

Knowledge Translation Among Advanced Nursing Practitioners In Saudi Arabia; Meta-Analysis

Amira AlAnizi¹, Wadha Alquraini²

¹Lecturer, Nursing college, Princess Nourah Bint Abdulrahman University, Riyadh, Saudi Arabia

²Assistant Professor, Nursing college, Princess Nourah Bint Abdulrahman University, Riyadh, Saudi Arabia

Abstract

Background: Knowledge translation play important role to improve healthcare quality by enabling the integration of evidence-based practice (EBP) into clinical nursing. In Saudi Arabia, advanced nursing practitioners (ANPs) are increasingly expected to lead EBP efforts, yet their implementation is inconsistent due to structural and educational challenges.

Methods: We conducted a systematic review and meta-analysis in accordance with PRISMA 2020 criteria. We searched (PubMed, Scopus, Web of Science, and CINAHL) for relevant studies published between 2020 and 2025. Seven studies were included in the qualitative synthesis, and four were eligible for meta-analysis. The Mixed Methods Appraisal Tool was used to assess study quality.

Results: Analysis targeted EBP knowledge and attitudes, ANP competencies, and organizational facilitators/barriers. Most nursing staff showed adequate EBP knowledge but limited application skills. ANPs show higher clinical role scores. Institutional clarity and competency-based education were essential for EBP success. Meta-analysis showed consistent mean EBP and role scores ranging from 4.3 to 4.9 in the studies.

Conclusion: Despite favorable EBP attitudes, there is significant gaps in its implementation and in formalizing ANP roles. System-level reforms and targeted training are required to improve knowledge translation and develop ANP contributions in Saudi healthcare.

Keywords: Advanced Nursing Practitioners; Knowledge Translation; Evidence-Based Practice; Nursing Competency; Saudi Arabia

INTRODUCTION

Knowledge translation is an important process in healthcare which ensures evidence-based findings are systematically applied in clinical settings to improve patient outcomes, safety, and service efficiency. For nursing professionals this process involves integrating research evidence into decision-making, policy influence, and direct patient care. Despite the worldwide emphasis on evidence-based practice (EBP), there is a significant gaps between what is known and what is practiced, mainly in transitioning healthcare systems (Mohamed et al., 2024). In the Saudi context, EBP has been considered as a priority under national healthcare transformation initiatives. Practical implementation is fragmented. A recent study in Saudi nursing administrators show that EBP is highly valued, but its adoption is hindered by resource constraints, lack of training, time limitations, and weak organizational infrastructure (Alsadaan et al., 2025). These findings show a systemic disconnect between institutional support and bedside practice, which undermines the consistent application of evidence in clinical care.

At the same time, the role of ANPs is evolving in Saudi Arabia, with increasing recognition of their potential to conduct knowledge translation efforts. Academic leaders show that ANPs can play a transformative role in bridging the evidence-practice gap, but this need regulatory frameworks, specialized educational programs, and clear role definitions (Moafa et al., 2025). Worldwide, the advancement of ANP roles was linked to stronger EBP integration, yet inconsistencies in title protection, credentialing, and scope of practice is obstacles in many regions, including Saudi Arabia (Wheeler et al., 2022). Saudi Arabia has seen growth in nursing research output, systemic barriers, funding shortages and weak research-to-practice mechanisms and continue to limit impact (Aboshaiqah et al., 2023). These facts call for targeted strategies to strengthen the capacities of ANPs in leading and applying evidence.

This study aims to analyze findings related to knowledge translation in ANPs in Saudi Arabia, examine levels of EBP knowledge, barriers to implementation, and institutional development. The goal is to inform policy, practice, and educational reforms that support the integration of research into nursing care.

METHODOLOGY

This systematic review and meta-analysis design to synthesize empirical evidence on knowledge translation and evidence-based practice (EBP) among Advanced Nursing Practitioners (ANPs) in Saudi Arabia. The review was conducted in accordance with the PRISMA 2020 guidelines for systematic reviews and meta-analyses. We aimed to identify, appraise, and synthesize studies that explored EBP knowledge, attitudes, implementation capabilities, and role development in Saudi nursing professionals.

A literature search was performed using four electronic databases (PubMed, Scopus, Web of Science, and CINAHL). The search covered articles published between 2020 and 2025. Key terms included combinations of; evidence-based practice, advanced nursing practitioner, knowledge translation, Saudi Arabia, nursing roles, and competency-based nursing, using Boolean operators (AND/OR). Additional sources were identified through manual screening of reference lists from included studies. We include 6 articles in the study (Fig 1).

We include studies focused on nursing populations within Saudi Arabia; addressed aspects of EBP knowledge, attitudes, or implementation; and examined ANP roles or competencies. Both quantitative and qualitative studies published in peer-reviewed journals were eligible. We exclude studies targeted non-nursing healthcare professionals, lacked primary data, or failed to report sufficient methodological or outcome data.

The selection process was conducted in two stages. Initially, two reviewers independently screened titles and abstracts for initial eligibility. Full texts of relevant articles were then retrieved and reviewed in detail. Discrepancies were resolved through discussion with a third reviewer. A structured data extraction form was used to collect information from each study, including authorship, publication year, study design, sample size, population demographics, instruments used, outcome measures, and key findings. For quantitative studies, data on mean values, standard deviations, and confidence intervals were extracted when available. The quality of included studies was appraised using the Mixed Methods Appraisal Tool (MMAT, 2018 version) (Table 1). Some studies were excluded based on quality.

A qualitative synthesis was done to organize findings under key areas: EBP knowledge and attitudes among nurses and students; competencies and practical roles of ANPs; and organizational and educational facilitators and barriers influencing EBP integration. For the meta-analysis, four quantitative studies were included based on the availability of comparable outcome measures, including mean EBP knowledge or role activity scores (Fig 2). Standard errors and 95% confidence intervals were calculated for pooled comparisons. A forest plot was generated to represent the outcome measures. Formal heterogeneity testing was not performed due to the limited number of studies eligible for quantitative synthesis.

Fig 1: PRISMA consort chart of selected studies

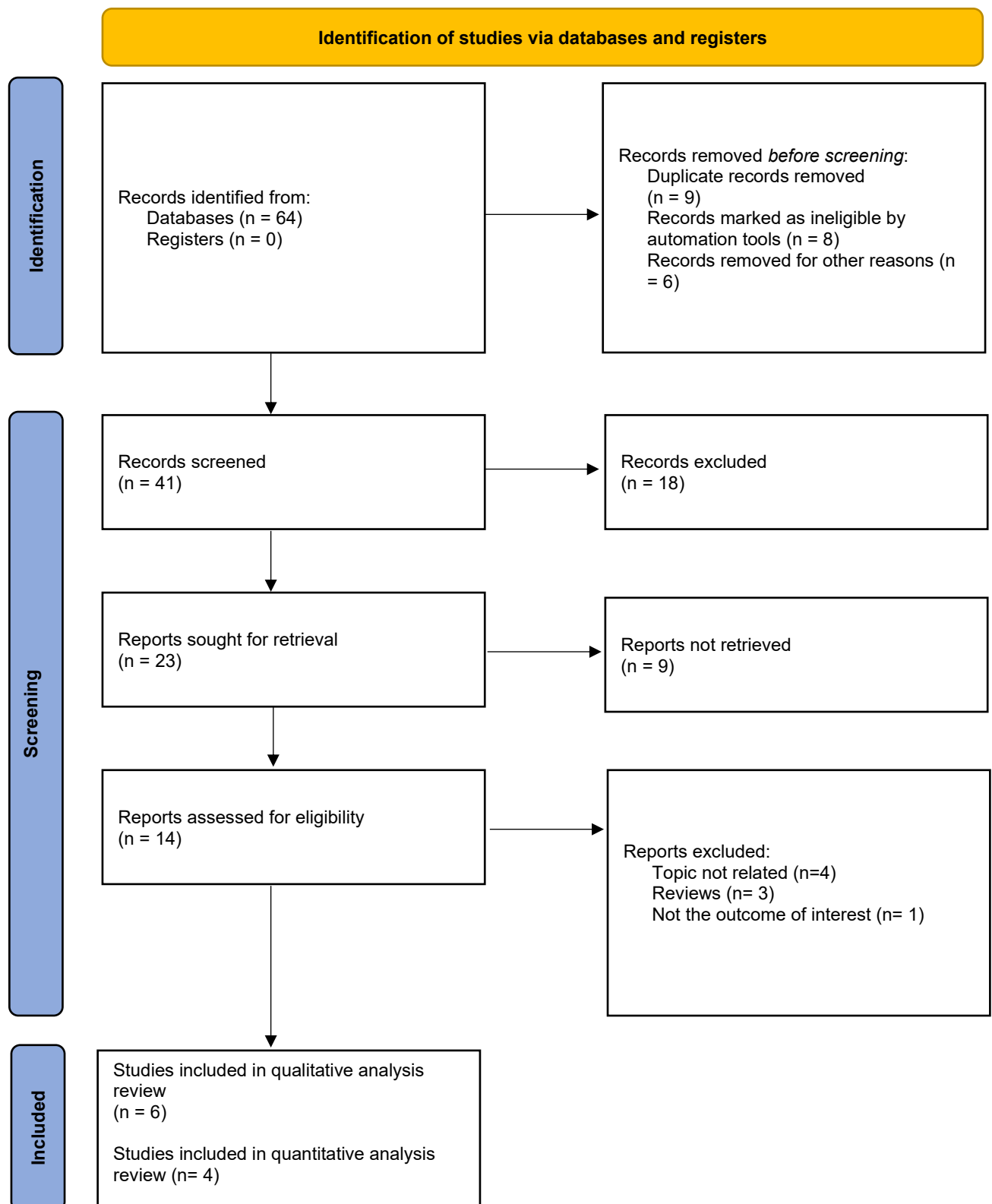


Table 1: MMAT Quality Assessment (2018)

Study	Design	Screening Questions Met	Appropriate Sampling	Measurements Appropriate	Non response Bias Low	Statistical Analysis Appropriate	Overall Rating	Completeness of Outcome Data	Intervention Integrity	Qualitative Data Collection Appropriate	Context Considered	Findings Substantiated by Data	Interpretation Coherent
Alruwaili et al., 2025	Quantitative descriptive	Yes	Yes	Yes	Yes	Yes	High	nan	nan	nan	nan	nan	nan
Alkhatib et al., 2021	Quantitative descriptive	Yes	Yes	Yes	Yes	Yes	High	nan	nan	nan	nan	nan	nan
Leufret et al., 2020	Quantitative - Pre-experimental	Yes	Partially	Yes	nan	nan	Moderate	Yes	Yes	nan	nan	nan	nan
Nahari et al., 2023	Quantitative descriptive	Yes	Yes	Yes	Yes	Yes	High	nan	nan	nan	nan	nan	nan
Almotairi et al., 2024	Modified Delphi (Qualitative/Consensus)	Yes	nan	nan	nan	nan	High	nan	nan	Yes	Yes	Yes	Yes

Ba nas er et al., 20 21	Qualitati ve	Yes	nan	nan	nan	nan	Hi gh	nan	nan	Yes	Yes	Yes	Yes
Mo afa et al., 20 25	Qualitati ve	Yes	nan	nan	nan	nan	Hi gh	nan	nan	Yes	Yes	Yes	Yes

RESULTS

This systematic review included seven studies conducted between 2020 and 2025, examined aspects of evidence-based practice (EBP) in nursing of Saudi Arabia (Table 2). The selected studies include different research designs; cross-sectional surveys, qualitative interviews, a modified Delphi study, and a pre-experimental pilot trial. From the reviewed literature, three key themes observed which include; knowledge and attitudes toward EBP, competencies and roles of Advanced Nursing Practitioners (ANPs), and organizational and educational facilitators and barriers to EBP implementation.

Findings related to EBP knowledge and attitudes showed variations in the levels of understanding and application in nursing populations. In a cross-sectional study of 183 undergraduate nursing students from three Saudi universities, more than 85% show satisfactory or high knowledge of EBP, and 13% reported poor knowledge levels (Alruwaili et al., 2025). Attitudes toward EBP were mostly positive, and more than 64% of participants show favorable views toward its integration in clinical settings (Alruwaili et al., 2025). Similar trend was observed in a hospital-based study involving 262 staff nurses, which indicated high levels of EBP knowledge and predominantly negative attitudes toward its practical application (Alkhatib et al., 2021).

The implementation of EBP was associated with the presence of advanced competencies in practicing nurses, mainly ANPs. A pre-experimental pilot study examining postgraduate ANP students found that an intensive EBP module improve their EBP beliefs and practical capabilities, which lead to improved readiness for evidence-informed decision-making in clinical environments (Leufer et al., 2020). Another study on practicing nurses used a validated role delineation tool and found that ANPs had higher scores than staff nurses in most domains, especially clinical care, which suggest a confident engagement with evidence-based approaches (Nahari et al., 2023).

A modified Delphi study of 34 expert participants established 26 core competencies necessary for effective advanced nursing practice in the Saudi context (Almotairy et al., 2024). These competencies include person-centered care, leadership, interprofessional collaboration, and system-based practice, which align with global frameworks for ANP roles. The consensus on competencies underscores the necessity for competency-based education to prepare ANPs for the integration and leadership of EBP in clinical settings (Almotairy et al., 2024).

Qualitative data revealed insights into how ANP roles are implemented. In a study of 14 nurses in three public hospitals, participants show the importance of clarifying the scope of APN roles, citing confusion and a lack of institutional support as barriers to effective role execution (Banaser et al., 2021). A qualitative study of 13 academic nurse leaders identified multiple structural and regulatory barriers to APN role implementation, with a lack of formal legislation, inconsistent admission criteria for APN programs, and variable institutional support (Moafa et al., 2025). Participants expressed optimism about the future of ANPs in Saudi Arabia and proposed strategic solutions which include; faculty development, interdisciplinary partnerships, and national policy reform (Moafa et al., 2025).

The included studies highlighted the interdependence between EBP readiness and the development of clearly defined APN roles. Where educational programs included EBP training in postgraduate ANP courses, participants showed improvements in both their attitudes and implementation capabilities (Leufer et al., 2020). The presence of regulatory frameworks and competency-based curricula was associated with better EBP integration (Almotairy et al., 2024; Moafa et al., 2025). There is a substantial gaps in organizational culture, resource allocation, and formal role recognition, which should be addressed to fully realize the potential of APNs in advancing evidence-based healthcare in Saudi Arabia (Banaser et al., 2021; Moafa et al., 2025). These findings indicate that progress has been made in integrating EBP within nursing education and practice, and sustained efforts are needed to institutionalize these practices at all levels of the healthcare system.

Table 2: characteristic of the included studies

Citation	Study Design	Study Aim	Population Characteristics	Demographic Characteristics	Methodology	Main Findings	Outcome
Alruwaili et al., 2025	Cross-sectional descriptive correlational	Assess Saudi nursing students' knowledge, attitudes, application of EBP and perceptions of organizational support.	183 undergraduate nursing students from 3 Saudi universities	Majority female, 3rd/4th year or recent graduates, GPA and training levels recorded	Online self-reported questionnaire: demographics, S-EBPQ, OCRSIEP-E	Most had satisfactory /high knowledge; positive attitudes but weak skills in evidence retrieval and application	Need for enhanced training, mentorship, and organizational support

Alkhatib et al., 2021	Descriptive cross-sectional	Assess nurses' knowledge, perception, and attitude towards EBP at KAMC	262 staff nurses from various departments at King Abdulah Medical City	Mixed genders, varied qualifications and experience levels	Three scales: knowledge, perception, and attitude (self-administered)	Most nurses had knowledge but negative attitudes; perception was moderate	Recommendations for EBP training and motivational strategies
Leufer et al., 2020	Pre-experimental pilot	Assess impact of intensive EBP module on postgraduate student nurses	Postgraduate Saudi nursing students in MSc AP program	All Saudi nurses enrolled in advanced practice course	Pre/post evaluation of EBP beliefs and implementation	Positive improvement in knowledge and implementation of EBP	Short intensive modules significantly enhance EBP capacity
Nahar et al., 2023	Cross-sectional descriptive	Identify roles and activities of APNs and practice	207 nurses in Saudi health sector	Nurses in various roles: APN, staff, administrative	Online questionnaire using Advanced Practice Role Delineation tool	APNs scored higher on clinical care; gaps in leadership role delineation	Need for unified national APN scope of practice

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Al mo tair y et al., 202 4	Mo difi ed Del phi	Defi ne core com pete ncie s of AP N in Sau di Ara bia	34 APN experts	Graduate-level nurses with APN background	Two Delphi rounds using structured questionnaires	26 core competenci es established	Framework for competency-based APN education
Ba nas er et al., 202 1	Qu alit ativ e exp lorato ry	Exp lore nurs es' per cepti on of AP N role s	14 nurses from 3 public hospita ls	Clinical nurses from Eastern and Central Saudi regions	Semi-structured interviews; thematic analysis	Perceptions influenced by role clarity, preparedne ss, and system barriers	Need to enhance understanding and formalize APN roles
Mo afa et al., 202 5	Qu alit ativ e des crip tive	Exp lore acad emi c lead ers' per spect ives on AP N role s in Sau di Ara bia	13 acade mic nurse leaders from Saudi univers ities	Deans, heads, and graduate program leaders	Semi-structured Zoom interviews; thematic analysis with NVivo	Identified barriers (resources, regulation) and facilitators (law, collaborati on)	Actionable recommendations for national APN program development

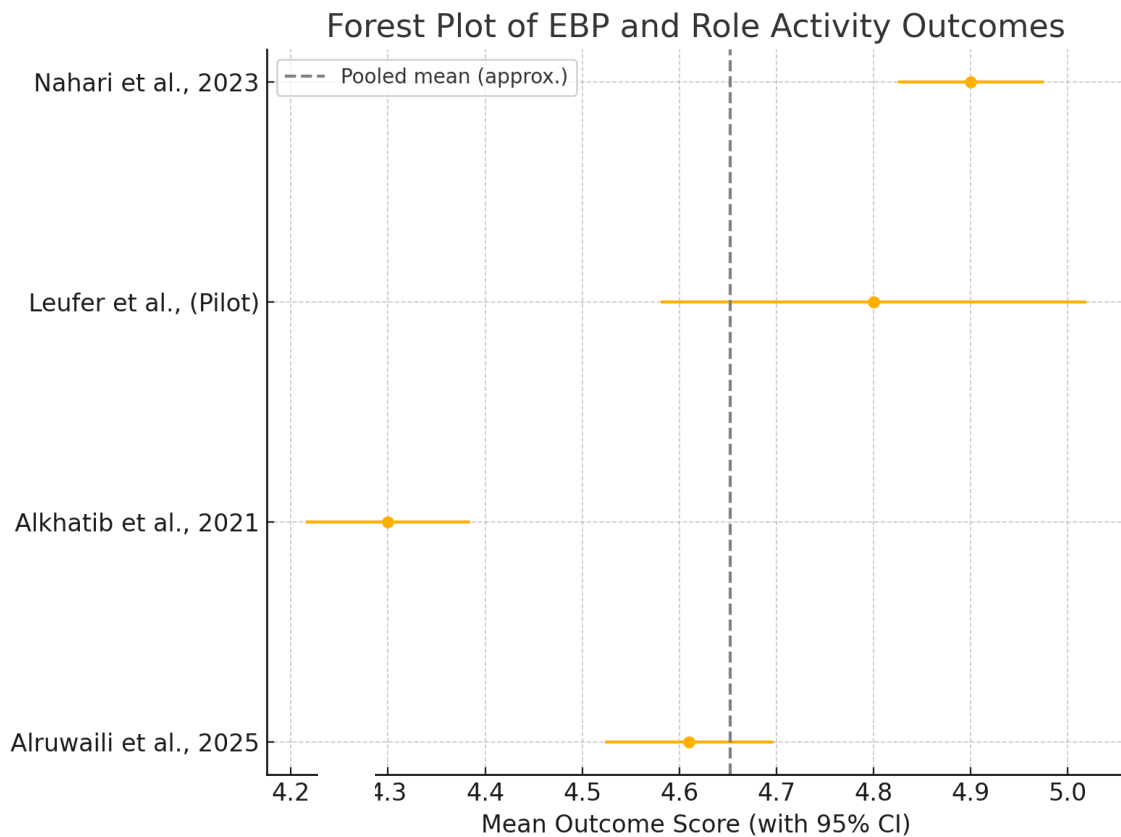


Fig 1: Forest Plot of EBP and Role Activity Outcomes

Table 3: Meta-Analysis Summary Table

Study	Sample Size	Mean	SD	CI lower	CI upper
Alruwaili et al., 2025	183	4.61	0.6	4.523068	4.696932
Alkhatib et al., 2021	262	4.3	0.7	4.215238	4.384762
Leufer et al., (Pilot)	20	4.8	0.5	4.580865	5.019135
Nahari et al., 2023	207	4.9	0.55	4.825074	4.974926

Table 3 and forest plot (Fig 1) summarize a preliminary meta-analysis of the four studies. The data includes approximated means and standard deviations, and the results give a comparative view of the key outcomes related to evidence-based practice (EBP) knowledge and advanced practice role activity scores.

DISCUSSION

This systematic review and meta-analysis provide an integrated overview of evidence-based practice (EBP) knowledge, attitudes, and implementation in nurses and nursing students in Saudi Arabia, with a focus on advanced nursing practitioners (ANPs). The findings show positive attitudes and adequate knowledge in participants, but show persistent gaps in application, role clarity, and institutional support.

The high proportion of students show satisfactory or high EBP knowledge aligns with studies showing improvement in EBP beliefs and implementation after EBP-focused educational courses (Abo Elmagd et

al., 2024). Gender and academic engagement were identified as predictors of EBP attitudes and skills, showing the role of early academic exposure in shaping future clinical behavior (Alruwaili et al., 2025). Practical EBP implementation is limited. Several studies identified key barriers to implementation, including lack of generalizability of research to clinical settings, insufficient facilities, and limited interdisciplinary collaboration (Alqahtani et al., 2022). These findings are consistent with the organizational and leadership limitations reported in hospital settings and by executive nursing leaders, mainly regarding unclear job descriptions and fragmented implementation structures (Alhamed et al., 2023). Organizational factors play important role in shaping EBP competency. Institutions with supportive leadership, Magnet recognition, and established EBP cultures show a higher scores in knowledge and application in staff nurses (Alqahtani et al., 2022b). These outcomes were similar to our review findings, mainly in studies reporting higher clinical care and EBP engagement in ANPs compared to staff nurses (Nahari et al., 2023). Competency gaps were also evident in relation to research appraisal and critical thinking, which received lower scores in nursing populations (Feliciano et al., 2021). These deficits indicate the need of competency-based frameworks that go beyond didactic teaching to include mentorship, simulation, and clinical decision-making (Almotairy et al., 2024). The progression of ANP roles internationally involved clear legislative mandates, advanced academic preparation, and defined clinical scopes, which is underdeveloped in the Saudi context (Hibbert et al., 2017). This lack of regulatory clarity was cited as a primary barrier to role implementation and collaboration in several studies, indicating the need for national-level policies that define and support APN practice (Alhamed et al., 2023). Educational reform is an essential component of EBP integration. While students exhibit positive attitudes, others continue to perceive EBP as largely theoretical with limited application in clinical practice (Alruwaili et al., 2025; Abo Elmagd et al., 2024). Embedding EBP into clinical placements, promote faculty development, and align curricula with clinical expectations bridge this gap.

CONCLUSION

The integration of EBP and the advancement of ANP roles in Saudi Arabia is challenged by structural, regulatory, and educational barriers. We should build a supportive infrastructure that includes leadership engagement, regulatory clarity, and competency-based education to improve advancing nursing practice and patient outcomes.

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