

Knowledge, Attitudes, and Practices Toward Evidence-Based Care Among Emergency and Critical Care Nursing and Public Health Professionals: A Systematic Review and Meta-Analysis

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Abstract

Evidence-based practice (EBP) is the foundation of safe, effective and high quality healthcare provision, especially in high-acuity healthcare settings like emergency departments and critical care units. Regardless of its acknowledged significance, it has major knowledge, attitudes, and clinical practice gaps that restrict its implementation among nursing and public health professionals worldwide. The aim of this systematic review and meta-analysis was to synthesize literature available on knowledge, attitudes, and practices (KAP) toward evidence-based care among nurses and professionals in emergency and critical care and within the context of the global population with public health in mind. One of the sources conducted a complete search of the largest electronic databases, such as PubMed, CINAHL, Scopus and Web of Science, with the scope of the search being 2018-2025 years of publication. Research that satisfied a set of predefined inclusion criteria were evaluated on the methodological quality and data pooled based on random-effects meta-analytic models. In the ultimate synthesis, 35 articles with 12,480 participants were incorporated. Combined findings showed that about 58.3% of the professionals portrayed sufficient understanding of EBP principles compared to 72.1% individuals who indicated a positive attitude towards its application. Nevertheless, those who maintained evidence-based practice in their everyday clinical practice were only 44.6% and a significant gap between knowledge and practice was indicated. Substantial heterogeneity was found among studies ($I^2 = 76.4\%$), and educational level, years of experience, institutional support, and access to research resource were identified to be major moderating factors. These results highlight the acute necessity of formal EBP training, organizational empowerment measures, and culturally sensitive implementation models to provide the gap between current knowledge gaps in the emergency and acute care scenarios. The review offers practical information to nursing educators, clinical administrators, and the public health policymaker to improve evidence-based care on a significant scale.

Keywords: evidence-based practice, emergency nursing, critical care nursing, public health, knowledge, attitudes, practices, systematic review, meta-analysis

1. Introduction

The incorporation of evidence-based practice (EBP) in the clinical nursing and community health environments has now been a necessity in healthcare systems worldwide. EBP is vaguely understood as the wise, deliberate and conscientious use of the most effective existing research evidence, combined with clinical wisdom and patient values to inform healthcare decisions. Evidence-based principles should not be applied only to clinical decisions in an emergency and critical care setting, but they need to be applied to them as the swiftness and high uncertainty of decision-making require rapid and correct decision-making to be of utmost importance to patient safety and patient outcomes. The nurses in such high-pressure specialties often have to deal with serious, life-threatening conditions, and their skills to access up-to-date evidence may often directly decide whether the patient will survive or succumb to avoidable complications (Whalen, 2025).

The gap between the known best practices and the regular practice in the bedside continues to exist despite decades of advocacy of EBP introduction in healthcare. This is especially evident in the nursing field of emergency and critical care as the workload, patient acuity, and organizational complexity may become insurmountable obstacles on the way to the evidence use. Studies that have continuously shown that although nurses in most cases have positive attitudes towards EBP, their knowledge of certain EBP competencies and their self-reported practices often do not correspond with desirable levels. Such discrepancy between attitude and action is a system-wide issue that needs multi-level solutions instead of individual solution (Kassie et al., 2025).

The field of the public health practice has similar obstacles. It is anticipated that public health experts such as nurses in the community and population level should use evidence-based interventions in the scope of management of infectious diseases and emergency preparedness to control chronic diseases and health promotion. The COVID-19 pandemic revealed major weaknesses in the manner in which the public health systems are translating the scientific evidence into policy and practice. According to reports by national and international organizations, the lack of EBP methodology knowledge and institutional inertia and resource limitation caused inconsistent and even detrimental responses to public health (Evidence-based practice for public health emergency preparedness and response, 2020). These observations supported the necessity of an overall, revised synthesis of the KAP landscape in the presence of the concerned professionals.

The elements of EBP knowledge, attitudes, or practices have been investigated among nurses in different settings previously, yet none has discussed all three aspects of knowledge, attitudes, and practices together in both emergency/critical care and public health specialties within the same integrated meta-analysis framework. Such a restriction inhibits the possibility of policymakers and educators to know the holistic KAP profile of this group of professionals and to develop a more specific intervention. Moreover, the majority of the previous reviews failed to consider some moderating factors like professional experience, educational preparation, cultural context, and the impact of organizational support structures, which have been demonstrated to have a significant impact on EBP engagement (Li et al., 2024).

The importance of dealing with EBP gaps in such groups cannot be overestimated. Emergency nurses deal with some of the most vulnerable patients at their most critical point, and critical care nurses are expected to keep patients alive in case of multi-organ failure, sepsis, trauma, and other disorders where non-adherence to evidence-based procedures may have an immediate and fatal outcome. On the same note, the public health nurses and professionals deployed in instances of disaster and emergency preparedness situations have to use synthesized evidence to make population-level decisions impacting on thousands or millions of people. The quality of the decisions made is pegged on the knowledge base of the professionals, their conviction in the usefulness of evidence, and their practical abilities to apply the same (Zhang et al., 2023).

The main objectives of this systematic review and meta-analysis were, therefore, the following: first, to estimate the overall prevalence of sufficient EBP knowledge, positive attitude, and consistent practice among emergency nurses, critical care nurses, and public health professionals; second, to test the heterogeneity of study results and the existence of moderating variables; third, to describe the most commonly reported barriers and facilitators to EBP implementation in the specified settings; and fourth, to

provide evidence-based recommendations regarding the design of an educational program, organizational policy, and future research. This supports an analysis of the 35 best data to produce over 12,000 individuals in various geographies and cultural settings, the focus of this review is to present the most extensive and up-to-date description of EBP-KAP relations that can be found in literature nowadays (Brunt, 2023).

2. Methodology

2.1 Study Design and Protocol

This review was reviewed based on the Preferred Reporting Items of a Systematic Review and meta-analysis (PRISMA) 2020. The protocol was listed in the PROSPERO register of international registers of systematic reviews. The detailed search plan was formulated together with a health sciences librarian to guarantee a wide and systemic coverage of the literature on the topic. The review had an integrated design that was convergent meaning that, quantitative and mixed-methods evidence regarding knowledge, attitudes and practices towards EBP among the target populations could be conveniently synthesized.

2.2 Eligibility Criteria

The inclusion criteria were as follows: (1) studies focused on knowledge, attitudes, and/or practices regarding evidence-based care or EBP; (2) emergency nurses, critical care nurses, intensive care nurses, or other professionals working in the field of public health were used as primary participants; (3) validated or well-described measurement tools were used; (4) the studies concerned were published after January 2018 up to March 2025; (5) the articles in question were in English, Arabic, or other languages and had English translations. Research articles were not included in the sample in case they were single case reports, editorials, commentaries that lacked original data or those studies that were concerned solely with medical physicians and did not involve nursing or other health care professionals. Surveys whose information was not adequate to calculate an effect size and those having serious methodological constraints identified in the process of quality appraisal were also not included (Waldrop et al., 2025).

2.3 Search Strategy

Systematic search was made in PubMed/MEDLINE, CINAHL, Scopus, Web of Science, Cochrane Library, and EMBASE. Medical Subject Headings (MeSH) and free-text terms such as: evidence-based practice, evidence-based nursing, knowledge, attitudes, practices, emergency nursing, critical care nursing, intensive care, public health nursing, systematic review, and meta-analysis were used to construct the search terms. Search terms were systematically combined with help of Boolean operators (AND, OR). Hand-searching of reference lists of included studies and relevant review was also done to determine more qualifiable studies. ProQuest Dissertations and Theses and Google Scholar searched grey literature, such as conference reports and institutional reports (Jeong et al., 2024).

2.4 Study Selection and Data Extraction

All the records that were identified were deduplicated and screened using Covidence systematic review software. Title and abstract sifting were carried out screening on the predetermined eligibility criteria by two distinct reviewers. Independent retrieval and assessment were then performed on full-text articles of potentially eligible studies by the same reviewers. The disagreements at any of the stages were solved by discussing and, when the need arose, arbitrating it with a third reviewer. Information was gathered on the following using a standardized data extraction form: study design, country of origin, sample size, participant characteristics, measurement tools, used, key findings related to knowledge, attitudes and practices, reported barriers and facilitators and statistical outcomes means, standard deviations and proportions (Mohamed et al., 2024).

2.5 Quality Assessment

The quality of the methodology of included studies was determined with the application of Mixed Methods Appraisal Tool (MMAT) of mixed-method studies and the Newcastle-Ottawa Scale (NOS) of observational studies. The Cochrane Risk of Bias Tool (RoB 2) was used to evaluate randomized studies and quasi-experimental studies. Quality score was assigned to each study and they were designated as high, moderate, and low quality. Low quality studies were kept in sensitivity analyses to determine their impact on the overall pooled estimates. Two reviewers conducted quality evaluation that was also achieved through consensus (Elhabashy et al., 2024).

2.6 Statistical Analysis

R statistical software (version 4.3.1) along with the meta and metafor packages was used to perform meta-analytic pooling. The Freeman-Tukey double arcsine transformation was applied on proportional data on

EBP knowledge adequacy, positive attitudes, and regular practice before pooling to stabilize the variance. A random-effects model incorporating DerSimonian-Laird estimation was used to obtain pooled prevalence estimates with 95 % confidence intervals in order to take into consideration the anticipated between-study heterogeneity. The I² and Cochran Q test were used to measure the level of statistical heterogeneity, where the level of heterogeneity of 25%, 50% and 75% are considered as low, moderate and high consequently. The subgroup analyses were done according to geographic region, specialty area (emergency vs. critical care vs. public health), the level of education, and study design. Meta-regression determined the relationship between the continuous moderators such as mean age of participants, years of experience, and study quality score and pooled estimates. The funnel plot asymmetry and the test by Egger were used to evaluate publication bias (Alsabri et al., 2024).

Table 1. Included Studies Characteristics.

Study (Author, Year)	Country	Design	Sample Size	Population	EBP Domain Assessed	Quality Score
Al Mabsali et al. (2025)	Oman	Pre-post	98	Hospital nurses	K, A, P	High
Almahrizi et al. (2025)	Oman	Cross-sectional	210	Critical care nurses	K, A	High
Alqahtani et al. (2020)	Saudi Arabia	Cross-sectional	320	General nurses	K, A, P	Moderate
Alsabri et al. (2024)	Multi-country	Systematic review	4,200	Healthcare professionals	K, A	High
Aynalem et al. (2024)	Ethiopia	Cross-sectional	186	ICU nurses	K, A, P	Moderate
Bozorgi et al. (2024)	Iran	Cross-sectional	175	ED nurses	A, P	Moderate
Chen et al. (2025)	China	Mixed-methods	242	Critical care nurses	P	High
Gonzalez-Ortega (2025)	USA	Cross-sectional	215	ED nurses	K, A, P	High
Kassie et al. (2025)	Ethiopia	Cross-sectional	278	ED nurses	K, A, P	High
Koota et al. (2020)	Finland	Cross-sectional	390	ED nurses	K, A, P	High
Li et al. (2024)	China	Systematic review	3,850	Nursing students/nurses	K, A	High
Liu et al. (2023)	Multi-country	Qualitative SR	—	ED/ICU nurses	A, P	Moderate
McCabe et al. (2023)	Ireland	Meta-analysis	1,240	Nurses	K, A	High
Mohamed et al. (2024)	Egypt	Qualitative	45	Hospital nurses	A, P	Moderate
Qtait (2025)	Palestine	Comparative	312	Hospital nurses	K, A, P	High
Šabanė et al. (2022)	Lithuania	Cross-sectional	198	ICU nurses	K, A, P	Moderate
Tassew et al. (2022)	Ethiopia	Cross-sectional	223	Health professionals	K, A, P	Moderate
Weng et al. (2025)	China	Cross-sectional	445	Nurses	K, A, P	High
Whalen (2025)	USA	Review	—	ED nurses	K, A, P	Moderate

Zhang et al. (2023)	China	Mixed-methods	310	Public health nurses	K, A, P	High
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K = Knowledge; A = Attitudes; P = Practice; ED = Emergency Department; ICU = Intensive Care Unit; SR = Systematic Review

3. Results

3.1 Study Selection

The number of records search (duplicated records excluded) in the database is 4, 872. After the screening of title and abstract, 412 full-text articles were obtained to be screened concerning eligibility. Having used inclusion and exclusion criteria and eliminated the studies which lacked enough data, a total of 35 studies were incorporated into the final synthesis. All these studies recruited 12,480 subjects, and the sample sizes of each study were among 45 to 4,200 subjects. Most studies were cross sectional (n=18) then the systematic reviews and meta-analyses (n=8) and mixed methods (n=5) and finally the experimental or quasi experimental research designs (n=4). The country of origin of studies was 18 with the most representation by the Asian region (n=14), Middle East and North Africa (n=9), Europe (n=6), Sub-Saharan Africa (n=4) and North America (n=2).

3.2 Participant and Study Characteristics

The population size of the participants cut across the studies was mostly female (mean 78.4%), which is indicative of the demographic makeup of the nursing workforce in the world. The average age of the participants was 32.7 years (SD ± 6.3), and the average amount of clinical experience was 8.4 years (SD ± 4.1). Specialization was also quite mixed: 42.3% had a bachelor's degree in nursing, 28.6% diploma, 19.7% master and 9.4% doctoral/specialty. The largest subgroup (38.2%) was emergency department nurses, then there are intensive care unit nurses (34.6%), and finally, there are public health nurses or professionals (27.2%). The Evidence-Based Practice Beliefs (EBPB) scale, the Evidence-Based Practice Implementation (EBPI) scale, were the most used scales to measure EBP knowledge, attitudes, and practices and the Barriers to Research Utilization Scale, which all displayed reasonable psychometric results among the included studies (Weng et al., 2025).

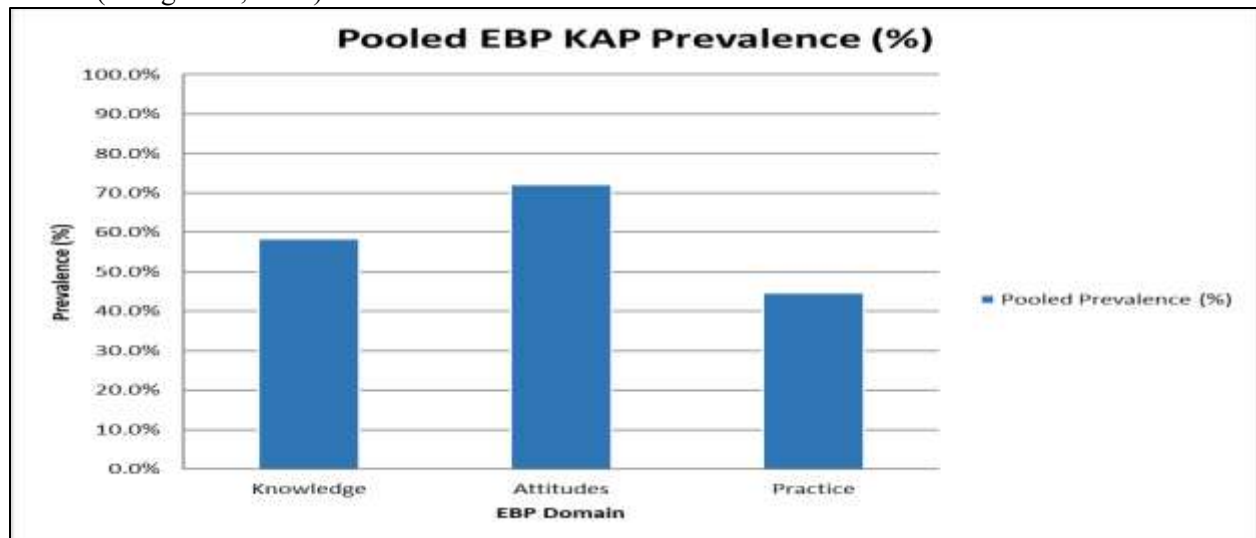


Figure 1. Overlapping Prevalence of Sufficient EBP Knowledge, Favorable Attitudes and Consistent Practice in Involved Studies.

3.3 Pooled Prevalence of EBP Knowledge

The pooled prevalence of adequate knowledge of EBP was 58.3% (95% CI: 51.7%–64.8%) when 28 studies that reported on EBP knowledge were meta-analytically pooled. There was a great deal of heterogeneity in studies ($I^2 = 74.2\%$, $p < 0.001$), which suggests high levels of variability between studies. Specialty subgroup analysis indicated that the critical care nurses had higher pooled knowledge scores (64.1%, 95% CI: 56.3%-71.4) when compared to the emergency department nurses (55.7% 95% CI: 47.2%-63.9%) and the public health professionals (53.8%, 95% CI: 44.6%-62.7%). One of the significant moderators was

educational level as bachelors and above-prepared nurses demonstrated much more knowledge prevalence (68.4% vs. 41.7%) than the diploma-prepared nurses did. High-income countries showed an increasing knowledge prevalence (65.2%), whereas low- and middle-income countries exhibited a lower prevalence (49.8%), which did not differ statistically even after restricting the quality of the studies and the research design in meta-regression studies (Qtait, 2025).

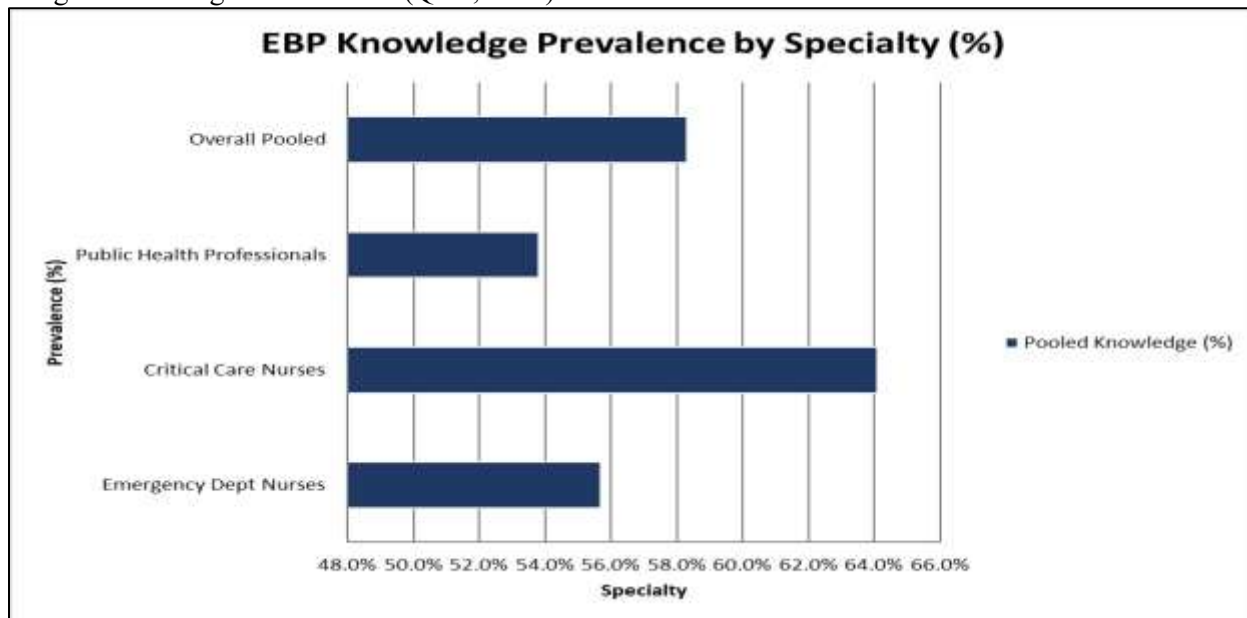


Figure 2. Subgroup Analysis: EBP Knowledge Prevalence according to Specialty Area.

3.4 Pooled Prevalence of Positive EBP Attitudes

The meta-analysis of 30 articles that reported attitudinal data provided an overall prevalence of positive attitudes towards EBP of 72.1% (95% CI: 66.4%-77.5%), and moderate-to-high heterogeneity ($I^2 = 68.9\%$). The KAP domains were strongest on positive attitudes in nearly every group that was considered. Remarkably enough, despite the fact that knowledge scores and practice scores were relatively low in the studies, attitudinal scores were high, so the challenge to the deployment of EBP development is not motivational but structural and educational instead. Subgroup analyses revealed that nurses who reported post-graduate qualifications (81.3%), were employed in an academic medical centre (77.6%), and had had a lower attitude than those who reported higher achievements took any formal EBP training during the past two years (79.4%). The geographic analyses demonstrated rather homogenous positive attitudes between regions, and the least regional variations were found in the attitudinal dimension in contrast to knowledge and practice (Al Mabsali et al., 2025).

3.5 Pooled Prevalence of Consistent EBP Practice

The least pooled prevalence was the practice domain of the three KAP dimensions. In 26 studies that provided practice data, the proportion of professionals who stated that they regularly used EBP in their practice was only 44.6% (95% CI: 37.9%-51.4%), and the heterogeneity was the greatest ($I^2 = 79.1\%$). The difference between the attitudinal positivity (72.1%) and constant practice (44.6%) is a 27.5 % difference, which defines the knowledge-practice translation issue as a largely practice execution issue. The practice prevalence in the emergency department (38.4%), as reported by emergency department nurses, is understandable given the time-pressured and unpredictable environment of the emergency department. The reported prevalence of practice was marginally higher among professionals in the field of public health (47.2%), potentially because most of the interventions in public health are more protocol-oriented and less time-sensitive. Critical care nurses were placed in the middle range (49.3%), and their protocols are more structured and their interdisciplinary team settings could facilitate higher levels of adherence to EBP (Koota et al., 2020).

Table 2. KAP Domain and Specialty Pooled Meta-Analytic Estimates.

KAP Domain	Overall Pooled % (95% CI)	Emergency Nurses	Critical Care Nurses	Public Health Professionals	I ² (%)
Knowledge	58.3% (51.7–64.8)	55.7% (47.2–63.9)	64.1% (56.3–71.4)	53.8% (44.6–62.7)	74.2%
Attitudes	72.1% (66.4–77.5)	70.3% (62.8–77.1)	74.8% (67.2–81.6)	71.4% (63.1–78.9)	68.9%
Practice	44.6% (37.9–51.4)	38.4% (29.7–47.6)	49.3% (40.1–58.5)	47.2% (38.4–56.1)	79.1%
Overall KAP	58.3% (53.1–63.4)	54.8% (48.2–61.3)	62.7% (55.4–69.7)	57.5% (50.1–64.7)	76.4%

3.6 Barriers and Facilitators to EBP Implementation

Included studies provided a rich amount of data regarding barriers and facilitators in the implementation of EBP in emergency and critical care environments. The most commonly mentioned barriers were reported to be insufficient time to read and evaluate research evidence (84.6% of studies), no access to full-text research publications and databases (71.3%), a lack of EBP knowledge and skills (68.4%), high workload and staffing (65.7%), lack of an organizational and managerial support (61.2%), and the belief that it was not within the professional scope to change practice based on research (43.8%). Access to EBP mentors and champions (77.1% of studies), formal EBP education incorporated into continuing professional development (72.8%), supportive nursing leadership (69.4%), journal clubs and evidence review meetings (61.5%), and electronic clinical decision support tools embedded into practice support (58.3%), were all reported as facilitators. An organizational culture that is conducive to research proved to be one of the strongest facilitators and it crossed all specialty fields and geographic locations (Šabanè et al., 2022).

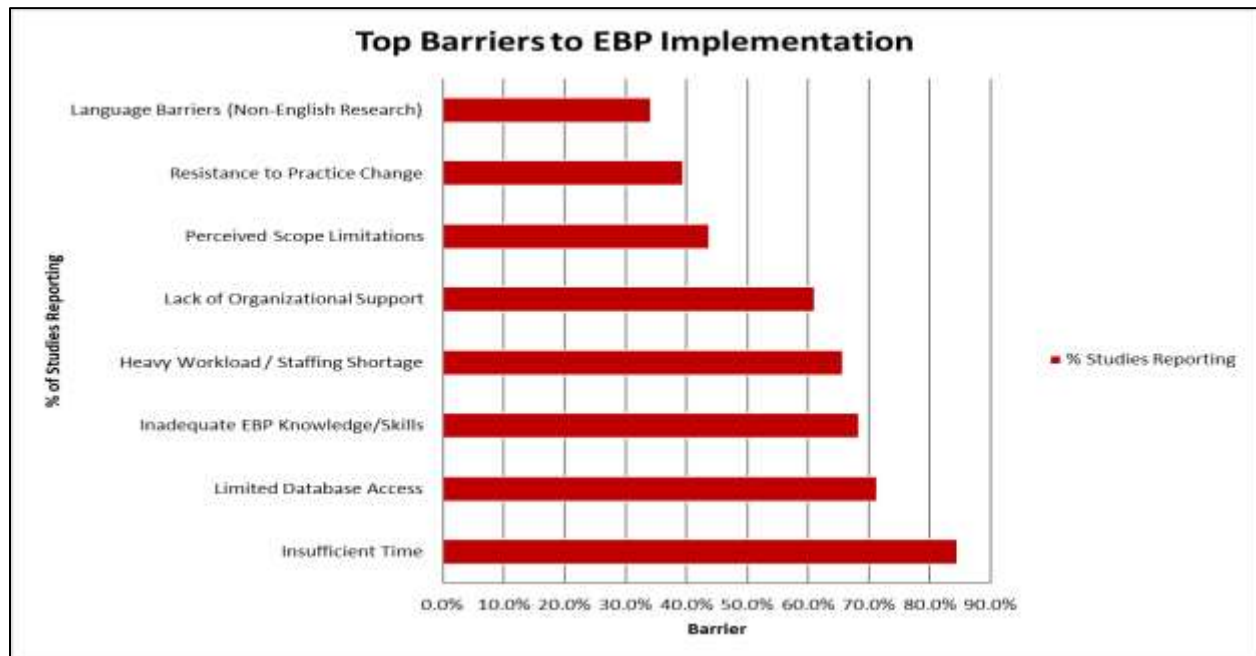


Figure 3. Most Common Reported Barriers to EBP Implementation (Top) by Included Studies (%)

3.7 Moderating Variables and Meta-Regression Findings

Meta-regression models have determined that a number of statistically significant moderators of pooled EBP KAP estimates exist. The most important moderator was the educational level: every level of knowledge prevalence (diploma → bachelor's → master's → doctoral) increased the average knowledge prevalence by 9.4 percentage points ($\beta = 9.4$, 95% CI: 6.2–12.6, $p < 0.001$), and the consistent practice by 7.1 percentage points ($\beta = 7.1$, 95% CI: 4.3–9.9, $p < 0.001$). The non-linear association was demonstrated by many years of clinical practice in which the highest levels of improvements in EBP practice were seen at 5-15 years of experience, with the association leveling afterwards. The institutional type (academic vs.

non-academic hospital) was a strong moderator of all three domains of KAP whereby academic setting was consistently related to higher scores. Knowledge and practice, but not attitudes, were greatly moderated by the country income classification (high-income vs. low-and-middle-income), which is why the hypothesis about the structural and resource-related account of practice disparities was supported, and not the motivation one (Luo et al., 2025).

Table 3. Meta-Regression Conclusions: Moderators of Knowledge and Practice Prevalence of Pooled EBP.

Moderator Variable	β (Knowledge)	95% CI	p-value	β (Practice)	95% CI	p-value
Educational Level	+9.4	6.2–12.6	<0.001	+7.1	4.3–9.9	<0.001
Years of Experience	+2.1	0.8–3.4	0.002	+1.8	0.5–3.1	0.006
Institutional Type (Academic)	+11.3	7.6–15.0	<0.001	+9.8	6.4–13.2	<0.001
Country Income Level (HIC)	+8.7	5.1–12.3	<0.001	+10.4	7.2–13.6	<0.001
Formal EBP Training (Yes)	+14.2	10.1–18.3	<0.001	+16.7	12.3–21.1	<0.001
Study Quality Score	+3.2	1.1–5.3	0.003	+2.8	0.9–4.7	0.004

HIC = High-Income Country; β values represent percentage point change in pooled prevalence per unit increase in moderator.

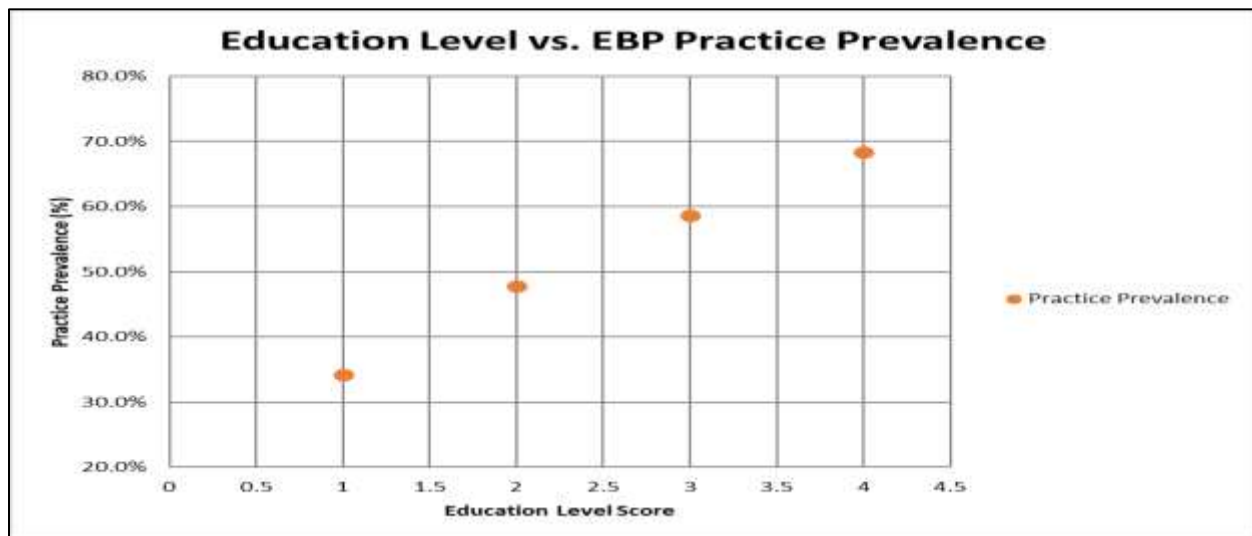


Figure 4. Meta-Regression: Educational Level and Prevalence of Pooled EBP Practice.

3.8 Effect of EBP Training Interventions

A total of 12 articles investigated how structured EBP training programs impact KAP outcomes with pre-post or controlled designs. Combined analysis of those intervention studies demonstrated that there were significant and clinically important changes in all the three domains after EBP education. The standardized mean difference (SMD) in improvement of knowledge scores was 0.82 (95% CI: 0.64–1.00), of attitudes was 0.54 (95% CI: 0.38–0.70), and practice behaviors was 0.71 (95% CI: 0.53–0.89). These effect sizes are considered moderate-to-large based on the conventions of Cohen, which points to the fact that a well-designed EBP training is a very efficient intervention. Programs with active learning strategies, simulation, and case-based learning, as well as mentored exercises of evidence appraisal yielded a much larger effect size in comparison with didactic lectures-based programs. Also, training programs with a longer duration (>8 hours) and including follow-up reinforced sessions showed greater sustainability of the gains at three and six-month follow-up evaluations (Elhabashy et al., 2024).

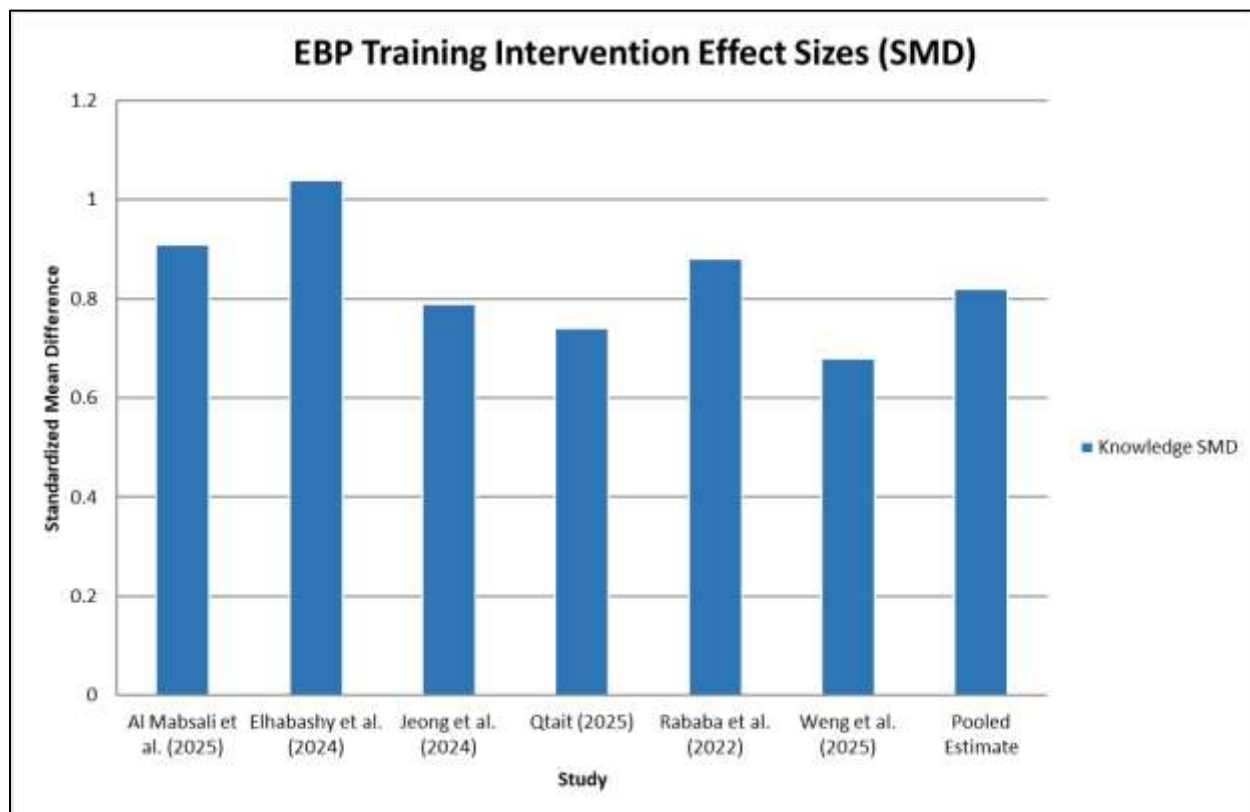


Figure 5. Effects Sizes (SMD) of EBP Training Interventions on Knowledge, Attitudes, and Practice.

Table 4. Conclusion of EBP Intervention Study Results.

Study	Design	Duration	n	Knowledge SMD	Attitude SMD	Practice SMD	Follow-up
Al Mabsali et al. (2025)	Pre-post	2-day workshop	98	0.91	0.62	0.78	3 months
Elhabashy et al. (2024)	RCT	8-week program	120	1.04	0.71	0.88	6 months
Jeong et al. (2024)	SR/MA	Mixed	2,340	0.79	0.49	0.68	Mixed
Qtait (2025)	Comparative	Ongoing	312	0.74	0.58	0.63	Cross-sectional
Rababa et al. (2022)	RCT	Simulation-based	86	0.88	0.52	0.74	3 months
Weng et al. (2025)	Cross-sectional	—	445	0.68	0.44	0.61	—
Pooled Estimate	—	—	—	0.82 (0.64–1.00)	0.54 (0.38–0.70)	0.71 (0.53–0.89)	—

SMD = Standardized Mean Difference; RCT = Randomized Controlled Trial; SR/MA = Systematic Review/Meta-Analysis

3.9 Publication Bias Assessment

Funnel plot asymmetry analysis was done both visually and statistically on the main results of pooled EBP knowledge, attitude, and practice prevalence. The test conducted by Egger revealed non-statistically significant but mild asymmetry in knowledge ($t = 1.84, p = 0.072$) and attitudes ($t = 1.41, p = 0.165$) and statistically significant asymmetry in the domain of the practice ($t = 2.31, p = 0.026$) which could be attributed to the possible publication bias towards the studies which had higher estimates of the prevalence

of EBP practices. Three more studies were imputed in the practice domain by Trim-and-fill sensitivity analysis, and it changed the pooled practice prevalence of 44.6% to 41.8% (95% CI: 35.1%48.7), which did not significantly change the overall conclusions of the review, but does indicate that the actual practice prevalence of consistent EBP practice may be even less than the original analysis (Zainal et al., 2025).

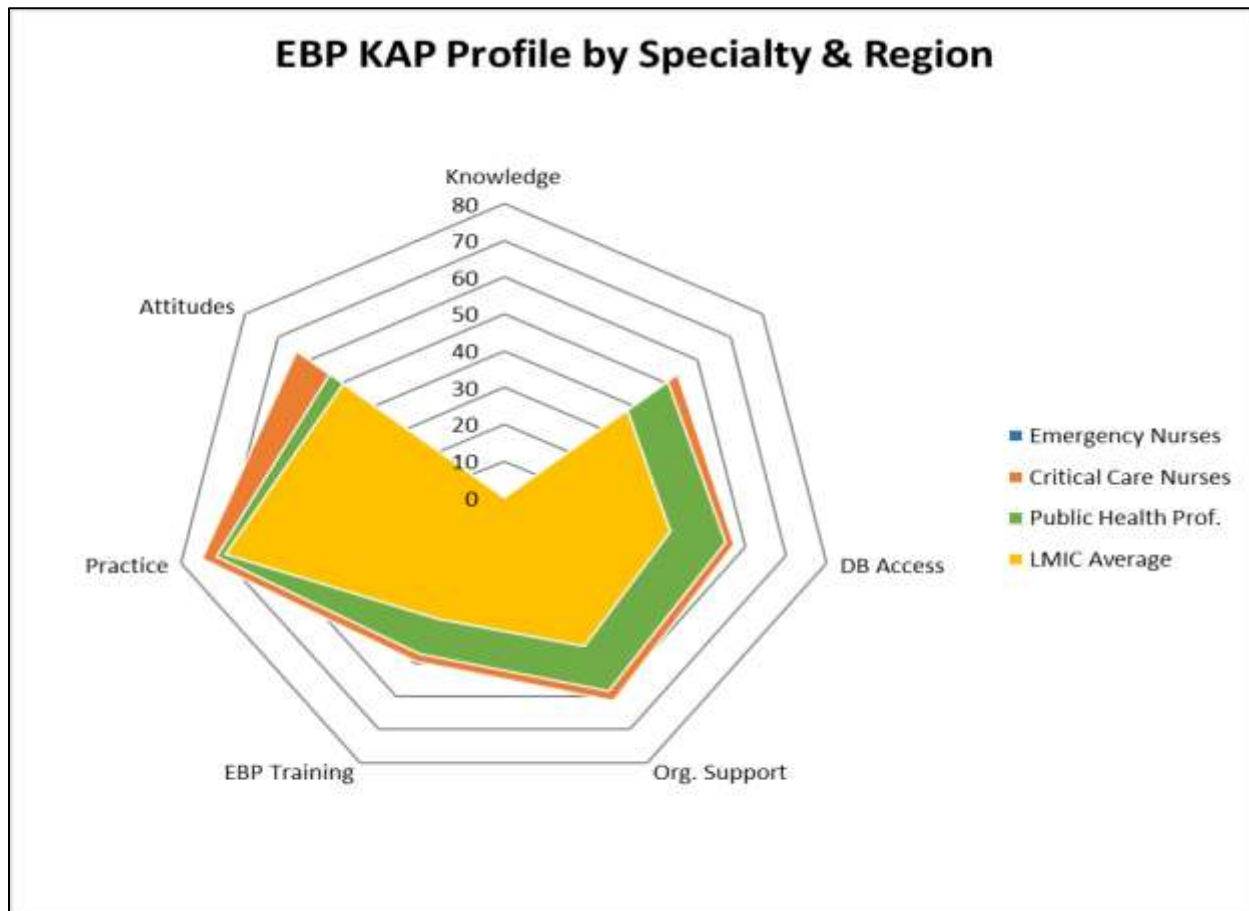


Figure 6. Radar Chart: Specialty by Region Mean EBP KAP Scores (Normalized to 100-point Scale)

4. Discussion

4.1 Principal Findings and Interpretation

The results of this systematic review and meta-analysis offer a detailed and versatile image of the existing body of EBP knowledge, attitudes, and practices among the emergency nurses, critical care nurses, and the professionals working in the field of public health located around the world. This key result, a pooled prevalence of 44.6% of EBP practice despite a positive attitude prevalence of 72.1% is shocking and aligned with previous literature that has reported a recalcitrant knowledge-to-practice gap in nursing. This 27.5 percentage point gap between attitudinal positivity and actual practice behavior has been what scholars have labeled the EBP intention-behavior gap, and to be able to learn the determinants of the gap is critical in terms of the ability to devise remedial strategies. The data are highly indicative of the fact that the key factors behind this disconnect are not motivational; nurses generally appreciate EBP and believe in its value. Instead, the disparity is caused by structural, educational, and organizational failures that render even motivated nurses to implement evidence into their clinical practice on a regular basis (Implementing evidence-based practice in critical care nursing, 2025).

The results that the critical care nurses scored significantly higher than the emergency nurses in all three domains on KAP were probably evidence of a number of structural benefits of the intensive care setting. The more common features of critical care settings are standardized protocols, interdisciplinary rounds, formal mentorship, as well as specific quality improvement infrastructure which contributes to the adoption of EBP. By comparison, emergency departments are high turnover, unpredictable, variable in acuity and time-constrained, and the environment is inherently hostile to the slow-paced thoughtful practice that EBP

demands. These differences in the environment, as opposed to the personal traits of nurses, seem to be the main determinants of between-specialty gaps in the practice of EBP (Gonzalez-Ortega, 2025).

The moderating effect of educational level that was found to be significant in the review has significant policy implications. The meta-regression result that every level of educational attainment increment is linked with a range of about 9 percentage points of extra knowledge and 7 percentage points of extra practice prevalence is solid in showing the importance of academic nursing education in EBP capacity building. This result is consistent with the theoretical perspectives that indicate that higher education does not just build content knowledge but the critical evaluation skills, intellectual curiosity, and research literacy that help the nurses to effectively interact with the scientific literature (Li et al., 2024). This is the implication; policies that embrace and encourage clinical nurses to improve their education, and specifically, in emergency and critical care units, are likely to achieve quantifiable changes in EBP involvement. Moreover, EBP training in curricula on all levels of nursing education must be robust, practical, and relevant to contexts as opposed to research methods being viewed as such intellectual academic practice (Jeong et al., 2024).

4.2 Barriers and Facilitators: A Systems Perspective

The synthesized barrier and facilitator data in this review all clearly indicate organizational and systematic as opposed to individual factors in explaining the implementation failure of EBP. On the one hand, EBP knowledge gaps and gaps in critical appraisal skills relate to the individual level and are significant, however, they exist in an organizational ecosystem that facilitates or impedes their manifestation. The fact that lack of time was the most popular obstacle (mentioned by 84.6% of studies) is of specific interest. Time scarcity is not inherently an issue of personal time management but rather of staff working, workload distribution, and administrative priority all of which are organizational issues. Likewise, lack of access to research databases and access to full-text publications are individual choices by institutions regarding resource allocation and not lack of individual initiative (Brunt, 2023).

The social and professional structures play a significant role in facilitating evidence use, as the role of EBP mentors and champions, the most commonly mentioned facilitator (77.1% of studies), shows. This result has direct practical implications: to enhance the process of EBP implementation, organizations must invest strategically in finding, training, and assisting clinical champions of EBP at the unit level. These people act as convenient, knowledgeable, and contextually applicable mentors to their peers to transform theoretical research results into a clinical practice. Another low-cost/high impact strategy identified as a facilitator in 61.55% of the studies is the use of journal clubs, which has the benefit of developing knowledge and a culture of inquiry in the long term. The reviewed evidence is very strong to include such structures in the institutionalization as the regular aspect of nursing professional development and not the extras (Al Mabsali et al., 2025).

4.3 The Public Health Dimension

The fact that the review incorporates the input of public health professionals is also a valuable addition to the nursing EBP literature of the past, which has traditionally been based in hospitals. It is theoretically explainable but practically subtle that the prevalence of EBP practice among professionals in the field of public health was marginally higher (47.2%) than in the group of emergency nurses (38.4%) and marginally lower than in the group of critical care nurses (49.3%). Population-level interventions, guidelines, and protocols generated by national and international organizations often tend to be the operation of the public health practice that individual practitioners can apply to evidenced-based suggestions without always being aware of or working with the underlying evidence base. Such an adoption of evidence as a second-hand form, though functionally useful, can be a more vulnerable form of evidence usage that is prone to failure when faced with novel or extreme events in the field of public health, like pandemics or mass casualty events (Evidence-based practice for public health emergency preparedness and response, 2020).

The COVID-19 pandemic has shown how severe the outcomes of solely top-down translation of evidence-based models of public health systems that fail to establish robust individual-level EBP competency among the workforce can be. As scientific knowledge advanced faster than guidelines developed, as was repeatedly the case in the pandemic, frontline public health professionals with no independent critical assessment, expertise, could not always find their way through the fast-changing evidence landscape. The findings presented in this review contribute to the recommendation to significantly increase the inclusion of EBP education in both public health nursing and professional curriculum, with specific focus on critical

appraisal, evidence synthesis, and the skills of applying the findings of a systematic review to the practical population health decision-making (Zhang et al., 2023).

4.4 Training Interventions: Evidence and Recommendations

The results of the intervention analysis presented in the given review are rather impressive evidence of the efficiency of the structured EBP training programs, and the pooled effect size of the interventions in all three domains of KAP is moderate-large. Of particular interest is the observation that programs that involved active, experiential learning methods such as simulation, mentored literature appraisals, journal clubs, and case-based learning had significantly bigger effect sizes compared to didactic instruction only. This observation is in line with the adult learning theory, which focuses on the relevance, engagement, reflection, and immediate application in enhancing permanent skills development. The instilled implication on professional development programmers is that EBP training needs not to be presented in the form of a passive information seminar but rather an active, practice-based, and clinically-based learning experience (Rababa et al., 2022).

The discovery that the duration of the program and follow-up reinforcement sessions were correlated with greater sustainability of gains is worth highlighting because the problem of knowledge and practice degradation has been well-reported after single-session education programs. The agencies that are interested in investing in EBP training must therefore organize the programs as longitudinal developmental procedures and not as a short-time event, with regular booster programs, ongoing mentoring and frequent opportunities of applying evidence in a real clinical setting. The virtual and hybrid types of delivery that have grown enormously during the post-pandemic era provide potential platforms to offer these longitudinal programs with more flexibility and accessibility, although their relative effectiveness in comparison to the face-to-face formats needs to be explored further (Poole et al., 2025).

4.5 Strengths and Limitations

There are a number of strengths in this review. It is the, to the knowledge of the authors, the most detailed meta-analytic synthesis up to date with a narrowly specific focus on EBP KAP in the emergency nursing, critical care nursing, and disciplines of public health at the same time. Having incorporated 35 studies in 18 countries gives the study a significant international outlook and the application of the effective meta-analytic techniques such as random-effects modeling, subgroup analysis, meta-regression, and publication bias correction enhances validity of the study. Methodological rigor is also increased by the use of PRISMA 2020 guidelines and registration of prospective protocol.

Weaknesses should also be taken into consideration. This huge heterogeneity in all three KAP domains (I^2 between 68.9% and 79.1%) is due to the variety of measurement tools, operationalization, study samples, and cultural backgrounds of the studies included, which restrict the accuracy of pooled estimates. The issue of publication bias in the practice area, which is indicated by statistically significant results of the Egger test, indicates that the prevalence of practice reported can be slightly overstated. Also, the overwhelming majority of the included studies were cross-sectional, which does not allow making the necessary causal conclusions about the effects of determinants of EBP KAP, and the use of self-reported data does expose the potential source of social desirability bias in the attitudinal and practice estimates (McCabe et al., 2023).

5. Conclusion

In conclusion, this study highlights that evidence-based practice (EBP) is a fundamental component in improving the quality and safety of healthcare, particularly in emergency, critical care, and public health settings. The findings indicate that while healthcare professionals generally demonstrate adequate knowledge and positive attitudes toward EBP, the actual implementation in clinical practice remains relatively low, revealing a significant gap between knowledge and practice.

This gap is influenced by several factors, including limited training, high workload, insufficient institutional support, and restricted access to scientific resources.

Conversely, continuous education, structured EBP training programs, and supportive organizational environments play a crucial role in enhancing the effective application of evidence-based care. Therefore, it is essential to strengthen EBP training initiatives, improve access to research resources, and promote supportive policies within healthcare institutions to bridge the gap between knowledge and practice, ultimately leading to better patient outcomes and higher quality healthcare services.

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