International Journal of Reproduction, Contraception, Obstetrics and Gynecology
Kalaivani V et al. Int J Reprod Contracept Obstet Gynecol. 2026 Oct;15(10):4261-4270
www.ijrcog.org
pISSN 2320-1770 | eISSN 2320-1789

DOI: https://dx.doi.org/10.18203/2320-1770.ijrcog20263485

Review Article

Closing the first 1,000 days gap: midwife-and nurse-led interventions for maternal, neonatal and child health-a narrative review

Kalaivani V.[1], N. Vedavathi[1], D. Ruby Anitha[2], Neeta Devi[3], Precilla Jebarani J.[4], Rebecca Priti Bahadur[5], Deepa N. R.[6], Ankita Wellington[7], Nisha J.[8], Tamanna Koley[9], Jyoti Katiyar[10], Mohammed Umar[11]*

[1]Department of Obstetrics and Gynaecological Nursing, Chettinad College of Nursing, Chettinad Academy of Research and Education (CARE), Kelambakkam, Chennai, Tamil Nadu, India
[2]Department of Child Health Nursing (Principal), United College of Nursing, Coimbatore, Tamil Nadu, India
[3]Department of Obstetrics and Gynaecological Nursing, National Institute of Nursing Education (NINE), Postgraduate Institute of Medical Education and Research (PGIMER), Chandigarh, India
[4]Department of Obstetrics and Gynaecological Nursing, Sapthagiri College of Nursing, Bengaluru, Karnataka, India
[5]Department of Obstetrics and Gynaecological Nursing, SGRRIM and HS, College of Nursing, SGRR University, Dehradun, Uttarakhand, India
[6]Department of Obstetrics and Gynaecological Nursing, ESIC College of Nursing, Kalaburagi, Karnataka
[7]Department of Obstetrics and Gynaecological Nursing, FH College of Nursing, Agra, Uttar Pradesh, India
[8]Department of Obstetrics and Gynaecological Nursing, (Research Scholar), Meenakshi Academy of Higher Education and Research (MAHER), Chennai, Tamil Nadu, India
[9]Department of Nursing, M.Sc. Pediatric Nursing, (Nursing Officer), ESIC Medical College and Hospital, Bihta, Patna, Bihar, India
[10]Department of Obstetrics and Gynaecological Nursing (PhD Scholar), Vimla Nursing College, Atal Bihari Vajpayee Medical University, Kanpur and Lucknow, Uttar Pradesh, India
[11]Department of Nursing, Uttar Pradesh University of Medical Sciences (UPUMS), Saifai, Etawah, Uttar Pradesh, India

Received: 07 August 2026
Revised: 21 September 2026
Accepted: 22 September 2026

***Correspondence:**
Mohammed Umar,
E-mail: umarrathore0786@gmail.com

ABSTRACT

The first 1,000 days, from conception to a child's second birthday, shape maternal survival, newborn health and the course of early child development. Nurses and midwives deliver most of the care received in this period, yet evidence on their contribution is usually reported one stage at a time. This narrative review brings that evidence together across the whole continuum. PubMed/MEDLINE, Scopus, Web of Science, CINAHL, Embase, the Cochrane Library, WHO IRIS and UNICEF repositories were searched for English-language publications from January 2019 to June 2026, and current WHO guidance was consulted. Eighteen key studies were charted and synthesised thematically. Midwife continuity of care increased spontaneous vaginal birth and reduced caesarean and instrumental birth, although its effect on preterm birth was small or uncertain. Midwife-delivered bundles for postpartum haemorrhage, basic newborn resuscitation training, deferred cord clamping and immediate kangaroo mother care reduced severe morbidity or mortality in trials from low- and middle-income countries. Kangaroo mother care also lowered maternal depressive symptoms, and breastfeeding support reduced early cessation of exclusive breastfeeding. Parenting programmes improved early child development, whereas intensive nurse home visiting in one large trial did not change birth outcomes. Two-way mobile health communication increased antenatal attendance and skilled birth attendance. Three gaps remain: in coverage, in quality and in continuity between facility and community, with the second year of life the least studied. Closing them requires adequate nursing and midwifery staffing, competency-based education and services that follow the mother–child pair through all 1,000 days.

Keywords: First 1,000 days, Midwifery, Nursing, Maternal health, Neonatal care, Child health, Continuity of care, Kangaroo mother care, Breastfeeding, Early childhood development

INTRODUCTION

The period from conception to a child's second birthday, commonly called the first 1,000 days, is the stage of life in which human biology is most responsive to the conditions around it. Fetal growth, brain development, immune maturation and metabolic regulation are all laid down during these months, and the effects of undernutrition, infection or chronic stress experienced then tend to persist into school age and adult life.[1,2] For this reason, the first 1,000 days have become an organising idea for maternal, newborn and child health programmes and for national nutrition policy, and they sit at the centre of efforts to achieve Sustainable Development Goal (SDG) 3 on health and well-being at all ages.[3]

Progress has been real but uneven. An estimated 260,000 women died from pregnancy-or childbirth-related causes in 2023. This is 40% fewer than in 2000, yet the global maternal mortality ratio of 197 per 100,000 live births is still almost three times the 2030 target, and Sub-Saharan Africa accounts for about 70% of these deaths.[4] In 2024, 4.9 million children died before the age of five, 2.3 million of them in the first month of life, and the pace of decline has slowed considerably since 2015.[5] About 148 million children under five were stunted in 2022.[6] Most of these deaths, and much of this growth failure, arise from conditions that can be prevented or treated with known interventions, among them postpartum haemorrhage, hypertensive disorders, sepsis, complications of preterm birth, intrapartum hypoxia and poor infant feeding. In most settings, the limiting factor is not knowledge of what works but the reliability with which it is delivered to every woman and child.[4,5]

Nurses and midwives provide the greater part of this care. When educated and regulated to international standards, midwives can deliver around 90% of essential sexual, reproductive, maternal and newborn health interventions, yet in 2021 the world was short of roughly 900,000 midwives.[7] The global nursing workforce reached 29.8 million in 2023, but the shortage of 5.8 million nurses is projected to fall only to 4.1 million by 2030, and it is concentrated in Africa and the Eastern Mediterranean, the regions with the highest maternal and child mortality.[8] Modelling across 88 low- and middle-income countries suggests that universal coverage of midwife-delivered interventions could avert about two-thirds of maternal deaths, neonatal deaths and stillbirths, or some 4.3 million deaths each year by 2035; even a modest rise in coverage would avert more than one-fifth of them.[9]

Current WHO guidance treats pregnancy, birth and the postnatal weeks as one continuum rather than as separate episodes, and each guideline judges care by the woman's experience as well as by clinical outcome.[10–12] In practice, three distinct gaps can open along this continuum. The first is a coverage gap, in which women and infants never reach a skilled provider. The second is a quality gap, in which contact takes place but essential actions are missed or care is disrespectful. The third, and the one that receives least attention, is a continuity gap: points at which responsibility for a mother or child passes from one provider or level of the health system to another, for example at discharge after birth or at the move from newborn to child health services. Nurses and midwives work at every one of these junctions, which is why their contribution is best judged across the full 1,000 days rather than stage by stage.

Existing reviews have mostly examined single interventions, such as kangaroo mother care or breastfeeding support, or single models of care, such as midwife continuity.[13,14] Few have asked how nurse- and midwife-led care performs across the whole continuum, where the evidence is strong and where it is thin. This narrative review therefore synthesises evidence published between 2019 and 2026 on nurse- and midwife-led interventions from pregnancy to the second birthday, examines that evidence against the coverage, quality and continuity gaps described above, and considers the implications for practice, education, policy and research.

LITERATURE SEARCH

This is a narrative review. It was planned and reported with reference to the Scale for the Assessment of Narrative Review Articles (SANRA), which asks for a clear justification, explicit aims, a described literature search, accurate referencing, sound scientific reasoning and appropriate presentation of data.[15] A narrative approach was chosen because the review question covers interventions of very different kinds, from bundled obstetric protocols to community parenting programmes, which cannot sensibly be pooled in a single meta-analysis. Interventions were included when they were led by nurses or midwives or when nurses or midwives were the principal providers within a team.

Peer-reviewed primary studies, systematic reviews and meta-analyses were given priority, together with guidance and reports from WHO, UNICEF, UNFPA and the International Confederation of Midwives. The main search covered January 2019 to June 2026. WHO guidelines issued before 2019 that remain in force, such as the antenatal care recommendations of 2016 and the intrapartum care recommendations of 2018, were consulted for policy context.

Search strategy

PubMed/MEDLINE, Scopus, Web of Science Core Collection, CINAHL Complete, Embase, the Cochrane Library, the WHO Institutional Repository for Information Sharing (IRIS) and UNICEF digital resources were searched. Medical Subject Headings (MeSH), or the equivalent thesaurus terms in each database, were combined with free-text words in titles and abstracts. Terms were grouped under five concepts: the first 1,000 days and its component stages; nurses and midwives; maternal care; newborn and child care; and health

outcomes. Terms within a concept were joined with OR and concepts were joined with AND, with vocabulary adapted to each database. Reference lists of included articles were searched by hand, and forward citation tracking was carried out for key trials. The PubMed version of the strategy is shown in Table 1.

Table 1: PubMed search strategy used for literature retrieval.

Concepts	MeSH terms and free-text keywords	Operator
#1 First 1,000 days	"first 1000 days"[tiab] OR "first thousand days"[tiab] OR "Pregnancy"[MeSH] OR "Infant, Newborn"[MeSH] OR "Infant"[MeSH]	OR
#2 Providers	"Nurses"[MeSH] OR "Nurse Midwives"[MeSH] OR "Midwifery"[MeSH] OR "Community Health Nursing"[MeSH] OR "Neonatal Nursing"[MeSH] OR midwife*[tiab] OR "nurse-led"[tiab] OR "midwife-led"[tiab]	OR
#3 Maternal care	"Prenatal Care"[MeSH] OR "Delivery, Obstetric"[MeSH] OR "Postnatal Care"[MeSH] OR "Continuity of Patient Care"[MeSH] OR "Postpartum Hemorrhage"[MeSH]	OR
#4 Newborn and child care	"Kangaroo-Mother Care Method"[MeSH] OR "Breast Feeding"[MeSH] OR "Resuscitation"[MeSH] OR "Umbilical Cord Clamping"[MeSH] OR "Immunization"[MeSH] OR "Child Development"[MeSH] OR "Parenting"[MeSH] OR "Infant Nutritional Physiological Phenomena"[MeSH]	OR
#5 Outcomes	"Maternal Mortality"[MeSH] OR "Infant Mortality"[MeSH] OR "Perinatal Mortality"[MeSH] OR "Quality of Health Care"[MeSH] OR outcome*[tiab]	OR
Final search	#1 AND #2 AND (#3 OR #4) AND #5; filters: English, humans, 2019/01/01 to 2026/06/30	AND

Eligibility criteria

Publications were eligible if they were written in English, published between January 2019 and June 2026, involved human participants and evaluated an intervention delivered wholly or mainly by nurses or midwives during pregnancy, childbirth, the postnatal period or the first two years of life. Eligible designs were randomised and quasi-experimental trials; cohort, case-control and cross-sectional studies; qualitative and mixed-methods studies; implementation research; systematic, scoping and integrative reviews; meta-analyses; and modelling studies. Hospitals, primary care facilities, maternity units, community programmes and home-based services were all eligible settings, and no geographical restriction was applied.

Editorials, commentaries, letters, conference abstracts without a full text, study protocols and dissertations were excluded, as were studies of specialist medical or surgical interventions that had no nursing or midwifery component. Where several reports came from the same dataset, the most complete one was retained.

Study selection and data extraction

Records were exported to a reference manager and duplicates were removed. Titles and abstracts were screened first, and the full texts of potentially relevant articles were then assessed against the eligibility criteria. Uncertain cases were resolved by rereading the article against the review question and by discussion within the review team. Articles found through hand-searching and citation tracking passed through the same steps. For each included publication, the following were recorded: first author, year, country and setting, aim, design, population and sample size, intervention and comparator, outcomes, main findings, certainty of evidence where reported, authors' conclusions, and the professional group that delivered the intervention.

Synthesis

Findings were grouped by stage of the first 1,000 days: pregnancy, labour and birth, the newborn and postnatal period, and infancy and early childhood. Digital tools were considered within the stage in which they were tested. Within each stage, the direction and size of effects were compared and the certainty ratings given by source reviews were noted. Null and negative results were looked for deliberately, so that the synthesis would not rest only on favourable studies. The findings were then examined against the three gaps in care described in the introduction. Because the aim was interpretive rather than exhaustive, the synthesis is anchored on key publications that were large, methodologically strong or directly informative about nursing and midwifery roles.

OBSERVATIONS

Eighteen key publications are summarised in Table 2. They comprise nine systematic reviews or meta-analyses,

one of them using individual participant data; one scoping review and one integrative review; four randomised trials; one modelling study; one multi-country cross-sectional study; and one review from the 2023 Lancet Breastfeeding Series. Together they cover high-income countries and a wide range of low- and middle-income settings, and hospital, primary care and home-based services.

PREGNANCY AND ANTENATAL CARE

The most detailed evidence on a model of care comes from the 2024 Cochrane update on midwife continuity of care, which included 17 trials with 18,533 women in Australia, Canada, China, Ireland and the United Kingdom.[16] Women cared for by a known midwife or a small team of midwives were more likely to have a spontaneous vaginal birth and less likely to have a caesarean section or an instrumental birth; they may also have had fewer episiotomies, and they reported more positive experiences of pregnancy, labour and the postnatal period. The update is less favourable than earlier versions on preterm birth, for which it found little or no difference, and effects on fetal loss and neonatal death remain uncertain.[16] This distinction matters, because the claim that continuity of care prevents preterm birth is still widely repeated.

A scoping review of 175 reports on midwifery continuity found that 90% came from high-income countries and that, apart from New Zealand, no country had scaled continuity to national level.[13] An integrative review of midwife-led care in low- and middle-income countries reached a related conclusion: outcomes were generally favourable, but the evidence was sparse and implementation depended on staffing, supervision and referral systems that were often weak.[14] The strong continuity evidence therefore comes largely from well-resourced health systems, and its transfer to other settings cannot be assumed.

Antenatal contact is also the main channel for nutritional care. An updated review of maternal and child nutrition interventions confirmed benefit from multiple micronutrient supplementation in pregnancy for low birthweight and small-for-gestational-age birth, from balanced energy–protein supplementation for undernourished women, and from breastfeeding and complementary feeding counselling after birth.[17] In most health systems these interventions are delivered or supervised by nurses and midwives during antenatal and postnatal visits, so their reach depends directly on how many visits take place and how much time each visit allows.

Mobile health tools have been studied mainly as a way of bringing women into care. A meta-analysis of nine trials with 10,348 pregnant women in low- and middle-income countries found that mHealth interventions increased attendance at four or more antenatal visits.[18] Two-way communication between women and providers also increased skilled birth attendance (risk ratio [RR] 1.23), whereas one-way messaging had no clear effect on this outcome, and facility birth rose only in settings where it had been low at baseline.[18] The tools worked best, in other words, when they strengthened an existing relationship with a provider. Perinatal mental health remains the least developed part of antenatal nursing care, and WHO now advises that screening, psychosocial support and referral be built into routine maternal and child health contacts, delivered largely by non-specialist staff including nurses and midwives.[19]

LABOUR AND BIRTH

Respectful care is a precondition for everything else. In a study combining direct labour observation with community surveys in Ghana, Guinea, Myanmar and Nigeria, around four in ten women experienced physical or verbal abuse, stigma or discrimination during facility-based childbirth, most often in the period immediately before and after delivery.[20] Mistreatment of this kind discourages women from returning to facilities, and so feeds back into the coverage gap.

The E-MOTIVE trial showed what a midwife-delivered protocol can achieve at scale. Across 80 hospitals in Kenya, Nigeria, South Africa and Tanzania, objective measurement of blood loss with a calibrated drape, combined with a bundle of first-response treatments, reduced the composite of severe postpartum haemorrhage, laparotomy for bleeding or maternal death from 4.3% to 1.6% (RR 0.40).[21]

For the newborn, Helping Babies Breathe, a simulation-based course in basic resuscitation taught largely to midwives and nurses, was associated with lower rates of intrapartum-related stillbirth and first-day neonatal death, although the underlying studies were of moderate quality and skill retention depended on regular practice.[22] Among preterm infants, an individual participant data meta-analysis found that deferring cord clamping, rather than clamping immediately, reduced death before hospital discharge (odds ratio [OR] 0.68).[23] This is a simple action performed by the birth attendant, but it depends on training and on labour ward routines that allow the attendant time to wait.

THE NEWBORN AND POSTNATAL PERIOD

Kangaroo mother care has the largest body of new evidence in this review. WHO's 2022 recommendations on the care of preterm and low-birthweight infants now advise that it begin as soon as possible after birth, including for infants who are not yet fully stable.[24] That change followed a multicentre trial in Ghana, India, Malawi, Nigeria and Tanzania, in which immediate and continuous skin-to-skin contact for infants weighing 1.0 to less than 1.8 kg lowered 28-day mortality from 15.7% to 12.0% (RR 0.75).[25]

In Haryana, India, kangaroo mother care initiated in the community and supported through home visits improved survival among 8,402 low-birthweight infants at both 28

and 180 days.[26] A 2023 meta-analysis of 31 trials involving 15,559 infants found that, compared with conventional care, kangaroo mother care reduced mortality during the birth admission or by 28 days by about one-third (RR 0.68), with greater benefit when it was started within 24 hours and continued for at least eight hours a day.[27]

The benefits extend to parents. A meta-analysis of 30 studies provided high-certainty evidence that kangaroo mother care reduced moderate-to-severe postpartum depressive symptoms in mothers (RR 0.76), with lower-certainty evidence of reduced stress and anxiety and better mother–infant bonding.[28] Across these studies, nurses and midwives were the staff who taught positioning, supported feeding, monitored infants and helped families through long periods of hospital care.

Breastfeeding support is similarly well established. The 2022 Cochrane review, covering 116 trials and 98,816 mother–infant pairs, found that breastfeeding-specific support probably reduced the number of women who stopped exclusive breastfeeding by six months (RR 0.90), and that support from both health professionals and trained lay supporters was effective.[29]

Even so, only about 48% of infants under six months are exclusively breastfed worldwide.[30] The Lancet Breastfeeding Series argues that the main obstacles now lie less in what mothers know than in commercial marketing of formula, inadequate maternity protection and hospital practices that separate mothers from their babies, so professional support needs to be matched by policy protection.[31]

INFANCY AND EARLY CHILDHOOD

After the postnatal weeks, the density of evidence falls sharply. Immunisation is the clearest example of a nurse-delivered service with measurable population coverage. In 2024, 85% of infants worldwide received three doses of diphtheria-tetanus-pertussis vaccine, but 14.3 million received no dose at all, more than in 2019.[32]

Zero-dose children tend to live in the same communities where antenatal and postnatal coverage is weakest, so a missed vaccination is often the visible sign of a continuity gap that began before birth.

Parenting and responsive caregiving programmes show consistent benefit. A meta-analysis of 102 randomised trials of parenting interventions in the first three years of life found improvements in children's cognitive, language, motor and socioemotional development, and in parenting knowledge and practices, with larger effects for programmes that focused on responsive care.[33]

Many of these programmes were delivered through routine child health contacts, which fits the nurturing care framework's emphasis on building on existing services rather than creating new ones.[2]

Not every nurse-led programme has improved outcomes. In a randomised trial of 5,670 Medicaid-eligible pregnant individuals in South Carolina, United States, the Nurse-Family Partnership home visiting programme did not reduce a composite of adverse birth outcomes that included preterm birth, low birthweight, small-for-gestational-age birth and perinatal death.[34]

The result does not show that home visiting is without value, but it does indicate that intensive nursing contact cannot, by itself, offset deep structural disadvantage, and that effects reported in earlier and smaller trials may not persist when programmes are scaled up.

DISCUSSION

Read as a whole, the evidence reveals a pattern that is easy to miss when interventions are studied one at a time. Nurse- and midwife-led care produces its clearest reductions in death and serious illness when it takes the form of specific clinical actions delivered at the right moment, such as a first-response bundle for postpartum haemorrhage, basic newborn resuscitation, deferred cord clamping or immediate skin-to-skin contact.[21-23,25] Broader models of care, including midwife continuity and intensive home visiting, show real benefit for some outcomes, particularly mode of birth and women's experience, but smaller or less certain effects on mortality and preterm birth, and their results depend heavily on context.[16,34] This does not make such models less important. Continuity and home visiting are often the means by which specific actions reach families, and women who trust their midwife are more likely to return for care and to act on advice. The practical conclusion is that models of care should be judged by how reliably they deliver the actions known to work, and not only by how they are organised.

The coverage gap is, at root, a workforce gap. Shortages of midwives and nurses are heaviest in the regions that account for most maternal and newborn deaths, and the modelling evidence suggests that closing them would avert more deaths than almost any other single investment.[7-9] Digital tools can extend reach at the margins, as the effect of two-way mobile communication on skilled birth attendance shows.[18] The same review, however, found little benefit where facility birth was already common, which suggests that mobile health mainly helps women to use services that already exist. It cannot replace a midwife who is not there.

Contact with a provider does not guarantee good care. The finding that roughly four in ten women in four countries experienced mistreatment during childbirth is a reminder that the quality gap concerns dignity as much as clinical competence.[20]

Table 2: Characteristics of key publications included in the synthesis.

Author (reference)	Year	Country/ setting	Domain	Objective	Methodology (design, population, sample, tools)	Key results	Conclusion
Sandall et al[16]	2024	Australia, Canada, China, Ireland, UK	Midwifery continuity	Compare midwife continuity models with other models of care	Cochrane systematic review and meta-analysis; 17 RCTs; 18,533 women; GRADE	More spontaneous vaginal births; fewer caesarean and instrumental births; more positive experience; little or no difference in preterm birth	Continuity improves mode and experience of birth; effect on perinatal death uncertain
Bradford et al[13]	2022	Global	Midwifery continuity	Map where, how, by whom and for whom continuity models operate	Scoping review; 175 reports, 2012–2022	90% of reports from high-income countries; wide variation in models; only New Zealand scaled nationally	Implementation research needed, especially in LMICs
Nove et al[9]	2021	88 LMICs	Workforce	Estimate deaths averted by scaling up midwife-delivered interventions	Lives Saved Tool modelling; four coverage scenarios to 2035	Universal coverage could avert 67% of maternal deaths, 64% of neonatal deaths and 65% of stillbirths (4.3 million per year)	Investment in midwives offers large mortality gains
Michel-Schuldt et al[14]	2020	LMICs	Midwife-led care	Review the provision of midwife-led care in LMICs	Integrative review	Generally favourable outcomes; limited evidence; barriers in staffing, supervision and referral	An enabling health system is needed for midwife-led care
Keats et al[17]	2021	LMICs	Maternal and child nutrition	Update the evidence on nutrition interventions	Systematic review of trials and reviews	Micronutrient supplementation reduced low birthweight and SGA; benefit from energy–protein supplements and feeding counselling	Deliver through routine antenatal and postnatal contacts
Rahman et al[18]	2022	LMICs	Digital health	Assess mHealth effects on antenatal visits and skilled birth care	Systematic review and meta-analysis; 9 RCTs; 10,348 women; GRADE	More women attended ≥4 antenatal visits; two-way mHealth increased skilled birth attendance (RR 1.23)	mHealth supports, but does not replace, provider care
Bohren et al[20]	2019	Ghana, Guinea, Myanmar, Nigeria	Respectful maternity care	Measure mistreatment during facility-based childbirth	Cross-sectional; labour observations and community surveys	About four in ten observed women experienced physical or verbal abuse, stigma or discrimination	Accountability and support for providers are required
Gallos et al[21]	2023	Kenya, Nigeria, S. Africa, Tanzania	Intrapartum care (PPH)	Test early detection with a first-response treatment bundle	Cluster RCT; 80 hospitals; calibrated drape	Severe PPH, laparotomy or death: 1.6% vs 4.3% (RR 0.40)	Midwife-delivered bundle should be scaled up

Continued.

Author (reference)	Year	Country/ setting	Domain	Objective	Methodology (design, population, sample, tools)	Key results	Conclusion
Versantvoort et al[22]	2020	Low-resource settings	Newborn resuscitation	Assess effects of Helping Babies Breathe training	Systematic review	Moderate evidence of fewer intrapartum-related stillbirths and first-day deaths	Refresher training is needed to sustain skills
Seidler et al[23]	2023	International	Preterm birth care	Compare cord management strategies at preterm birth	Systematic review with individual participant data meta-analysis of RCTs	Deferred clamping reduced death before discharge vs immediate clamping (OR 0.68)	Deferred clamping should be routine for preterm infants
WHO immediate KMC study group[25]	2021	Ghana, India, Malawi, Nigeria, Tanzania	Kangaroo mother care	Assess immediate KMC for infants 1.0 to <1.8 kg	Multicentre RCT; 3,211 infants	28-day mortality 12.0% vs 15.7% (RR 0.75)	KMC should start immediately after birth
Mazumder et al[26]	2019	India (Haryana)	Community KMC	Assess community-initiated KMC for stable low-birthweight infants	Individually randomised trial; 8,402 infants; home visits	Lower mortality at 28 days (HR-0.70) and 180 days (HR 0.75)	Home-initiated KMC is effective and feasible
Sivanandan and Sankar[27]	2023	International	Kangaroo mother care	Compare KMC with conventional care, and early with late start	Systematic review and meta-analysis; 31 trials; 15,559 infants	Mortality reduced (RR 0.68); greater benefit if started within 24 h, given ≥8 h/day	Early and prolonged KMC should be prioritised
Pathak et al[28]	2023	International	Parental health	Assess effects of KMC on maternal and paternal health	Systematic review and meta-analysis; 30 studies; 7,719 infants; GRADE	Fewer moderate-to-severe maternal depressive symptoms (RR 0.76); lower stress and anxiety	KMC benefits parents as well as infants
Gavine et al[29]	2022	International	Breastfeeding	Assess support for healthy breastfeeding mothers	Cochrane review; 116 trials; 98,816 mother–infant pairs	Fewer women stopped exclusive breastfeeding by 6 months (RR 0.90); professional and lay support effective	Support should be offered to all women
Pérez-Escamilla et al[31]	2023	Global	Breastfeeding policy	Examine barriers to breastfeeding	Narrative review (Lancet Breastfeeding Series)	Formula marketing, weak maternity protection and hospital practices undermine breastfeeding	Professional support must be backed by regulation
Jeong et al[33]	2021	Global (33 countries)	Early child development	Assess parenting interventions in the first three years	Systematic review and meta-analysis; 102 RCTs	Improved cognitive, language, motor and socioemotional development and parenting practices	Integrate responsive-care support into routine child health services
McConnell et al[34]	2022	USA (South Carolina)	Nurse home visiting	Assess the Nurse-Family Partnership effect on birth outcomes	RCT; 5,670 Medicaid-eligible pregnant individuals	No reduction in composite adverse birth outcomes	Home visiting alone does not offset structural disadvantage

*HR, hazard ratio; KMC, kangaroo mother care; LMICs, low- and middle-income countries; OR, odds ratio; PPH, postpartum haemorrhage; RCT, randomised controlled trial; RR, risk ratio; SGA, small for gestational age.

Several of the successful interventions in this review worked by making correct practice easier. The calibrated drape in E-MOTIVE turns an estimate of blood loss into a measurement, and simulation-based resuscitation training replaces hesitation with a rehearsed sequence.[21,22] Both depend on regular practice and supervision, and skills fade when training is a single event. For nurse and midwife educators, this favours short, repeated, on-site drills over occasional long courses.

The continuity gap is the least visible of the three and, in our reading, the most neglected. Many of the benefits described here depend on care that crosses a boundary. Kangaroo mother care started on the ward has to be sustained at home, and the Haryana trial showed that the home itself can be the starting point when families receive support visits.[26,27] Breastfeeding support works best when it continues through the weeks after discharge, which is when many women stop.[29] Zero-dose children are, to a large extent, children whose families lost contact with health services after birth.[32] Nurses and midwives are well placed to close these handover points, but only if services are organised around the mother and infant together, rather than around separate maternal, newborn and child programmes with separate staff and separate records.

The review also exposes an imbalance in the evidence itself. Trials and systematic reviews cluster around birth and the first month of life. The second year, when complementary feeding, growth faltering, developmental delay and missed vaccinations become the main concerns, is studied far less, and outcomes beyond the second birthday are rarely measured. The evidence is also unevenly distributed across regions, with midwifery continuity described mostly in high-income countries.[13] In addition, many studies describe interventions as delivered by "health workers" or "the maternity team" without naming the professional group, which makes it hard to attribute effects to nursing or midwifery care. Clearer reporting of who delivered what, how often and after what training would strengthen the evidence considerably.

Several of the most influential recent studies came from low- and middle-income countries, including India. The immediate kangaroo mother care trial enrolled infants in India alongside four African countries, the community-initiated trial was conducted in Haryana, and the largest recent meta-analysis on kangaroo mother care was led from Puducherry and New Delhi.[25-27] This matters for policy, because the evidence was generated under conditions close to those in which it will be applied.

Digital health, and more recently artificial intelligence, is often presented as an answer to workforce shortages. The evidence reviewed here supports a more modest role. Mobile tools helped where they strengthened communication between women and providers, but their effects varied by setting and by design.[18] Decision-support and predictive tools for maternal and newborn care are at an early stage of evaluation, and concerns about data security, digital literacy and unequal access to devices are real. Such tools should be evaluated as additions to nursing and midwifery care, with the same rigour applied to any other clinical intervention.

Strengths and limitations

This review covers the full 1,000-day continuum rather than a single stage, draws on recent trials and systematic reviews from both high-income and low- and middle-income countries, and deliberately reports null findings alongside positive ones. Framing the evidence around coverage, quality and continuity offers a structure that may be useful for service planning. The limitations are those of the narrative approach. Study selection involved judgement and may be subject to selection bias, and no formal meta-analysis or cross-study risk-of-bias assessment was undertaken, although certainty ratings from source reviews are reported where available. Only English-language publications were included, so relevant work in other languages, including national programme evaluations, may have been missed. Some included reviews overlap in the trials they cover, which means the same primary evidence may contribute to more than one finding.

Future directions

Research now needs to move from asking whether individual interventions work to asking how they can be delivered together and sustained. Priorities include implementation trials of combined packages running from pregnancy to the second birthday; evaluation of continuity models designed for low- and middle-income settings; studies of the period from 12 to 24 months, including nurse-delivered complementary feeding counselling and developmental surveillance; follow-up of trial cohorts into school age; economic evaluations; and equity-focused assessment of digital and artificial intelligence tools before they are scaled. Every trial in this field should report the professional group, training and workload of the staff who deliver the intervention.

CONCLUSION

The first 1,000 days offer a limited window in which to protect maternal survival, newborn health and the foundations of child development, and nurses and midwives are central to what happens within it. Specific actions they carry out, including haemorrhage bundles, newborn resuscitation, deferred cord clamping and immediate kangaroo mother care, reduce death and serious illness. Continuity of midwifery care improves the experience and mode of birth, and breastfeeding and parenting support improve infant feeding and development. The evidence also has limits: continuity alone does not appear to prevent preterm birth, intensive home visiting did not change birth outcomes in a large trial, and the second year of life remains poorly studied. The shortfall in the first 1,000 days is therefore better

understood as three gaps, in coverage, in quality and in continuity between facility and community. Closing them will require enough well-trained nurses and midwives, deployed where need is greatest, working in services organised to follow the mother and child through the whole period rather than in separate pieces. This is one of the most direct routes available towards universal health coverage and sustainable development goal 3.

Recommendations

For clinical practice, maternity and newborn services should give priority to the interventions with the strongest evidence and lowest cost: immediate and continuous kangaroo mother care for low-birthweight infants, deferred cord clamping, structured early detection and treatment of postpartum haemorrhage, a person trained in basic newborn resuscitation at every birth, and breastfeeding support that continues after discharge. Services should name a nurse or midwife responsible for each mother–infant pair across discharge and the early postnatal weeks, and should link maternal, newborn and immunisation records so that families who drop out of care can be found.

For education, pre-service and in-service programmes should use short, repeated, simulation-based drills for obstetric and newborn emergencies, treat respectful maternity care and perinatal mental health as core competencies, and prepare nurses and midwives to use digital tools critically. For policy, governments should treat investment in the nursing and midwifery workforce, including safe staffing, fair pay and retention in rural areas, as a central strategy for reducing maternal and neonatal mortality, and should fund continuity models that fit local staffing rather than adopting designs from high-income settings unchanged.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: Not required

REFERENCES

1. Victora CG, Christian P, Vidaletti LP, Gatica-Domínguez G, Menon P, Black RE. Revisiting maternal and child undernutrition in low-income and middle-income countries: variable progress towards an unfinished agenda. Lancet. 2021;397(10282):1388-99.
2. World Health Organization, United Nations Children's Fund, World Bank Group. Nurturing care for early childhood development: a framework for helping children survive and thrive to transform health and human potential. Geneva: World Health Organization. 2018.
3. Saran R, Kasar J, Jha M, Sahu JK, Babu SS, Mutreja A. Building blocks of life: improving nutrition and health outcomes through fortification and breastfeeding in the first 1000 days of a child's life. Front Nutr. 2025;12:1517247.
4. World Health Organization, United Nations Children's Fund, United Nations Population Fund, World Bank Group, United Nations Department of Economic and Social Affairs Population Division. Trends in maternal mortality estimates 2000 to 2023. Geneva: World Health Organization; 2025.
5. United Nations Inter-agency Group for Child Mortality Estimation (UN IGME). Levels and trends in child mortality: report 2025. New York: United Nations Children's Fund; 2026.
6. United Nations Children's Fund, World Health Organization, World Bank. Levels and trends in child malnutrition: UNICEF/WHO/World Bank Group joint child malnutrition estimates. Key findings of the 2023 edition. New York: United Nations Children's Fund and World Health Organization. 2023.
7. United Nations Population Fund, International Confederation of Midwives, World Health Organization. The State of the World's Midwifery 2021. New York: United Nations Population Fund. 2021.
8. World Health Organization. State of the world's nursing 2025: investing in education, jobs, leadership and service delivery. Geneva: World Health Organization. 2025.
9. Nove A, Friberg IK, de Bernis L, McConville F, Moran AC, Najjemba M, et al. Potential impact of midwives in preventing and reducing maternal and neonatal mortality and stillbirths: a Lives Saved Tool modelling study. Lancet Glob Health. 2021;9(1):e24-32.
10. World Health Organization. WHO recommendations on antenatal care for a positive pregnancy experience. Geneva: World Health Organization. 2016.
11. World Health Organization. WHO recommendations: intrapartum care for a positive childbirth experience. Geneva: World Health Organization. 2018.
12. World Health Organization. WHO recommendations on maternal and newborn care for a positive postnatal experience. Geneva: World Health Organization. 2022.
13. Bradford BF, Wilson AN, Portela A, McConville F, Fernandez Turienzo C, Homer CSE. Midwifery continuity of care: a scoping review of where, how, by whom and for whom? PLOS Glob Public Health. 2022;2(10):e0000935.
14. Michel-Schuldt M, McFadden A, Renfrew M, Homer C. The provision of midwife-led care in low- and middle-income countries: an integrative review. Midwifery. 2020;84:102659.
15. Baethge C, Goldbeck-Wood S, Mertens S. SANRA-a scale for the quality assessment of narrative review articles. Res Integr Peer Rev. 2019;4:5.
16. Sandall J, Fernandez Turienzo C, Devane D, Soltani H, Gillespie P, Gates S, et al. Midwife continuity of care models versus other models of care for childbearing women. Cochrane Database Syst Rev. 2024;4(4):CD004667.

17. Keats EC, Das JK, Salam RA, Lassi ZS, Imdad A, Black RE, et al. Effective interventions to address maternal and child malnutrition: an update of the evidence. Lancet Child Adolesc Health. 2021;5(5):367-84.
18. Rahman MO, Yamaji N, Nagamatsu Y, Ota E. Effects of mHealth interventions on improving antenatal care visits and skilled delivery care in low- and middle-income countries: systematic review and meta-analysis. J Med Internet Res. 2022;24(4):e34061.
19. World Health Organization. Guide for integration of perinatal mental health in maternal and child health services. Geneva: World Health Organization. 2022.
20. Bohren MA, Mehrtash H, Fawole B, Maung TM, Balde MD, Maya E, et al. How women are treated during facility-based childbirth in four countries: a cross-sectional study with labour observations and community-based surveys. Lancet. 2019;394(10210):1750-63.
21. Gallos I, Devall A, Martin J, Middleton L, Beeson L, Galadanci H, et al. Randomized trial of early detection and treatment of postpartum hemorrhage. N Engl J Med. 2023;389(1):11-21.
22. Versantvoort JMD, Kleinhout MY, Ockhuijsen HDL, Bloemenkamp K, de Vries WB, van den Hoogen A. Helping Babies Breathe and its effects on intrapartum-related stillbirths and neonatal mortality in low-resource settings: a systematic review. Arch Dis Child. 2020;105(2):127-33.
23. Seidler AL, Aberoumand M, Hunter KE, Barba A, Libesman S, Williams JG, et al. Deferred cord clamping, cord milking, and immediate cord clamping at preterm birth: a systematic review and individual participant data meta-analysis. Lancet. 2023;402(10418):2209-22.
24. World Health Organization. WHO recommendations for care of the preterm or low-birth-weight infant. Geneva: World Health Organization; 2022.
25. WHO Immediate KMC Study Group. Immediate "kangaroo mother care" and survival of infants with low birth weight. N Engl J Med. 2021;384(21):2028-38.
26. Mazumder S, Taneja S, Dube B, Bhatia K, Ghosh R, Shekhar M, et al. Effect of community-initiated kangaroo mother care on survival of infants with low birthweight: a randomised controlled trial. Lancet. 2019;394(10210):1724-36.
27. Sivanandan S, Sankar MJ. Kangaroo mother care for preterm or low birth weight infants: a systematic review and meta-analysis. BMJ Glob Health. 2023;8(6):e010728.
28. Pathak BG, Sinha B, Sharma N, Mazumder S, Bhandari N. Effects of kangaroo mother care on maternal and paternal health: systematic review and meta-analysis. Bull World Health Organ. 2023;101(6):391-402G.
29. Gavine A, Shinwell SC, Buchanan P, Farre A, Wade A, Lynn F, et al. Support for healthy breastfeeding mothers with healthy term babies. Cochrane Database Syst Rev. 2022;10(10):CD001141.
30. World Health Organization, United Nations Children's Fund. Global breastfeeding scorecard 2023: rates of breastfeeding increase around the world through improved protection and support. Geneva: World Health Organization. 2023.
31. Pérez-Escamilla R, Tomori C, Hernández-Cordero S, Baker P, Barros AJD, Bégin F, et al. Breastfeeding: crucially important, but increasingly challenged in a market-driven world. Lancet. 2023;401(10375):472-85.
32. World Health Organization, United Nations Children's Fund. Progress and challenges with achieving universal immunization coverage: 2024 WHO/UNICEF estimates of national immunization coverage. Geneva: World Health Organization. 2025.
33. Jeong J, Franchett EE, Ramos de Oliveira CV, Rehmani K, Yousafzai AK. Parenting interventions to promote early child development in the first three years of life: a global systematic review and meta-analysis. PLoS Med. 2021;18(5):e1003602.
34. McConnell MA, Rokicki S, Ayers S, Allouch F, Perreault N, Gourevitch RA, et al. Effect of an intensive nurse home visiting program on adverse birth outcomes in a Medicaid-eligible population: a randomized clinical trial. JAMA. 2022;328(1):27-37.

Cite this article as: Kalaivani V, Vedavathi N, Anitha DR, Devi N, Jebarani JP, Bahadur RP, et al. Closing the first 1,000 days gap: midwife-and nurse-led interventions for maternal, neonatal and child health-a narrative review. Int J Reprod Contracept Obstet Gynecol 2026;15:4261-70.