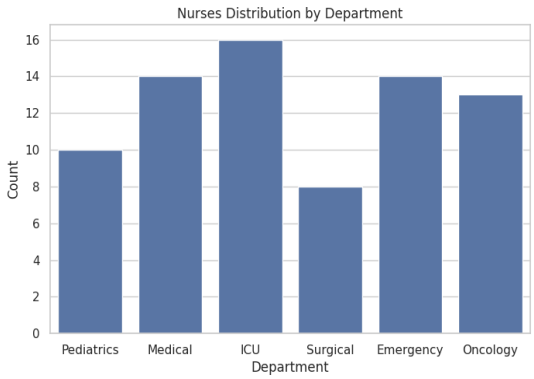
Frequency Distributions

The distribution of participants across hospitals showed that Jeddah General Hospital had the highest representation with 15 nurses, followed by Hail Regional Hospital[10], Prince Sultan Hospital[10], Dammam University Hospital[9], Riyadh Central Hospital[9], King Saud Medical City[8], King Abdulaziz Medical City[7], and King Fahd Hospital.[7]

Regarding regional representation, the majority of nurses were from Riyadh[34], followed by Jeddah[22], Hail[10], and Dammam.[9] By department, nurses were primarily from ICU[16], medical[14], emergency[14], oncology[13], pediatrics[10], and surgical units.[8]

In terms of EBP training, 44 nurses had received formal training, while 31 had not. The most frequently reported incident types were infections[20], patient falls[19], documentation errors[13], equipment failures[12], and medication errors.[11] Regarding interventions implemented, the most common strategies included checklists[17], safety rounds[17], staff training[15], hand hygiene protocols[15], and audit & feedback.[11]





Hypothesis Testing

The hypotheses were tested using appropriate inferential statistics to assess the impact of evidence-based nursing strategies on patient safety outcomes.

- Hypothesis 1 (Implementation of EBP improves patient safety): An independent t-test was conducted comparing patient safety scores between nurses who had received EBP training and those who had not. The results showed a significant difference, with nurses receiving EBP training having higher patient safety scores ($T = 7.07$, $p < 0.001$). This finding supports the hypothesis that EBP implementation positively influences patient safety outcomes.
- Hypothesis 2 (Nurse adherence to protocols reduces incidents): Pearson correlation analysis revealed a strong negative correlation between protocol adherence and patient safety incidents ($r = -0.92$). This indicates that higher adherence to clinical protocols is associated with fewer safety incidents, confirming the protective effect of protocol compliance on patient safety.
- Hypothesis 3 (Nurse EBP training is positively associated with high safety scores): Chi-square analysis demonstrated a significant association between EBP training and achieving high patient safety scores ($\chi^2 = 11.38$, $p = 0.0007$). Nurses who had received training were more likely to report high patient safety outcomes, reinforcing the importance of structured training programs in enhancing patient safety culture and performance.

These results collectively indicate that evidence-based nursing strategies, protocol adherence, and targeted interventions significantly contribute to improved patient safety in Saudi public hospitals. The findings highlight the critical role of EBP training and compliance with clinical protocols in reducing safety incidents and enhancing overall patient care quality.

APPENDIX

Table 1: Descriptive Statistics of Numeric Variables

Variable	*Count*	*Mean*	*Std Dev*	*Min*	*25%*	*Median*	*75%*	*Max*
Years of Experience	75	16.32	8.75	1	9	17	24.5	30
Protocol Adherence Score	75	3.35	1.27	1	2.5	3	4	5
Patient Safety Incidents	75	2.20	1.22	0	1	2	3	5
Intervention Effectiveness	75	3.31	1.33	1	2	3	4.5	5
Patient Safety Score	75	76.84	13.56	60	64.9	73.8	86.7	100
Staff Perception	75	3.19	1.43	1	2	3	5	5

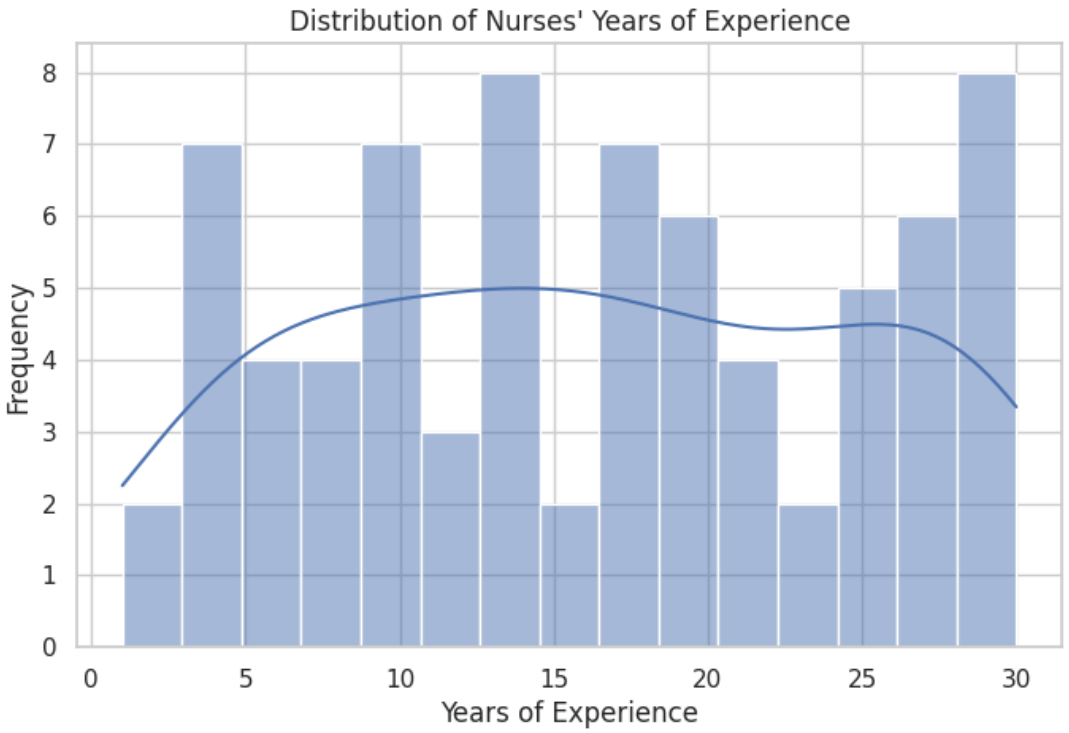
Table 2: Frequency Counts of Categorical Variables.

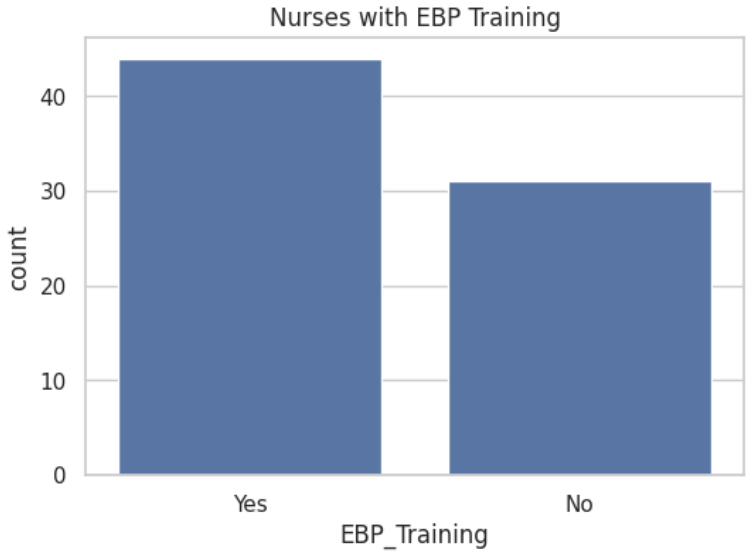
Variable	*Categories / Values*	*Count*
Hospital Name	Jeddah General Hospital	15
	Hail Regional Hospital	10
	Prince Sultan Hospital	10
	Dammam University Hospital	9
	Riyadh Central Hospital	9
	King Saud Medical City	8
	King Abdulaziz Medical City	7
	King Fahd Hospital	7
Region	Riyadh	34
	Jeddah	22

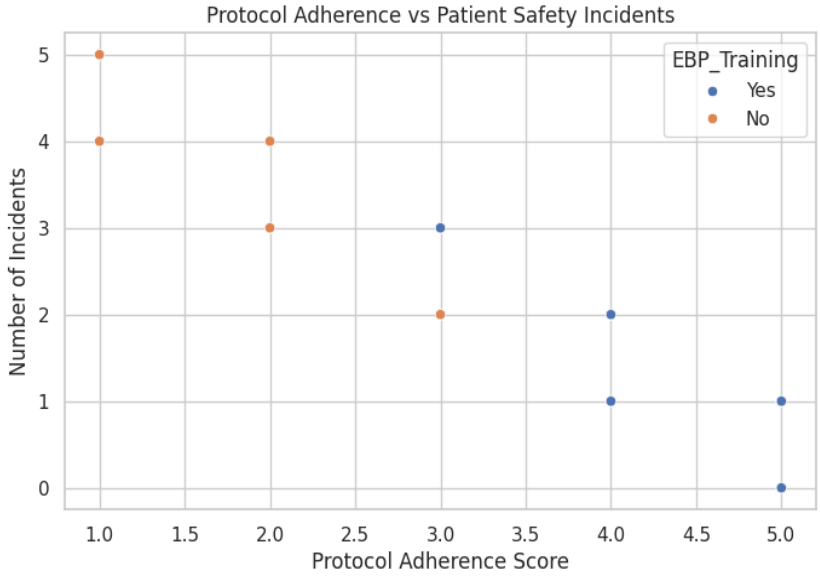
	Hail	10
	Dammam	9
Department	ICU	16
	Medical	14
	Emergency	14
	Oncology	13
	Pediatrics	10
	Surgical	8
EBP Training	Yes	44
	No	31
Incident Type	Infection	20
	Patient Fall	19
	Documentation Error	13
	Equipment Failure	12
	Medication Error	11
Intervention Implemented	Checklist	17
	Safety Rounds	17
	Staff Training	15
	Hand Hygiene Protocol	15
	Audit & Feedback	11

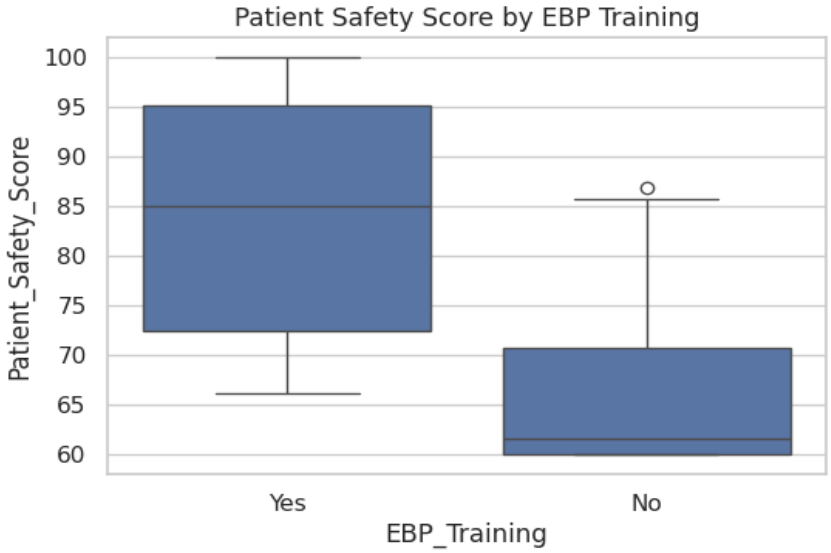
Table 3: Hypothesis Testing Results.

Hypothesis	***Test / Analysis***	***Result***	***Interpretation***
H1: Implementation of EBP improves patient safety	Independent t-test: EBP Training vs Patient Safety Score	T = 7.07, P < 0.001	Nurses with EBP training have significantly higher patient safety scores.
H2: Nurse adherence to protocols reduces incidents	Pearson correlation	r = -0.92	Strong negative correlation: higher protocol adherence → fewer patient safety incidents.
H3: Nurse EBP training positively associated with high safety score	Chi-square test	χ^2 = 11.38, P = 0.0007	Significant association between EBP training and high patient safety score.




Nurses with EBP Training
count
40
30
20
10
0
Yes
No
EBP_Training


Protocol Adherence vs Patient Safety Incidents
EBP_Training
Yes
No
Number of Incidents
5
4
3
2
1
0
1.0
1.5
2.0
2.5
3.0
3.5
4.0
4.5
5.0
Protocol Adherence Score


Patient Safety Score by EBP Training
Patient_Safety_Score
100
95
90
85
80
75
70
65
60
Yes
No
EBP_Training

V. DISCUSSION

The findings of this study provide valuable insights into the role of evidence-based nursing (EBN) strategies in enhancing patient safety in Saudi public hospitals. Analysis revealed that nurses who had received EBP training demonstrated significantly higher patient safety scores compared to those without training. This result aligns with international literature, which consistently reports that formal training in evidence-based practices equips nurses with the knowledge and skills necessary to identify, prevent, and manage potential safety hazards, ultimately improving patient care outcomes (Abuadas, 2021; Al Anazi, 2025). The strong association between EBP training and high safety scores underscores the critical role of continuing education and structured training programs in fostering a culture of safety within hospitals.

The study also found that higher adherence to clinical protocols was strongly associated with fewer patient safety incidents ($r = -0.92$). This finding emphasizes the importance of strict compliance with established protocols as a preventive strategy for adverse events. Consistent with previous research, adherence to standardized procedures, such as hand hygiene protocols, medication administration guidelines, and clinical checklists, has been shown to reduce the incidence of infections, medication errors, and other patient safety incidents (Rawas & Abou Hashish, 2023; Binkheder et al., 2023). Therefore, protocol adherence not only serves as a protective measure but also strengthens the overall safety culture within healthcare settings.

Interventions implemented in this study—including checklists, safety rounds, staff training, hand hygiene protocols, and audit & feedback mechanisms—were reported to be effective in enhancing patient safety. These findings support prior studies that highlight structured interventions as practical tools for improving safety outcomes. For example, Al Muharraq et al. (2024) demonstrated that teamwork, communication, and continuous learning initiatives positively influence nurses' perceptions of safety culture, which in turn reduces errors. Similarly, systematic implementation of checklists and regular safety rounds has been shown to improve adherence to clinical standards and reduce sentinel events (Binkheder et al., 2023; Allehebi & Hamed, 2024).

The implications of these findings are significant for hospital policy, nursing education, and patient outcomes. Hospitals should prioritize EBP training programs as part of professional development to enhance nurses' competence and confidence in evidence-based practice. Institutional policies that enforce protocol compliance and support structured interventions, such as checklists and safety rounds, can further reduce preventable incidents and foster a proactive safety culture. Additionally, these measures contribute to improved patient outcomes, reduced adverse events, and increased patient satisfaction, aligning with national and international quality standards for healthcare delivery.

However, the study has several limitations. First, the sample size of 75 nurses, while representing multiple hospitals, may limit the generalizability of the findings to all Saudi public hospitals. Second, data on protocol adherence, staff perception, and intervention effectiveness were collected via self-reported questionnaires, which may be subject to reporting bias. Third, the cross-sectional design captures associations at a single point in time, limiting the ability to infer causality between EBP training, protocol adherence, interventions, and patient safety outcomes. Despite these limitations, the study provides meaningful insights into the relationship between nursing strategies and patient safety in a Saudi context.

Based on the findings, several recommendations can be proposed. Hospitals should expand EBP training programs across all departments to ensure that all nursing staff are equipped with the latest evidence-based knowledge and skills. Structured interventions, such as checklists, safety rounds, and audit & feedback mechanisms, should be implemented hospital-wide to standardize care practices and enhance safety culture. Future research should employ longitudinal or experimental designs to examine the causal impact of EBP training and specific interventions on patient safety outcomes over time, ideally with larger and more diverse samples to increase generalizability.

In conclusion, this study highlights the significant role of evidence-based nursing strategies in improving patient safety in Saudi public hospitals. EBP training, strict adherence to protocols, and structured interventions collectively contribute to safer healthcare delivery and better patient outcomes. Implementing these strategies as part of hospital policy and nursing education is essential for fostering a culture of safety and continuous quality improvement.

VI. CONCLUSION

This research investigated the impact of evidence-based nursing (EBN) strategies on patient safety outcomes in public hospitals across Saudi Arabia, focusing on the role of evidence-based practice (EBP) training, adherence to clinical protocols, and structured safety interventions. The study provides compelling evidence that implementing these strategies significantly improves patient safety, reduces incidents, and fosters a positive safety culture within hospital settings.

The findings indicate that nurses who received formal EBP training achieved significantly higher patient safety scores compared to those without such training. This aligns with international and national studies emphasizing that structured educational programs in

evidence-based practice enhance nurses' knowledge, decision-making skills, and clinical competence, enabling them to identify potential risks and respond effectively. Training empowers nurses to adopt best practices consistently, which translates directly into improved patient outcomes, reduced adverse events, and a stronger culture of safety within healthcare organizations (Abuadas, 2021; Al Anazi, 2025).

In addition, this study confirmed a strong negative correlation between protocol adherence and patient safety incidents, highlighting that strict compliance with established clinical guidelines is essential for minimizing risks. Protocols such as hand hygiene procedures, medication administration standards, and procedural checklists provide structured guidance that reduces variability in care, prevents errors, and promotes consistency across departments. These findings reinforce the notion that adherence to standardized protocols is a cornerstone of patient safety, consistent with previous studies indicating that higher protocol compliance leads to fewer adverse events (Rawas & Abou Hashish, 2023; Binkheder et al., 2023).

The effectiveness of structured interventions, including checklists, safety rounds, staff training, hand hygiene protocols, and audit & feedback mechanisms, was also evident. These interventions support clinical staff by creating a systematic approach to patient safety, enhancing communication, teamwork, and accountability. When implemented consistently, such measures reinforce the hospital's safety culture, ensure adherence to best practices, and mitigate risks associated with human error. This is consistent with prior studies that demonstrate the utility of targeted safety interventions in improving nurses' perceptions and behaviors regarding patient safety (Al Muharraq et al., 2024; Allehebi & Hamed, 2024).

The implications of these findings are significant for hospital policy, nursing leadership, and healthcare quality improvement initiatives. Hospitals are encouraged to institutionalize ongoing EBP training programs, enforce compliance with clinical protocols, and implement structured interventions across all departments. Such strategies can contribute to reducing adverse events, enhancing patient care quality, and promoting a proactive safety culture. These measures also align with national healthcare quality standards and international best practices, supporting continuous improvement in patient outcomes and organizational performance.

Nevertheless, this study has certain limitations. The sample size of 75 nurses from eight hospitals may restrict the generalizability of findings, while reliance on self-reported measures for adherence and perception may introduce response bias. Additionally, the cross-sectional design limits the ability to draw causal inferences regarding the relationships between EBP training, protocol adherence, interventions, and safety outcomes. Future research should employ longitudinal or experimental designs with larger, more diverse samples to establish causality and further validate the effectiveness of EBN strategies.

In summary, this research highlights that evidence-based nursing strategies—including EBP training, strict protocol adherence, and structured safety interventions—play a critical role in improving patient safety in Saudi public hospitals. Implementing these strategies enhances nurse competence, strengthens organizational safety culture, reduces preventable incidents, and ultimately improves patient care quality. By embedding EBP education, standardized protocols, and structured interventions into hospital policies and nursing practice, healthcare organizations can achieve safer, more reliable, and higher-quality patient care. The findings underscore the importance of continuous professional development, organizational support, and research-based policy-making to sustain and expand evidence-based patient safety initiatives across Saudi Arabia.

VII. REFERENCES

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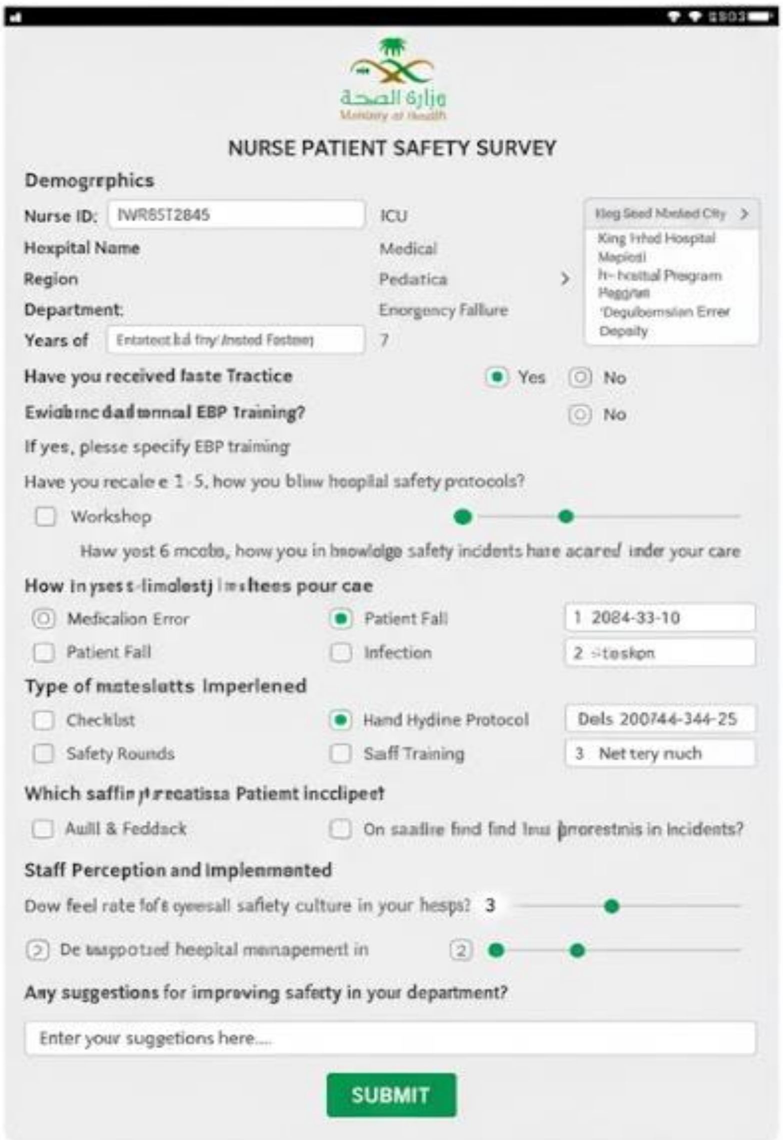
The Survey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