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Review Article

Effectiveness of Interventions Utilizing Community Health Worker Model on Reducing Stunting in Low- and Middle-Income Countries: A Systematic Review

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Abstract

Background: This study aimed to assess the effectiveness of interventions delivered by CHWs and their strategies for reducing stunting in LMICs.

Methods: We undertook a systematic review following PRISMA guidelines. The articles were selected from major electronic databases, reference lists and grey literature from 2016 and 2023.

Results: Seventeen articles were included in the final analysis from the initial 2,899 search results. CHW-led interventions significantly reduce stunting. Training and refresher courses enhanced outcomes, while challenges included inconsistent implementation and resource constraints. The variability in results underscores the need for multisectoral collaboration to maximize impact.

Conclusion: Our findings highlighted the significant role of CHW-led interventions in reducing stunting, emphasizing their potential as accessible and reliable resources for local communities.

Keywords: CHWs; Stunting; LMICs; Nutrition interventions; Health education; Food supplementation

Introduction

Stunting, defined as length/height-for-age below −2 standard deviations of the WHO Child Growth Standard, is a prevalent pediatric growth disorder with immediate and long-term repercussions (1), including increased illness and mortality, impaired physical and cognitive development, and heightened vulnerability to infections and chronic disease (2, 3). Key risk factors include low birth weight (4), poor hygiene, child morbidity (5), poor infant feeding practices (6) and food insecurity (5) with maternal nutrition knowledge and cultural beliefs (7).

Efforts to combat stunting have focused on nutrition-specific and nutrition-sensitive interventions (8), with healthcare professionals playing critical role, particularly in underserved regions (9). However, a projected global shortage of 18 million healthcare workers by 2030 (10) underscores the importance of Community Health Workers (CHWs) as cost-effective (11), accessible link between community and health systems (12). CHWs have proven crucial role in addressing public health priorities such as maternal and child health, chronic disease, and infectious disease control across the LMICs (12, 13).

CHWs have successfully implemented nutrition-focused initiatives and home-based programs in Malawi (14), Indonesia (15), and Pakistan (16). They also contribute to broader initiatives like the REACH U.S. program, emphasizing health education, facilitating service access, and managing chronic diseases (17). The WHO advocates integrating CHWs into formal health systems to enhance service delivery and achieve universal health coverage (18). Collaboration among CHWs, NGOs, and governments have improved program outcomes by pooling resources and expertise. Examples include state-run programs for high-risk children (19), NGO-led public health program in Kenya (20), and community interventions like MOVE UP (21). However, challenges such as funding constraints in North Aceh's tuberculosis program highlight the need for sustained financial support and policy integration (22).

CHWs are uniquely positioned to address complex health issues like stunting through community-based interventions. By tailoring programs to local contexts and promoting community engagement, CHWs enhance the effectiveness of nutrition initiatives (23). Integrating nutrition support with health education addresses key determinants such as maternal health and food security, fostering sustainable behavioral change (24). With sufficient training, resources, and policy support, CHW models can be efficiently scaled, forming a cornerstone of national strategies to combat stunting (23).

Despite their potential, the effectiveness of CHW programs in reducing stunting in LMICs remains underexplored. This review evaluated the impact of CHW interventions and strategies in mitigating stunting, providing critical insights for policymakers and health practitioners to optimize stunting prevention and management efforts.

Materials and Methods

Literature Search Strategy

We performed a systematic review adhering to the PRISMA guidelines. The literature search, unrestricted by publication year, utilized the PICO framework and spanned major databases (PubMed, Scopus, EBSCOhost CINAHL, Embase, ProQuest Science, Cochrane Library) and Grey Literature via Google Scholar. Additional studies were identified through reference-checking. Search terms focused on children diagnosed or treated for stunting by community health workers in LMICs. English-language articles were retrieved using MeSH terms, keywords related to CHWs, preventive intervention, preventive programs, stunting, and LMICs.

Study Selection

This review included studies involving CHW-led interventions in low—and LMICs, as defined by the World Bank Group. Exclusions comprised review articles, editorials, letters, abstracts, and studies without CHW-led nutrition interventions or stunting measurements. Records identified during the search were exported to EndNote X9, with titles and abstracts independently screened by two authors (M.A.E.P. and F.U.S.).

Data Extraction and Quality Assessment

We extracted key details, including study authorship, publication year, participant location, design, CHW-led health services, intervention duration, and findings. We resolved disagreements by consensus or reviewing by another reviewer.

The quality of the included studies was assessed using the Joanna Briggs Institute (JBI) Critical Checklist, adapted to match the respective study designs. Responses were categorized as "yes," "no," "unclear," or "not applicable (25). Bias was a low risk if studies scored "yes" over 70% (26).

Data Analysis

Cohen's Kappa statistic assessed inter-rater agreement for study selection and quality evaluation, with interpretations as follows: ≤0 (no agreement), 0.01–0.20 (slight), 0.21–0.40 (fair), 0.41–0.60 (moderate), 0.61–0.80 (substantial), and 0.81–1.00 (almost perfect) (27). Analyses were conducted using IBM SPSS Statistics.

Results

Study Selection

As shown in Fig. 1 from 2894 studies identified through literature searches and five from other sources, 130 duplicates were removed, leaving 2769 for title and abstract screening. After excluding 2728 studies, 41 underwent full-text review, with 23 excluded. Finally, seventeen studies were included. Inter-rater agreement was substantial, with Kappa values of 0.75 (title-abstract), 0.78 (full-text), and 0.85 (quality assessment).

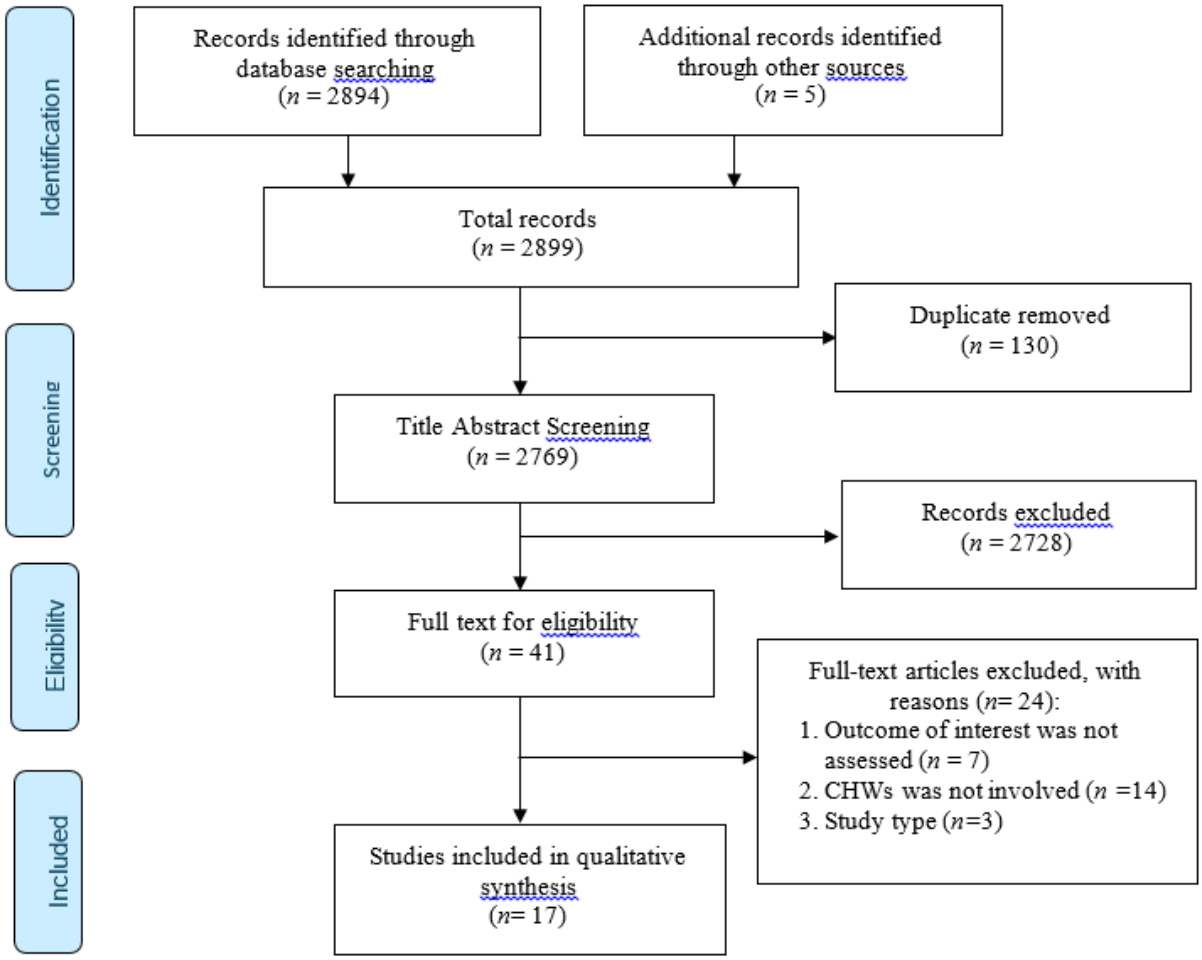

Fig. 1: PRISMA flow diagram of study selection.

Description of selected study

The included studies are summarized in Table 1, encompassing research published between 2016 and 2023. The majority were randomized controlled trials (RCTs), supplemented by cross-sectional studies, conducted across diverse regions, particularly in Asia (Nepal (28, 29), Bangladesh (30-32), Pakistan (33, 34), India (35), and Indonesia (36)) and Africa (Burkina Faso (37), Tanzania (38), Zambia (39), Kenya (40), South Africa (41, 42), and Madagascar (43)), with one study spanning three Sub-Saharan African countries (44).

Table 1: The key intervention of included studies

Country	Study Design	Intervention Types	Intervention Details by CHWs	Intervention Durations in Months	Findings
Pakistan (33)	RCT	Food Supplementation, Nutrition Counselling and Health Education	Pregnant women were provided monthly supplies of wheat-soy blends (WSB), vitamins, and minerals, alongside counseling on maternal nutrition and infant and young child feeding (IYCF) practices.	12	Providing WSB+ during pregnancy and the first six months of lactation via CHWs significantly lowered stunting risk at six months (RR 0.85, 95% CI 0.73–0.99, p = 0.041).
Burkina Faso (37)	RCT	Food Supplementation and Health Education	Delivering daily balanced energy-protein (BEP) and iron-folic acid (IFA) supplements to mothers at home during and post-pregnancy, alongside educating them on nutritious diets and newborn feeding practices.	14	Maternal supplementation with BEP via CHWs led to a 3.18% reduction in stunting. A combined intervention decreased stunting rates (p = 0.034), with a 4.05 percentage-point decline.
Tanzania (38)	RCT	Comprehensive Health Education	Delivering a comprehensive home-based intervention every 4-6 wk, combining health, nutrition, stimulation, and conditional cash transfers (CCT) to enhance maternal and child health outcomes.	18	At the endline, the intervention group recorded 19 stunting cases. Multivariable analysis showed a mean difference of 0.44 between the intervention and control groups, demonstrating the intervention's effectiveness in reducing stunting.
South Africa (42)	RCT	Comprehensive health education and counselling	Delivering monthly interventions guided by a job aid, focusing on child health, nutrition, developmental milestones, and age-appropriate play activities.	24	The intervention had no significant impact on stunting (OR, 0.63 [0.32, 1.25]; p = 0.184).
Nepal (28)	Cross-Sectional	Food Supplementation and Counselling	Providing 60 sachets of micronutrient powder (MNP) to children every six months, alongside weekly maternal education using IYCF-MNP counselling cards, flipcharts, and cooking demonstrations.	N/A	Stunting prevalence was significantly lower at endline compared to baseline. Children with at least twice-monthly CHW visits experienced reduced stunting (p = 0.03).
Kenya (40)	Cross-Sectional	Nutrition-based Education and Counselling	Delivering seven monthly nutrition education and counseling (NEC) sessions during pregnancy and post-delivery until the infant reaches one year.	N/A	The control group had higher stunting prevalence (33.5%) than the intervention group (28.6%). Maternal NEC by CHWs during pregnancy and the first-year postpartum reduced stunting in years one and five.
India (35)	RCT	Nutrition Education and Counselling	Provide nutrition counseling to pregnant mothers and conduct monthly home visits to advise on child growth.	N/A	The CHW interventions did not reduce stunting, as rates remained unchanged by the study's end.
Sub-Saharan Africa (44)	RCT	Exclusive Breastfeeding (EBF) Counselling	Conducting multiple visits to advise on exclusive breastfeeding: once at seven months of pregnancy and at one, four, seven, and ten weeks postpartum.	N/A	There are no significant differences in stunting prevalence among groups across nations.

Table 1: Continued…

Zambia (39)	RCT	Early Childhood Development Education and Services	Screened and referred children for acute malnutrition and infections during biweekly home visits while advising parents on vita min A, growth monitoring, and vaccinations.	12	By the end of the study, stunting prevalence dropped from 40% in 6–12-month-olds to 23% in 18–24-month-olds.
Pakistan (34)	RCT	Food Supplementation	Providing a monthly food package with micronutrient powder *(Vita-Mixe)* for children, delivered via a nearby healthcare center.	11	Stunting in 24-59-month-olds in the intervention group decreased from 22.41% (baseline) to 20.70% (endline), though not significantly ($p = 0.63$).
Bangladesh (32)	Cross-Sectional	Nutrition Education and Counselling	Counseling mothers of under-five children on proper feeding and nutrition, alongside providing Essential Health Care (EHC).	N/A	CHW-led nutrition counseling improved IYCF practices, reducing stunting by 29% ($p < 0.001$) and lowering the likelihood of stunting by 25% in the intervention group.
Indonesia (36)	RCT	Nutrition Education and Counselling	Delivering monthly home-based nutrition education and counseling, reinforcing key points, encouraging the implementation of guidance, and collecting food and health report forms.	5	Stunting prevalence in the intervention group remained stable from baseline to study end (19.8%, $p = 0.004$).
South Africa (41)	RCT	Health Education	Promoting eight health messages on HIV/TB prevention, alcohol addiction prevention, breastfeeding, and malnutrition prevention, with at least four antenatal and postnatal visits in the first two months of life.	N/A	The study found that CHW interventions reduced stunting risk in children (18.1%, $p < 0.013$).
Madagascar (43)	RCT	Food Supplementation and Counselling	Visiting all children and pregnant women monthly in the site area to deliver Lipid-Based Nutrient Supplementation (LNS) and comprehensive nutrition counseling.	24	CHW-delivered nutrition counseling, and LNS reduced stunting by 9.0%.
Nepal (29)	RCT	Nutrition Education and Counselling	Conducted monthly visits with community mother's groups to promote nutrition and feeding practices.	12	The intervention failed to reduce stunting prevalence, which increased by 0.1% from baseline to endline.
Bangladesh (31)	RCT	Nutrition Education and Counselling	Conducting IYCF-focused counseling visits to households of pregnant women and mothers of two-year-olds, coaching mothers as they practiced recommendations.	48	The intervention effectively reduced stunting in children 24-47.9 months (6.22%) and 6-23.9 months (7.32%).
Bangladesh (30)	RCT	Comprehensive health education and counselling	Two activities were conducted: 1. Educated caregivers on using affordable materials for child play during group meetings, instructing them to share practices at home. 2. Counseled young mothers in 10-minute sessions at clinics and homes, offering contraception and additional services.	10	The intervention did not lower stunting prevalence (16.0% at baseline vs. 24.2% at endline).

None of the studies were classified as high risk of bias. Fourteen studies were deemed low risk (28, 30-33, 35, 37-40, 42-44), while three were rated moderate risk due to unclear reporting on randomization, allocation concealment, and blinding (Table 2).

Table 2: Quality Appraisal Checklist

Author/Study Type	Risk of Bias
Khan (33)/RCT	Low
Argaw (37)/RCT	Low
Sudfeld (38)/RCT	Low
Rockers (39)/RCT	Low
Nair (35)/RCT	Low
Engebretsen (44)/RCT	Low
Rockers (42)/RCT	Low
Khan (34)/RCT	Moderate
Effendy (36)/RCT	Moderate
Tomlinson (41)/RCT	Moderate
Aboud (30)/RCT	Low
Yadav (29)/RCT	Low
Galasso (43)/RCT	Low
Nyamasege (40)/Cross Sectional	Low
Mistry (32)/Cross-Sectional	Low
Locks (28)/Cross-Sectional	Low
Menon (31)/RCT	Low

Community Health Workers' Characteristic

CHW training models varied in content, duration, and delivery. Most studies provided detailed descriptions (28-30, 32, 35, 36, 38-44), while four lacked specifics (31, 33, 34, 37). Training often used materials from UNICEF, WHO, and national health ministries, focusing on child development, infant and young child feeding (IYCF), and illness prevention, with two studies directly integrating these curricula (28, 38).

Over half the studies specified training duration (30, 32, 35, 36, 39, 41-44), ranging from two days (36) to one month (41). To reinforce skills and knowledge, many included refreshers training, such as bi-monthly sessions (33) or periodic updates (32, 42, 43).

Training delivery methods included direct instruction by research teams (29, 30, 36, 39, 41-44), medical professionals (32), government agencies (38, 40), and cascade training models (28). Programs emphasized practical skills like counseling on breastfeeding, complementary feeding, food security (30, 36, 43), diagnosing child illness, supporting development (39), and improving feeding behaviors and nutritional status (29). Many tailored training to local health and nutritional needs (35, 36, 41).

CHW eligibility criteria, detailed in over half the studies (30, 32, 33, 35, 36, 38-43), included education (32, 35, 39, 40) (primary to 12th grade (30)), health-related experience (e.g., infant care (39)), and strong social or problem-solving skills (41). Some required community integration, such as leader recommendations (30) or prior training (38, 40) (Table 3).

Community Health Workers Interventions

CHW interventions employed diverse strategies to enhance maternal and child health, nutrition, and development. These included providing nutritional supplements like WSB, vitamins, minerals (33); BEP and IFA pills (37); MNP (28, 34); and LNS CHWs also conducted structured counseling on maternal nutrition, infant feeding, and developmental milestones (31-33, 35, 36, 38, 40, 42, 44). Regular home visits, from fortnightly to monthly, involved malnutrition screenings (39), promoting HIV/TB prevention, breastfeeding (41), and offering health services like contraception and referrals. Caregivers were coached on play-based activities (30), targeting pregnant women, caregivers, and children under five to promote sustainable health practices.

Intervention durations varied: six studies lasted ≤12 months (29, 30, 33, 34, 36, 39), five exceeded 12 months (31, 37, 38, 42, 43), and some did not specify the duration. Detailed intervention summaries are in Table 1.

Effectiveness of Intervention by CHW

CHW interventions showed mixed effectiveness in reducing stunting. Khan et al. (33) found that WSB during pregnancy and lactation reduced stunting risk at six months (RR 0.85, P = 0.041). Argaw et al. (37) reported a 3.18% decrease, Rockers et al. (39) reduced stunting from 40% to 23%, and Mistry et al. (32) achieved a 29% reduction (P<0.001). Locks et al. (28) noted significant reductions with bi-monthly CHW visits (APR 0.87, P=0.03), while Nyamasege et al. (40) linked maternal nutrition education to stunting reductions in early and later childhood. Tomlinson et al. (41) reported an 18.1% risk reduction (P<0.013), and Galasso et al. (43) observed a 9% decrease with nutrition counseling and LNS. Khan et al. (34) and Menon et al. (31) noted non-significant reductions.

However, some studies found no impact: Rockers et al. (42) (OR 0.63, P=0.184), Nair et al., (35) and Engebretsen et al. (44) reported no changes, Yadav et al. (29) showed a slight increase (0.1%) in stunting prevalence, and Aboud et al. (30) reported an increase in from 16.0% to 24.2%. Overall, CHW interventions showed promise in reducing stunting, though effectiveness varied by context and implementation.

Table 3: Characteristics of the CHW

Author	CHWs' Training Status	The Eligibility of CHW	The Training Model
Khan et al. (33)	N/A	CHWs were integrated into the government's primary healthcare system program.	N/A
Argaw et al. (37)	Trained	N/A	N/A
Sudfeld et al. (38)	Trained	Women who completed a one-year government-certified CHW program were recruited for the intervention.	Along with government training, the study team equipped CHWs with a responsive stimulation intervention adapted from UNICEF and WHO Care for Development.
Rockers et al. (42)	Trained	At least 18 years old, active as a CHW for over 3 months at enrollment, completed South Africa's standard Phase 1 CHW training, did not regularly use	The study team conducted the training. CHWs received initial job aid training (4 d) and six-month refresher training (4 sessions over 2 years, 2 d each).

Table 3: Continued…

		mHealth technologies, was not involved in another research project, and had an eligible caregiver-child dyad in their catchment.	
Locks et al. (28)	Trained	N/A	CHWs were trained using a cascade method and a guide based on UNICEF's (2012) IYCF materials, supplemented by Nepal's MoH guidelines on MNP storage, distribution, and use.
Nyamasege et al. (40)	Trained	Those with basic government training and at least primary education.	The African Population and Health Research Centre trained CHWs in personalized, home-based nutrition counseling for mothers using Kenya's Ministry of Health-adopted Community IYCF package.
Nair et al. (35)	Trained	The individual had at least ten years of schooling, was married, and preferably belonged to a tribal community.	CHWs received bimonthly supervision and 14 d of progressive training. Home visit training covered IYCF counseling, care-seeking for childhood illnesses, and household-based prevention methods like handwashing, safe water and food handling, and feces disposal.
Engebretsen et al. (44)	Trained	N/A	CHWs received one-week training from national research teams using WHO courses.
Rockers et al. (39)	Trained	Required a ninth-grade education, proficiency in English and Tonga, good community standing, and prior infant healthcare experience.	The research team trained CHWs for five days on diagnosing child illnesses, supporting development, home visit protocols, and managing group meetings.
Khan et al. (34)	N/A	N/A	N/A
Mistry et al. (32)	Trained	Married women aged 25–40, residing in the target community, with at least primary education.	They underwent 15 training days by medical doctors and program staff on basic healthcare, maternal and child health, and 7 d on child nutrition, with monthly refresher training.
Effendy et al. (36)	Trained	Women with senior high school education, residing in the target area, active cadres recommended by health officers, and committed to the program were selected.	CHWs received two training days from the research team on complementary feeding principles and preparing WHO-standard children's dishes using affordable, local food.
Tomlinson et al. (41)	Trained	Having strong social and problem-solving skills, experience raising healthy children, and less than a high school education was selected.	The research team trained them for one month on delivering health information about maternal and child health, HIV, alcohol use, and nutrition, including scenarios encountered during home visits.
Galasso et al. (43)	Trained	At least lower secondary education, resided within the site, and received 10 d of intensive training post-baseline survey and refresher training.	Trained by the research team for 10 d, with refresher sessions on communication, problem-solving for exclusive breastfeeding, complementary feeding,

Table 3: Continued…

			and food security.
Yadav et al. (29)	Trained	N/A	The research team trained CHWs to promote child-feeding behaviors and improve nutritional status.
Menon et al. (31)	Trained	N/A	N/A
Aboud et al. (30)	Trained	Two training-based criteria: 1. CHWs must be young women with grade 10 education and community leader recommendations. 2. CHWs must have completed grade 12 and have long-term community work experience.	Two distinct trainings were conducted: 1. CHWs received four months of training on leading group sessions and parenting benefits, with three bimonthly one-day refreshers on key themes. 2. The organization provided a 2-day training and mid-program refresher, focusing on applying parenting lessons.

Discussion

To our knowledge, this is the first systematic review assessing CHW effectiveness in reducing stunting in LMICs, encompassing 17 studies. Most interventions effectively reduced stunting (28, 31, 33-41, 43), with notable declines in prevalence. For example, Rockers et al. reported a reduction from 40% to 23% (34). Our findings align with those Lewin et al. (45), who showed that CHW interventions promoted breastfeeding rates for an additional six months with encouraging results. The growing role of CHWs has been linked to reduced malnutrition prevalence among toddlers (46).

Results contrary to what was expected were found in five studies (29, 30, 35, 42, 44). For instance, in Bangladesh, stunting increased post-intervention (30), similar to Nepal (29). Factors like varying intervention durations and external disruptions, such as the COVID-19 pandemic delaying research (42), may explain these outcomes. Previous studies also suggest intervention effects may fade as children age (47).

According to this study, most CHWs underwent training tailored to meet specific needs before they began their intervention. Previous RCTs have shown that training enhances healthcare workers' nutrition knowledge and counseling behaviors (48). In addition, trained CHWs can improve energy intake, feeding frequency, and dietary variety of children aged six months to two years (49). Training can increase their knowledge in delivering counseling services and effectively and accurately distributing information to the community (29), helping to address knowledge gaps.

This research highlights that, besides receiving foundational training, a subset of CHWs participated in refresher training sessions to reinforces and reviews previously learned information and skills but also aids in identifying and correcting errors in practice. Refresher courses conducted by the research team or government officials, with the content tailored to meet the specific needs of the CHWs. Although the refresher training was relatively short, it is crucial in enhancing and updating CHWs' knowledge. A scoping review emphasized the significance of regular refresher training in maintaining effective community care (50). Similarly, in-person refresher courses, combined with monthly supportive supervision, improved CHW-led health promotion in rural Ethiopia, further underscoring the value of ongoing education and support for CHWs' effectiveness(51).

Building on this foundation of training and education, CHWs have demonstrated significant success in implementing nutrition and health education interventions. Nine studies in this review employed such interventions, documented as beneficial in rural areas (31, 32, 36, 40, 41). Nutrition counselling and health education delivered

by CHWs encouraged caregivers to adopt better dietary practices, boosting in energy and protein intake for toddlers (36), increasing infant and young child feeding (IYCF) practices (32), and overall nutritional status (40). These interventions contributed to the reduced stunting prevalence and addressed cultural misconceptions, enhancing caregivers' nutrition knowledge (52). CHWs' role as trusted community figures ensures that their health education is embraced, especially by pregnant mothers and caregivers of infants (11).

While health education is crucial, integrating food supplementation amplifies its impact on stunting reduction. Dietary supplements such as WSB (33), Lipid-based Nutrition Supplements (LNS) (43), Balanced Energy Protein (BEP) (37), and Micronutrient Powder (MNP) (28) have shown considerable efficacy when combined with education and counselling (34). For instance, Albelbeisi et al. (53) observed a significant reduction in stunting among children aged 6-24 months who received MNP for 12 months. Similarly, studies in Ghana (54) and Malawi (14) reported improvements in length-for-age z-scores (LAZ) after six months of LNS administration. These findings highlight the synergistic effect of combining educational and nutritional interventions.

However, the effectiveness of CHW-led interventions is not without challenges. One potential limitation is inconsistent program coverage, as demonstrated by the variability in MNP coverage between districts (71.4% versus 53.5%) (28), is linked to supply chain disruptions and a lack of maternal awareness. Weak supervision structures , compounded by limited resources and time, further hinder intervention success (42). Additionally, systemic barriers such as poor intersectoral coordination (55) and the stigma surrounding stunting discourage families from seeking help (23). Financial constraints limit the training and support available for CHWs, restricting their ability to provide effective, high-quality care (55).

This research has several limitations. First, potential publication bias may arise from excluding studies using native terms or languages of CHWs, despite efforts to minimize this by not restricting language during the initial search. Second, excluding theses and conference papers could introduce additional publication bias. Finally, the search was conducted solely in English, potentially omitting studies published in other languages, which limits the comprehensiveness of our findings. Addressing these limitations in future research will be essential to ensure a more inclusive and representative analysis of CHW interventions.

This study is the first systematic review to evaluate CHW-led interventions for reducing stunting in LMICs. Using the JBI method to assess evidence quality provides robust conclusions and critical insights for policy development. The findings highlight CHWs' transformative potential in improving child nutrition and community health, especially in resource-limited settings.

Conclusion

This systematic review underscores the critical role of CHWs in reducing stunting in LMICs. While results vary, most studies show that CHW interventions—through nutrition education, health counseling, and food supplementation—lower stunting prevalence. Training CHWs enhances their nutrition knowledge and counseling skills, equipping them to provide essential community resources. Integrating CHW programs into national health strategies, securing sustained funding, and standardizing training protocols are essential to maximize their impact.

Addressing stunting requires a multisectoral approach targeting its root causes. CHWs bridge the gap between healthcare services and underserved populations, ensuring interventions reach those most in need. Collaboration among practitioners, CHWs, and communities is vital to building trust, establishing monitoring systems, and dispelling cultural misconceptions. Stakeholders must support CHWs in promoting healthy behaviors and delivering quality care. Prioritizing resources for food supplementation, health education, and community outreach can significantly improve children's nutritional outcomes, fostering long-term public health benefits

Journalism Ethics considerations

Ethical issues (Including plagiarism, informed consent, misconduct, data fabrication and/or falsification, double publication and/or submission, redundancy, etc.) have been completely observed by the authors.

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Conflict of Interest

No potential conflict of interest was reported by the author(s).

References

1. WHO (2006). The WHO Child Growth Standards. WHO, USA. https://www.who.int/tools/child-growth-standards
2. Stewart CP, Iannotti L, Dewey KG, et (2013). Contextualising complementary feeding in a broader framework for stunting prevention. *Matern Child Nutr,* 9 (Suppl 2):27-45.
3. Gardner JM, Grantham-McGregor SM, Himes J, et al (1999). Behaviour and development of stunted and nonstunted Jamaican children. *J Child Psychol Psychiatry,* 40 (5):819-27.
4. Aryastami NK, Shankar A, Kusumawardani N, et al (2017). Low birth weight was the most dominant predictor associated with stunting among children aged 12–23 months in Indonesia. *BMC Nutrition,* 3 (1):1-6.
5. Goudet SM, Kimani-Murage EW, Wekesah F, et al (2017). How does poverty affect children's nutritional status in Nairobi slums? A qualitative study of the root causes of undernutrition. *Public Health Nutr,* 20 (4):608-619.
6. Fenske N, Burns J, Hothorn T, et al (2013). Understanding child stunting in India: a comprehensive analysis of socio-economic, nutritional and environmental determinants using additive quantile regression. *PloS One,* 8 (11):e78692.
7. Black RE, Victora CG, Walker SP, et al (2013). Maternal and child undernutrition and overweight in low-income and middle-income countries. *Lancet,* 382 (9890):427-451.
8. Horton S, Shekar M, McDonald C, et al (2009). Scaling up nutrition: What will it cost? World Bank Publications, WORLD.
9. Westerbotn M, Monfors F, Reusser J, et al (2023). Promoting health and preventing malnutrition among children in rural Bangladesh: A qualitative study. *Nurs Open,* 10 (8):5693-5700.
10. Darzi A, Evans T (2016). The global shortage of health workers-an opportunity to transform care. *Lancet,* 388 (10060):2576-2577.
11. Love MB, Gardner K, Legion V (1997). Community health workers: who they are and what they do. *Health Educ Behav,* 24 (4):510-22.
12. Perry HB, Zulliger R, Rogers MM (2014). Community health workers in low-, middle-, and high-income countries: an overview of their history, recent evolution, and current effectiveness. *Annu Rev Public Health,* 35:399-421.
13. Chen L, Evans T, Anand S, et al (2004). Human resources for health: overcoming the crisis. *Lancet,* 364 (9449):1984-90.
14. Phuka J, Maleta K, Thomas M, et al (2014). A job analysis of community health workers in the context of integrated nutrition and early child development. *Ann N Y Acad Sci,* 1308 (1):183-191.
15. Kemenkes R (2012). Buku Saku Posyandu. Pusat Promosi Kesehatan, KEMENKES Indonesia.
16. Yousafzai AK, Rasheed MA, Rizvi A, et al (2014). Effect of integrated responsive stimulation and nutrition interventions in the Lady Health Worker programme in Pakistan on child development, growth, and health outcomes: a cluster-randomised factorial effectiveness trial. *Lancet,* 384 (9950):1282-93.
17. Cosgrove S, Moore-Monroy M, Jenkins C, et al (2014). Community health workers as an integral strategy in the REACH U.S. program to eliminate health inequities. *Health Promot Pract,* 15 (6):795-802.

18. Organization WH (2018). *WHO guideline on health policy and system support to optimize community health worker programmes*. ed. World Health Organization.
19. Martin MA, Perry-Bell K, Minier M, et al (2019). A Real-World Community Health Worker Care Coordination Model for High-Risk Children. *Health Promot Pract,* 20 (3):409-418.
20. Mørkve ÅW, Sitienei J, Van den Bergh G (2024). "We Are Just Supposed to Be an NGO Helping": A Qualitative Case Study of Health Workers' and Volunteers' Perceptions of the Government and Civil Society's Role in Fighting Jiggers in Bungoma County, Kenya. *Societies,* 14 (2):28.
21. Venditti EM, Zgibor JC, Vander Bilt J, et al (2018). Mobility and Vitality Lifestyle Program (MOVE UP): A Community Health Worker Intervention for Older Adults With Obesity to Improve Weight, Health, and Physical Function. *Innov Aging,* 2 (2):igy012.
22. Khairunnisa C, Siagian A, Siregar FA, et al (2021). Social Medicine Approach in the Management of Lung Tuberculosis (TB) in North Aceh Regency: Role of Government and Non-Governmental Organization. *Journal of Health, Medicine and Nursing*,DOI: 10.7176/JHMN/95-07.
23. Bridge R, Lin TK (2024). Evidence on the impact of community health workers in the prevention, identification, and management of undernutrition amongst children under the age of five in conflict-affected or fragile settings: a systematic literature review. *Confl Health,* 18 (1):16.
24. Pallas SW, Minhas D, Pérez-Escamilla R, et al (2013). Community health workers in low- and middle-income countries: what do we know about scaling up and sustainability? *Am J Public Health,* 103 (7):e74-82.
25. JBI (2019) Critical Appraisal Tools. Joana Briggs Institute.
26. Melo G, Dutra KL, Rodrigues Filho R, et al (2018). Association between psychotropic medications and presence of sleep bruxism: A systematic review. *J Oral Rehabil,* 45 (7):545-554.
27. McHugh ML (2012). Interrater reliability: the kappa statistic. *Biochem Med (Zagreb),* 22 (3):276-82.
28. Locks LM, Dahal P, Pokharel R, et al (2019). Changes in growth, anaemia, and iron deficiency among children aged 6–23 months in two districts in Nepal that were part of the post-pilot scale-up of an integrated infant and young child feeding and micronutrient powder intervention. *Matern Child Nutr,* 15 (2):e12693.
29. Yadav D, Gupta N, Shrestha N, et al (2014). Community Based Nutrition Education for Promoting Nutritional Status of Children under Three Years of Age in Rural Areas of Mahottari District of Nepal. *Journal of Nepal Paediatric Society,* 34(3):181-187.
30. Aboud FE, Singla DR, Nahil MI, et al (2013). Effectiveness of a parenting program in Bangladesh to address early childhood health, growth and development. *Soc Sci Med,* 97:250-8.
31. Menon P, Nguyen PH, Saha KK, et al (2016). Combining intensive counseling by frontline workers with a nationwide mass media campaign has large differential impacts on complementary feeding practices but not on child growth: results of a cluster-randomized program evaluation in Bangladesh. *J Nutr,* 146 (10):2075-2084.
32. Mistry SK, Hossain MB, Arora A (2019). Maternal nutrition counselling is associated with reduced stunting prevalence and improved feeding practices in early childhood: a post-program comparison study. *Nutr J,* 18(1):47.
33. Khan GN, Ariff S, Kureishy S, et al (2021). Effectiveness of wheat soya blend supplementation during pregnancy and lactation on pregnancy outcomes and nutritional status of their infants at 6 months of age in Thatta and Sujawal districts of Sindh, Pakistan: a cluster randomized-controlled trial. *Eur J Nutr,* 60(2):781-789.
34. Khan A, Ul-Haq Z, Fatima S, et al (2023). Long-Term Impact of Multiple Micronutrient Supplementation on Micronutrient Status, Hemoglobin Level, and Growth in Children 24 to 59 Months of Age: A Non-Randomized Community-Based Trial from Pakistan. *Nutrients,* 15 (7):1690.
35. Nair N, Tripathy P, Sachdev H, et al (2017). Effect of participatory women's groups and counselling through home visits on children's

linear growth in rural eastern India (CARING trial): a cluster-randomised controlled trial. *Lancet Glob Health,* 5 (10):e1004-e1016.
36. Effendy DS, Prangthip P, Soonthornworasiri N, et al (2020). Nutrition education in Southeast Sulawesi Province, Indonesia: A cluster randomized controlled study. *Matern Child Nutr,* 16 (4):e13030.
37. Argaw A, de Kok B, Toe LC, et al (2023). Fortified balanced energy–protein supplementation during pregnancy and lactation and infant growth in rural Burkina Faso: A 2 × 2 factorial individually randomized controlled trial. *PLoS Med,* 20 (2):e1004186.
38. Sudfeld CR, Bliznashka L, Ashery G, et al (2021). Effect of a home-based health, nutrition and responsive stimulation intervention and conditional cash transfers on child development and growth: a cluster-randomised controlled trial in Tanzania. *BMJ Global Health,* 6(4):e005086.
39. Rockers PC, Fink G, Zanolini A, et al (2016). Impact of a community-based package of interventions on child development in Zambia: a cluster-randomised controlled trial. *BMJ Global Health,* 1(3):e000104.
40. Nyamasege CK, Kimani-Murage EW, Wanjohi M, et al (2021). Effect of maternal nutritional education and counselling on children's stunting prevalence in urban informal settlements in Nairobi, Kenya. *Public Health Nutr,* 24 (12):3740-3752.
41. Tomlinson M, Rotheram-Borus MJ, le Roux IM, et al (2016). Thirty-Six-Month Outcomes of a Generalist Paraprofessional Perinatal Home Visiting Intervention in South Africa on Maternal Health and Child Health and Development. *Prev Sci,* 17 (8):937-948.
42. Rockers PC, Leppänen JM, Tarullo A, et al (2023). Evaluation of a community health worker home visit intervention to improve child development in South Africa: A cluster-randomized controlled trial. *PLoS Med,* 20 (4):e1004222.
43. Galasso E, Weber AM, Stewart CP, et al (2019). Effects of nutritional supplementation and home visiting on growth and development in young children in Madagascar: a cluster-randomised controlled trial. *Lancet Global Health,* 7 (9):e1257-e1268.
44. Engebretsen IMS, Jackson D, Fadnes LT, et al (2014). Growth effects of exclusive breastfeeding promotion by peer counsellors in sub-Saharan Africa: the cluster-randomised PROMISE EBF trial. *BMC Public Health,* 14:633.
45. Lewin S, Munabi-Babigumira S, Glenton C, et al (2010). Lay health workers in primary and community health care for maternal and child health and the management of infectious diseases. *Cochrane Database Syst Rev,* 2010(3):CD004015.
46. Purwanti D, Pajeriaty P, Rasyid A (2014). Faktor yang berhubungan dengan status gizi balita di wilayah kerja Puskesmas Madello Kabupaten Barru. *Jurnal Ilmiah Kesehatan Diagnosis,* 5 (1):8-13.
47. Tanner JC, Candland T, Odden WS (2016) Later impacts of early childhood interventions: a systematic review. Washington: Independent Evaluation Group, World Bank Group, World Bank Group, USA
48. Aboud FE, Moore AC, Akhter S (2008). Effectiveness of a community-based responsive feeding programme in rural Bangladesh: a cluster randomized field trial. *Matern Child Nutr,* 4 (4):275-86.
49. Sunguya BF, Poudel KC, Mlunde LB, et al (2013). Effectiveness of nutrition training of health workers toward improving caregivers' feeding practices for children aged six months to two years: a systematic review. *Nutr J,* 12:66.
50. O'Donovan J, O'Donovan C, Kuhn I, et al (2018). Ongoing training of community health workers in low-income and middle-income countries: a systematic scoping review of the literature. *BMJ Open,* 8 (4):e021467.
51. Ayele F, Desta A, Larson C (1993). The functional status of community health agents: atrial of refresher courses and regular supervision. *Health Policy and Planning,* 8 (4):379-384.
52. Shi L, Zhang J (2011). Recent evidence of the effectiveness of educational interventions for improving complementary feeding practices in developing countries. *J Trop Pediatr,* 57 (2):91-8.
53. Albelbeisi A, Shariff ZM, Mun CY, et al (2020). Multiple micronutrient supplementation improves growth and reduces the risk of

anemia among infants in Gaza Strip, Palestine: a prospective randomized community trial. *Nutr J,* 19 (1):133.

54. Adu-Afarwuah S, Lartey A, Brown KH, et al (2007). Randomized comparison of 3 types of micronutrient supplements for home fortification of complementary foods in Ghana: effects on growth and motor development. *Am J Clin Nutr,* 86 (2):412-20.
55. Miranda AV, Sirmareza T, Nugraha RR, et al (2023). Towards stunting eradication in Indonesia: Time to invest in community health workers. *Public Health Chall,* 2 (3):e108.