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Community-Based Intervention for Malnutrition in Children Under Five: A Scoping Review

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Abstract: *Malnutrition remains a significant global challenge, especially in developing countries. This scoping review aimed to identify community-based strategies for malnutrition in children under five. The scoping review conducted herein adhered to the methodologies outlined in conjunction with the guidelines specified in the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) extension for the scoping Reviews checklist. This study used three databases (PubMed, ProQuest, and Scopus) and included studies published between 2014-2024, the study design was randomized controlled trials, cross-sectional, cohort, or case-control studies were included, available in English, and focused on community-based interventions for malnutrition in children under five, with the search keywords "Intervention" or "Community-Based Intervention," "Children," and "Malnutrition." Results: Out of the 4846 identified articles, 11 studies were selected based on strict eligibility criteria. The results show that malnutrition contributes to education, empowerment, supplementation, screening and monitoring, and other community-based interventions (home visits and meeting groups). The importance of community-based innovation in overcoming malnutrition in children can improve children's nutritional and health status. Program development includes increasing nutrition education, empowerment, providing adequate supplements, and effective screening and monitoring to ensure the sustainability and effectiveness of community-based nutrition interventions.*

Keywords: *Children, Community-Based Intervention, Intervention, Malnutrition*

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INTRODUCTION

Malnutrition is a condition in which a person's body has an imbalance of nutrients, whether a deficiency or excess (Setyoningsih, 2024). By 2022, stunting continues to decline last decade, with 148.1 million, or 22.3% percent of children under five years of age worldwide impacted in 2022 it is estimated that there will be 45 million children under five (6.8%) affected by wasting, of which 13.6 million (2.1%) suffer from severe wasting. More than three-quarters of all children with severe wasting lives in Asia, and another 22% live in Africa. There are about 37 million overweight children under five in the world, up almost 4 million since 2000 (WHO, 2023).

According to UNICEF's State of the World's Children report, malnutrition is the hidden cause of the disabilities that affect hundreds of millions of children globally (De & Chattopadhyay, 2019). Malnutrition in children under five can present in several forms, such as stunting, underweight, and wasting (with or without edema, formerly referred to as marasmus and kwashiorkor), which can ultimately lead to severe health consequences, including death (NB, GA, SM, & ME, 2017). To prevent and address malnutrition, several approaches, including community-based intervention, programs to increase food availability and quality, and supplemental feeding programs, have been

developed (Achmad, 2023).

The community-based intervention focuses on four categories of community-based projects based on the implicit construction of community used by researchers: community as a setting, community as a target, community as an agent, and community as a resource (McLeroy, Norton, Kegler, Burdine, & Sumaya, 2003). Target groups who are difficult to reach, including those who are socially disadvantaged or have health issues, can be reached through a community-based strategy without being stigmatised in daily life (Bader et al., 2023). Communities can serve as both agents of change and resources in health promotion efforts. When empowered, communities are capable of addressing health-related living conditions by adapting to various socio-economic and environmental challenges (Peters, Shannon, Kelman, & Meriläinen, 2022). This adaptability is crucial in regions where malnutrition is prevalent, as community engagement allows for the tailoring of interventions to meet local needs effectively (Chapman et al., 2024). Moreover, community-based interventions enable access to hard-to-reach groups, including those facing social disadvantages, by using inclusive approaches that enhance overall health outcomes (Bader et al., 2023).

As communities gain the capacity to modify and adapt to diverse health-related living conditions, they can significantly contribute to reaching this target group (Ehlen & Rehaag, 2018). Community-based interventions provide the capability of dealing with malnutrition and enhance health results for children under five years. However, understanding these interventions' content, implementation, and effectiveness still needs to be improved. So, further review is required regarding community-based interventions for malnutrition. This scoping review aimed to identify community-based interventions for malnutrition in children under five.

METHODS

Authors identified peer-reviewed literature reporting unintentional community-based interventions for malnutrition in children under five Between February 2024 and July 2024. This scoping review used the framework Arksey and O'Malley (2005) and this scoping review, and there is no review or registration protocol carried out.

Search and Research Resources

A comprehensive search for relevant studies was conducted in May 2024. Three databases, PubMed, ProQuest, and Scopus, used various combinations of keywords related to "Intervention" or "Community-Based Intervention" and "Children" and "Malnutrition" (including their synonyms).

Eligibility Criteria

The collected studies underwent a selection process based on specific criteria. Only randomized controlled trials, cross-sectional, cohort, or case-control studies were included. In addition, studies must meet the following requirements: published in the last 10 years between 1 January 2014 and 31 May 2024, available in English, and focused on community-based interventions for malnutrition. Supplementary Material 1 describes inclusion and exclusion criteria in more detail. The selection process involved screening titles and abstracts using Mendeley references and thoroughly reviewing all remaining articles. Any discrepancies identified during the process are resolved through further inspection.

Data Filtering and Extraction Process

After eliminating duplication, the selection process was carried out in three stages. First, articles that might be relevant based on their titles were identified. Second, articles that might be relevant based on their abstracts were identified. Finally, the full text is evaluated against eligibility criteria to determine relevant papers. This rigorous process ensured that only relevant studies were included. Reviewers carefully extracted data from eligible studies using standard methods to ensure consistency and accuracy.

RESULTS

A comprehensive search strategy was applied to identify relevant studies. Three databases were systematically searched, yielding a total of 4846 articles. Following Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines, duplicate records (n = 469) were removed using reference management software (Mendeley). Next, the titles and abstracts of the remaining studies (n = 4377) were screened by independent reviewers to assess eligibility. Studies were included based on predetermined criteria, and 11 articles were selected based on title, abstract, and full-text suitability (Figure 1).

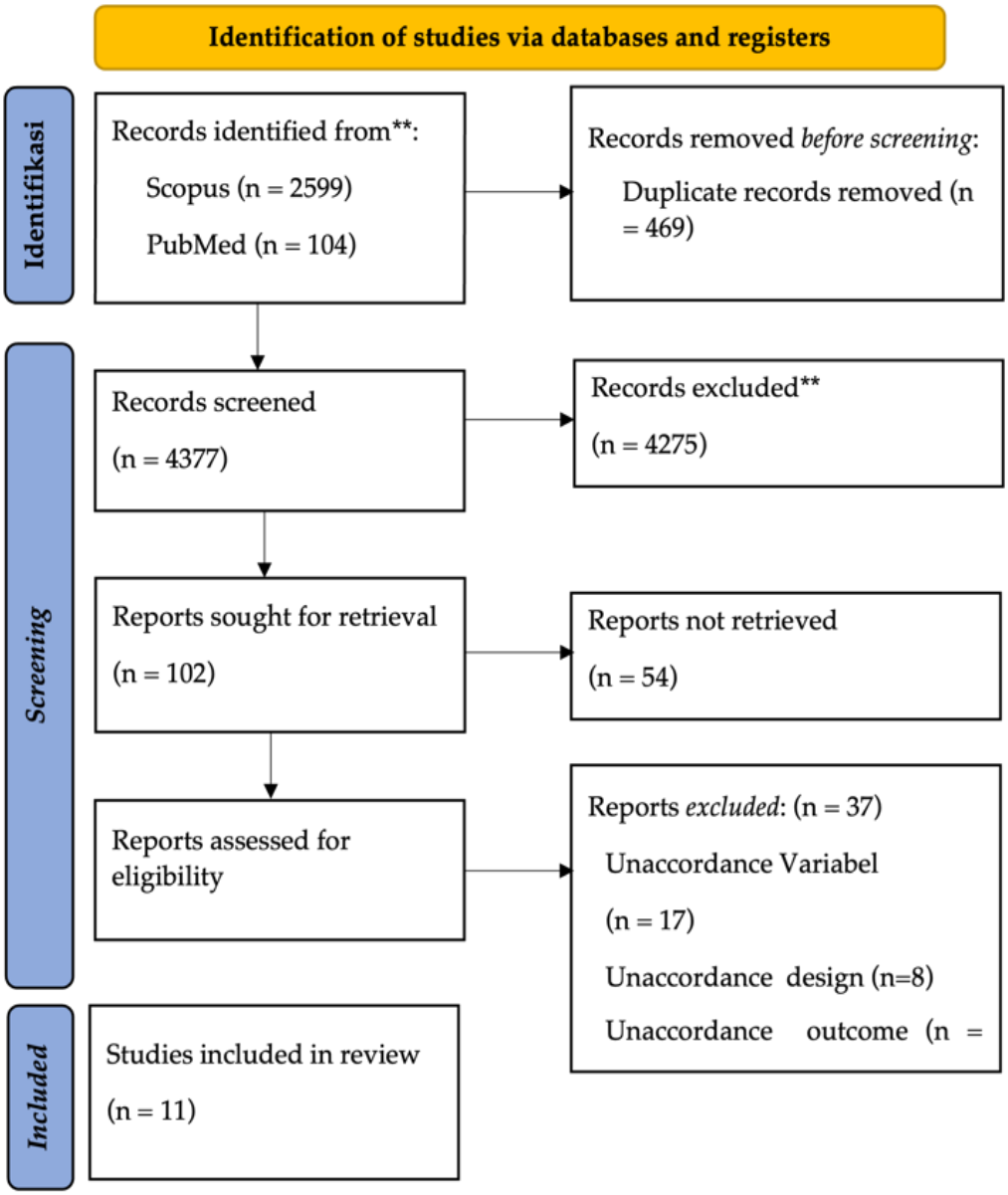

Figure 1. PRISMA Diagram

The included studies were published between 2014 and 2024 and conducted in Guatemala, India, Mexico, Zambia, Pakistan, Ecuador, Malawi, China, and Ethiopia. Table 1 provides a summary of the characteristic studies included in the scoping review. Table 1. Characteristic Studies (n=11).

Table 1. Characteristic Studies (n=11)

Author	Sample Size	Design	Duration	Intervention	Result
Juarez et al. (2021)	165 children (125 households)	A community-based intervention	4 years	Caregiver empowerment Evidence-based strategies to support child growth Audit and feedback for frontline workers	Reduction in stunting prevalence from 42.4% to 30.6% during the intervention period
Pavithra, Kumar, & Roy (2019)	The intervention group (57 mothers of 64 children) and control group (60 mothers of 64 children)	A community-based intervention	1 year 10 month	Health education	Improving children's nutritional status
Perdomo et al. (2019)	113 Children	Longitudinal study	Not specific	Interventions based on socio-ecological models	Median Z W/H Improvement reducing the Prevalence of Low Body Weight Appropriate Weight Increase
Rockers et al. (2016)	Intervention group (220 dyads) and the control group (215 dyads)	Randomized controlled trial	years	Biweekly home visits by CDAs (Child Development Agents) Group meetings once every two weeks	Increase in weight and height for age and decrease in stunting
Shah More et al. (2018)	The intervention group (3455) and the control group (2155)	Quasi-experimental dan cross-sectional	months	Community-based management of acute malnutrition (CMAM) Growth monitoring.Home visits by health workers. Referral for MCGM and ICDS health services.Group meetings and community events	Wasting prevalence decreased by 28% (18% to 13%) in intervention areas and by 5% (16.9% to 16%) in comparison areas.
I. Hussain et al. (2021)	The intervention group (430 children) and the control group (399 children)	Cluster randomized controlled trial	1 year 3 months	Severe acute malnutrition (SAM) by women health workers (LHWs) in the community CMAM program standards are provided in health facilities.	There was no difference between the two interventions for severe acute malnutrition
Roche et al. (2017)	Intervention groups (80 mother-child pairs) and control groups (84 mother-child pairs).	A quasi-experimental nonrandomized	7 months	Health education	Children in the intervention group had improvements in weight-for-age z scores
Liang, Xing, Pang, Wang, & Yan (2018)	The intervention group (2673 children) and the control group (9031 children)	Quasi-experimental	2.5 months in 2001 and 2005	Health education	Three anthropometric indicators in the intervention group were better than the control group
Gelli et al. (2018)	1,248 pre-school children and 304 younger siblings	Cluster randomized controlled trial	1 year	Standard early childhood development (PAUD) program with additional activities to increase nutritious food production and behavior change	Implementation of integrated agricultural and nutrition interventions through PAUD platforms provides benefits children's diet and reduction in stunting among younger siblings of target preschool children
Kang, Kim, Sinamo, & Christian (2017)	The intervention group (876 children) and the control group (914 children)	Cluster randomized trial	2 weeks	Community-based participatory nutrition promotion (CPNP)	The prevalence of stunting (8.1%) and underweight (6.3%) was significantly lower in the intervention group compared with the control group.
Wang et al. (2017)	693 children	Cross-sectional	1 year 6 months	Nutritional health education and provision of soybean-based complementary foods	The prevalence of stunting and underweight decreased.

The research results obtained various community-based interventions. Based on these results, there are five community-based interventions for malnutrition. First is health education, which covers topics such as nutrition, child feeding practices, the process of cooking and recommending food based on age and what children need, and Hepatitis B vaccination and vitamin A supplementation (Kang et al., 2017; Liang et al., 2018; Pavithra et al., 2019; Roche et al., 2017; Wang et al., 2017). The second community-based intervention is empowerment. Empowerment is conducted based on a socio-ecological model and empowerment for caregivers (Juarez et al., 2021; Perdomo et al., 2019).

Third is supplementation, supplementation carryout out by additional complementary foods made from soybean (Wang et al., 2017). CMAM is also an intervention that can be conducted by female health workers (D. Hussain & Biswas, 2024; Shah More et al., 2018). Screening and monitoring are divided into monitoring the program and children's health status. Monitoring programs are performed with audits and feedback for front-line workers (Juarez et al., 2021). Monitoring children's health status involves monitoring nutritional status and children's growth and development (Shah More et al., 2018). Other community-based interventions are home visits and group meetings conducted once every two weeks (Rockers et al., 2016; Shah More et al., 2018).

DISCUSSION

Based on these results, there are five community-based interventions. Health education can conduct on the topic related to malnutrition (Kang et al., 2017; Liang et al., 2018; Pavithra et al., 2019; Roche et al., 2017; Wang et al., 2017). Health education can help mothers meet the needs of babies and toddlers, especially regarding nutrition (Prasetyo et al., 2023). The research results show that education through lectures, demonstrations, and brainstorming can increase mothers' knowledge about malnutrition prevention. The knowledge can increase because information from health education can be received and responded to well (Yunitasari, Rahayu, & Kurnia, 2020). Increasing mothers' understanding of nutrition through education is intended to enhance eating habits. If mothers are able to exclusively breastfeed their children and successfully control the amount of nutrients they receive, including supplemental foods, then conditions like stunting, for example, can be prevented from an early age (Siagian & Ramschie, 2024). Numerous community groups have adopted health education programs to raise awareness of health-related topics, such as nutrition, breastfeeding, the advantages of obtaining health care, and adopting healthy dietary habits (Maizuputri, Mutmainnah, & Meinarisa, 2024; Nwachan, Ejoh, Noumo, & Njong, 2024). Prior studies have demonstrated that gaining knowledge is a crucial first step toward altering one's behavior. Thus, having a basic understanding of nutrition is essential to developing healthy eating habits (Bidira, Tamiru, & Belachew, 2022). Focused education can help significantly change children's diets and feeding practices, although sustainability and consistent implementation still need to be overcome.

The results show that caregiver empowerment, especially the role of mothers or other family members, is crucial to the success of nutrition programs (Juarez et al., 2021). Through skills training and capacity building, caregivers can effectively manage children's nutrition, from food selection and preparation to implementing appropriate care practices (Juarez et al., 2021). Women's empowerment factors are essential in improving children's nutrition (Singh & Jha, 2024). Research conducted by Singh & Jha (2024) identified several significant predictors of malnutrition in children under five, including gender, higher birth order, lower levels of parental education, a poor wealth index, a mother's lack of access to a bank or savings account, and whether the household owns a mobile phone. Additionally, other research highlights that providing caregiver empowerment support is highly effective in enhancing mothers' capacity to care for their children's nutritional needs ($p<0.05$) (Umijati, Kardjati, Ismudijanto, & Sunarjo, 2021). It took six months to empower 13.2% of moms with a minimal knowledge score of 2.5 and 3.1 practice times, respectively—much longer than the counseling technique. Empowered mothers will be able to spot changes in their child's nutritional circumstances (Umijati et al., 2021).

The following factors in the socio-ecological model are correlated with detected malnutrition: family size, diversity, genetics, race, short mothers, breastfeeding status, low maternal education, and rural and urban settlements (Mahmudiono, Segalita, & Rosenkranz, 2019). Perdomo et al. (2019) carried out caregiver empowerment based on socio-ecological models for four months, and its implementation contributed to an increase in several anthropometric indicators. Empowering caregivers through a socio-ecological approach can strengthen individual and family capacity in managing children's nutrition (Korom et al., 2023). Caregivers need comprehensive programs that will empower them to provide effective care to children (Tsabedze & Habedi, 2024). According by Saadah, Hasanah, & Yulianto (2022), the maternal empowerment model in addressing malnutrition focuses on prevention and intervention, particularly through early detection training for stunting, with maternal commitment identified as the most significant factor. Interventions can become more relevant and sustainable by empowering caregivers and integrating them into nutrition-related decision-making. However, challenges in achieving active participation and full adoption of recommended nutrition practices remain obstacles that must be overcome.

The following intervention, nutritional supplementation, such as the use of additional food or nutritional supplements, has shown effectiveness in improving the nutritional status of children. In research by Wang et al. (2017), providing soy-based complementary foods that contain a supplement called Yingyangbao can reduce stunting and underweight rates. The initiation of complementary breastfeeding from an early age significantly impacts a child's growth, development, and survival (Katepa-Bwalya et al., 2015). The use of supplementation as part of a nutritional intervention provides a significant additional boost to the nutritional status of children, especially in the context of chronic malnutrition. Nutritional supplements such as vitamins, minerals, or additional foods have been proven effective in reducing nutritional deficiencies and increasing child growth (Zhang et al., 2021). However, program sustainability, adequate availability of supplements, and compliance with their use are essential issues that must be managed well.

The World Health Organization (WHO) has recommended the community-based acute malnutrition management (CMAM) program to address acute malnutrition globally (Akuu & Amagnya, 2023). The four primary components of the CMAM program are community outreach programs, community-based management for children with uncomplicated SAM, hospital care for children with complicated SAM, and community-based management for children with mild acute malnutrition (Pati, Mahapatra, Sinha, Pati, & Samal, 2018). A study by Maleta and Amadi (2014) conducted in Malawi, Ghana, and Zambia shows that CMAM has significantly expanded the scope of services, and treatment outcomes have improved, with cure rates ranging from 73% in Ghana to 90% in Malawi, while also achieving very low mortality rates.

Monitoring programs are performed with audits and feedback for front-line workers (Juarez et al., 2021). This is in line with Viajar, Dorado, Rongavilla, Caraig, & Gulay (2022), which notes that as childhood malnutrition is still a major issue, particularly in developing nations, monitoring data is crucial for efficient management in health and nutrition programs. Consistent monitoring of children's growth, development, and nutritional status is crucial for preventing micronutrient deficiencies and malnutrition, including stunting, wasting, overweight, and obesity (Zsakai et al., 2023). Systematic and continuous monitoring of children's nutritional status is important to evaluating interventions' effectiveness and long-term impact (Scaglioni et al., 2022). Good monitoring allows early detection of needed program changes and provides a strong data basis for decision-making. However, resource challenges, adequate information technology, and health worker capacity may limit effective monitoring at the community level.

Other community-based interventions are home visits and group meetings (Rockers et al., 2016; Shah More et al., 2018). Based on research by Rahman, Tariqujjaman, Ahmed, & Sarma (2023), in comparison to carers of children who had not received a health worker visit, parents of children who had received one within the previous year before the follow-up survey were more likely to continue implementing nutritional diversity in their feeding practices. Carers exposed to visits from health workers had 1.57 times greater chances (AOR 1.57; 95% CI 1.14–2.17) of sustaining minimum

recommended dietary patterns in feeding practices. Community events and group meetings are organized using activities such as games, discussions, celebrations, cooking demonstrations, and educational film showings. Events include baby shower celebrations, breastfeeding initiation ceremonies, and International Breastfeeding and Nutrition Week (Shah More et al., 2018).

Strengths and limitations

This scoping review contains interventions from various countries with cultural and socio-economic differences. However, there are also several limitations to our scoping review. Only three databases were used in this scoping review. Some articles come from developing countries and are located in rural areas. So, the ability to find the most effective intervention for various interventions is limited.

Implications for practice

The results of this scoping review show various interventions in reducing malnutrition. Knowing these various interventions can be a reference source for implementing programs/interventions between the community and health workers, especially nurses. Thus, community-based intervention programs for malnutrition can be carried out to cover more possibilities.

CONCLUSION

This scoping review shows the role of community-based innovation in addressing child malnutrition. Approaches involving nutritional education, empowerment, supplementation, monitoring, and other interventions (home visits and group meetings) can improve children's nutritional and health status. Targeted nutrition education can increase understanding and good dietary practices, while caregiver empowerment strengthens family capacity in managing their children's nutrition. Nutritional supplementation significantly boosts a child's nutritional status, and appropriate monitoring allows early detection and effective intervention. This study emphasizes that community-based interventions that involve active community participation are more sustainable and prosperous. Recommendations for future program development include improving nutrition education and empowerment, providing adequate supplements, and an effective monitoring system to ensure the sustainability and effectiveness of community-based nutrition interventions.

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AUTHOR CONTRIBUTIONS

Vira Amelia (V.A), Yuni Sufyanti Arief (Y.S.A) , Sylvia Dwi Wahyuni (S.D.W).
V.A.: Conceptualization, methodology, data collection, and manuscript writing. Y.S.A.: manuscript review, supervision and editing. S.D.W.: Supervision, critical review, and final approval of the manuscript.

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ETHICAL STATEMENT

Ethical approval was not required as this study is a scoping review.

DATA AVAILABILITY STATEMENT

No data are available for this study.

CONFLICT OF INTEREST STATEMENT

The authors declare no conflict of interest.

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