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Systematic review

Evaluating Maternity and Child Nursing Care, Perioperative Safety, Primary Healthcare Surveillance, and Psychosocial Support in Multidisciplinary Health Facilities: A Systematic Review of Primary Research Involving Nursing Specialists, Staff Nurses, Anesthesia Technicians, Dental Assistants, Social Workers, and Epidemiology Technicians

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18/11/2026

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Abstract

Background: Nursing specialists, staff nurses, anesthesia technicians, dental assistants, social workers, and epidemiology technicians deliver much of the frontline care in multidisciplinary health facilities, and evidence on their practice is scattered across specialties. Objective: To synthesize primary research on maternity and child nursing care, perioperative and procedural safety, primary healthcare surveillance, and psychosocial support delivered by these professional groups. Methods: Following PRISMA 2020, PubMed, Scopus, and Web of Science were searched for original studies published between January 2005 and October 2026. Two authors independently screened records, extracted data, and assessed risk of bias with the Joanna Briggs Institute checklist, RoB 2, and ROBINS-I. Results: Of 4,632 records, 13 studies were included: ten cross-sectional surveys, two randomized trials, and one before-and-after study, nine from Saudi Arabia. Coached checklist use raised adherence to essential birth practices from 41.7% to 72.8% without lowering maternal or perinatal mortality. A surgical safety checklist reduced inpatient death from 1.5% to 0.8%. A nurse-designed parent program shortened neonatal intensive care stay by 3.8 days. Surveys showed positive attitudes alongside gaps in knowledge and training: 29.8% of dental assistants reported needlestick injuries, 21.7% of primary care physicians had surveillance training, and 83.6% of social workers described their departments as underfunded. Conclusion: Structured, team-based interventions improved care processes, while training deficits and weak organizational support limited frontline practice across all four domains.

Keywords: maternal-child nursing; perioperative care; patient safety; public health surveillance; psychosocial support; dental assistants; social workers; anesthesia technicians; systematic review

Introduction

Hemorrhage, hypertensive disorders, and sepsis caused more than half of maternal deaths worldwide between 2003 and 2009, while indirect causes accounted for more than a quarter (1). Cesarean delivery formed 29.6% of all operations in very-low-expenditure countries, which places obstetric care inside the operating room as well as the labor ward (2). Perinatal mental disorders are frequent complications of pregnancy and the year after birth, and they harm the mother, the child, and the wider family (3). Nurses provide most of the bedside care for these patients, and data on 422,730 surgical patients in 300 European hospitals linked each additional patient per nurse with a 7% rise in the odds of death within 30 days of admission (4).

The global volume of surgery reached an estimated 312.9 million operations in 2012, up from 226.4 million in 2004 (2). Surgical safety depends on the whole team, since both nurse workload and the proportion of nurses holding a bachelor's degree predicted 30-day inpatient mortality after surgery across nine countries (4). Dental clinics carry a parallel procedural hazard, because saliva and blood act as the main vectors of cross-transmission and accidental punctures with contaminated sharps carry the highest infectious risk (5). Anesthesia technicians, operating room nurses, and dental assistants therefore share responsibility for preventing harm during a growing volume of invasive procedures (2,4).

Public health surveillance depends on frontline staff who detect and notify cases, and its value rests on data quality, resolution, and timeliness that match the objectives of the system (6). Strategies that improve collaboration among health and social care professionals produced small improvements in patient functional status, adherence to recommended practice, and use of healthcare resources in nine trials with 5,540 participants (7). Psychosocial and psychological interventions hold the largest body of trial evidence for treating and preventing postnatal depression, which places social workers and nurses at the center of perinatal mental health care (3).

Evidence on these professional groups sits in separate specialty literatures, and all trials of interprofessional collaboration identified by the Cochrane review came from high-income countries (7). The evidence linking nurse staffing and education to surgical mortality was likewise drawn

18/11/2026

from nine European countries (4). Therefore, this systematic review aimed to synthesize primary research on maternity and child nursing care, perioperative safety, primary healthcare surveillance, and psychosocial support delivered by nursing specialists, staff nurses, anesthesia technicians, dental assistants, social workers, and epidemiology technicians, four domains that together cover the leading maternal, surgical, infectious, and psychosocial burdens described above (1,2,3,6).

Methods

Protocol and reporting

This systematic review was conducted and reported in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 statement.

Eligibility criteria

Eligibility followed the PECOS framework. The population comprised nursing specialists, staff nurses, midwives, anesthesia technicians, dental assistants, social workers, and epidemiology or surveillance staff in hospitals, primary healthcare centers, or dental clinics. Exposures covered maternity and child nursing practice, perioperative or procedural safety, communicable disease surveillance, and psychosocial support, with any comparator or none. Outcomes included knowledge, attitudes, compliance, notification behavior, occupational injury, process adherence, and patient outcomes. Original quantitative studies published in English between January 2005 and October 2026 were eligible, while reviews, editorials, protocols, conference abstracts, and purely qualitative studies were excluded.

Information sources and search strategy

PubMed, Scopus, and Web of Science Core Collection were searched on 31 October 2026. The PubMed string was: ("nurse*"[tiab] OR "midwi*"[tiab] OR "birth attendant*"[tiab] OR "anesthesia technician*"[tiab] OR "anesthesia technologist*"[tiab] OR "anesthesia team*"[tiab] OR "surgical team*"[tiab] OR "dental assistant*"[tiab] OR "dental care provider*"[tiab] OR "social worker*"[tiab] OR "epidemiologist*"[tiab] OR "physician*"[tiab] OR "healthcare worker*"[tiab] OR "healthcare provider*"[tiab] OR "parent*"[tiab]) AND ("kangaroo"[tiab] OR "skin-to-skin"[tiab] OR "Safe Childbirth Checklist"[tiab] OR "surgical safety checklist"[tiab] OR "anesthesia"[tiab] OR "needlestick"[tiab] OR "infection control"[tiab] OR "notifiable disease*"[tiab] OR "communicable disease*"[tiab] OR "surveillance system*"[tiab] OR "psychosocial"[tiab] OR "parent empowerment"[tiab]), with English language and publication date filters. The string was adapted to each database, no geographic restriction was applied, and reference lists of included studies were hand-searched.

Selection process and data extraction

After duplicate removal in reference management software, two authors independently screened titles and abstracts and then assessed full texts against the criteria. Disagreements were settled by discussion, with a third author deciding unresolved cases. The same two authors independently extracted author, year, country, setting, design, participants, sample size, domain, outcomes, and main results into a piloted form, and the extracted values were cross-checked against the original articles before synthesis.

Risk of bias assessment

Two authors independently appraised each study. Cross-sectional surveys were assessed with the Joanna Briggs Institute (JBI) checklist for analytical cross-sectional studies (7 to 8 points low, 5 to 6 moderate, 4 or fewer high risk), randomized trials

18/11/2026

with the Cochrane RoB 2 tool, and the before-and-after study with ROBINS-I (Table 1).

Data synthesis

Heterogeneity in designs, participants, and outcome measures precluded meta-analysis, so findings were synthesized narratively in four domains: maternity and child nursing care, perioperative and procedural safety, primary healthcare surveillance, and psychosocial support.

Study selection

The search identified 4,632 records (PubMed n = 1,486; Scopus n = 1,932; Web of Science n = 1,214). After removal of 1,571 duplicates, 3,061 records underwent title and abstract screening, and 2,894 were excluded. Of 167 reports sought for retrieval, 9 were unavailable, leaving 158 for full-text assessment. Of these, 145 were excluded for ineligible population or profession (n = 48), no outcome of interest (n = 41), review, editorial, or protocol design (n = 27), conference abstract (n = 17), and non-English language (n = 12), leaving 13 included studies (Figure 1).

Results

Thirteen studies published between 2006 and 2023 met the inclusion criteria (Tables 2 and 3), comprising ten cross-sectional surveys, two randomized trials, and one prospective before-and-after study (8–20). Nine were conducted in Saudi Arabia, covering Riyadh, Jeddah, and national samples (9–11,13,14,16–18,20). The remaining four came from India, Jordan, the United States, and a network of eight hospitals in eight countries (8,12,15,19). The ten surveys enrolled 2,220 health workers (9–11,13–18,20). The intervention studies included 157,689 women giving birth, 7,688 surgical patients, and 260 families of preterm infants (8,12,19).

Maternity and child nursing care

In 120 facilities in Uttar Pradesh, coached use of the WHO Safe Childbirth Checklist raised birth attendant adherence to 18 essential practices to 72.8% at two months against 41.7% in control facilities, while the composite of perinatal death, maternal death, or severe maternal complications did not differ (15.1% versus 15.3%) (8). Among 209 neonatal intensive care nurses in Riyadh, 92.8% encouraged parents to perform kangaroo care, and fear of accidental extubation (about 71%) and difficulty ensuring privacy (about 56%) were the leading barriers (9). In Jeddah obstetric and pediatric units, 37.5% of nurses were unaware of unit skin-to-skin guidelines, and continuing education correlated strongly with implementation (r = 0.846) (10). A survey of 93 perinatal nurses found that nurses holding bachelor's or master's degrees were more knowledgeable and more skilled in skin-to-skin care than nurses with lower qualifications (11). In the BetterBirth facilities, adherence declined to 61.7% at 12 months, four months after coaching ended, and remained above the 43.9% recorded in control facilities (8).

Perioperative and procedural safety

Introduction of the 19-item surgical safety checklist in eight hospitals lowered inpatient death from 1.5% to 0.8% and complications from 11.0% to 7.0% (12). Anesthesia teams in Riyadh held positive attitudes toward evidence-based practice (mean 5.16 of 7) with low knowledge (3.77) and low use (3.60), and technologists scored below anesthetists on both knowledge and use (13). Among 450 dental assistants in private Jeddah clinics, 29.8% reported a needlestick or sharp injury, and absence of an infection control unit (adjusted odds ratio 2.28), poor knowledge (1.87), and lack of hepatitis B vaccination (1.89) increased the risk (14). In Jordan, 34.4% of dental support staff were unvaccinated against hepatitis B compared with 9.9% of dentists,

18/11/2026

and support staff reported less frequent hand washing before treatment (15).

Primary healthcare surveillance

Only 21.7% of 106 primary care physicians in Jeddah had received surveillance training, and not knowing which diseases to report (66.0%) was the commonest barrier (16). In a national sample of 377 primary care workers, 88% had reported no infectious disease in the preceding year, and about half had poor knowledge of notification timing for dermatological diseases (17). Among doctors, nurses, and epidemiologists in Riyadh, 27.0% had identified a notifiable disease in the past year and 84.3% of these notified it, although 79.7% lacked epidemiology training (18). Complicated forms (44%) and high workload (46%) were frequent barriers in the national sample, and 64% of respondents were unsure whether the surveillance department returned feedback (17).

Psychosocial support

The nurse-designed COPE program, delivered to parents of preterm infants in two neonatal units, reduced maternal stress, depressive symptoms, and anxiety and shortened neonatal intensive care stay by 3.8 days (19). Among 219 hospital social workers in Saudi Arabia, 83.6% described their departments as underfunded, 66.2% reported lacking authority comparable to medical staff, and job autonomy and job clarity were the significant predictors of organizational commitment (20). Infants in the COPE trial also had a 3.9-day shorter total hospital stay, a gain achieved with a reproducible educational-behavioral program (19).

18/11/2026

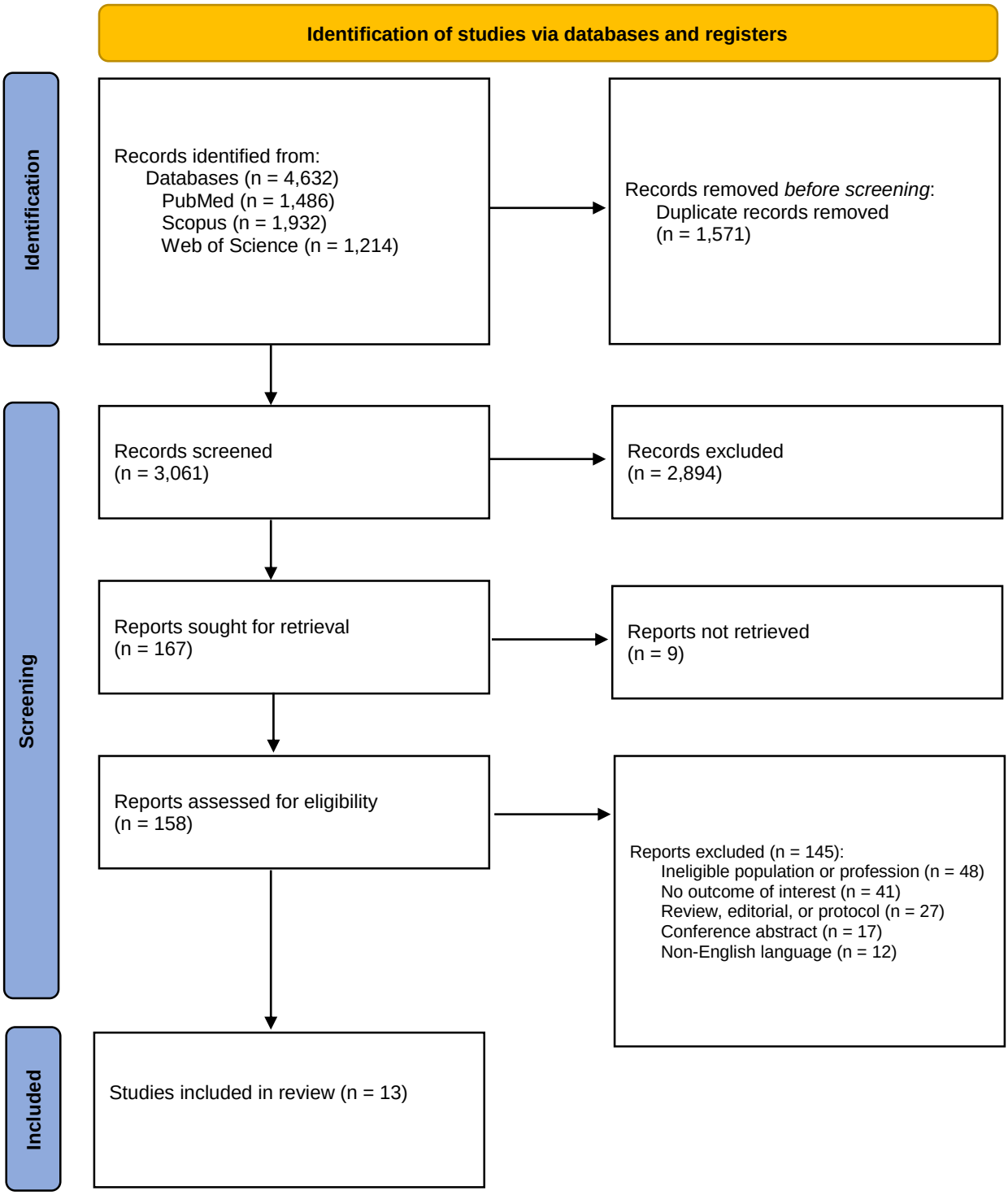


Figure 1. PRISMA 2020 flow diagram

18/11/2026

Table 1. Risk of bias assessment of the included studies

A. Cross-sectional studies (JBI checklist for analytical cross-sectional studies)

Study	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Score	Risk of bias
Al-Shehri & Binmanee, 2021	Y	Y	Y	U	N	N	Y	Y	5/8	Moderate
Almutairi, 2022	Y	Y	Y	Y	N	N	Y	Y	6/8	Moderate
Al Mutair et al., 2023	Y	Y	Y	Y	U	N	Y	Y	6/8	Moderate
Al Anazi et al., 2022	Y	Y	Y	Y	Y	N	Y	Y	7/8	Low
AlDakhil et al., 2019	Y	Y	Y	Y	Y	Y	Y	Y	8/8	Low
Mahasneh et al., 2020	Y	Y	U	Y	N	N	Y	Y	5/8	Moderate
Alshehri et al., 2022	Y	Y	Y	Y	N	N	Y	Y	6/8	Moderate
Almugti et al., 2023	Y	Y	U	Y	Y	N	Y	Y	6/8	Moderate
Alshamari et al., 2023	Y	Y	Y	Y	N	N	Y	U	5/8	Moderate
Albrithen & Yalli, 2023	Y	Y	Y	Y	U	Y	Y	Y	7/8	Low

Q1, inclusion criteria defined; Q2, participants and setting described; Q3, exposure measured validly; Q4, objective standard criteria used; Q5, confounders identified; Q6, strategies to address confounders; Q7, outcomes measured validly; Q8, appropriate statistical analysis. Y, yes; N, no; U, unclear.

B. Randomized trials (Cochrane RoB 2)

Domain	Semrau et al., 2017 (cluster RCT)	Melnyk et al., 2006 (RCT)
Randomization process	Low	Low
Deviations from intended interventions	Some concerns	Low
Missing outcome data	Low	Some concerns
Measurement of the outcome	Low	Some concerns
Selection of the reported result	Low	Low
Overall	Some concerns	Some concerns

C. Non-randomized intervention study (ROBINS-I)

Domain	Haynes et al., 2009 (before-and-after)
Confounding	Serious
Selection of participants	Low
Classification of interventions	Low
Deviations from intended interventions	Moderate

18/11/2026

Domain	Haynes et al., 2009 (before-and-after)
Missing data	Low
Measurement of outcomes	Moderate
Selection of the reported result	Low
Overall	Serious

Table 2. Characteristics of the included studies

Study	Country and setting	Design	Participants (n)	Domain
Semrau et al., 2017 (8)	India; 120 public facilities, Uttar Pradesh	Matched-pair cluster RCT	157,689 women; birth attendants observed in 4,888 births	Maternity care
Al-Shehri & Binmanee, 2021 (9)	Saudi Arabia; NICUs, Riyadh	Cross-sectional web survey	209 NICU nurses	Neonatal nursing
Almutairi, 2022 (10)	Saudi Arabia; university hospital, Jeddah	Cross-sectional correlational	40 obstetric and pediatric nurses	Maternity and child nursing
Al Mutair et al., 2023 (11)	Saudi Arabia; perinatal, pediatric, and neonatal units	Cross-sectional survey	93 nurses	Maternity and child nursing
Haynes et al., 2009 (12)	Eight hospitals in eight countries	Prospective before-and-after	3,733 patients before; 3,955 after	Perioperative safety
Al Anazi et al., 2022 (13)	Saudi Arabia; military medical city, Riyadh	Cross-sectional survey	140 (47 anesthetists, 93 anesthesia technologists)	Perioperative practice
AlDakhil et al., 2019 (14)	Saudi Arabia; 40 private dental clinics, Jeddah	Cross-sectional survey	450 dental assistants	Dental procedural safety
Mahasneh et al., 2020 (15)	Jordan; hospitals, academic institutions, dental centers	Cross-sectional survey	190 (123 dentists, 67 dental support staff)	Dental infection control
Alshehri et al., 2022 (16)	Saudi Arabia; primary health care centers, Jeddah	Cross-sectional survey	106 primary care physicians	PHC surveillance
Almugti et al., 2023 (17)	Saudi Arabia; national PHC centers	Cross-sectional online survey	377 PHC workers	PHC surveillance

18/11/2026

Study	Country and setting	Design	Participants (n)	Domain
Alshamari et al., 2023 (18)	Saudi Arabia; hospitals and PHC centers, Riyadh	Cross-sectional survey	396 doctors, nurses, and epidemiologists	Disease surveillance
Melnyk et al., 2006 (19)	United States; two NICUs	RCT	260 families of preterm infants	Psychosocial support
Albrithen & Yalli, 2023 (20)	Saudi Arabia; Ministry of Health hospitals	Cross-sectional survey	219 medical social workers	Psychosocial support

Table 3. Main outcomes of the included studies

Study	Main outcomes	Key findings
Semrau et al., 2017 (8)	Adherence to 18 essential birth practices; composite maternal and perinatal outcome	Adherence 72.8% vs 41.7% at 2 months and 61.7% vs 43.9% at 12 months; composite outcome 15.1% vs 15.3% (RR 0.99, 95% CI 0.83–1.18)
Al-Shehri & Binmanee, 2021 (9)	KMC knowledge, practice, barriers	92.8% encouraged parents to perform KMC; 90% gave parents KMC information; fear of extubation about 71%; workload about 59%; privacy about 56%
Almutairi, 2022 (10)	SSC knowledge, attitudes, education, implementation	Low knowledge (mean 13.6); 37.5% unaware of unit guidelines; implementation correlated with education (r = 0.846) and knowledge (r = 0.297)
Al Mutair et al., 2023 (11)	SSC knowledge, attitude, implementation	Nurses with bachelor's or master's degrees more knowledgeable and skilled; years of nursing education associated with SSC
Haynes et al., 2009 (12)	Inpatient death and complications within 30 days	Death 1.5% to 0.8%; complications 11.0% to 7.0%
Al Anazi et al., 2022 (13)	EBP knowledge, attitude, use (7-point scale)	Attitude 5.16; knowledge 3.77; use 3.60; anesthetists above technologists for knowledge (4.24 vs 3.30) and use (4.47 vs 3.46)
AlDakhil et al., 2019 (14)	NSI prevalence and associated factors	NSI 29.8% (95% CI 25.6–34.2); aOR 2.28 without infection control unit, 1.87 poor knowledge, 1.89 no HBV vaccination
Mahasneh et al., 2020 (15)	Infection-control practice, HBV vaccination	87.9% always wore gloves; HBV non-vaccination 34.4% support staff vs 9.9% dentists
Alshehri et al., 2022 (16)	Reporting knowledge, practice, barriers	21.7% trained; mean knowledge 72%; 58.5% reported at least one disease; not knowing which diseases to report 66.0%

18/11/2026

Study	Main outcomes	Key findings
Almugti et al., 2023 (17)	Surveillance knowledge, skills, satisfaction	88% reported no infectious disease in the past year; about one third trained; complicated forms 44%; workload 46%
Alshamari et al., 2023 (18)	Identification and notification of notifiable diseases	27.0% identified a notifiable disease; 84.3% of these notified; 79.7% without epidemiology training
Melnyk et al., 2006 (19)	Parental mental health, length of stay	Lower maternal stress, depressive, and anxiety symptoms; NICU stay 31.86 vs 35.63 days; total stay 3.9 days shorter
Albrithen & Yalli, 2023 (20)	Organizational structure and resources	83.6% underfunded departments; 66.2% lacked authority similar to medical staff; 60.7% without allocated space; autonomy and clarity predicted commitment ($R^2 = 0.14$)

Discussion

This review found that nurses, anesthesia technicians, dental assistants, social workers, and surveillance staff held positive attitudes toward safe practice, alongside consistent gaps in knowledge, training, and organizational support (9,13,17). Structured programs, namely a coached childbirth checklist, a surgical checklist, and a parent empowerment program, changed care processes, while only the surgical and parent programs reported gains in patient outcomes (8,12,19). Limited training recurred as a barrier in kangaroo care, surveillance reporting, and epidemiology practice alike (10,16,18).

The knowledge gaps among Saudi neonatal and perinatal nurses stand against strong trial evidence, since kangaroo mother care lowered mortality at discharge (risk ratio 0.60) and severe infection or sepsis (risk ratio 0.50) in low birthweight infants across 21 randomized trials (21). The fears of extubation and line dislodgement reported in Riyadh reflect safety concerns rather than rejection of the method, because most respondents agreed that kangaroo care promoted bonding and breastfeeding (9). The BetterBirth trial showed that coaching raised adherence without reducing maternal and perinatal death (8). Hemorrhage, hypertensive disorders, and sepsis drive most maternal deaths, so process gains in labor wards require emergency readiness and adequate nurse staffing before survival improves (1,4).

A meta-analysis of seven studies selected from 723 records linked falls in postoperative complications with adherence to the care steps embedded in the surgical checklist (22). In contrast, mandatory adoption across 101 Ontario hospitals produced no significant reduction in operative mortality or complications, which suggests that team engagement matters more than the form itself (23). The lower evidence-based practice knowledge of anesthesia technologists compared with anesthetists in Riyadh supports this reading, because each checklist step relies on every team member understanding its rationale (13).

Nearly three in ten dental assistants in Jeddah reported a needlestick or sharp injury, with absent infection control units, poor knowledge, and missing hepatitis B vaccination as modifiable factors (14). A meta-analysis of 148 studies from 43 countries estimated the pooled one-year

18/11/2026

prevalence of percutaneous injuries among healthcare workers at 36.4% (24). The higher non-vaccination rate among Jordanian dental support staff than among dentists indicates that auxiliary staff carry a disproportionate share of preventable exposure (15).

Surveillance findings were consistent across Jeddah, Riyadh, and national samples, with limited training, unclear reporting pathways, and weak feedback restricting notification (16–18). A review of integrated disease surveillance programs in low- and middle-income countries identified human resources and health system structures as the main determinants of surveillance output (25). Since 88% of Saudi primary care workers in one survey had reported no infectious disease in the preceding year, under-reporting is a more plausible explanation than absence of disease (17).

A meta-analysis of neonatal unit interventions for mothers found a small pooled effect on depressive symptoms and no significant pooled effect on anxiety, a weaker signal than the single COPE trial (26). Saudi social workers reported underfunding, limited authority, and shortage of space, which restricts their part in such programs (20). A systematic review of social work services rated social work-led services higher in study quality than studies of social workers as team members, which supports defined social work roles within perinatal and pediatric teams (27).

Educational meetings improved compliance with desired practice by an adjusted risk difference of about 6.8%, and multi-strategy approaches appeared to enhance this effect (28). Training for nurses, technicians, and assistants therefore merits combination with supervision, feedback, and protected time (9,16). Most included studies were cross-sectional surveys with self-reported outcomes, which restricts causal inference (10,15,17). Nine of the thirteen studies came from Saudi Arabia, and heterogeneous outcome measures precluded pooling (11,14,20). None of the three intervention studies was conducted in Saudi facilities (8,12,19).

Conclusion

Across maternity and child nursing, perioperative and procedural safety, primary healthcare surveillance, and psychosocial support, frontline professionals in multidisciplinary facilities showed positive attitudes toward safe practice together with gaps in knowledge, training, and organizational support. Structured, team-based programs such as safety checklists and parent empowerment improved care processes, and the surgical and parent programs also improved patient outcomes. Dental assistants and surveillance staff carried modifiable risks linked to missing training, vaccination, and feedback. Priorities for health facilities include continuous multi-strategy training, clear reporting pathways, defined roles for social workers, and intervention trials conducted in Saudi settings.

List of Abbreviations

aOR: adjusted odds ratio; CI: confidence interval; COPE: Creating Opportunities for Parent Empowerment; EBP: evidence-based practice; HBV: hepatitis B virus; JBI: Joanna Briggs Institute; KMC: kangaroo mother care; NICU: neonatal intensive care unit; NSI: needlestick and sharp injury; PECOS: population, exposure, comparator, outcome, study design; PHC: primary healthcare; PRISMA: Preferred Reporting Items for Systematic Reviews and Meta-Analyses; RCT: randomized controlled trial; RoB 2: Cochrane risk-of-bias tool for randomized trials, version 2; ROBINS-I: Risk Of Bias In Non-randomized Studies of Interventions; RR: relative risk; SSC: skin-to-skin contact; WHO: World Health Organization

18/11/2026

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18/11/2026

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18/11/2026

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18/11/2026