



EFFECTIVENESS OF COMMUNITY HEALTH WORKER INTERVENTIONS IN IMPROVING MATERNAL HEALTH OUTCOMES IN INDIA: A NARRATIVE REVIEW

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ABSTRACT

Background: Community health workers are central to India's strategy for improving maternal healthcare access, particularly among rural, socioeconomically disadvantaged, tribal, migrant, and geographically underserved populations. Accredited Social Health Activists, Anganwadi Workers, Auxiliary Nurse Midwives, and community facilitators contribute to early pregnancy identification, antenatal counselling, birth preparedness, institutional delivery and referral, postnatal follow-up, and family-planning support. However, the extent to which these interventions improve healthcare utilization, continuity of care, maternal morbidity, and maternal mortality requires careful evaluation.

Objective: To review the effectiveness of community health worker interventions in improving maternal health outcomes in India, with emphasis on antenatal-care utilization, birth preparedness, institutional delivery, skilled birth attendance, postnatal care, referral of high-risk pregnancies, postpartum contraception, equity, and direct clinical outcomes.

Methods: A structured narrative review was conducted using literature identified through PubMed/MEDLINE, Google Scholar, publisher databases, citation tracking, and official repositories of the Government of India and the World Health Organization. English-language publications available through July 2026 were considered. Randomized and non-randomized trials, nationally representative analyses, longitudinal studies, cross-sectional studies, programme evaluations, economic evaluations, qualitative and mixed-methods studies, and relevant systematic reviews were included. Evidence was organized according to intervention type, maternal-care stage, outcome category, and health-system determinant. Because of substantial clinical and methodological heterogeneity, no pooled meta-analysis was undertaken.

Results: The most consistent evidence indicates that community health worker exposure increases antenatal-care contact, birth preparedness, institutional delivery, skilled birth attendance, early postnatal contact, and postpartum contraceptive use. National analyses reported higher utilization of facility-based childbirth among women receiving Accredited Social Health Activist services. Coordinated counselling by Accredited Social Health Activists and Anganwadi Workers produced particularly large improvements in birth preparedness and postnatal-care attendance. Participatory women's groups improved community problem-solving, birth preparedness, and neonatal survival, while digitally supported community health worker programmes increased scheduled home visits and service coverage. Nevertheless, evidence for reductions in severe maternal morbidity or maternal mortality attributable specifically to community health workers remains limited. Screening and referral interventions did not consistently improve composite clinical outcomes when transport, referral completion, or facility readiness were inadequate.

Conclusion: Community health worker interventions are effective in improving maternal healthcare utilization and continuity in India. Their greatest demonstrated contribution is as trusted community-based counsellors, mobilizers, navigators, and referral facilitators. Greater effects on severe maternal morbidity and mortality require community interventions to be integrated with reliable transport, responsive referral pathways, respectful maternity care, skilled personnel, blood-transfusion capacity, essential medicines, and high-quality emergency obstetric services.

Keywords: Community Health Workers, Accredited Social Health Activist, ASHA, Maternal Health, Antenatal Care, Institutional Delivery, Postnatal Care, Birth Preparedness, India, Narrative Review.



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INTRODUCTION

Maternal health refers to the health and well-being of women during pregnancy, childbirth, and the postnatal period. Safe motherhood requires more than contact with healthcare services. It depends on early pregnancy registration, appropriate antenatal assessment, prevention and treatment of anaemia, recognition of hypertensive disorders and other complications, birth preparedness, skilled attendance during childbirth, access to emergency obstetric care, and timely postnatal follow-up.

India has achieved substantial progress in reducing maternal mortality. According to the Sample Registration System, the maternal mortality ratio declined to 87 maternal deaths per 100,000 live births during 2022-2024, compared with 88 during 2021-2023.[1] Nevertheless, the national average conceals considerable differences between states, districts, rural and urban populations, socioeconomic groups, tribal communities, and women living far from comprehensive obstetric-care facilities.

The National Family Health Survey-6, conducted during 2023-2024, showed that 95.9% of mothers received some antenatal care and 76.2% received antenatal care during the first trimester. However, only 65.2% completed at least four antenatal visits. Institutional deliveries reached 90.6%, and 91.3% of births were attended by skilled health personnel. Iron and folic acid consumption remained comparatively low: 54.9% of women reported consumption for at least 100 days and 37.8% for at least 180 days.[2] These findings demonstrate that high initial contact does not always translate into complete, timely, continuous, or high-quality maternity care.

Multiple barriers can prevent women from receiving appropriate care. These include limited knowledge of danger signs, financial constraints, travel distance, lack of transport, loss of wages, household responsibilities, gendered decision-making, social exclusion, previous negative experiences with healthcare facilities, and poor-quality or disrespectful maternity care. Such barriers correspond broadly to delays in deciding to seek care, reaching a suitable facility, and receiving adequate treatment after arrival.

Community health workers were introduced and expanded to address several of these barriers. India's Accredited Social Health Activist programme was launched under the National Rural Health Mission and subsequently incorporated into the National Health Mission. Accredited Social Health Activists,

commonly called ASHAs, are women selected from their communities who act as health activists, service facilitators, and links between households and the public health system.[3]

ASHAs counsel women regarding pregnancy, nutrition, birth preparedness, safe delivery, breastfeeding, contraception, and immunization.

They facilitate antenatal and postnatal care, mobilize women for institutional delivery, accompany women to health facilities when required, and support community-level health activities.[3] They work alongside Anganwadi Workers, Auxiliary Nurse Midwives, self-help groups, village health committees, and facility-based healthcare professionals.

The World Health Organization emphasizes that community health worker programmes are most effective when workers are appropriately selected, trained, supervised, remunerated, supplied, and integrated into the broader health system.[4] Community health workers should therefore not be viewed as substitutes for skilled professional care. Their principal value lies in extending the reach of the health system, promoting timely care-seeking, providing culturally acceptable counselling, and facilitating continuity between households and healthcare facilities.

This narrative review examines the effectiveness of community health worker interventions in improving maternal health outcomes in India. It distinguishes improvements in service utilization from direct improvements in maternal morbidity and mortality and identifies the programme and health-system conditions required for intervention effectiveness.

Objectives

Primary Objective

To evaluate the effectiveness of community health worker interventions in improving maternal health outcomes in India.

Secondary Objectives

The secondary objectives were to:

1. Examine the effect of community health worker interventions on pregnancy registration and antenatal-care utilization.
2. Assess their influence on maternal health knowledge, birth preparedness, institutional delivery, and skilled birth attendance.
3. Review their contribution to postnatal care, postpartum contraception, and continuity across the maternity-care pathway.
4. Evaluate interventions aimed at detecting and referring high-risk pregnancies.
5. Examine the contribution of participatory women's groups, digital health tools, coordinated frontline-worker counselling, and performance-based incentives.
6. Identify training, supervision, remuneration, workload, referral, equity, and facility-level factors that modify intervention effectiveness.

7. Distinguish evidence concerning healthcare utilization from evidence concerning severe maternal morbidity and maternal mortality.

METHODS

Review Design

A structured narrative review was undertaken. A narrative approach was selected because community health worker interventions in India differ substantially in their composition, intensity, workforce model, geographical setting, target population, comparator, outcome definition, follow-up duration, and evaluation design.

The review was designed to provide a clinically and programmatically meaningful synthesis rather than a statistical pooled estimate.

Information Sources

Relevant literature was identified through:

- PubMed/MEDLINE;
- Google Scholar;
- publisher databases;
- backward reference-list screening;
- forward citation tracking;
- National Health Mission and Ministry of Health and Family Welfare repositories;
- Office of the Registrar General and Census of India publications; and
- World Health Organization reports and guidelines.

The search included literature available through July 2026.

Search Strategy

Search terms were used individually and in combinations based on Boolean operators. Principal terms included:

- "community health worker";
- "Accredited Social Health Activist";
- "ASHA worker";
- "Anganwadi Worker";
- "Auxiliary Nurse Midwife";
- "frontline health worker";
- "maternal health";
- "pregnancy";
- "antenatal care";
- "birth preparedness";
- "institutional delivery";
- "skilled birth attendance";
- "postnatal care";
- "postpartum contraception";
- "high-risk pregnancy";
- "pre-eclampsia";
- "maternal referral";
- "participatory women's group";
- "mobile health";
- "maternal morbidity";
- "maternal mortality"; and
- "India."

Eligibility Criteria

Studies were considered eligible when they:

- were conducted wholly or substantially in India;
- evaluated an intervention delivered by or involving a community health worker, ASHA, Anganwadi Worker, Auxiliary Nurse Midwife, community facilitator, or coordinated frontline team;
- reported at least one maternal health, maternity-care utilization, referral, behavioural, equity, morbidity, mortality, or implementation outcome;
- used a randomized trial, quasi-experimental, longitudinal, cross-sectional, ecological, mixed-methods, economic-evaluation, qualitative, or programme-evaluation design; and
- were available in English.

Systematic reviews and international guidelines were used to support interpretation and policy discussion but were not treated as substitutes for Indian primary evidence.

Studies exclusively examining childhood outcomes were not emphasized unless the intervention also included maternal counselling, birth preparedness, maternity-care utilization, or postnatal maternal support.

Outcome Classification

Outcomes were classified into three broad categories.

Process and Contact Outcomes

These included:

- pregnancy identification and registration;
- number and timing of home visits;
- exposure to counselling;
- birth-plan preparation;
- referral initiation; and
- Accompaniment to healthcare facilities.

Healthcare-Utilization Outcomes

These included:

- antenatal-care attendance;
- institutional delivery;
- skilled birth attendance;
- postnatal-care contact;
- postpartum contraception; and
- Referral completion.

Clinical Outcomes

These included:

- maternal complications;
- severe maternal morbidity;
- maternal near-miss;
- maternal mortality;
- perinatal or neonatal mortality; and
- Maternal psychological outcomes.

This classification was important because an increase in service contact does not necessarily establish an improvement in clinical outcome.

Evidence Synthesis

Findings were synthesized thematically according to antenatal care, health education, birth preparedness, institutional delivery, skilled attendance, postnatal care, contraception, community mobilization,

digital health, high-risk pregnancy referral, equity, workforce factors, and direct clinical outcomes. Greater interpretive weight was given to randomized trials, longitudinal analyses, large nationally representative datasets, and studies with clearly defined intervention exposure and adjusted analyses.

No meta-analysis was conducted because of differences in intervention design, outcome definitions, study populations, and analytical approaches.

Community Health Worker Structure Relevant to Maternal Health in India

Accredited Social Health Activists

ASHAs are community-based female health activists selected primarily from the villages or urban communities they serve. Their major maternal health responsibilities include:

- identifying newly pregnant women;
- supporting early registration;
- encouraging antenatal examinations;
- counselling regarding diet, rest, anaemia, supplementation, immunization, and danger signs;
- assisting with birth and emergency preparedness;
- promoting institutional delivery;
- helping families arrange transport;
- accompanying women to health facilities where required;
- conducting or supporting postnatal home visits;
- facilitating postpartum contraception;
- supporting breastfeeding; and
- Referring women with warning signs or complications.

The ASHA role combines demand generation, health education, social support, administrative navigation, and referral facilitation. Because ASHAs reside in or near the communities they serve, they can understand household relationships, local transport limitations, seasonal access problems, cultural practices, and financial constraints.

Anganwadi Workers

Anganwadi Workers function under the Integrated Child Development Services programme. Their work includes nutrition education, supplementary nutrition, growth monitoring, early childhood services, and support for pregnant and lactating women.

Although their primary programme mandate differs from that of ASHAs, Anganwadi Workers can reinforce counselling on maternal nutrition, anaemia prevention, breastfeeding, and service utilization. Coordinated counselling by ASHAs and Anganwadi Workers may improve the frequency, consistency, and credibility of maternal health messages.

Auxiliary Nurse Midwives

Auxiliary Nurse Midwives are trained frontline healthcare personnel who provide clinical and

public-health services. Their maternal health functions include antenatal assessment, blood-pressure measurement, immunization, risk identification, basic treatment, counselling, and referral.

The ASHA-Anganwadi Worker-Auxiliary Nurse Midwife team is intended to provide complementary community and clinical support. Effectiveness depends on clear role definition, regular communication, joint planning, and functional referral linkages.

Community Facilitators and Women's Groups

Several Indian maternal and newborn health programmes have used trained facilitators or ASHAs to organize participatory women's groups. These interventions differ from conventional one-to-one counselling because women collectively identify local health problems, prioritize barriers, develop strategies, implement community solutions, and assess their progress.

Financial-Incentive Context

The Janani Suraksha Yojana introduced conditional financial incentives to promote institutional delivery, particularly among socioeconomically disadvantaged women. ASHAs play an important role in informing eligible women, facilitating registration, arranging or coordinating transport, accompanying women, and supporting administrative procedures.[26]

Consequently, the observed effect of ASHA exposure on institutional delivery often reflects the interaction of community mobilization with financial incentives, transport arrangements, and expansion of facility-based services rather than the influence of a single isolated intervention.

Pathways through Which Community Health Workers Influence Maternal Health

Increasing Knowledge and Perceived Need for Care

Repeated household counselling can improve awareness of:

- the importance of early antenatal registration;
- recommended antenatal examinations;
- iron and folic acid supplementation;
- hypertensive and haemorrhagic danger signs;
- institutional delivery;
- postpartum warning signs; and
- Contraception.

Influencing Household Decision-Making

In many settings, maternity-care decisions involve husbands, mothers-in-law, or other family members. Community health workers can counsel these decision-makers and reduce delays caused by uncertainty or disagreement.

Reducing Administrative Barriers

ASHAs may assist women with registration, health records, benefit-scheme documentation, referral slips, transport communication, and navigation within public facilities.

Improving Geographical and Social Reach

Home visits bring health information and basic support to women who may not independently attend health facilities because of distance, poverty, disability, migration, restricted mobility, or social marginalization.

Supporting Referral

Community workers can identify danger signs, initiate referral, communicate urgency, assist with transport, and follow up after discharge.

Providing Social and Emotional Support

A familiar community-based worker may reduce anxiety, provide reassurance, encourage adherence, and help women communicate with formal healthcare providers.

Linking Community Demand with Facility Supply

The final effect of community intervention depends on whether the receiving health facility can provide timely, respectful, evidence-based care. Community health worker effectiveness therefore depends on both demand-side and supply-side health-system performance.

Effectiveness of Community Health Worker Interventions

Early Pregnancy Identification and Antenatal-Care Initiation

Early pregnancy registration creates opportunities for timely risk assessment, prevention, counselling, and follow-up. ASHAs can identify pregnancies through household contact and local community networks, including women who may not initially seek facility-based care.

A nationally representative longitudinal analysis by Agarwal et al. found that exposure to the ASHA programme was associated with increased utilization of maternity services. ASHA exposure was associated with an approximately 17% increase in the likelihood of receiving at least one antenatal-care visit.[5]

This finding supports the role of ASHAs in facilitating entry into maternity care. However, the effect on completion of four or more antenatal visits was smaller and less certain.[5] Community health workers may therefore be more successful at initiating care than ensuring repeated attendance throughout pregnancy.

Completion of antenatal care depends on several factors outside the direct control of community workers, including travel distance, waiting time, availability of clinicians, transport costs, diagnostic expenses, competing domestic responsibilities, loss of wages, perceived quality of care, and previous experiences of disrespect or neglect.

The World Health Organization recommends a positive pregnancy experience based on timely and meaningful antenatal contacts rather than attendance alone.[27] Community health worker programmes should therefore assess not only whether a woman attended but also whether she received appropriate blood-pressure assessment, anaemia evaluation,

supplementation, immunization, diagnostic testing, counselling, and risk-based follow-up.

Completion and Quality of Antenatal Care

Evidence concerning completion of recommended antenatal care is mixed. Agarwal et al. found a comparatively modest association between ASHA exposure and four or more antenatal visits.[5]

Similarly, Gopalakrishnan et al., in a study of 6,635 women from Madhya Pradesh and Bihar, found that coordinated counselling by both ASHAs and Anganwadi Workers was not significantly associated with completion of at least four antenatal visits. The estimated difference was -1.3 percentage points, with confidence intervals including no effect.[9]

These findings indicate that counselling alone cannot overcome all structural barriers to repeated attendance. They also demonstrate the importance of differentiating any antenatal contact, timely first-trimester registration, completion of the recommended number of visits, receipt of essential components, and clinical quality of care.

Community health workers may improve adherence to iron and folic acid supplementation by explaining its purpose, managing misconceptions, reminding women, and directing them to resupply. Nevertheless, stock-outs, adverse effects, inadequate counselling, and inconsistent follow-up may limit adherence.

Maternal Health Knowledge and Counselling

Home-based counselling is one of the most common community health worker interventions. Counselling may cover nutrition, anaemia prevention, rest, medication adherence, antenatal tests, birth planning, obstetric danger signs, breastfeeding, postpartum warning signs, and family planning.

The effectiveness of counselling depends on frequency, timing, accuracy, interpersonal quality, cultural appropriateness, and inclusion of influential family members.

Women may receive similar messages from ASHAs, Anganwadi Workers, Auxiliary Nurse Midwives, and facility staff. When communication is coordinated, repetition may reinforce behaviour. When messages conflict, confidence may be reduced.

The cross-sectional analysis by Gopalakrishnan et al. showed that coordinated counselling by ASHAs and Anganwadi Workers was more strongly associated with several maternal health behaviours than isolated or less coordinated contact.[9] This supports team-based community counselling rather than parallel and disconnected frontline programmes.

Birth Preparedness and Complication Readiness

Birth preparedness generally includes selecting a delivery facility, identifying an alternative referral facility, arranging transport, saving emergency funds, preparing documentation, identifying a support person, knowing whom to contact,

recognizing obstetric danger signs, and planning for blood availability where appropriate.

Gopalakrishnan et al. reported that coordinated ASHA and Anganwadi Worker counselling was associated with a 20.5-percentage-point increase in birth preparedness compared with the reference group.[9] This was among the strongest effects identified across the reviewed community counselling outcomes.

Birth preparedness is particularly suited to community-based intervention because it involves household decisions and practical arrangements that cannot be completed through facility-based clinical care alone.

Nevertheless, a prepared household may still experience delay when ambulance services do not respond, roads are inaccessible, the selected facility lacks staff, the facility cannot perform an emergency operation, blood products are unavailable, or the woman is referred between multiple facilities.

Birth-preparedness interventions must therefore be linked with accurate information regarding functional facilities, emergency transport, and referral pathways.

Institutional Delivery

Promotion of institutional delivery is the maternal health outcome most consistently associated with ASHA exposure.

A secondary analysis of the India Human Development Survey by Paul and Pandey included 8,711 women. After adjustment for antenatal care and sociodemographic factors, women exposed to ASHA services had approximately three times higher odds of institutional delivery than women without such exposure, with an adjusted odds ratio of 3.04 and a 95% confidence interval of 2.37-3.89.[6]

Mishra et al. analysed National Family Health Survey-5 data for 232,920 women. Use of ASHA services was associated with a 5.1-percentage-point increase in institutional delivery nationally and a 7.4-percentage-point increase in Empowered Action Group states and Assam. Adjusted odds of institutional delivery were 1.58 nationally and 1.78 in the priority-state group.[7]

Agarwal et al. also reported that ASHA exposure was associated with an approximately 28% increase in facility births.[5]

Coordinated ASHA and Anganwadi Worker counselling was associated with an 8.7-percentage-point increase in institutional delivery in Madhya Pradesh and Bihar.[9]

These findings are consistent across nationally representative and multi-state analyses. They indicate that ASHAs can reduce informational, logistical, administrative, financial, and social barriers to facility-based childbirth.

However, observational analyses may be influenced by residual confounding. Women who are more receptive to healthcare services may be more likely to engage with ASHAs, and areas with stronger

ASHA programmes may also have better facilities, roads, transport, or administrative capacity.

Wagner et al., using district-level data, found that increases in ASHA placement were not uniformly associated with improvements in all maternal and child healthcare indicators.[8] This finding highlights the difference between worker deployment and effective worker functioning. Simply appointing more community workers does not ensure adequate household contact, supervision, motivation, supplies, referral, or facility quality.

Skilled Birth Attendance

Agarwal et al. reported that ASHA programme exposure was associated with an approximately 26% increase in skilled attendance at birth.[5] This effect likely operates through promotion of institutional delivery, accompaniment, counselling, and assistance with benefit schemes.

Skilled attendance is clinically meaningful only when the attendant is competent and supported by appropriate medicines, equipment, referral, and emergency services. Institutional delivery and skilled attendance should therefore be treated as necessary but insufficient conditions for maternal safety.

Interaction with the Janani Suraksha Yojana

Community health worker interventions have operated alongside the Janani Suraksha Yojana, which provides financial incentives for institutional delivery.

Lim et al. evaluated the programme and found that Janani Suraksha Yojana participation was associated with increased antenatal care and institutional childbirth. The evaluation also suggested reductions in perinatal and neonatal mortality, although effects varied between population groups and states.[10]

Powell-Jackson et al. subsequently found that the programme substantially increased institutional delivery, while evidence concerning mortality effects was less consistent.[11]

ASHAs contribute to the programme by identifying eligible women, explaining benefits, facilitating registration, arranging transport, accompanying women, and supporting completion of administrative requirements.[26]

The effectiveness of institutional-delivery promotion should therefore be understood as the result of interacting interventions, including community counselling, financial incentives, transport support, expanded public facilities, household mobilization, and administrative facilitation.

Continuity across the Maternity-Care Pathway

The maternal-care continuum extends from pregnancy registration through antenatal care, childbirth, early postnatal assessment, later postnatal follow-up, and contraception.

Community health workers can reduce discontinuity by tracking pregnancy, reminding women of appointments, updating expected delivery dates, linking facility discharge with home follow-up,

reinforcing treatment instructions, and identifying postnatal complications.

Nevertheless, dropout often occurs after institutional delivery. Once the immediate objective of facility childbirth has been achieved, maternal follow-up may receive less attention than newborn care.

Programme indicators should therefore measure progression across the entire pathway rather than isolated achievements. Relevant indicators include first-trimester registration, adequate antenatal contacts, institutional delivery, postnatal maternal assessment within 48 hours, subsequent home follow-up, completion of referral, and postpartum family planning.

Postnatal Care

The postnatal period is associated with risks of haemorrhage, hypertensive complications, sepsis, thromboembolism, severe anaemia, complications after caesarean delivery, breastfeeding difficulties, and mental health problems.

Gopalakrishnan et al. reported that coordinated ASHA and Anganwadi Worker counselling was associated with a 29.2-percentage-point increase in postnatal care within six weeks compared with the reference group.[9] This was the largest estimated improvement reported in that study.

In a district-level assessment from western Uttar Pradesh, Chaurasiya et al. found gaps in the completeness of antenatal and postnatal services provided by ASHAs. Only 57.2% of mothers reported receiving six or more postnatal home visits.[20] The study illustrates the difference between programme guidelines and routine implementation.

Postnatal visits should include structured maternal assessment rather than concentrating almost exclusively on the newborn. Maternal assessment should address excessive or recurrent bleeding, fever, severe headache, visual symptoms, breathlessness, convulsions, lower-limb swelling or pain, wound infection, urinary symptoms, breast problems, severe weakness, emotional distress, and contraceptive needs.

Postpartum Contraception

Community health workers can introduce contraceptive options during pregnancy, revisit the discussion after childbirth, address misconceptions, involve partners appropriately, and facilitate access to temporary or permanent methods.

Coordinated ASHA and Anganwadi Worker counselling was associated with an 11.5-percentage-point increase in postpartum contraceptive use in the Madhya Pradesh and Bihar study.[9]

Counselling should remain voluntary, non-coercive, informed, confidential, and consistent with reproductive rights. Performance incentives must not encourage pressure toward a particular method.

Participatory Women's Groups and Community Mobilization

Rationale

Individual counselling may be insufficient when maternal health behaviours are shaped by community norms, collective resources, gender relations, transport systems, and shared beliefs.

Participatory learning and action groups typically follow a cycle in which community members identify maternal and newborn health problems, prioritize local barriers, develop feasible strategies, implement those strategies, and evaluate progress.

Evidence From Jharkhand and Odisha

Tripathy et al. conducted a cluster-randomized controlled trial in Jharkhand and Odisha. The participatory women's-group intervention improved birth outcomes and reduced neonatal mortality. It also produced favourable effects on maternal depression.[12]

A subsequent cluster-randomized trial integrated participatory women's groups with ASHAs. Neonatal mortality was approximately 30 per 1,000 live births in intervention clusters compared with 44 per 1,000 in control clusters, corresponding to an odds ratio of 0.69.[13]

Although neonatal mortality was the primary outcome, the pathway included maternal health knowledge, birth planning, hygienic care, complication recognition, and care-seeking. The intervention therefore demonstrates how community health workers can facilitate collective action rather than delivering only one-way health messages.

Scale-Up Through the Public Health System

Nair et al. evaluated participatory women's groups scaled through the public health system in Jharkhand. The pragmatic trial reported a 24% reduction in neonatal mortality, with an adjusted odds ratio of 0.76.[14]

Secondary analysis of the earlier trial suggested that the intervention could benefit disadvantaged groups and reduce socioeconomic inequalities in neonatal mortality.[15]

Economic evaluation showed that participatory learning and action facilitated by ASHAs was highly cost-effective in rural eastern India.[16]

A broader systematic review and meta-analysis by Prost et al. concluded that participatory women's groups using learning and action cycles could reduce maternal and neonatal mortality where adequate population coverage was achieved.[29]

Interpretation

The evidence suggests that community health workers can be effective facilitators of community problem-solving. Benefits depend on adequate group coverage, regular participation, competent facilitation, community ownership, inclusion of marginalized women, connection with health services, and capacity to implement locally developed solutions.

Maternal mortality was uncommon in individual trials, and most Indian studies were not statistically

powered to establish a direct maternal mortality effect. Claims should therefore remain proportionate to the outcomes actually measured.

Digital Health Support for Community Health Workers

Digital tools may assist community health workers with registration, tracking, home-visit scheduling, structured counselling, danger-sign checklists, clinical decision support, referral communication, supervision, supply monitoring, and programme reporting.

ImTeCHO Trial

Modi et al. evaluated the Innovative Mobile-phone Technology for Community Health Operations intervention in tribal Gujarat through a cluster-randomized trial involving 22 primary health centres and 561 ASHAs.[17]

The intervention combined mobile scheduling, structured counselling support, screening, decision support, supportive supervision, and programme monitoring.

Women in intervention areas were more likely to receive early postnatal home visits, and overall coverage of maternal, newborn, and child health services improved.[17]

The trial demonstrates that technology is most useful when embedded within a broader implementation package. The benefit cannot be attributed to the application alone because supportive supervision, structured workflows, and programme management were integral components.

Conditions Required for Effectiveness

Digital interventions require:

- reliable devices;
- offline functionality;
- adequate battery life;
- user-friendly interfaces;
- local-language content;
- timely technical support;
- interoperability;
- data protection;
- removal of duplicate registers; and
- Non-punitive use of performance data.

Digital systems may reduce effectiveness when community health workers must record identical information in several applications and paper registers. Technology should simplify work rather than add administrative burden.

Detection and Referral of High-Risk Pregnancies Potential Contribution

Community health workers may support early identification of women with hypertension, symptoms suggestive of pre-eclampsia, severe anaemia, bleeding, fever, reduced fetal movements, prolonged labour, previous obstetric complications, or other danger signs.

However, community-level screening improves clinical outcomes only when each subsequent step functions adequately.

Community-Level Interventions for Pre-eclampsia Trial

Bellad et al. evaluated community-level interventions for pre-eclampsia in Karnataka through a cluster-randomized controlled trial involving 14,783 pregnancies.[18]

The intervention included community health worker assessment supported by a mobile application, risk classification, referral, and selected community-level actions. The primary composite maternal, fetal, and neonatal outcome did not differ significantly between intervention and control groups. The adjusted odds ratio was 0.92, with a 95% confidence interval of 0.74-1.15.[18]

The absence of a significant primary effect does not establish that community screening is unhelpful. Instead, it demonstrates that screening and referral alone may be insufficient when women decline referral, transport is unavailable, referral is delayed, the receiving facility lacks capacity, recommended treatment is not provided, clinical communication is incomplete, or follow-up is inadequate.

Ramadurg et al. found that community health workers in rural Karnataka could acquire knowledge and support management pathways for pre-eclampsia when appropriately trained and supported.[19] Translation of knowledge into improved outcomes nevertheless depends on referral completion and quality of treatment.

Referral Closure

Referral performance should not be measured only by the number of referral slips issued. A complete referral pathway should document whether the woman accepted the referral, obtained transport, reached the designated facility, was assessed promptly, received appropriate treatment, was transferred elsewhere if necessary, and returned to community follow-up.

Community health workers should receive feedback concerning referred women. Without feedback, they cannot reinforce treatment, understand referral failures, or improve subsequent decision-making.

Equity and Vulnerable Populations

Community health workers have the potential to reduce inequities because they bring services and information directly to households.

Potentially disadvantaged groups include:

- women living in remote rural areas;
- Scheduled Tribe communities;
- Scheduled Caste communities;
- urban informal-settlement residents;
- migrants;
- adolescents;
- women with disabilities;
- women with limited education;
- women without independent income; and
- Women living far from referral facilities.

Fathima et al. assessed the ASHA programme in Karnataka and found that ASHAs were generally accepted within their communities and contributed

to maternal and child health activities. However, performance varied according to training, supervision, incentives, workload, and local support.[21]

Verma et al. examined incentivized community workers serving informal urban settlements and found that community workers could influence maternal and infant health service utilization among vulnerable urban populations.[22]

Participatory women's-group evidence also suggests that well-covered interventions may produce equitable benefits rather than disproportionately benefiting women who are already better connected to services.[14,15]

However, inequity can persist when remote households receive fewer visits, migrant women are not included in local registers, marginalized groups have weaker relationships with local workers, incentives encourage workers to prioritize easier cases, language differences interfere with counselling, referral costs remain unaffordable, or higher-level care is geographically inaccessible. Programme evaluation should therefore disaggregate outcomes by geography, wealth, education, social group, age, migration status, and distance from facilities.

Studies of Community Health Worker Interventions in India

Study	Design And Setting	Intervention Or Exposure	Principal Findings	Main Interpretation
Agarwal Et Al., 2019[5]	Nationally Representative Longitudinal Modelling Study	Exposure To ASHA Programme	Increased Likelihood Of At Least One Antenatal Visit, Skilled Attendance, And Facility Birth; Smaller Effect On Four Or More Antenatal Visits	Ashas Improve Entry Into And Utilization Of Maternity Services
Paul And Pandey, 2020[6]	Secondary Analysis Of 8,711 Women	ASHA Service Exposure	Adjusted Odds Ratio For Institutional Delivery 3.04	Strong Association With Institutional Delivery
Mishra Et Al., 2024[7]	NFHS-5 Analysis Of 232,920 Women	Use Of ASHA Services	Institutional Delivery Increased By 5.1 Percentage Points Nationally And 7.4 Points In Priority States	Greater Benefit Where Baseline Access Was Historically Lower
Wagner Et Al., 2018[8]	District-Level Ecological Analysis	Expansion Of ASHA Placement	Increased ASHA Density Was Not Consistently Associated With All Service Indicators	Worker Deployment Alone Does Not Ensure Programme Effectiveness
Gopalakrishnan Et Al., 2024[9]	Cross-Sectional Study In Madhya Pradesh And Bihar	Coordinated ASHA And Anganwadi Worker Counselling	Improved Birth Preparedness, Institutional Delivery, Postnatal Care, And Contraception; No Significant Improvement In Four Antenatal Visits	Coordination Between Frontline Cadres Strengthens Several Maternal Behaviours
Lim Et Al., 2010[10]	National Impact Evaluation	Janani Suraksha Yojana With ASHA Facilitation	Increased Antenatal Care And Institutional Delivery; Variable Mortality Effects	Community Mobilization And Financial Incentives Act Synergistically
Tripathy Et Al., 2010[12]	Cluster-Randomized Trial In Jharkhand And Odisha	Participatory Women's Groups	Improved Birth Outcomes, Neonatal Survival, And Maternal Depression	Collective Problem-Solving Can Complement Individual Counselling
Tripathy Et Al., 2016[13]	Cluster-Randomized Trial In Eastern India	ASHA-Facilitated Participatory Groups	Neonatal Mortality 30 Versus 44 Per 1,000 Live Births	Ashas Can Effectively Facilitate Participatory Community Action

Nair Et Al., 2021[14]	Pragmatic Cluster Non-Randomized Trial	Public-System Scale-Up Of Women's Groups	Adjusted 24% Reduction In Neonatal Mortality	Participatory Interventions Can Remain Effective At Scale
Modi Et Al., 2019[17]	Cluster-Randomized Trial In Tribal Gujarat	Mobile Decision Support And Supportive Supervision For Ashas	Improved Early Postnatal Home Visits And Composite Service Coverage	Digital Tools Work Best As Part Of An Implementation Package
Bellad Et Al., 2020[18]	Cluster-Randomized Trial In Karnataka	Mobile-Supported Pre-Eclampsia Screening And Referral	No Significant Improvement In Primary Composite Clinical Outcome	Screening Requires Reliable Referral And Facility Treatment
Chaurasiya Et Al., 2020[20]	District-Level Assessment In Uttar Pradesh	Routine ASHA Antenatal And Postnatal Services	Incomplete Delivery Of Recommended Postnatal Visits	Implementation Gaps Reduce Real-World Effectiveness
Fathima Et Al., 2015[21]	Programme Assessment In Karnataka	Routine ASHA Programme	Community Acceptance But Variability In Training, Support, And Performance	Local System Support Determines Programme Functioning
Verma Et Al., 2017[22]	Evaluation In Urban Informal Settlements	Incentivized Community Workers	Improved Access To Selected Maternal And Infant Services	Community Health Workers Can Reach Underserved Urban Populations

Determinants of Effectiveness

Training and Competency

Community health workers require more than initial classroom instruction. Effective training should Decision-making, digital-tool use, respectful care, confidentiality, and periodic competency assessment.

Refresher training is especially important when responsibilities expand or guidelines change.

Supportive Supervision

Supervision should review difficult cases, solve field-level problems, reinforce clinical and communication skills, verify service quality, facilitate referral, address supply shortages, and provide constructive feedback.

Supervision limited to checking registers or achieving numerical targets may increase reporting without improving care.

Scott et al., in their health-systems review of the ASHA programme, found that strongly supported interventions often produced favourable results, whereas routine implementation evidence was more variable.[23] This difference illustrates the risk of losing effectiveness when pilot programmes are expanded without equivalent supervision, financing, logistics, and management.

Remuneration and Incentives

ASHAs are compensated largely through activity-based incentives. Incentives may increase attention to targeted activities, particularly institutional delivery and immunization. However, they may also narrow attention toward paid tasks, discourage time-intensive counselling, disadvantage workers serving remote populations, create administrative burden, produce frustration when payments are delayed, and

include practical demonstrations, simulation, case scenarios, danger-sign recognition, communication skills, referral

place responsibility on workers for outcomes outside their control.

Gopalan et al. found that ASHA motivation was influenced by financial incentives, community recognition, support from the health system, workload, and opportunities for achievement.[24]

A discrete-choice experiment by Abdel-All et al. found that ASHAs valued predictable remuneration, manageable workload, improved training, supportive supervision, and career opportunities.[25]

A blended remuneration model combining a predictable base payment with appropriate performance components may improve stability while maintaining accountability.

Workload and Role Expansion

ASHA responsibilities have expanded to include maternal and child health, communicable-disease control, non-communicable-disease screening, surveillance, health insurance assistance, public-health campaigns, digital data entry, and multiple community programmes.

Role expansion without additional time, remuneration, equipment, or staffing can reduce the frequency and quality of maternal home visits.

Programmes should identify essential maternal tasks and estimate the time required to perform them properly. Duplicate paper and electronic reporting should be minimized.

Community Trust and Acceptability

Community residence and shared language can make ASHAs trusted sources of information. Trust is strengthened when workers maintain confidentiality, communicate respectfully, provide accurate information, remain available after childbirth, avoid coercion, involve family members appropriately, and assist during practical difficulties. Trust may be damaged when promised incentives are delayed, workers are unable to resolve facility problems, or women experience disrespect after being encouraged to seek institutional care.

Coordination Between Cadres

ASHAs, Anganwadi Workers, and Auxiliary Nurse Midwives may serve the same households but work through different reporting and supervisory structures.

Coordination can be improved through shared pregnancy lists, joint village-level meetings, clearly assigned responsibilities, shared high-risk pregnancy registers, coordinated home visits, referral feedback, and joint review of maternal complications.

Evidence from Madhya Pradesh and Bihar indicates that coordinated counselling can outperform fragmented frontline contact for several outcomes.[9]

Supplies and Equipment

Community workers cannot effectively deliver assigned tasks without counselling materials, functional mobile devices, referral forms, blood-pressure devices where included in the programme, protective materials, essential medicines or supplements within their authorized scope, and reliable communication facilities.

Stock-outs and equipment failure reduce worker credibility and interrupt continuity of care.

Referral Transport

Reliable transport is a critical determinant of intervention success. Community health workers may correctly identify danger signs but remain unable to prevent adverse outcomes when transport is delayed or unaffordable.

Transport systems should include a functional call mechanism, clear dispatch responsibility, response-time monitoring, backup arrangements, transport between facilities, and special planning for difficult geographical areas.

Facility Readiness and Quality

Community health workers primarily influence demand, navigation, and continuity. Clinical outcomes depend on what occurs after a woman reaches a facility.

Facilities require:

- skilled maternity personnel;
- round-the-clock emergency care;
- essential medicines;
- magnesium sulphate;
- uterotonics;
- antibiotics;
- blood-transfusion capacity;

- operating-theatre availability;
- infection-prevention systems;
- respectful care; and
- efficient referral.

The World Health Organization's quality-of-care standards emphasize that a positive maternal outcome requires both evidence-based clinical care and a respectful experience of care.[28]

DISCUSSION

Principal Findings

This narrative review demonstrates that community health worker interventions in India are generally effective in improving maternal healthcare utilization and selected health behaviours.

The strongest and most consistent evidence relates to early entry into antenatal care, birth preparedness, institutional delivery, skilled birth attendance, postnatal-care contact, postpartum contraception, and community mobilization.

National analyses consistently show positive associations between ASHA exposure and facility-based childbirth.[5-7] Coordinated counselling by ASHAs and Anganwadi Workers produced particularly large improvements in birth preparedness and postnatal care.[9]

Participatory women's groups demonstrated that community health workers can do more than transmit information. They can facilitate collective problem-solving, strengthen community ownership, and improve birth-related outcomes.[12-16]

Digital decision-support tools can improve visit scheduling, counselling consistency, supervision, and early postnatal coverage when they are integrated into a supportive programme.[17]

Difference Between Utilization and Clinical Outcomes

The available evidence is substantially stronger for healthcare utilization than for severe maternal morbidity or maternal mortality.

Institutional delivery is important, but it is an intermediate outcome. A woman may reach a facility and still experience delayed triage, failure to recognize complications, absence of skilled staff, unavailable blood products, inappropriate referral, infection, disrespectful treatment, or delayed emergency intervention.

Similarly, identification of a high-risk pregnancy does not guarantee appropriate treatment. The pre-eclampsia trial showed that a community-level screening and referral package did not significantly improve the primary composite clinical outcome.[18]

Therefore, the effectiveness of community health workers should not be judged solely by whether they increase demand. Their contribution must be considered within the performance of the entire health system.

Why Effects Vary Across Studies

Variation in reported effectiveness may reflect differences in baseline service coverage, ASHA

selection and retention, training quality, intensity of supervision, timing of incentive payments, population density, travel distance, local facility readiness, programme maturity, intervention fidelity, household socioeconomic status, and study design.

A highly supported trial with dedicated supervision and technical assistance may demonstrate greater effects than routine implementation. Conversely, a district may appoint many ASHAs without ensuring adequate home contact, supplies, transport, referral, or facility capacity.

Importance of Coordinated Interventions

The reviewed evidence suggests that single-component interventions are less likely to produce sustained benefits than integrated packages.

An effective maternal health pathway may include household identification by the ASHA, nutritional support from the Anganwadi Worker, clinical antenatal assessment by the Auxiliary Nurse Midwife, financial and transport facilitation, skilled facility-based childbirth, emergency referral where required, discharge communication, structured postnatal home follow-up, and postpartum contraceptive support.

No individual cadre can provide all of these components independently.

Community Health Workers as System Navigators

The principal contribution of community health workers is not the replacement of doctors, nurses, or midwives. Their value lies in connecting women with services, identifying social and practical barriers, supporting household decisions, explaining the care pathway, facilitating documentation and benefits, coordinating transport, encouraging referral completion, and maintaining contact after discharge.

They function most effectively as integrated members of a responsive health system.

Policy and Programme Implications

Moving Beyond Institutional-Delivery Targets

Institutional delivery should remain an important indicator, but maternal health monitoring should also include:

- first-trimester registration;
- content and completion of antenatal care;
- anaemia screening and treatment;
- blood-pressure assessment;
- birth preparedness;
- referral completion;
- treatment after referral;
- respectful maternity care;
- early maternal postnatal assessment;
- postnatal home follow-up; and
- postpartum contraception.

Strengthening Maternal Components of Postnatal Visits

Postnatal protocols should require structured maternal assessment. Supervisory systems should

verify whether women, not only newborns, were examined and counselled.

Establishing Referral-Feedback Systems

Community workers should be informed about the outcome of referred cases. Digital or paper-based referral closure should document arrival, assessment, treatment, transfer, and follow-up.

Ensuring Predictable Remuneration

Payment systems should be timely, transparent, easily verifiable, administratively simple, and adjusted for difficult geographical areas.

A predictable base payment may be combined with selected quality-sensitive incentives.

Reducing Administrative Duplication

Community workers should not be required to enter the same information into multiple registers and applications. Digital tools should replace redundant documentation rather than add to it.

Using Quality-Sensitive Indicators

Performance indicators should reward meaningful care rather than only task completion. For example, birth preparedness should be assessed for completeness, and referral should be assessed for successful closure.

Supporting Career Development

ASHAs should have access to competency certification, continuing education, advanced community health roles, pathways into formal healthcare training, and recognition of long-term service.

Prioritizing Vulnerable Populations

Programme plans should identify women who are geographically isolated, socially marginalized, adolescent, migrant, disabled, economically disadvantaged, or affected by previous obstetric complications.

Visit intensity and transport arrangements may need to be adapted for these groups.

Integrating Community and Facility Quality Improvement

Community mobilization should be introduced alongside emergency obstetric capacity, blood availability, skilled staffing, respectful maternity-care initiatives, reliable ambulance services, infection prevention, and maternal-death and near-miss review.

Research Gaps and Future Directions

Direct Maternal Outcomes

Future studies should measure severe maternal morbidity, maternal near-miss, haemorrhage-related outcomes, hypertensive complications, sepsis, maternal mortality, and long-term maternal recovery.

Large sample sizes and longer follow-up will be required.

Quality-Adjusted Service Utilization

Research should distinguish between attendance, receipt of recommended care, timeliness, clinical appropriateness, respectful treatment, and continuity.

Referral Completion

Studies should document each stage between danger-sign identification and definitive treatment.

Maternal Mental Health

Community health workers may be positioned to identify anxiety, depression, intimate-partner violence, social isolation, and postpartum psychological distress. Evidence regarding feasible, safe, and effective community-worker roles remains limited.

Cost-Effectiveness

Economic evaluations should include programme costs, worker time, supervision, digital infrastructure, household costs, avoided complications, transport, and facility costs.

Long-Term Sustainability

Trials should be followed by implementation research evaluating whether effects persist after external research support is withdrawn.

Worker Well-Being

Future research should examine burnout, psychological stress, occupational safety, violence or harassment, financial insecurity, unpaid work, digital burden, and career aspirations.

Urban and Migrant Populations

Most ASHA research has focused on rural settings. More evidence is required from urban informal settlements, migrant communities, and rapidly growing peri-urban areas.

Strengths of the Review

This review has several strengths.

- It focuses specifically on India's community health worker system and incorporates nationally representative analyses, randomized trials, implementation studies, economic evaluations, and official national data.
- It distinguishes process outcomes, service-utilization outcomes, and direct clinical outcomes.
- It examines both intervention effectiveness and health-system conditions affecting effectiveness.
- It includes evidence concerning coordinated frontline workers, participatory community groups, digital health, high-risk pregnancy screening, equity, incentives, and routine implementation.

Limitations

This review has several limitations.

- First, it is a narrative review rather than a systematic review. A prospectively registered protocol, duplicate study selection, formal risk-of-bias assessment, and meta-analysis were not undertaken.
- Second, the included studies were heterogeneous in their intervention design, population, exposure measurement, comparator, outcome definition, and follow-up period.
- Third, several influential studies were observational. Associations between ASHA

exposure and service utilization may be affected by residual confounding, self-selection, recall bias, and differences in programme strength between regions.

- Fourth, self-reported exposure to community health workers may not accurately reflect the number, timing, duration, or quality of contacts.
- Fifth, many studies measured institutional delivery or antenatal attendance without assessing the clinical quality of services received.
- Sixth, community health worker programmes operate alongside financial incentives, ambulance services, facility expansion, and other National Health Mission reforms. The independent contribution of community health workers may therefore be difficult to isolate.
- Finally, direct maternal deaths are relatively uncommon outcomes, and most individual studies were not sufficiently powered to detect changes in maternal mortality.

CONCLUSION

Community health worker interventions are an essential component of India's maternal health strategy. The strongest evidence shows that ASHAs and other community-based frontline workers improve pregnancy registration, antenatal-care initiation, birth preparedness, institutional delivery, skilled birth attendance, postnatal-care contact, and postpartum contraception.

Coordinated counselling by ASHAs and Anganwadi Workers can strengthen multiple stages of the maternity-care continuum. Participatory women's groups can promote collective community action, while well-designed digital tools can improve scheduling, counselling consistency, supervision, and postnatal coverage.

However, evidence that community health workers alone reduce severe maternal morbidity or maternal mortality remains limited. Their effectiveness is constrained when referral transport is unreliable, payments are delayed, workloads are excessive, supervision is weak, or receiving facilities lack essential obstetric capacity.

Community health workers should therefore be regarded as trusted community-based counsellors, mobilizers, navigators, and referral facilitators functioning within an integrated health system. Sustainable improvement in maternal outcomes requires simultaneous investment in community outreach, frontline-worker support, referral pathways, respectful maternity care, skilled personnel, blood-transfusion services, essential medicines, and emergency obstetric care.

Declarations

Ethical Approval: Ethical approval was not required because this article is a narrative review of previously published studies and publicly available reports.

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