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Enhancing Capacity of Health Workers and Community Health Cadres in Preterm Infant Care Through Behavior Change Communication: A Community-Centric Training Initiative in Bandung District

Mira Miraturrofi'ah
Universitas Padjadjaran / Universitas Bhakti Kencana, INDONESIA

Qorinah Estiningtyas Sakilah Adnani
Universitas Padjadjaran, INDONESIA

Dwi Agustian
Universitas Padjadjaran, INDONESIA

Yanyan Mulyani
Universitas Bhakti Kencana, INDONESIA

Citra
Universitas Islam Bandung, INDONESIA

Niknik Nursifa
School of Health Sciences Budhi Luhur Cimahi, INDONESIA

Hana Nurhanifah
School of Health Sciences Budhi Luhur Cimahi, INDONESIA

Ika Khairunnisa
School of Health Sciences Indonesia (STIKindo) Wirautama, INDONESIA

Wenny Desmana
Indonesian Midwives Association, INDONESIA

Nenden Nurul Aulia
Indonesian Midwives Association, INDONESIA

Dany Hilmanto*
Universitas Padjadjaran, INDONESIA

*** Corresponding author:**
Dany Hilmanto, Universitas Padjadjaran, Indonesia. ✉ dany.hilmanto@unpad.ac.id

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Abstract

Background: Preterm birth, characterized as childbirth prior to 37 weeks of gestation, continues to pose a significant challenge in mother and child health due to the heightened susceptibility of preterm newborns to complications, including respiratory issues, hypothermia, infections, feeding difficulties, and developmental issues. Efficient post-discharge care is crucial to avert difficulties and hospital readmissions; nevertheless, numerous families possess insufficient knowledge and abilities to care for preterm newborns at home. Enhancing the capabilities of healthcare professionals and community health workers is essential to support families and maintain treatment continuity, thereby improving families' ability to provide appropriate home care for preterm infants and reducing the risk of complications and readmissions.
Aims: This study sought to enhance the capabilities of health workers and community health cadres to assist families of preterm children through a Behavior Change Communication (BCC)-oriented mentorship strategy in Bandung Regency, Indonesia.
Methods: This community-oriented program employed a participatory capacity-building training methodology, engaging 69 participants, including 23 midwives and 46 community health workers from 23 primary health facilities. The program was delivered over three days, utilizing a blended learning strategy that integrated online lectures, workshops, discussions, simulations, role-playing, and skill-based practice stations. Knowledge enhancement was evaluated by pre-test and post-test assessments.
Results: The findings indicated a significant enhancement in participants' understanding. The percentage of cadres with adequate knowledge rose from 58.7% to 91.3%, while among health workers it increased from 65.2% to 91.3%. Knowledge scores enhanced in 89.1% of cadres and 87.0% of health workers.
Conclusion: The findings demonstrate that participatory training, which combines clinical care and behavior change communication, effectively enhances the capabilities of health workers and community cadres to support families in the home care of preterm newborns.

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INTRODUCTION

Premature birth remains an important global neonatal health problem and continues to contribute substantially to neonatal morbidity and mortality. However, in the local community, families of preterm infants still face practical challenges in providing appropriate care, which highlights the need for targeted community-based support and education (WHO, 2023a, 2022, 2020; Cunningham et al., 2010; Lau, 2016; North et al., 2022). Based on this situation analysis, the present service activity was designed to strengthen family capacity in the care of preterm infants through community engagement and practical assistance (WHO, 2023b; Ohuma et al., 2023; Damus, 2008; Menon, 2012; Chawanpaiboon et al., 2019).

In Indonesia, the prevalence of preterm birth remained above 10% in 2023 and considerably contributes to neonatal mortality (9.3 per 1,000 live births), accounting for approximately 23.28% of total infant deaths and representing the second leading cause of neonatal mortality (Kementerian Kesehatan RI, 2023; Kemenkes, 2023; Dinas Kesehatan Jawa Barat, 2023). At the regional level, West Java continues to exhibit relatively high prematurity rates, including in Bandung Regency, where infant deaths associated with prematurity and low birth weight reached 54.98% in 2022 (Kementerian Kesehatan RI, 2023; Dinas Kesehatan Jawa Barat, 2022; Dinas Kesehatan Kabupaten Bandung, 2023). Premature birth also has a substantial impact on child health globally, contributing to more than one million infant deaths annually and accounting for 60–80% of neonatal deaths, particularly during the first week of life (Guenther et al., 2017; Wulandari et al., 2021). Beyond mortality, prematurity is associated with impaired growth, developmental delays, and an increased risk of chronic diseases (Suci & Ginting, 2022).

One of the major challenges in the care of preterm infants is the high rate of hospital readmission after discharge. Several studies report that readmission rates vary widely across countries, ranging from approximately 4% to nearly 49%, depending on the structure and capacity of health systems (Qureshi et al., 2022; Saini et al., 2022; Amsalu et al., 2022; Kair & Goyal, 2023; Feister et al., 2024; Kardum & Serdaru, 2022). In Indonesia, approximately 7.4% of preterm infants experience hospital readmission within the first two weeks after birth, primarily due to breast milk aspiration, diarrhea, and infection (Rustina et al., 2006). These findings indicate that the transition period from hospital-based care to home care represents a critical phase that is often influenced by families' limited capacity to provide appropriate care.

In the context of home-based care for preterm infants, family capability, particularly among mothers, plays a crucial role in determining the success of care. This capability is commonly referred to as caring ability, which encompasses knowledge of preterm infants' needs, self-efficacy in performing caregiving practices, and practical skills such as safe breastfeeding, maintaining thermal stability, infection prevention, and monitoring danger signs (Amsalu et al., 2022; Kair & Goyal, 2023; Feister et al., 2024; Kardum & Serdaru, 2022; Rustina et al., 2006; Hannan et al., 2020). Adequate caring ability supports responsive caregiving, whereas insufficient capacity increases the risk of improper care practices, complications, and hospital readmissions among preterm infants (Li et al., 2024).

Several studies indicate that mothers' caring ability in caring for preterm infants remains relatively low. Approximately 79% of mothers have limited knowledge regarding preterm infant care (Alinejad Naeini et al., 2019), while psychological stress related to the infant's condition may reduce mothers' self-efficacy in providing care after hospital discharge (Reisenhofer et al., 2021). In addition, approximately 45.62% of mothers demonstrate low caregiving skills, particularly in maintaining thermal regulation and providing appropriate infant nutrition (Priyadharsini et al., 2021). These findings highlight the importance of strengthening mothers' caring ability to improve the quality of home-based care for preterm infants.

Improving mothers' caring ability cannot rely solely on individual education, as caregiving practices are also influenced by family support, access to health information, and ongoing support from health workers and community health cadres (Ahun et al., 2024; Warren et al., 2023). In the

Indonesian health system, neonatal services are delivered through referral hospitals (FKRTL) and primary health facilities (FKTP), including community health centers (Puskesmas), private health practices, community midwives, and community health cadres, all of which play strategic roles in ensuring continuity of care for preterm infants at home (RI, 2018).

In Bandung Regency, services for preterm infants involve referral hospitals, community health centers, community midwives, and community health cadres that conceptually support continuity of care down to the household level. However, several challenges persist, including variations in health workers' understanding of preterm infant care, limited communication across service levels, suboptimal engagement of community cadres, and inadequately optimized discharge planning due to limited education time, insufficient educational media, and inadequate evaluation of families' understanding before discharge (Mataniari & Rahayuningsih, 2018; Julianti et al., 2019; Boykova, 2016; Yulianita et al., 2022). These conditions contribute to fragmented care and limited family preparedness in caring for preterm infants at home (Kusumahati et al., 2021).

Several public health programs have demonstrated that strengthening the capacity of health workers and community health cadres can improve the quality of maternal and child health services at the community level, including breastfeeding promotion, kangaroo mother care, and early detection of neonatal danger (Akuiyibo et al., 2022; Saleh et al., 2023; Shi & Zhang, 2011; Zaman et al., 2008; Santos et al., 2001; McCourt & Griffin, 2000). One important strategy to increase family engagement is Behavior Change Communication (BCC), a systematic communication approach designed to influence knowledge, attitudes, and behaviors so individuals can adopt and sustain healthier practices (Wilkins et al., 2014; Conner & Norman, 2015). Previous studies have shown that BCC-based interventions can improve knowledge, self-efficacy, and health practices; however, their application in supporting families of preterm infants after hospital discharge remains limited, often restricted to short-term clinical education (Akuiyibo et al., 2022; Saleh et al., 2023; Shi & Zhang, 2011; Zaman et al., 2008; Santos et al., 2001; McCourt & Griffin, 2000). Structured and sustainable communication models integrating health workers, community cadres, and families are also rarely developed, creating gaps in continuity of care for preterm infants at home.

Findings from the FGD and expert Delphi process further strengthened the rationale for the program. Experts agreed that communication training for health workers and community health cadres should be continuous, structured, and integrated into existing systems such as staff orientation and continuing professional development, using a blended learning approach in which online sessions strengthen core communication concepts while face-to-face sessions focus on simulation, role play, and practical skills in preterm infant care. The agreed core competencies included therapeutic communication, empathy, teach-back, motivational interviewing, crisis communication, intercultural and digital communication, emotional assessment of family members, interprofessional handover, and conflict management.

Midwives and primary health care providers play a strategic role in bridging continuity of care for preterm infants from hospital settings to community-based care. The competency standards of the International Confederation of Midwives (ICM) emphasize the responsibility of health professionals in providing health education, early detection of complications, and ongoing family support (ICM, 2024). However, communication practices within health services often remain largely informative and are not fully integrated with systematic behavior change communication approaches, potentially resulting in inconsistent health messages and limited support for families in implementing appropriate preterm infant care practices at home. Therefore, strengthening the capacity of health workers and community health cadres through structured BCC approaches is essential. Based on these conditions, this community service initiative was implemented through the program "Strengthening the Capacity of Health Workers and Community Health Cadres in Supporting Families of Preterm Infants through Behavior Change Communication (BCC) in Bandung Regency" to improve mothers' caring ability and support better health outcomes for preterm infants at the family and community levels.

METHOD

This community service program employed a participatory training approach based on capacity strengthening to enhance the ability of health workers and community health cadres to support families of preterm infants through a Behavior Change Communication (BCC) approach. The target participants were health workers and community health cadres involved in maternal and child health services in Bandung Regency. Participants consisted of representatives of community midwives and community health cadres from each primary health center (Puskesmas) in Bandung Regency (23 Puskesmas). Each Puskesmas was represented by one midwife and two cadres, totaling 69 participants. Participants were selected purposively based on predefined criteria, namely their involvement in maternal and infant health services at the community level, their roles in the referral system, and their participation in monitoring preterm infants within the Puskesmas service areas.

Prior to program implementation, an initial situation analysis was conducted through focus group discussions (FGDs), expert consultations, and discussions with health workers and community health cadres in Bandung Regency. The assessment identified several challenges in community-based preterm infant care, including variations in participants' understanding of preterm infant management, limited communication skills in family mentoring, inconsistent educational messages across service levels, and limited preparedness for continuity of care after hospital discharge. The findings also indicated the need for structured capacity strengthening focused on practical caregiving skills and Behavior Change Communication (BCC)-based approaches to support families of preterm infants in community settings.

The program was conducted over three days using a blended learning approach. The first day was conducted online via Zoom Meeting on Tuesday, 10 February 2026 at 8:00 AM (WIB) as a webinar to strengthen participants' understanding of preterm infant care services. The session covered the dynamics of prematurity in West Java, referral systems and service governance in Bandung Regency, practical nutrition management from hospitalization to home care, the clinical characteristics and developmental monitoring of preterm infants, the BCC-based family mentoring model, and effective communication in family accompaniment. The second and third days were conducted offline as workshops at the auditorium (Hall 01), 4th Floor, Otto Iskandar Dinata Regional General Hospital, Bandung Regency. The learning methods were designed to be participatory, combining interactive lectures, guided discussions, reflection on field experiences, simulations, role-play, and hands-on practice to strengthen both conceptual understanding and practical skills in supporting families of preterm infants. Participants were also provided with training modules containing practical guidance on preterm infant care procedures and BCC-based communication approaches for family mentoring.

The training materials covered various aspects relevant to preterm infant care and the strengthening of the health service system. Topics included the dynamics of prematurity in West Java and its implications for maternal and child health programs; referral systems for preterm infants and health service governance in Bandung Regency; nutritional management of preterm infants from hospitalization to transition to home care; clinical characteristics of preterm infants, essential care needs, and principles of growth and development monitoring; post-discharge care and monitoring of preterm infants in the community; and the introduction of a BCC-based family mentoring model for preterm infant care. In addition, a dedicated health communication session, facilitated by experts in health promotion and behavioral sciences, was provided to strengthen participants' skills in empathetic and family-centered communication, and in applying BCC principles to support families of preterm infants. Fig. 1 highlights interactive learning processes, including group discussions, role-play, and communication skill-building sessions.

Figure 1. Interactive learning, discussion, and communication skill-building sessions.

Practical sessions were organized using a skill station approach to enhance participants' practical competencies. Participants were divided into five groups and rotated through five practice stations, each lasting 36 minutes. The first station focused on stability management of preterm infants, including assessment of the infant's general condition, kangaroo mother care practice, safe techniques for holding and transferring infants, and environmental stimulation management. Fig. 2 presents simulation activities on kangaroo mother care (KMC), infant positioning, and safe handling techniques practiced by participants.

Figure 2. Kangaroo mother care (KMC) and safe infant handling simulation.

The second station emphasized nutritional care and safe feeding techniques, including breastfeeding positioning for preterm infants, expressed breast milk feeding, cup-feeding methods, and indications for the use of feeding tubes. The third station focused on growth and development monitoring, including measurement of body weight, body length, and head circumference, observation of infant behavior, and the use of monitoring checklists and follow-up schedules based on corrected age. Fig. 3 shows practical sessions on nutritional care, including breastfeeding positioning, expressed breast milk feeding, and alternative feeding techniques for preterm infants. Figure 4 depicts hands-on practice of growth and development monitoring, including anthropometric measurements and the use of monitoring tools based on corrected age.

Figure 3. Nutritional care and feeding techniques for preterm infants.

Figure 4. Growth and development monitoring practices using corrected age.

The fourth station emphasized infection prevention and daily home care, including proper handwashing practices, environmental hygiene, visitor management, and skin and umbilical cord care. Figure 5 illustrates infection prevention practices, including hand hygiene, umbilical cord care, and safe bathing techniques for preterm infants. The fifth station focused on identification of danger signs in preterm infants and clinical referral mechanisms, delivered through emergency simulation scenarios. Figure 6 presents simulation scenarios on identifying danger signs in preterm infants and appropriate referral decision-making.

Figure 5. Infection prevention and daily care practices for preterm infants

Figure 6. Identification of danger signs and emergency simulation scenarios

Program evaluation was conducted formatively through observation of participant engagement during discussions, simulations, and practice sessions at each skill station. This approach was used to assess participants' understanding of the training materials and their ability to apply caregiving and BCC-based communication skills in supporting families of preterm infants. The implementation method was designed to ensure effective knowledge transfer, improve practical skills, and strengthen communication capacity among health workers and community health cadres, thereby supporting the sustainable implementation of family mentoring for preterm infants at the community level.

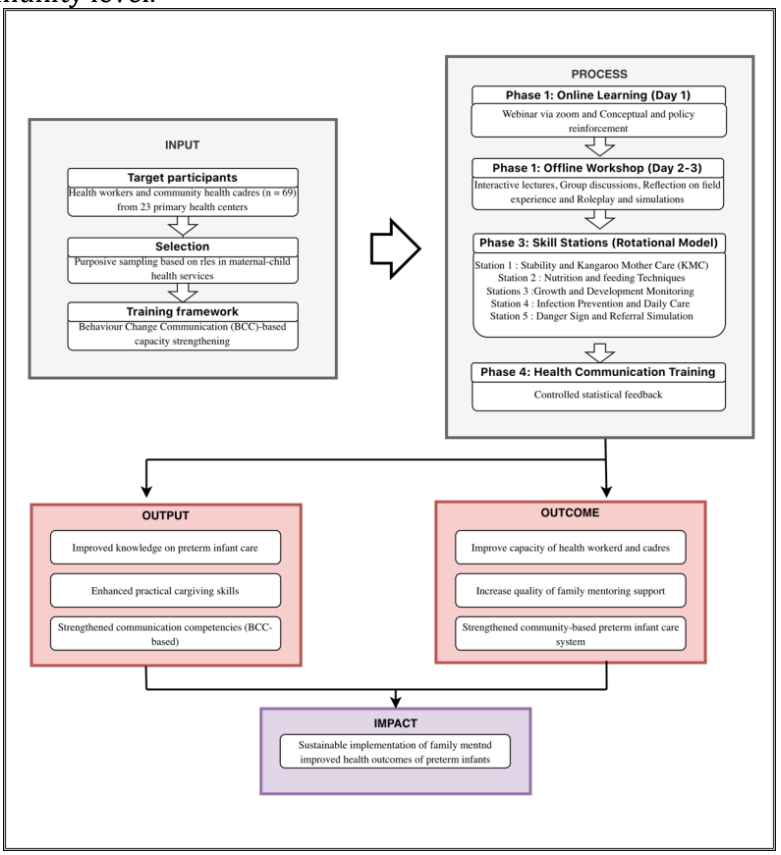

Figure 7. Operational flow of the BCC-based capacity-strengthening program for preterm infant family mentoring preparation

RESULTS AND DISCUSSION

Results :

1. Participant Characteristics

This capacity-strengthening program involved health workers and community health cadres from 23 primary health centers (Puskesmas) in Bandung Regency. A total of 69 participants attended the program, consisting of 23 health workers (midwives) and 46 community health cadres.

The educational distribution of health workers indicated that most participants held a Diploma III in Midwifery. In contrast, community health cadres predominantly had a secondary education level (senior high school), with a smaller proportion having junior high school, elementary school, and undergraduate education. These characteristics reflect the structure of the health workforce at the primary care and community levels that is directly involved in maternal and child health services.

Table 1. Educational Characteristics of Health Workers and Community Health Cadres

Education	Health Workers		Community Health Cadres	
	f	%	f	%
Senior High School	0	0	33	71.7
Junior High School	0	0	9	19.6
Elementary School	0	0	3	6.5
Diploma III in Midwifery	12	52.2	0	0
Bachelor's Degree (S1)	5	21.7	1	2.2
Professional Midwifery Degree	6	26.1	0	0
Total	23	100	46	100

The results indicate that most health workers had a vocational midwifery education, which represents the common educational background of health personnel in primary health care facilities. The presence of midwives with professional and undergraduate degrees also demonstrates variations in the level of professional competence among participants.

Most community health cadres had a senior high school educational background. This finding indicates that cadres generally represent community members with a secondary level of education; therefore, capacity-building activities through training are essential to strengthen their knowledge and skills in supporting maternal and child health services in the community.

2. Changes in Participants' Knowledge (Pre-test and Post-test)

Participants' capacity development in this program was evaluated through a knowledge assessment conducted before (pre-test) and after (post-test) the training. The analysis was performed for two participant groups: community health cadres and health workers (midwives).

a. Distribution of Knowledge Scores among Community Health Cadres and Health Workers

A total of 46 community health cadres and 23 health workers completed both pre-test and post-test assessments. In both groups, the distribution of knowledge levels shifted from moderate and poor categories toward the good category after the training.

Table 2. Distribution of Knowledge Levels among Community Health Cadres and Health Workers Based on Pre-test and Post-test Scores

	Community Health Cadres				Health Workers			
	Pre-test		Post-test		Pre-test		Post-test	
	f	%	f	%	f	%	f	%
Good (≥80)	27	58.7	42	91.3	15	65.2	21	91.3
Moderate (60–79)	15	32.6	3	6.5	7	30.4	2	8.7
Poor (<60)	4	8.7	1	2.2	1	4.3	0	0
Total	46	100	46	100	23	100	23	100

The findings indicate an overall improvement in participants' knowledge following the training. The proportion of participants in the good knowledge category increased to 91.3% in both groups, while the proportion within the moderate and poor categories decreased after the intervention. Among health workers, no participants remained in the poor knowledge category in the post-test assessment.

b. Changes in Knowledge Capacity among Community Health Cadres and Health Workers

A total of 46 community health cadres and 23 health workers completed both pre-test and post-test evaluations. The analysis indicated that most participants in both groups experienced increases in knowledge scores following the training.

Table 3. Changes in Knowledge Scores among Community Health Cadres and Health Workers

Score Change	Community Health Cadres		Health Workers	
	f	%	f	%
Increased	41	89.1	20	87.0
Unchanged	3	6.5	2	8.7
Decreased	2	4.3	1	4.3
Total	46	100	23	100

The results demonstrate that most community health cadres (89.1%) and health workers (87.0%) experienced increased knowledge scores after the training, while only a small proportion showed unchanged or decreased scores. Overall, post-test scores in both groups showed an upward trend compared to pre-test scores, indicating improved knowledge regarding preterm infant care, including growth and development monitoring, nutritional management, referral pathways, and effective communication in family mentoring. Compared with health workers, cadres demonstrated greater score gains from a lower baseline level of knowledge.

Discussion :

This capacity-strengthening program involved 69 participants, including 23 health workers (midwives) and 46 community health cadres from 23 primary health centers in Bandung Regency. This composition reflects a collaborative approach between professional health workers and community health cadres in supporting maternal and child health services at the primary care level. The involvement of both groups is important because community-based health services emphasize the synergy between formal health professionals and community actors to ensure the continuity of care, particularly for vulnerable populations such as preterm infants.

Most health workers had a vocational midwifery educational background, reflecting the common educational profile of health personnel involved in primary maternal and child health services. This condition reflects the structure of the midwifery workforce in primary health care facilities in Indonesia, where midwives with vocational education still dominate maternal and child health services in the community (Diniyati & Rauf, 2025; Zou et al., 2024). Vocational midwifery education is designed to equip health workers with essential clinical competencies in maternal and neonatal care, including maternal and infant health monitoring and early detection of complications (International Confederation of Midwives, 2025).

The presence of health workers with undergraduate and professional backgrounds also demonstrates variation in professional competence within the participant group. Such diversity may support collaborative learning during training activities, as participants with diverse educational levels and field experience can share practical knowledge. In the context of capacity strengthening, diversity in educational backgrounds may enrich discussion processes and enhance the effectiveness of experiential learning (Kolb, 2015).

Meanwhile, the characteristics of community health cadres show that most had a senior high school education (71.7%), followed by junior high school (19.6%), elementary school (6.5%), and undergraduate education (2.2%). This finding aligns with the general characteristics of community health cadres in many public health programs in Indonesia, where cadres are typically community members who volunteer to promote health and provide basic health services.

Within the community health approach, cadres serve as intermediaries between health professionals and the community. They assist in disseminating health information, monitoring family health conditions, and encouraging the utilization of health services. However, because community health cadres generally do not have formal health education backgrounds, capacity strengthening through training is essential to ensure that they possess adequate knowledge and skills to perform their roles effectively (WHO, 2018).

In the context of preterm infant care, the involvement of community health cadres is also crucial to ensure continuity of care after infants are discharged from hospitals. Preterm infants have a high risk of complications such as hypothermia, nutritional problems, and infections; therefore, monitoring and family support at the community level are critical (Blencowe et al., 2012). Through capacity strengthening, cadres are expected to assist families in recognizing danger signs, providing basic education on preterm infant care, and facilitating referrals to health facilities when necessary.

The participant characteristics in this program indicate that the capacity-strengthening initiative was designed to reach key actors in community-based health services midwives, as professional health workers, and community health cadres, as community health mobilizers. Collaboration between these two groups represents an essential component of the continuum of care approach in maternal and child health, which emphasizes the importance of integrated health services from health facilities to families and communities (Kerber et al., 2007). Strengthening the capacity of both groups is therefore expected to improve the effectiveness of family mentoring in caring for preterm infants at home.

This program represents an initial capacity-strengthening phase designed to prepare health workers and community health cadres for the subsequent implementation and effectiveness evaluation of a structured BCC-based mentoring model for families of preterm infants.

CONCLUSION

The capacity-strengthening program for health workers and community health cadres in Bandung Regency, supporting families of preterm infants through a Behavior Change Communication (BCC) approach, demonstrated effectiveness in improving participants' knowledge and skills. The training, which involved collaboration between midwives and community health cadres as key actors in community-based health services, resulted in an increase in the proportion of participants with good knowledge to 91.3% in both groups, with the majority of participants showing improved knowledge scores (89.1% among cadres and 87.0% among health workers). These findings suggest that a participatory training approach integrating clinical aspects of preterm infant care, growth and development monitoring, and behavior change communication can strengthen the preparedness of health workers and cadres in supporting families of preterm infants in community settings. More broadly, this capacity-strengthening initiative has the potential to support the continuity of preterm infant care after hospital discharge by improving service coordination, early detection of complications, and enhanced family support for home-based care practices. These findings further suggest that the program can be integrated into routine training for health workers at first-level health facilities (FKTP) to ensure sustainable and systematic support for families of preterm infants.

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AUTHOR CONTRIBUTION STATEMENT

MM conceptualized the program, coordinated implementation, conducted monitoring and evaluation, and led the manuscript preparation and reporting. QESA, DA, and DH contributed to the monitoring and evaluation of program implementation and provided critical input during the activity. YM provided expert guidance on the conceptual design of the premature infant care workshop. CM contributed to the development of the behavior change communication–based training framework. NN, HN, IK, WD, and NNA served as facilitators during the training and workshop sessions and supported the practical learning activities. All authors contributed to the review and approval of the final manuscript.

AI DISCLOSURE STATEMENT

The authors declare that this research was prepared, conducted, written, and edited without the use of artificial intelligence (AI) tools or techniques.

CONFLICTS OF INTEREST

The authors declare that there are no conflicts of interest related to this study, including financial, institutional, or personal interests that could have influenced the conduct of the research, data analysis, manuscript preparation, or publication process.

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