

Exploring the implementation of community-based health promotion programs for childhood diarrhea prevention in primary healthcare: A qualitative study

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ABSTRACT

Introduction: Childhood diarrhea remains a major public health challenge in low- and middle-income countries despite the widespread implementation of health promotion initiatives through primary healthcare services. While previous studies have largely evaluated intervention effectiveness using quantitative indicators, there is limited evidence on how community-based health promotion programs are implemented in routine primary healthcare settings. This study aimed to explore the implementation of community-based health promotion programs to prevent childhood diarrhoea from multiple stakeholders' perspectives.

Research Methodology: A qualitative descriptive study with an interpretive approach was conducted between January and March 2026 in the working area of Bontomangape Primary Health Center, Takalar Regency, Indonesia. Twenty-five purposively selected informants, including healthcare managers, health promotion officers, healthcare professionals, community health volunteers, and mothers of children under five years, participated in semi-structured in-depth interviews. Non-participant observations and document reviews were used to strengthen data triangulation. Data were analyzed using Braun and Clarke's six-phase Reflexive Thematic Analysis supported by NVivo Release 14. Trustworthiness was established through credibility, transferability, dependability, and confirmability.

Results: Four interconnected themes emerged: implementation of community-based health promotion activities, perceived program benefits, barriers to implementation, and strategies for program strengthening. Participants reported that health education, home visits, and Posyandu activities improved caregivers' knowledge and preventive practices. However, workforce shortages, limited educational resources, and inconsistent community participation constrained program sustainability. Data saturation was achieved after the twenty-third interview and confirmed through two additional interviews.

Conclusion: Community-based health promotion is an essential component of childhood diarrhoea prevention but requires stronger organisational capacity, sustained community engagement, and intersectoral collaboration to maximise its effectiveness. Strengthening primary healthcare systems through context-sensitive, community-centred health promotion strategies may improve program sustainability and help reduce the burden of preventable childhood diarrhoea.

Keywords: child health; diarrhea; health promotion; primary health care.



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INTRODUCTION

Childhood diarrhea remains one of the most persistent public health challenges despite substantial advances in preventive interventions and primary healthcare services. Globally, diarrheal disease continues to account for approximately 1.7 billion episodes annually and remains a leading cause of morbidity and mortality among children under five years of age¹. Although most diarrhea-related deaths are preventable through timely treatment, improved sanitation, safe drinking water, and effective health promotion, the disease continues to disproportionately affect low- and middle-income countries where health systems frequently encounter resource limitations and unequal access to preventive services². Recurrent diarrheal episodes also contribute to chronic malnutrition, impaired cognitive development, growth retardation, and increased household economic burden, making diarrhea prevention an essential component of child survival strategies and sustainable health development^{3,4}.

Indonesia continues to experience a substantial burden of childhood diarrhea despite implementing national prevention and control programs through primary healthcare facilities⁵. Community Health Centers (Puskesmas) are expected to function not only as providers of curative services but also as centers for health promotion, community empowerment, and disease prevention. Various health promotion activities, including health education, home visits, integrated health posts (Posyandu), counseling, and community mobilization have been introduced to improve caregivers' knowledge and encourage healthy behavioral practices⁶. Nevertheless, national and regional reports consistently demonstrate that childhood diarrhoea remains prevalent, suggesting that the presence of health promotion programs alone does not necessarily translate into effective disease prevention⁷. This discrepancy suggests that implementation processes, rather than intervention availability, deserve greater scholarly attention.

Previous studies have consistently demonstrated that community-based health promotion interventions improve maternal knowledge, hand hygiene practices, exclusive breastfeeding, utilisation of oral rehydration therapy, and environmental sanitation⁸. Educational interventions delivered through community health workers and local health volunteers have been associated with increased caregiver awareness and healthier childcare practices⁹. Likewise, integrated Water, Sanitation and Hygiene (WASH) programs have shown favorable effects on reducing diarrheal incidence through behavioral modification and community participation¹⁰. These findings collectively indicate that health promotion constitutes a critical pillar of diarrhea prevention strategies.

However, evidence also reveals that successful implementation depends on considerably more than educational content. Implementation science emphasizes that intervention effectiveness is strongly influenced by organizational readiness, leadership support, workforce capacity, resource availability, stakeholder collaboration, communication systems, and community engagement. Several international studies have reported that shortages of trained personnel, inadequate educational materials, limited operational funding, inconsistent supervision, and weak community participation frequently undermine health promotion activities^{11,12}. Consequently, programs with demonstrated efficacy under controlled conditions often produce inconsistent outcomes when translated into routine primary healthcare practice¹³.

Within the Indonesian context, the existing literature has primarily focused on epidemiological determinants of childhood diarrhoea, environmental sanitation, maternal knowledge, nutritional status, and quantitative evaluations of program outcomes¹⁴. Although these studies have generated valuable evidence regarding disease risk factors, they provide only a limited understanding of how community-based health promotion programs are implemented in real-world healthcare settings¹⁵. Most investigations evaluate program performance using quantitative indicators while giving relatively little attention to the experiences of healthcare providers, community health volunteers, and caregivers who collectively shape program implementation¹⁶. As a result, important contextual factors including organisational constraints,

communication dynamics, cultural influences, and local community participation remain underexplored^{17,18}.

Previous studies have primarily evaluated individual components of childhood diarrhea control programs rather than examining implementation as an integrated process involving planning, coordination, service delivery, stakeholder engagement, and community participation. Consequently, existing evidence provides limited insight into why comparable health promotion interventions produce varying outcomes across different primary healthcare settings. This fragmented understanding impedes the development of practical strategies to improve program implementation.

An important research gap, therefore, remains. While the effectiveness of health promotion interventions has been widely documented, few qualitative studies have comprehensively explored how community-based health promotion programs are implemented within Indonesian primary healthcare. Existing research rarely integrates the perspectives of health centre managers, health promotion officers, healthcare workers, community health cadres, and mothers, leaving the organisational, social, and contextual factors influencing implementation insufficiently understood. This study addresses these gaps by providing a qualitative exploration of the implementation of community-based health promotion programs from multiple stakeholder perspectives. Rather than focusing solely on program outcomes, it examines the barriers, facilitators, and contextual conditions that shape implementation in routine primary healthcare practice. The findings are expected to provide practical evidence to strengthen health promotion policies, improve community engagement, and enhance childhood diarrhoea prevention strategies. Accordingly, this study aims to explore the implementation of community-based health promotion programs to prevent childhood diarrhoea in Indonesian primary healthcare.

RESEARCH METHODOLOGY

Study Design

This study employed a qualitative descriptive design with an interpretive approach to explore the implementation and outcomes of the health promotion program for diarrhoea prevention among children under five in the working area of the Bontomangape Primary Health Centre. A qualitative descriptive design was considered appropriate because it enables researchers to obtain a comprehensive understanding of participants' experiences, perceptions, and interpretations within their natural settings. This approach also facilitates the exploration of contextual factors influencing program implementation, community participation, and perceived effectiveness without manipulating the research environment.

Setting and Participants

The study was conducted in the working area of Bontomangape Primary Health Center (Puskesmas Bontomangape), Takalar Regency, South Sulawesi Province, Indonesia, between January and March 2026. A total of 25 informants were recruited using purposive sampling, enabling the selection of participants with direct experience and substantial knowledge of the health promotion program's implementation. The participants included one head of the primary health centre, three health promotion officers, five healthcare professionals, six community health volunteers (cadres), and ten mothers of children under 5 years of age. Eligible participants had been actively involved in or exposed to the health promotion program for at least six months, were able to communicate effectively, and voluntarily agreed to participate by signing written informed consent. Individuals who were unavailable during the data collection period, declined to participate, or were unable to complete the interview due to health or communication limitations were excluded. Participant recruitment continued until data saturation was achieved, at which point no new themes or meaningful information emerged from subsequent interviews.

Data Sources and Research Instruments

The study primarily utilized primary data collected through semi-structured in-depth interviews and non-participant observations. Secondary data, including health promotion reports, educational materials, and routine program documentation, were reviewed to complement and validate the interview findings. The principal research instrument was a semi-structured interview guide developed from previous literature on health promotion, childhood diarrhea prevention, and community-based public health interventions. The interview guide covered several domains, including program implementation, community participation, perceived benefits, implementation barriers, behavioral changes, and recommendations for program improvement. Before data collection, the interview guide was reviewed by three public health experts to establish content validity. It was pilot-tested with participants outside the study setting to improve clarity and consistency. As this was qualitative research, methodological rigor was evaluated through the principles of credibility, transferability, dependability, and confirmability, rather than conventional measures of statistical validity and reliability.

Data Collection

Data collection was conducted by the principal investigator using face-to-face, semi-structured interviews in locations that ensured participants' comfort and privacy. Each interview lasted approximately 45–60 minutes and was audio-recorded with participants' permission. Detailed field notes were prepared to document contextual observations, participant interactions, and non-verbal expressions during the interviews. In addition, non-participant observations were undertaken during health education sessions, Posyandu activities, and community outreach programs to obtain a comprehensive understanding of the implementation process. Relevant institutional documents were also reviewed to strengthen data triangulation. To ensure data quality, the researchers applied several quality assurance strategies, including prolonged engagement in the field, triangulation of multiple data sources and collection methods, member checking, peer debriefing among qualitative researchers, maintenance of an audit trail, and continuous reflexive journaling to minimise researcher bias throughout the study.

Data Analysis

The qualitative data were analyzed using Reflexive Thematic Analysis following the six-phase framework proposed by Braun and Clarke. Audio-recorded interviews were transcribed verbatim immediately after each interview and repeatedly reviewed to facilitate data familiarization. The analysis began with systematic coding of meaningful statements, followed by the identification of initial categories and the development of broader themes representing participants' experiences and perspectives. Emerging themes were refined iteratively through comparisons across transcripts until conceptual coherence was achieved. Data coding, organization, and retrieval were managed using NVivo Release 14 (QSR International) to improve analytical transparency and consistency because this study adopted a qualitative design; statistical analyses such as descriptive statistics, bivariate tests, multivariable regression, significance testing, or p-values were not performed, as they were not aligned with the epistemological foundation of qualitative inquiry.

Trustworthiness

The trustworthiness of the findings was established according to the criteria proposed by Lincoln and Guba, including credibility, transferability, dependability, and confirmability. Credibility was strengthened through prolonged engagement, methodological triangulation, and member checking. Transferability was enhanced by providing rich descriptions of the research context and participant characteristics. Dependability was ensured through systematic

documentation of methodological decisions and peer examination of the analytical process. Confirmability was maintained by preserving an audit trail and reflexive field notes that documented researchers' assumptions, analytical decisions, and interpretation processes throughout the study.

Ethical Approval

Ethical approval for this study was obtained from the Health Research Ethics Committee of Universitas Megarezky, Makassar, Indonesia, before data collection. All participants received detailed verbal and written explanations of the study's objectives, research procedures, voluntary participation, confidentiality, and their right to withdraw from the study at any time without consequences. Written informed consent was obtained from every participant before the interviews commenced. Participants' identities were anonymized throughout data processing and reporting, and all electronic data were securely stored in password-protected files accessible only to the research team.

RESULTS

Analysis of the interview transcripts, field observations, and document reviews yielded four major themes and ten subthemes that describe participants' experiences with the implementation of the health promotion program for childhood diarrhoea prevention. Data saturation was achieved after the twenty-third interview, with two additional interviews conducted to confirm that no new codes or themes emerged. The thematic structure is presented in Table 1.

Table 1. Themes and Subthemes Identified from Thematic Analysis

Theme	Subtheme	Representative Participants
Theme 1. Implementation of the Health Promotion Program	Health education through Posyandu and community outreach	Head of Primary Health Center, Health Promotion Officers, and Mothers
	Home visits and individualized counseling	Health Workers, Community Health Volunteers
	Distribution of educational media	Health Promotion Officers
Theme 2. Perceived Benefits of the Program	Increased maternal knowledge of diarrhea prevention	Mothers
	Improved hygiene and sanitation practices	Mothers, Community Health Volunteers
	Increased awareness of early treatment seeking	Health Workers
Theme 3. Barriers to Program Implementation	Limited health promotion workforce	Health Promotion Officers
	Inadequate educational media	Health Workers
	Low community participation	Mothers, Community Health Volunteers
Theme 4. Strategies for Program Improvement	Strengthening community participation	All participant groups
	Expanding health education resources and intersectoral collaboration	Health Center Management and Health Workers

Theme 1. Implementation of the Health Promotion Program

Participants consistently described that the health promotion program was implemented through multiple community-based strategies, including health education sessions during Posyandu activities, home visits, community meetings, and the distribution of printed educational

materials. These activities aimed to improve caregivers' knowledge regarding diarrhea prevention, oral rehydration therapy, hand hygiene, exclusive breastfeeding, and environmental sanitation.

A health promotion officer explained:

"Every month we provide health education during Posyandu activities, but we also conduct home visits for families who rarely attend community sessions." (HP2)

Similarly, one mother stated:

"After attending the education session, I understood the importance of preparing oral rehydration solution immediately when my child develops diarrhea." (M7)

Theme 2. Perceived Benefits of the Program

Most participants perceived that the program had substantially improved caregivers' knowledge and encouraged healthier practices to prevent diarrhoea. Mothers reported adopting regular handwashing, safer food preparation, improved household sanitation, and earlier utilization of healthcare services when their children developed diarrhea.

One participant noted:

"Previously, many parents waited until the child's condition became severe before visiting the health center. Now they usually come much earlier." (HW3)

Another mother reflected:

"I now understand that preventing diarrhea starts with keeping water and food clean, not only giving medicine after the child becomes sick." (M4)

Theme 3. Barriers to Program Implementation

Despite positive outcomes, participants identified several challenges affecting program effectiveness. The most frequently reported barriers included an insufficient number of health promotion personnel, limited educational materials, competing workloads among healthcare providers, and inconsistent attendance of caregivers during health education activities.

One health promotion officer commented:

"Our biggest challenge is the limited number of staff. We cannot reach every village regularly because one officer often manages several programs simultaneously." (HP1)

A community health volunteer added:

"Some mothers cannot attend because they are working or taking care of other children, so they miss important health information." (CHV5)

Theme 4. Strategies for Strengthening the Program

Participants emphasized that improving community participation and expanding educational resources were essential for strengthening future health promotion efforts. They recommended increasing collaboration between healthcare providers, village leaders, schools, and community organizations to ensure broader dissemination of health information.

The head of the health center stated:

"Health promotion should involve multiple sectors. Community leaders and local organizations need to participate so that health messages become part of everyday community activities." (HC1)

Similarly, another participant suggested:

"Educational media should become more interactive because visual demonstrations are easier for mothers to understand than lectures alone." (HW2)

Data saturation was reached after the twenty-third interview, when no additional codes or concepts emerged from the ongoing analysis. Two subsequent interviews were conducted to verify thematic stability and confirm the consistency of the findings. Continuous comparison of

interview transcripts demonstrated that participant responses repeatedly reflected the same patterns across stakeholder groups. The convergence of findings from interviews, field observations, and documentary evidence further strengthened the credibility of the identified themes through methodological triangulation.

Table 2. Representative Quotations Supporting Each Theme

Theme	Representative Quotations
Implementation of the Program	<i>"Every month we provide health education during Posyandu activities, but we also conduct home visits." (HP2)</i>
Perceived Benefits	<i>"I now understand how to prevent diarrhea before my child becomes sick." (M4)</i>
Implementation Barriers	<i>"One health promotion officer often has to manage several programs simultaneously." (HP1)</i>
Program Improvement	<i>"Health promotion should involve community leaders and local organizations." (HC1)</i>

DISCUSSION

The present study extends current understanding of community-based health promotion by demonstrating that the effectiveness of diarrhea prevention programs cannot be explained solely by the delivery of health education. Instead, the findings indicate that successful implementation arises from the interaction among community engagement, organisational readiness, and the broader primary healthcare system. This perspective shifts the discussion from viewing health promotion as a collection of educational activities to recognising it as a dynamic governance process that facilitates collaboration among healthcare providers, community volunteers, caregivers, and local institutions. Consequently, the contribution of this study lies not merely in documenting participants' experiences but in illustrating how health promotion functions as a system that continuously shapes health-related decision-making within communities¹⁹.

From a conceptual standpoint, the findings suggest that behavioral change should be interpreted as a socially constructed process rather than an individual cognitive outcome. Participants consistently described how their understanding of diarrhoea prevention developed through repeated interactions with health workers, community health volunteers, and peer networks, rather than through isolated educational sessions^{20,21}. This observation reinforces contemporary perspectives in health promotion that regard knowledge acquisition, social support, and environmental reinforcement as mutually dependent mechanisms²². Health behaviour therefore evolves through continuous negotiation between individual beliefs and collective community practices, underscoring that sustainable prevention strategies require long-term engagement rather than the one-time dissemination of health information²³.

The findings also contribute to implementation science by highlighting the importance of contextual adaptation in primary healthcare interventions. Although national health promotion policies generally provide standardised implementation guidelines, realities at the community level show that program effectiveness depends largely on local organisational capacity and community responsiveness^{24,25}. The experiences shared by participants demonstrate that identical intervention strategies may produce different outcomes depending on workforce availability, leadership commitment, communication practices, and community participation²⁶. This reinforces the argument that successful implementation should not be assessed solely by adherence to

program protocols, but also by local health systems' ability to adapt interventions to their social and cultural contexts while preserving their core objectives.

Another important conceptual contribution concerns the evolving role of community health volunteers as intermediaries within the health system. Rather than functioning merely as program assistants, community volunteers emerged as knowledge brokers, translating technical health information into culturally meaningful messages that families more readily accepted^{27,28}. Their position within local social networks enabled them to bridge institutional health services and community life, thereby reducing communication barriers that frequently limit preventive health programs²⁹. This finding supports a more relational understanding of community participation in which volunteers facilitate trust-building, strengthen social capital, and enhance the legitimacy of public health interventions. Such a perspective expands conventional approaches that often evaluate volunteer performance primarily through service coverage or activity indicators.

The study further demonstrates that organizational capacity remains one of the most influential determinants of sustainable health promotion. Participants consistently identified workforce shortages, competing professional responsibilities, and limited educational resources as constraints affecting program continuity. These challenges should not be interpreted merely as operational deficiencies but as indicators of broader systemic issues within primary healthcare governance. Health promotion programs frequently depend on the commitment of a relatively small number of personnel who simultaneously manage multiple public health responsibilities. Under these circumstances, the quality of community engagement becomes vulnerable to institutional limitations that extend beyond individual performance. Accordingly, strengthening health promotion requires structural investments in workforce development, resource allocation, leadership support, and organizational learning rather than isolated improvements in educational materials alone.

These findings also have important implications for understanding health promotion from a systems perspective. Preventing childhood diarrhoea involves multiple interacting determinants, including caregiver knowledge, sanitation practices, environmental conditions, healthcare accessibility, institutional coordination, and community participation. Addressing only one component of this interconnected system is unlikely to generate sustainable improvements in population health. Instead, effective health promotion requires coordinated actions across different sectors that simultaneously strengthen individual capacity, supportive environments, community networks, and organizational performance. This systems-oriented interpretation aligns with contemporary public health thinking, which increasingly recognizes that complex health problems cannot be adequately addressed through single-component interventions.

Compared with previous qualitative studies, the present findings confirm that community-based education remains an effective strategy for improving awareness and preventive practices. However, this study advances existing knowledge by illustrating that educational activities become substantially more effective when embedded within enduring social relationships between healthcare providers and community members. Earlier research has frequently emphasized increases in knowledge or health literacy as principal indicators of program success. In contrast, the present findings suggest that knowledge represents only one element within a broader process of community empowerment. Participants emphasised the importance of continuous dialogue, mutual trust, and repeated interpersonal contact, suggesting that relational continuity may be a more influential determinant of sustained behavioural change than the number of educational sessions delivered.

The findings also complement previous implementation research by emphasising that contextual barriers should not be viewed solely as obstacles but also as opportunities for adaptive innovation. Limited human resources led to greater reliance on community volunteers, while inconsistent attendance at educational sessions highlighted the need for more flexible communication approaches, including household visits and locally tailored outreach. Such adaptations illustrate the resilience of community-based health promotion systems when supported by collaborative leadership and responsive local governance. Therefore, implementation success depends not only on program design but also on local institutions' capacity to adapt delivery strategies in response to changing community needs.

Nevertheless, several considerations should be taken into account when interpreting these findings. Because the study was conducted within a single primary healthcare setting, the organizational characteristics and community dynamics described may differ from those of other regions. Rather than seeking statistical generalization, the study provides analytical insights that may inform comparable community health contexts. Furthermore, participants' perspectives inevitably reflect subjective experiences shaped by their individual roles within the health system. Although methodological rigor was enhanced through triangulation, member checking, and reflexive analysis, alternative interpretations remain possible, reflecting the inherently interpretive nature of qualitative inquiry.

The implications of this study extend beyond the local context by offering conceptual guidance for strengthening community-based health promotion within primary healthcare systems. Future research should investigate how organizational leadership, intersectoral collaboration, digital health innovations, and community governance interact to influence the sustainability of preventive health programs across diverse settings. Comparative qualitative and mixed-methods studies involving multiple districts would further clarify how contextual differences shape implementation processes and health outcomes. Longitudinal investigations may also provide valuable evidence regarding the evolution of community participation and the durability of behavioral change over time.

Overall, this study argues that effective health promotion should be understood not simply as the transmission of health information but as the development of an adaptive community health ecosystem in which knowledge, trust, institutional capacity, and social participation reinforce one another. This perspective offers a broader conceptual contribution to public health promotion by positioning preventive interventions within the interconnected structures of primary healthcare governance, community empowerment, and health system resilience. Such an approach provides a stronger foundation for designing sustainable policies capable of reducing preventable childhood illnesses while simultaneously strengthening the responsiveness and equity of primary healthcare services.

CONCLUSIONS

This study demonstrates that the health promotion program implemented at Bontomangape Primary Health Centre has strengthened community knowledge and encouraged preventive behaviours related to childhood diarrhoea, thereby addressing the study objective of exploring the implementation and perceived outcomes of community-based health promotion. The findings indicate that the program's effectiveness extends beyond health education activities and relies on sustained interactions among healthcare professionals, community health volunteers, caregivers, and local stakeholders. Nevertheless, persistent challenges, including limited human resources, insufficient educational materials, and inconsistent community participation, continue to constrain program sustainability and effectiveness. These findings highlight that successful

diarrhea prevention requires not only individual behavioral change but also supportive organizational capacity and an enabling community environment. From a policy perspective, strengthening health promotion should be an integral component of primary healthcare development, supported by increased investment in workforce capacity, continuous training for community health volunteers, and the provision of culturally appropriate educational resources. Future interventions should also promote stronger intersectoral collaboration involving local governments, educational institutions, and community organizations to improve program reach and sustainability. Adopting a systems-oriented, community-centred approach will enhance the resilience of primary healthcare services while supporting evidence-based strategies to reduce the burden of preventable childhood diarrhoea and improve child health outcomes in similar community settings.

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Conflict of Interest

The authors declare that they have no competing interests or financial and non-financial conflicts of interest that could have influenced the design, conduct, interpretation, or reporting of this study.

Authors' Contributions

Wahyuni Wahyuni: Conceptualization, Methodology, Investigation, Data Curation, Formal Analysis, Writing – Original Draft, and Project Administration.

Hairuddin K: Methodology, Validation, Supervision, Formal Analysis, and Writing – Review & Editing.

Dian Meiliani Yulis: Investigation, Data Collection, Data Curation, Visualization, and Writing – Review & Editing.

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Declaration of Generative AI Use

During the preparation of this manuscript, the authors used generative artificial intelligence tools solely to improve language clarity, grammar, and manuscript readability. All scientific interpretations, methodological decisions, data analysis, and conclusions were developed, critically reviewed, and verified by the authors. The authors accept full responsibility for the accuracy, integrity, and originality of the manuscript and confirm that the use of generative AI did not replace intellectual contributions or independent scientific judgment.

Data Availability Statement

The datasets generated and analyzed during the current study are not publicly available because they contain information that could compromise participant confidentiality. De-identified data may be made available by the corresponding author upon reasonable request and subject to approval by the relevant ethics committee and institutional regulations.

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