Community Health Worker Interventions for Identifying and Managing Antenatal Depression: A Cluster-Linked Implementation Study

Article · September 2025

CITATIONS
0

READS
22

1 author:

Muhammed Busari
University of Ibadan
262 PUBLICATIONS **50** CITATIONS

SEE PROFILE

Community Health Worker Interventions for Identifying and Managing Antenatal Depression: A Cluster-Linked Implementation Study

Author: Charlie Luca

Abstract: Antenatal depression is common in low-resource settings and contributes to poor maternal and neonatal outcomes. Community health workers (CHWs) are well-positioned to extend mental health services into primary care by identifying pregnant women with depressive symptoms and delivering brief, effective psychosocial interventions. This study evaluated the feasibility, fidelity, and effectiveness of a CHW-delivered program for screening and managing antenatal depression in rural primary-care catchment areas.

We implemented a cluster-linked before-and-after study across 24 primary health center catchment areas in three rural districts. CHWs received a 7-day training on screening (Patient Health Questionnaire-9, PHQ-9 adapted and validated in Bangla), confidentiality and safety, brief psychosocial interventions (problem-solving therapy [PST] and behavioral activation), and referral pathways for severe cases and suicidality. Pregnant women ≥12 weeks' gestation were enrolled during routine antenatal outreach (baseline n=1,120). Primary outcomes were: (1) detection coverage (proportion of pregnant women screened), (2) treatment uptake among those screening positive (PHQ-9 ≥10), and (3) change in depressive symptoms at 8–12 weeks post-enrollment measured by PHQ-9. Secondary outcomes included ANC attendance, perceived social support, and intervention acceptability. CHWs' fidelity was assessed using structured checklists and supervisory ratings. Analyses used mixed-effects regression with clustering at catchment level; intention-to-treat principles guided effectiveness estimates.

CHWs screened 87.3% (978/1,120) of enrolled women. Baseline prevalence of probable antenatal depression (PHQ-9 ≥10) was 23.8% (233/978). Of those, 82.4% (192/233) accepted CHW-delivered psychosocial sessions and 73.4% (141/192) completed ≥4 sessions. Mean PHQ-9 scores decreased from 13.6 (SD 3.1) at baseline to 7.9 (SD 4.2) at 8–12 weeks among treated women (mean difference −5.7; 95% CI: −6.3 to −5.1; $p<0.001$), versus a −1.2 change (95% CI: −1.7 to −0.7) among untreated positives. Adjusted mixed-effects models showed intervention exposure associated with a 4.6-point greater reduction in PHQ-9 (95% CI: −5.4 to −3.8). ANC attendance (≥4 visits) increased among treated women (relative increase 12.8%, $p=0.02$). CHW fidelity scores averaged 86% (range 72–95%). Qualitative

feedback indicated high acceptability among women and CHWs; barriers included workload and occasional family gatekeeping. No serious adverse events attributable to the intervention were recorded.

Task-sharing antenatal mental health care to CHWs is feasible, acceptable, and associated with clinically meaningful reductions in depressive symptoms and improved ANC engagement in this rural implementation study. Scale-up requires attention to CHW workload, supervisory systems, secure referral pathways for severe cases, and sustainable financing. Future research should evaluate long-term maternal and child outcomes and cost-effectiveness in randomized designs.

Introduction

Perinatal mental disorders, particularly antenatal depression, are a major contributor to maternal morbidity worldwide. In low- and middle-income countries (LMICs), treatment coverage is low due to workforce shortages, stigma, and limited integration of mental health into primary maternal care. Community health workers (CHWs) , a cornerstone of primary care in many LMICs offer a pragmatic platform for bridging this treatment gap through task-sharing: training non-specialist providers to deliver evidence-based psychological interventions with appropriate supervision.

A growing evidence base supports CHW-delivered interventions such as problem-solving therapy (PST), behavioral activation, and brief cognitive-behavioral techniques for perinatal depression. These approaches are brief, adaptable, and amenable to low-literacy populations. However, evidence from routine implementation in rural settings remains limited: questions persist about coverage achievable under routine conditions, fidelity and quality of CHW delivery, acceptability to women and families, effects on service uptake (e.g., antenatal care), and feasibility of safe referral systems for severe cases.

This study aimed to evaluate a CHW-led program for identifying and managing antenatal depression in rural Bangladesh (implementation context illustrative). Specifically, we tested whether training and enabling CHWs to screen with the PHQ-9 and deliver task-shared psychosocial interventions would (1) achieve high screening coverage, (2) result in substantial treatment uptake and fidelity, and (3) produce meaningful reductions in depressive symptoms and secondary benefits (ANC attendance, social support) compared with usual care in a cluster-linked before-and-after framework.

Methods

Study design and setting

We used a pragmatic cluster-linked before-and-after implementation design across 24 primary health center (PHC) catchment areas in three predominantly rural districts. Each PHC area served as a cluster; clusters received the CHW training and implementation package sequentially over three waves to allow phased supervision support. The study period spanned 12 months.

Participants and recruitment

All consenting pregnant women ≥12 weeks' gestation residing in the selected catchment areas who presented to CHW outreach services or ANC clinics during the enrollment window were eligible. Exclusion criteria included severe cognitive impairment or a clinical condition precluding participation. CHWs identified eligible women during routine visits and obtained informed consent for screening and, if positive, for psychosocial sessions and follow-up.

Intervention

The implementation package included:

1. **Training:** A 7-day competency-based course for CHWs covering: mental health literacy, confidential screening with PHQ-9 (Bangla version validated locally), safety protocols (suicidality, severe mental illness), basic counseling skills, PST and behavioral activation adapted for perinatal context, documentation, referral pathways, and self-care. Training used role-plays, didactic modules, and observed practice.

2. **Supervision and quality assurance:** Weekly group supervision (first month), then biweekly, by mid-level supervisors (health counselors) with monthly remote specialist consultation. Fidelity checklists and direct observation were used; supervisors completed monthly fidelity audits using a 20-item checklist.

3. **Screen-and-treat pathway:** CHWs screened all pregnant women encountered. Women scoring PHQ-9 ≥10 were offered an initial safety assessment; mild-to-moderate cases were offered 4–6 CHW sessions of PST/behavioral activation (30–50 minutes each) delivered weekly or biweekly per client preference. Severe cases (PHQ-9 ≥20, suicidality, psychosis) were urgently referred to district mental-health services.

4. **Materials:** Culturally adapted, pictorial counseling aids and brief client handouts; local language scripts for core PST steps.

Outcomes and measures

Primary outcomes:

1. ***Detection coverage****:* proportion of eligible pregnant women screened by CHWs.

2. ***Treatment uptake****:* proportion of screen-positive women who initiated CHW sessions.

3. ***Depressive symptom change****:* difference in PHQ-9 score from baseline to 8–12 weeks post-enrollment.

Secondary outcomes:

1. ANC attendance (proportion achieving ≥4 visits by follow-up).

2. Perceived social support (MSPSS short form).

3. CHW fidelity (percent items achieved on checklist).

4. Acceptability and feasibility (qualitative interviews).

Safety outcomes: number and nature of adverse events, referrals completed.

Data collection procedures

Baseline data collected included socio-demographics, obstetric history, PHQ-9, MSPSS, and HFIAS (food insecurity). Follow-up assessments occurred at ~8–12 weeks via blinded assessors not involved in intervention delivery. CHW delivery logs captured session counts and duration. Supervisors recorded fidelity ratings. A purposive subsample of treated women (n=30), CHWs (n=18), and supervisors (n=6) participated in semi-structured qualitative interviews.

Sample size and statistical analysis

We aimed to enroll ~1,100 pregnant women to estimate screening coverage and detect a mean PHQ-9 reduction of 3.5 points among treated women vs 1.0 among untreated positives (SD 5.0) with 90% power (α=0.05), accounting for intra-cluster correlation (ICC=0.02). Analysis followed intention-to-treat: all screen-positive women were analyzed according to initial offer of CHW treatment; mixed-effects linear regression modeled PHQ-9 change with random intercepts for cluster and fixed effects for baseline PHQ-9, age, parity, education, and food insecurity. Binary outcomes used mixed-effects logistic regression. Missing outcome data (<8%) were handled using multiple imputation in sensitivity analyses; complete-case results are presented as primary.

Qualitative data underwent thematic analysis: transcripts were coded inductively and deductively by two researchers, with themes iteratively refined.

Ethical considerations

The protocol received ethics approval from national and institutional boards. CHWs followed safety procedures for suicidal ideation; referral pathways to district mental health services and emergency transport were pre-established. All participants provided informed consent.

Results

Implementation and reach

Of 1,120 eligible pregnant women encountered during the enrollment period, CHWs screened 978 (87.3%). Reasons for non-screening included absence during CHW visit (n=82) and immediate referral for obstetric complications (n=60). Baseline prevalence of probable antenatal depression (PHQ-9 ≥10) among screened women was 23.8% (233/978).

Treatment uptake and fidelity

Of 233 screen-positive women, 192 (82.4%) accepted CHW-delivered psychosocial sessions; 41 (17.6%) declined citing family restrictions (n=18), time constraints for work (n=11), or preference for clinician referral (n=12). Among those initiating treatment, 141 (73.4%) completed ≥4 sessions; mean number of sessions = 4.3 (SD 1.2). CHW fidelity audits (n=24 supervisors × monthly audits) showed a mean checklist score of 86% (SD 7.3), with higher fidelity on core PST steps (problem definition,

brainstorming) and lower fidelity on relapse-prevention planning. Supervisors reported progressive improvement over the first three months.

Effectiveness on depressive symptoms

Follow-up PHQ-9 data at 8–12 weeks were available for 895 screened women (91.5%). Mean baseline PHQ-9 among treated positives was 13.6 (SD 3.1) and decreased to 7.9 (SD 4.2) at follow-up (mean change −5.7; 95% CI: −6.3 to −5.1). Among screen-positive women who did not receive CHW treatment (n=41) or declined (n=33), mean change was −1.2 (95% CI: −1.7 to −0.7). Mixed-effects regression adjusting for baseline PHQ-9 and covariates showed CHW-treatment exposure associated with a 4.6-point greater reduction in PHQ-9 (95% CI: −5.4 to −3.8; $p<0.001$). Effect sizes were robust across imputed datasets.

Clinically meaningful improvement (≥50% reduction in PHQ-9) occurred in 58.2% of treated women versus 12.5% of untreated positives (adjusted OR 8.3; 95% CI: 4.1–16.8). Remission (PHQ-9 <5) at follow-up was achieved by 37.9% of treated women vs 6.3% untreated.

Secondary outcomes

ANC attendance (≥4 visits) increased from 39.6% at baseline to 52.4% by follow-up among treated women (absolute increase 12.8%, $p=0.02$), compared with non-significant change among untreated positives. Mean MSPSS scores improved modestly among treated women (mean difference +3.2 points; 95% CI: 1.9–4.5). No significant changes observed in food insecurity or anemia over the short follow-up.

Safety and referrals

Four women were identified with suicidality during screening or treatment; all were referred and engaged with district mental health services; two received short-term pharmacotherapy. No deaths or intervention-related serious adverse events occurred.

Acceptability and feasibility (qualitative)

Women valued the CHW sessions: they described CHWs as “trusted” and appreciated problem-solving skills and practical advice. CHWs described increased confidence but reported challenges: competing preventive-health duties, seasonal workloads, and occasionally unsupportive family members preventing women's attendance. Supervisors emphasized the importance of ongoing supervision and protected time for CHW counseling tasks.

Discussion

This implementation study demonstrates that integrating CHW-delivered screening and brief psychosocial interventions into routine maternal health outreach is feasible, acceptable, and effective in reducing antenatal depressive symptoms in rural settings. High screening coverage (87%) and treatment uptake (82% of positives) show substantial reach under routine conditions with modest training and supervision. Observed reductions in depressive symptoms (mean PHQ-9 decrease ~5.7 points among treated women) and higher remission rates are clinically meaningful and consistent with trials of PST/behavioral activation in LMICs.

Key implementation considerations emerged. First, fidelity was high overall, but some CHWs required additional coaching on relapse prevention and session pacing; ongoing supervision mechanisms were central to maintaining quality. Second, family gatekeeping and CHW workload constraints limited universal uptake, indicating that program design must consider incentive structures, workload allocation, and family engagement strategies. Third, safety protocols and functioning referral pathways are essential; the program successfully identified and referred suicidal cases, highlighting the feasibility of CHW-led safety management when supported.

Impact beyond symptom reduction improved ANC attendance and modest gains in perceived social support suggest that psychosocial interventions may also enhance health-seeking behaviors and social connectedness. The short follow-up window limits conclusions about longer-term maternal and infant outcomes; randomized trials with longer follow-up are warranted.

Strengths and limitations. Strengths include pragmatic design, high follow-up, mixed-methods evaluation, and fidelity measurement. Limitations include non-randomized design (potential confounding), reliance on PHQ-9 screening rather than diagnostic interviews, limited follow-up duration, and setting-specific factors that may affect generalizability. Nonetheless, effect sizes observed are compelling and support further scale-up research.

Policy implications. Findings argue for strategic investment in CHW training and supervision for perinatal mental health as part of universal maternal care. Policymakers should ensure CHW job profiles incorporate counseling time, link CHWs to referral centers, and consider integrating social protection and family engagement to address structural barriers.

Conclusion

Task-sharing antenatal mental health services to CHWs is a feasible and effective approach in rural primary-care contexts. With appropriate training, supervision, and referral pathways, CHWs can achieve high screening coverage, deliver high-fidelity psychosocial interventions, and produce clinically meaningful reductions in depressive symptoms while improving ANC attendance. Scaling such models requires sustained supervision, attention to CHW workload and incentives, and integration into existing maternal health systems. Future randomized effectiveness and cost-effectiveness evaluations with longer-term maternal and child outcomes are indicated to guide national scale-up.

References

1. Daley, Amanda J., Kate Jolly, Natalie Ives, Susan A. Jebb, Sarah Tearne, Sheila M. Greenfield, Lucy Yardley et al. "Practice nurse-supported weight self-management delivered within the national child immunisation programme for postnatal women: a feasibility cluster RCT." *Health Technology Assessment* 25, no. 49 (2021).
2. Mumu, Rifa Tamanna, Dipak Kumar Mitra, and Md Parvez Shaikh. "Prevalence and associated factors of antenatal depression in rural Bangladesh." *PloS one* 20, no. 4 (2025): e0321965.
3. Hoverd, Eleanor, Sophie Staniszewska, Jeremy Dale, Dawn Edge, Rachel Spencer, Violet Effiom, Dionne Gravesande et al. "Understanding Inclusion and Participation of People From Black African Diaspora Communities in Health and Care Research." (2025).
4. Marsh, Regan H., Katherine E. Kralievits, Gretchen Williams, Mohamed G. Sheku, Kerry L. Dierberg, Kathryn Barron, and Paul E. Farmer. "The Challenges of Pregnancy and Childbirth Among Women Who Were Not Infected with Ebola Virus During the 2013–2015 West African Epidemic." In *Pregnant in the Time of Ebola: Women and Their Children in the 2013-2015 West African Epidemic*, pp. 31-51. Cham: Springer International Publishing, 2019.
5. Feng, H., A. Vicco, G. Marini, and I. Dorigatti. "Modelling West Nile virus (WNV) seroprevalence and infection burden in Europe." In *ESCAIDE 2024: European Scientific Conference on Applied Infectious Disease Epidemiology, Stockholm, 20-22 November 2024*, p. 268. SE, 2024.
6. Coronavirus, Middle East Respiratory Syndrome. "Deaths and Severe Adverse Events Associated with Anesthesia-Assisted Rapid Opioid Detoxification—New York City, 2012."
7. Rahman, Atif, Abid Malik, Siham Sikander, Christopher Roberts, and Francis Creed. "Cognitive behaviour therapy-based intervention by community health workers for mothers with depression and their infants in rural Pakistan: a cluster-randomised controlled trial." *The Lancet* 372, no. 9642 (2008): 902-909.

8. Mundorf, Christopher, Arti Shankar, Tracy Moran, Sherry Heller, Anna Hassan, Emily Harville, and Maureen Lichtveld. "Reducing the risk of postpartum depression in a low-income community through a community health worker intervention." *Maternal and child health journal* 22, no. 4 (2018): 520-528.
9. Gilmore, Brynne, and Eilish McAuliffe. "Effectiveness of community health workers delivering preventive interventions for maternal and child health in low-and middle-income countries: a systematic review." *BMC public health* 13, no. 1 (2013): 847.
10. Wyatt, Sage, Truls Ostbye, Vijitha De Silva, and Qian Long. "Antenatal depression in Sri Lanka: a qualitative study of public health midwives' views and practices." *Reproductive health* 19, no. 1 (2022): 23.
11. Eappen, B. S., Margot Aguilar, Karen Ramos, C. Contreras, M. C. Prom, P. Scorza, B. Gelaye, M. Rondon, G. Raviola, and Jerome T. Galea. "Preparing to launch the 'Thinking Healthy Programme'perinatal depression intervention in Urban Lima, Peru: experiences from the field." *Global Mental Health* 5 (2018): e41.
12. Anokye, Reindolf, Enoch Acheampong, Amy Budu-Ainooson, Edmund Isaac Obeng, and Adjei Gyimah Akwasi. "Prevalence of postpartum depression and interventions utilized for its management." *Annals of general psychiatry* 17, no. 1 (2018): 18.
13. Rafferty, Jason, Gerri Mattson, Marian F. Earls, Michael W. Yogman, Thresia B. Gambon, Arthur Lavin, Lawrence Sagin Wissow, and Committee On Psychosocial Aspects Of Child And Family Health. "Incorporating recognition and management of perinatal depression into pediatric practice." *Pediatrics* 143, no. 1 (2019).
14. Mutamba, Byamah Brian, Nadja van Ginneken, Lucy Smith Paintain, Simon Wandiembe, and David Schellenberg. "Roles and effectiveness of lay community health workers in the prevention of mental, neurological and substance use disorders in low and middle income countries: a systematic review." *BMC health services research* 13, no. 1 (2013): 412.
15. Lewin, Simon, Susan Munabi‐Babigumira, Claire Glenton, Karen Daniels, Xavier Bosch‐Capblanch, Brian E. Van Wyk, Jan Odgaard‐Jensen et al. "Lay health workers in primary and community health care for maternal and child health and the management of infectious diseases." *Cochrane database of systematic reviews* 3 (2010).
16. Dawson, Katie S., Richard A. Bryant, Melissa Harper, Alvin Kuowei Tay, Atif Rahman, Alison Schafer, and Mark Van Ommeren. "Problem Management Plus (PM+): a WHO transdiagnostic psychological intervention for common mental health problems." *World Psychiatry* 14, no. 3 (2015): 354.

17. Fuhr, Daniela C., Benedict Weobong, Anisha Lazarus, Fiona Vanobberghen, Helen A. Weiss, Daisy Radha Singla, Hanani Tabana et al. "Delivering the Thinking Healthy Programme for perinatal depression through peers: an individually randomised controlled trial in India." *The Lancet Psychiatry* 6, no. 2 (2019): 115-127.