Changes in Awareness, Capacity, and Empowerment among Family Planning Cadres Following Community Empowerment Training in Padang City: A Three-Month Repeated-Measures Study

Dewi Susanti[1*], Rahmi Andrita Yuda[2], Erwani[1]

[1]Midwifery Department, Politeknik Kesehatan Padang, Kementerian Kesehatan, Padang, West Sumatra, Indonesia
[2]Midwifery Department, Faculty of Health, Universitas Mohammad Husni Thamrin, East Jakarta Indonesia

*Email correspondence: dewisusanti.bd@gmail.com

Track Record Article

Revised: 27 July 2026
Accepted: 05 September 2026
Published: 26 September 2026

How to cite :
Susanti, D., Yuda, R. A., & Erwani, E. (2026). Changes in Awareness, Capacity, and Empowerment among Family Planning Cadres Following Community Empowerment Training in Padang City: A Three-Month Repeated-Measures Study. *Contagion: Scientific Periodical Journal of Public Health and Coastal Health*, *8*(3), 374–390.

Abstract

Unmet need for contraception, defined as women who wish to postpone or avoid pregnancy but are not using any contraceptive method, remains a major public health challenge. In Indonesia, the prevalence of unmet need has remained at approximately 10–12% over the past two decades, while Padang City recorded 28.9% in the 2020 National Socioeconomic Survey, highlighting the need for effective community-based interventions. This study examined changes in family planning cadres' awareness, capacity, and empowerment following Community Empowerment Module–based training in Padang City. A one-group repeated-measures quasi-experimental study included 120 family planning cadres in Padang City, West Sumatra. All participants completed assessments at baseline (T0), immediately after the 21-day training program (T1), and at the three-month follow-up (T2). Awareness, capacity, and empowerment were assessed using structured questionnaires and knowledge assessments. Changes over time were analyzed using a repeated-measures General Linear Model with a significance level of $p < 0.05$. All three outcomes increased progressively across the three measurement points. From baseline to three months, awareness increased by 3.875 points (95% CI: 3.648–4.102), capacity by 8.875 points (95% CI: 8.587–9.163), and empowerment by 18.692 points (95% CI: 18.243–19.140), with all adjusted p-values < 0.001. The overall effects across the three measurement points were large for awareness (partial $\eta^2 = 0.936$), capacity (partial $\eta^2 = 0.979$), and empowerment (partial $\eta^2 = 0.993$). Community Empowerment Module–based training was associated with improvements in family planning cadres' awareness, capacity, and empowerment, with improvements persisting at the three-month assessment. These findings suggest enhanced cadre competencies that may support community-based efforts to address unmet need for contraception; however, whether the intervention reduces the prevalence of unmet need for contraception remains to be demonstrated.

Keywords: Contraception, Unmet Need, Community Empowerment, Community Health Workers, Indonesia

INTRODUCTION

Family planning is a cornerstone of reproductive health, contributing directly to maternal survival, healthy child development, and overall family welfare. Global estimates indicate that among approximately 923 million women of reproductive age in low- and middle-income countries who wish to avoid pregnancy, about 218 million still have an unmet need for modern contraception; that is, they want to postpone or limit childbearing but are not using any effective modern method (Habib, 2022; WHO, 2020, 2023). This situation leaves millions of women at high risk of unintended pregnancy and illustrates a persistent gap between fertility preferences and the actual use of family planning services (Mulenga et al., 2020).

Recent nationally representative evidence from the 2017 Indonesia Demographic and Health Survey (IDHS) reported an adjusted 1.3-fold higher odds of unintended pregnancy among women with unmet contraceptive need compared with those whose contraceptive needs were met (Lubis & Sartika, 2025). According to the 2017 Indonesia Demographic and Health Survey (IDHS), the prevalence of unmet need for family planning was 10.6%, exceeding the National Medium-Term Development Plan (RPJMN) 2015–2019 target of 9.9%. The subsequent RPJMN (2020–2024) further reduced the target to 7.4%, highlighting the need for continued efforts to reduce unmet need in Indonesia (Utami & Samosir, 2021).

Local evidence also indicates that the unmet need for family planning remains an important concern in Padang City. Data reported from the 2020 National Socioeconomic Survey (SUSENAS) showed an unmet need prevalence of 28.9% in Padang City, while West Sumatra recorded 25.5% (Erwani et al., 2023). These city- and provincial-level figures provide contextual evidence that unmet need remains a relevant family planning issue in the study setting. However, the provincial estimate is presented only as broader regional context and is not used to infer the epidemiological situation in Padang City. The relatively high prevalence observed in Padang City underscores the importance of strengthening community-based family planning support and the capacity of family planning cadres (BKKBN, 2022). Padang City and the wider Minangkabau region of West Sumatra exemplify this situation while presenting distinctive socio-cultural characteristics. Minangkabau society is organized around a matrilineal kinship system in which lineage and inheritance are traced through the maternal line, and women occupy a symbolically central position in family and community life (Noviarini, 2021).

In everyday practice, contraceptive decision-making in Padang may be influenced by spousal support and communication. A study among new family planning acceptors in Padang found that husband support was significantly associated with contraceptive method selection, with husband support identified as the dominant factor in the study population. However, the nature and extent of spousal and family influence may vary across households and should not be assumed to be uniform across Minangkabau families (Rahmatiqa & Patricia, 2020). Studies in Minangkabau communities have reported that husbands' disapproval, preferences for the number and sex of children, and persistent myths or fears about contraception are important reasons for non-use, alongside concerns about religious permissibility and adherence to customary norms (Dwi Santi Violentina et al., 2020). These cultural dynamics may help explain why unmet need remains elevated in this region despite the formal availability of services and the priority given to family planning within local health programs. One strategy

that has been implemented to address these challenges is the strengthening of community-based support through family planning cadres and the development of community empowerment modules.

In the Indonesian family planning program, community cadres play a supportive role in disseminating family planning information, encouraging community participation, and facilitating access to family planning services. Depending on local program implementation, cadres may also provide basic information and facilitate referrals to formal family planning providers, under the coordination of family planning personnel (BKKBN, 2022; Rahayu et al., 2022). Community empowerment modules have been introduced as structured tools to guide cadres and other stakeholders in identifying women with unmet need, addressing misconceptions about contraception, and facilitating linkages to appropriate services while taking into account local cultural and religious contexts (Saputri et al., 2022; Yaya et al., 2021).

Evidence from various settings suggests that empowerment-oriented, community-based interventions can improve knowledge, shift norms, and increase contraceptive uptake. Nevertheless, most studies to date have focused on determinants of unmet need or on short-term educational activities (Kaysin et al., 2024). Previous studies have evaluated community-based family planning interventions through cadre training, educational modules, and community empowerment approaches (Wolfe et al., 2025). However, the interventions and outcomes assessed have varied across studies. Some have primarily focused on improvements in knowledge or immediate post-intervention outcomes, while fewer have examined broader changes in cadres' capacity and empowerment. Moreover, evidence on structured, module-based cadre training in urban Indonesian settings remains limited, particularly regarding changes that persist beyond the immediate post-training period.

In Padang, where unmet need for family planning remains a concern, there is a need for evidence on whether structured cadre training can strengthen cadres' awareness, capacity, and empowerment. Therefore, the present study evaluates a structured, module-based cadre empowerment intervention and examines changes in cadres' awareness, capacity, and empowerment over time (Hakizimana & Odjidja, 2021; Irma & Mario, 2020; Utami & Samosir, 2021). The present study was designed to address this gap by developing and evaluating a Community Empowerment Module integrated into a structured training program for family planning cadres in Padang City. Using data collected through monitoring, interviews, and questionnaires administered to cadres, health-care stakeholders, and community members, the study assesses changes in key cadre competencies and explores their potential contribution to reducing unmet need. This study introduces a structured, module-

based approach to family planning cadre development that integrates awareness, capacity, and empowerment as interconnected dimensions of cadre performance. Its contribution extends beyond immediate knowledge improvement by examining sustained changes following the intervention in an urban Indonesian setting. The study therefore provides context-specific evidence on the potential of structured cadre empowerment to strengthen community-based responses to unmet need for family planning in Padang City.

METHOD

This study employed a one-group repeated-measures quasi-experimental design to evaluate changes in the awareness, capacity, and empowerment of family planning (FP) cadres following a structured FP training program combined with the Community Empowerment Module. The same participants were assessed at three measurement points: baseline before the intervention (T0), immediately after completion of the 21-day training program (T1), and three months after the intervention (T2). The *Repeated-Measures* design enabled within-participant comparisons of changes over time and examination of whether the changes observed immediately after training remained evident at the three-month follow-up.

The study was conducted in 12 Kampung KB (Family Planning Villages) in Padang City, West Sumatra, Indonesia. Data collection was conducted from June to August 2023. Eligible FP cadres were selected using proportional random sampling according to the number of eligible cadres in each Kampung KB, thereby ensuring proportional representation across the participating sites. The study included 120 active FP cadres from the Minangkabau region of West Sumatra. Participants were eligible if they had at least a senior high school education, had previous experience as FP cadres, and were willing to participate in the training program and complete all study assessments. All 120 participants completed assessments at T0, T1, and T2 and were therefore included in the repeated-measures analysis.

An a priori power analysis was conducted for a one-group repeated-measures design using an F test (ANOVA: *Repeated Measures, Within Factors*) with three measurement time points. Because no directly comparable study was available to provide an effect-size estimate for the combined awareness, capacity, and empowerment outcomes among FP cadres, a medium effect size (Cohen's $f = 0.25$) was assumed based on conventional criteria for ANOVA effect sizes. The analysis was specified with a significance level of $\alpha = 0.05$, statistical power of 85%, a correlation of 0.50 among repeated measurements, and a nonsphericity correction of 1.0. Based on these parameters, the final sample of 120 participants was considered adequate to detect a medium within-subject effect.

The intervention consisted of a structured 21-day FP training program incorporating the Community Empowerment Module. The program was designed to strengthen cadres' knowledge, practical skills, confidence, and participation in addressing unmet need for family planning at the community level. The training covered FP principles, contraceptive methods, determinants of unmet need, communication and counselling, family involvement, and community mobilization. Teaching methods included lectures, guided discussions, role-play, case-based learning, and supervised practice.

The Community Empowerment Module was developed based on findings from a preceding qualitative needs-assessment study conducted in Kampung KB, Padang City (Erwani et al., 2023). The study identified five major factors contributing to unmet need for family planning: limited knowledge, attitudes, and beliefs; limited access to information and services; religious understanding; and husband support. It also identified three community empowerment strategies: awareness raising, capacity building, and empowerment/enabling. These findings were translated into module content addressing FP knowledge and misconceptions, culturally and religiously appropriate communication, access to information and services, couple communication and male involvement, cadre capacity building, and community mobilization.

The initial module and questionnaire were reviewed by three experts with expertise in module development, instructional design, and family and reproductive health. Expert review assessed the relevance, clarity, comprehensiveness, and appropriateness of the content for FP cadres. The recommendations were incorporated into the revised module and questionnaire before pilot testing. The questionnaire was pilot-tested among 30 individuals who were not included in the main study and represented the intended community stakeholders, including FP cadres, religious leaders, and community leaders. Item validity was assessed using item-total correlation, with a correlation coefficient of ≥ 0.30 considered acceptable. All items met the predetermined validity criterion. Internal consistency was assessed separately for each construct using Cronbach's alpha, and the awareness, capacity, and empowerment scales demonstrated acceptable internal consistency, with Cronbach's alpha coefficients of ≥ 0.70 (Kennedy, 2022).

The revised Community Empowerment Module was subsequently tested with 10 potential users comprising FP cadres, religious leaders, and community leaders. This stage assessed language clarity, comprehensibility, and ease of use. Feedback resulted in simplification of language, provision of more detailed instructions for module use, and inclusion of additional supporting educational media. These recommendations were

incorporated into the final module, which was subsequently reviewed by the expert team before implementation.

The primary outcomes were awareness, capacity, and empowerment. Awareness referred to cadres' knowledge and understanding of FP concepts, contraceptive methods, and unmet need. Capacity referred to cadres' perceived ability to identify unmet need, provide basic FP information and counselling, support referrals, and conduct community-level FP activities. Empowerment referred to cadres' confidence, autonomy, participation, and perceived role in mobilizing families and communities to support family planning. The same validated questionnaire was administered at T0 (baseline), T1 (immediately post-training), and T2 (three-month follow-up) to enable direct within-participant comparisons. The characteristics and psychometric assessment of the instruments are summarized in Table 1.

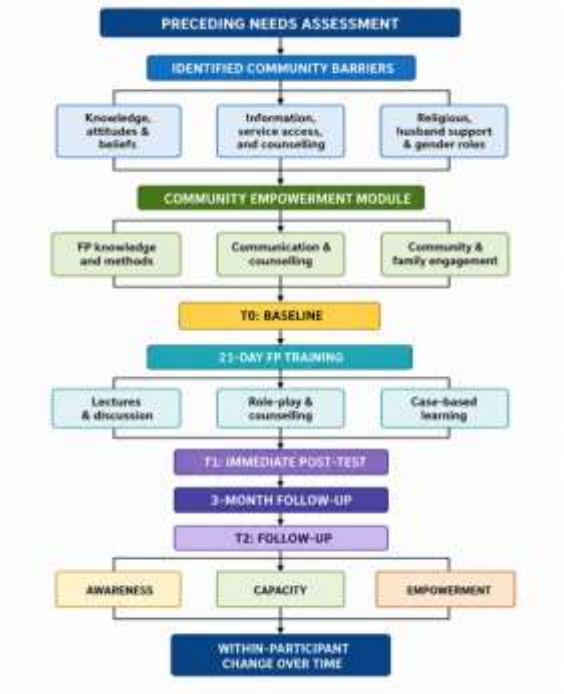
Table 1. Description and Psychometric Assessment of the Study Instruments

Outcome	Operational Definition	Main Domains	Psychometric Assessment
Awareness	Knowledge and understanding of FP and unmet need	FP concepts, contraceptive methods, side effects, and unmet need	Item-total correlation ≥0.30; Cronbach's α ≥0.70
Capacity	Perceived ability to perform FP-related activities at community level	Identification of unmet need, counselling, communication, referral, and community activities	Item-total correlation ≥0.30; Cronbach's α ≥0.70
Empowerment	Confidence, autonomy, participation, and perceived role in FP promotion	Self-confidence, family involvement, community mobilization, and participation	Item-total correlation ≥0.30; Cronbach's α ≥0.70

A logical framework was developed to illustrate how the findings of the preceding needs assessment informed the intervention and the expected cadre-level outcomes.

All data were entered and analyzed using IBM SPSS Statistics version 27.0 (IBM Corp., Armonk, NY, USA). Descriptive statistics were used to summarize participants' characteristics and awareness, capacity, and empowerment scores at each measurement point. Changes in awareness, capacity, and empowerment across T0, T1, and T2 were examined using a one-way repeated-measures General Linear Model (GLM). Before the analysis, assumptions of normality, sphericity, and the presence of potential outliers were assessed. Normality was evaluated using the Shapiro-Wilk test, while potential outliers were examined using standardized residuals and inspection of score distributions. Participant retention and missing data were also examined before the repeated-measures analysis.

Figure 1. Logical Framework of the Community Empowerment-Based Family Planning Training Program



Mauchly's test of sphericity was used to assess the sphericity assumption. When sphericity was violated, the Greenhouse–Geisser correction was applied to the degrees of freedom. Significant overall within-subject effects were followed by pairwise comparisons based on estimated marginal means with Bonferroni adjustment for multiple comparisons. Statistical significance was set at $p < 0.05$, and partial eta squared (ηp^2) was reported as the measure of effect size. The repeated-measures GLM approach was used to evaluate within-participant changes across the three measurement points (Piegorsch & Bailer, 2020). Because the study used a one-group design without a control group, statistically significant differences were interpreted as changes over time following the training program and were not interpreted as definitive evidence of a causal effect attributable solely to the intervention.

The study received ethical approval from the Research Ethics Committee of the Faculty of Medicine, Andalas University (approval number 160/UN.16.2/KEP-FK/2022, dated 23 May 2022). All participants received an explanation of the study objectives and procedures before enrolment. Written informed consent was obtained from all participants who agreed to participate. Participant confidentiality was maintained throughout data collection, analysis, and reporting, and all study procedures followed applicable ethical principles for research involving human participants.

RESULTS

A total of 120 eligible family planning cadres were recruited and enrolled. All participants completed the baseline assessment (T0), participated in the 21-day training program, and completed both the immediate post-training assessment (T1) and the three-month follow-up assessment (T2). No loss to follow-up occurred**,** and all 120 participants were included in the repeated-measures analysis. The mean age was 37.92 ± 6.80 years (range, 26–53 years). Regarding educational attainment, 62 participants (51.7%) had completed senior high school and 58 (48.3%) had attained higher education (Table 2). Before conducting the repeated-measures GLM, the distribution of the model residuals was assessed using the Shapiro–Wilk test and normal Q–Q plot. The Shapiro–Wilk test indicated a statistically significant deviation from normality (W = 0.938, $p < 0.001$). However, visual inspection of the Q–Q plot showed that most residuals were reasonably distributed around the reference line, with deviations primarily observed at the lower and upper tails (Figure 2). Given the sample size (n = 120) and the overall distributional pattern, the repeated-measures GLM was retained for the analysis.

Table 2. Sociodemographic Characteristics of Family Planning Cadres

Characteristic	n (%) / Mean ± SD
Age (years)	**37.92 ± 6.80**
Range	26–53
Educational attainment	
Senior high school	62 (51.7)
Higher education	58 (48.3)
Total	**120 (100.0)**

Figure 2. Normal Q-Q Plot

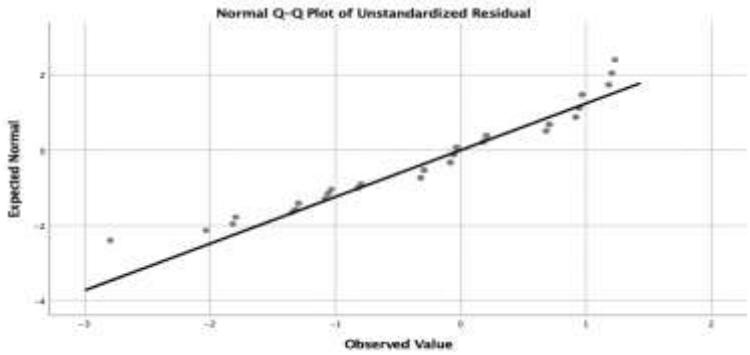


Table 3. Descriptive Statistics of Awareness, Capacity, and Empowerment Scores Across Measurement Points

Variable	Baseline (T0), Mean ± SD	Posttest 1 (21 days), Mean ± SD	Posttest 2 (3 months), Mean ± SD	n
Awareness	5.03 ± 0.983	6.96 ± 0.749	8.90 ± 0.726	120

Variable	Baseline (T0), Mean ± SD	Posttest 1 (21 days), Mean ± SD	Posttest 2 (3 months), Mean ± SD	n
Capacity	9.90 ± 1.177	13.93 ± 1.265	18.77 ± 0.884	120
Empowerment	27.88 ± 1.285	37.42 ± 1.733	46.58 ± 1.986	120

Table 3 presents the changes in cadres' awareness, capacity, and empowerment scores across the three measurement points. Overall, all three outcomes demonstrated a progressive upward pattern from baseline to the immediate post-training assessment, with further increases observed at the three-month follow-up. The consistent increase across successive assessments indicates that the highest scores for all three domains were observed at the end of the follow-up period. Among the three outcomes, empowerment showed the greatest overall change, followed by capacity and awareness. This pattern indicates progressive improvements across the assessed domains throughout the observation period. The relatively small standard deviations at each measurement point indicate limited variability in participants' scores within each assessment period.

Table 4. Within-Subject Comparisons of Awareness, Capacity, and Empowerment Across Measurement Points

Variable	Comparison	F (1,119)	p-value	Partial η^2
Awareness	Baseline (T0) vs. 21 days (T1)	655.18	<0.001	0.846
	21 days (T1) vs. 3 months (T2)	1643.53	<0.001	0.932
Capacity	Baseline (T0) vs. 21 days (T1)	1504.26	<0.001	0.927
	21 days (T1) vs. 3 months (T2)	4634.04	<0.001	0.975
Empowerment	Baseline (T0) vs. 21 days (T1)	9574.22	<0.001	0.988
	21 days (T1) vs. 3 months (T2)	5957.65	<0.001	0.980

Within-subject analysis demonstrated statistically significant changes in awareness, capacity, and empowerment across successive measurement points (Table 4). Significant increases were observed from baseline to the 21-day post-training assessment and continued from the 21-day assessment to the three-month follow-up for all three outcomes ($p < 0.001$). The magnitude of the observed changes was substantial, with partial η^2 values ranging from 0.846 to 0.988 across the comparisons. Capacity and empowerment showed particularly large changes across both assessment intervals, whereas awareness also demonstrated a large increase over time. Overall, the findings indicate that changes in all three outcomes occurred progressively across the observation period, with further increases observed at the three-month follow-up.

Table 5. Multivariate Test of Contrasts: Awareness, Capacity and Empowerment

Variable	Effect	Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared
Awareness	Pillai's Trace	.936	865.175[b]	2.000	118.000	.000	.936
	Wilks' Lambda	.064	865.175[b]	2.000	118.000	.000	.936
	Hotelling's Trace	14.664	865.175[b]	2.000	118.000	.000	.936
	Roy's Largest Root	14.664	865.175[b]	2.000	118.000	.000	.936
Capacity	Pillai's Trace	.979	2807.438[b]	2.000	118.000	.000	.979
	Wilks' Lambda	.021	2807.438[b]	2.000	118.000	.000	.979
	Hotelling's Trace	47.584	2807.438[b]	2.000	118.000	.000	.979
	Roy's Largest Root	47.584	2807.438[b]	2.000	118.000	.000	.979
Empowerment	Pillai's Trace	.993	8039.355[b]	2.000	118.000	.000	.993
	Wilks' Lambda	.007	8039.355[b]	2.000	118.000	.000	.993
	Hotelling's Trace	136.260	8039.355[b]	2.000	118.000	.000	.993
	Roy's Largest Root	136.260	8039.355[b]	2.000	118.000	.000	.993

Multivariate analysis using Pillai's Trace demonstrated statistically significant changes in awareness, capacity, and empowerment across the three measurement points (all $p < 0.001$). The magnitude of the observed time-related changes was very large for all three outcomes, with partial η^2 values of 0.936, 0.979, and 0.993 for awareness, capacity, and empowerment, respectively. Among the three outcomes, empowerment showed the largest magnitude of change, followed by capacity and awareness. Overall, these findings demonstrate substantial differences in the three outcome scores across the baseline, immediate post-training, and three-month follow-up assessments.

Table 6. Bonferroni-Adjusted Pairwise Comparisons

Variable	Comparison	Mean Difference (I–J)	95% CI	Adjusted p-value
Awareness	T0 vs T1	−1.933	−2.117 to −1.750	<0.001
	T0 vs T2	−3.875	−4.102 to −3.648	<0.001
	T1 vs T2	−1.942	−2.102 to −1.781	<0.001
Capacity	T0 vs T1	−4.025	−4.288 to −3.762	<0.001
	T0 vs T2	−8.875	−9.163 to −8.587	<0.001

Variable	Comparison	Mean Difference (I–J)	95% CI	Adjusted p-value
	T1 vs T2	−4.850	−5.154 to −4.546	<0.001
Empowerment	T0 vs T1	−9.540	−9.778 to −9.305	<0.001
	T0 vs T2	−18.692	−19.140 to −18.243	<0.001
	T1 vs T2	−9.150	−9.609 to −8.691	<0.001

Bonferroni-adjusted pairwise comparisons confirmed statistically significant differences between all measurement points for awareness, capacity, and empowerment (all adjusted $p < 0.001$). Scores increased significantly from baseline to the 21-day post-training assessment and increased further between the 21-day assessment and the three-month follow-up. The comparison between baseline and three months showed the largest overall difference across all three outcomes, with the greatest magnitude observed for empowerment, followed by capacity and awareness. These findings confirm that the observed changes occurred consistently across each successive measurement interval.

DISCUSSION

The findings of this study provide preliminary evidence of favorable changes in cadres' awareness, capacity, and empowerment following a 21-day family planning training program integrated with Community Empowerment modules. Significant changes were observed across the three measurement time points, with improvements continuing through the 3-month follow-up. These findings provide insight into the potential role of an integrated training and community empowerment approach in strengthening cadre-level support for family planning. However, given the one-group study design and absence of a comparison group, the observed changes should not be interpreted as definitive evidence of intervention efficacy or as direct evidence of a reduction in unmet need for family planning.

The observed improvement in awareness following the 21-day family planning training may be related to the structured and intensive learning process provided through the Community Empowerment modules. The training combined systematic delivery of family planning information with discussion, clarification, and opportunities for practical application, which may have facilitated knowledge acquisition and retention (Kaysin et al., 2024). This interpretation is supported by previous training studies among community health workers. Firooznia et al. (2020), using repeated measurements and a General Linear Model, reported a substantial increase in knowledge among community health workers following in-service training, from 45.23 at baseline to 79.31 immediately after training, with the score remaining higher than baseline at 3 months (66.82) (Firooznia et al., 2020). Similarly, an action-oriented educational intervention among community health workers demonstrated sustained

improvements in knowledge and practice one year after training, with the intervention group maintaining significantly higher scores than baseline and the control group (Wolfe et al., 2025). More recently, Pathare et al. (2026) reported that knowledge among 436 community health workers increased substantially after training and remained above baseline at 6 and 12 months, although scores declined slightly from the immediate post-training assessment (Pathare et al., 2026). These findings suggest that structured and practice-oriented training may facilitate knowledge retention beyond the formal training period. In the present study, the significant improvement observed at three months may similarly reflect retention of the training content and possible opportunities to apply the acquired knowledge in routine community activities. However, because post-training reinforcement, frequency of cadre activities, and actual application of knowledge were not directly measured, these mechanisms cannot be confirmed. Repeated exposure to the assessment instrument may also have contributed to the observed improvement. The findings of this study showed that cadres' capacity increased after participating in the 21-day training program and continued to improve at the three-month follow-up. This finding suggests that the Community Empowerment Module not only enhanced cadres' competencies immediately after the intervention but also supported the retention and application of these competencies over time.

The observed improvement in cadres' capacity may be related to the structured learning process provided through the Community Empowerment Module. According to Adult Learning Theory, learning is more effective when participants engage actively in problem-oriented learning and have opportunities to apply newly acquired knowledge and skills in real-life situations (Levandowski, 2025). In the present study, interactive training sessions, practical exercises, and module-guided learning may have supported improvements in cadres' understanding and perceived capacity to identify women with unmet need for contraception, provide counselling, and facilitate access to contraceptive services. The further improvement observed at the three-month assessment may potentially reflect retention of the training content and opportunities to apply the acquired knowledge in routine community activities. However, because post-training reinforcement, frequency of cadres' activities, and additional exposure to family planning information were not systematically assessed, these mechanisms cannot be confirmed. Repeated exposure to the assessment instrument may also have contributed to the observed increase.

Furthermore, Empowerment Theory explains that increasing knowledge and practical skills enhances individuals' perceived competence and self-efficacy, thereby increasing their confidence and readiness to perform community-based health activities. These theoretical

perspectives may explain why the improvement in cadres' capacity was sustained three months after the intervention(Baghini et al., 2023). These findings are consistent with previous studies by Kim et al. (2022) and Rahayu et al. (2022), which demonstrated that community empowerment interventions effectively strengthened the capacity of community health workers (Kim et al., 2022; Rahayu et al., 2022). Likewise, recent evidence indicates that strengthening community empowerment and engaging community health workers are important strategies for increasing contraceptive use and addressing unmet need for family planning (Pal & Akanda, 2026). The present findings add evidence that cadres' perceived capacity improved through the three-month assessment following structured training; whether these changes affect contraceptive use or unmet need requires further study.(Utami & Samosir, 2021)

The study demonstrates that the empowerment levels of participants witnessed a significant upsurge subsequent to the training. Those initially possessing limited empowerment in the context of family planning became more adept in terms of knowledge, skills, and readiness to combat Unmet Need for Contraception. This elevation in empowerment aligns with the conceptualization of empowerment in the research, which emphasizes the agency of empowered individuals in making informed decisions about healthcare (Kaysin et al., 2024; Khan et al., 2022). Saputri et al. (2022) further substantiate the importance of empowerment modules in enhancing community readiness for behavioral transformation(Saputri et al., 2022).

The observed improvements in awareness, capacity, and empowerment were maintained or further increased at the three-month follow-up. However, these findings indicate persistence of the observed changes at the three-month assessment rather than long-term sustainability. Although the changes showed large statistical effect sizes, their practical significance should be interpreted cautiously because validated minimally important differences or clinically meaningful thresholds were not established for the instruments. The observed improvements may nevertheless have practical relevance for strengthening cadres' potential to support community-based family planning activities (Sharma et al., 2024). These findings indicate favorable changes in cadres' awareness, capacity, and empowerment following the training. Although such cadre-level improvements may strengthen their potential to support community-based family planning activities, whether these improvements translate into increased contraceptive uptake or reduced unmet need for contraception among women remains to be determined in future studies (Amaje & Ayalew, 2022; Teshale, 2022). This notion of sustained impact is in harmony with the research of Mulenga et al. (2020), which underscores the enduring effects of interventions in mitigating unmet need for family planning.

Furthermore, Utami and Samosir (2021) spotlight the criticality of sustained capacity among community health workers, lending support to the program's sustained impact (Mulenga et al., 2020; Utami & Samosir, 2021).

The observed improvements in cadres' awareness, capacity, and empowerment may reflect the contribution of the Community Empowerment Module to cadre-level outcomes. However, specific components of the empowerment strategy, including community and religious leader involvement, husbands' participation, and access to family planning services, were not separately measured or evaluated. Therefore, their individual contributions cannot be determined from the present study. Future research should evaluate these components systematically and examine whether cadre-level improvements translate into increased contraceptive uptake and reduced unmet need for contraception.

The findings of this study may be relevant to community-based family planning programs in settings with similar community structures, cadre roles, and cultural contexts. However, transferability should be interpreted cautiously because the study was conducted in a single city and did not include a comparison group. The findings therefore provide preliminary evidence of favorable changes in cadres' awareness, perceived capacity, and empowerment following the 21-day family planning training program incorporating the Community Empowerment Module, but should not be interpreted as definitive evidence of program efficacy or a direct reduction in unmet need for family planning. The culturally adapted, empowerment-based approach may contribute to the refinement of community-based family planning programs, consistent with recent evidence supporting contextually adapted, competency-based training and continued support for strengthening community health worker capacity and community engagement (Kim et al., 2022; Othman & Selnow, 2025; Wolfe et al., 2025). Further controlled, larger-scale studies with longer follow-up and direct assessment of contraceptive uptake, unmet need, and other population-level family planning outcomes are warranted to determine whether improvements in cadre-level competencies translate into measurable community-level benefits (Fitrianingsih & Deniati, 2022; Namukoko et al., 2022; Utomo et al., 2021).

CONCLUSION

This study demonstrated significant improvements in awareness, capacity, and empowerment among family planning cadres following a 21-day training program integrated with a Community Empowerment module. The progressive increases observed from baseline to the immediate post-training assessment and at the three-month follow-up, together with very

large effect sizes, suggest potential strengthening of cadres' competencies and preparedness to support community-based family planning activities. However, the one-group repeated-measures design without a comparison group limits causal inference, and the observed changes cannot be attributed solely to the training program. In addition, unmet need for contraception, modern contraceptive prevalence rate (mCPR), contraceptive uptake, and unintended pregnancy were not directly assessed; therefore, the findings are limited to cadre-level outcomes. The transferability of these findings may also be influenced by the sociocultural context of the matrilineal Minangkabau community in Padang City. Future research should employ a cluster-randomized controlled trial (cRCT) to determine whether improvements in cadre competencies translate into population-level changes in unmet need and mCPR. Longer follow-up and cost-effectiveness analyses are also warranted to assess the sustainability, economic value, and applicability of the intervention across different settings.

REFERENCES

Amaje, E., & Ayalew, T. (2022). Unmet need for family planning and associated factors, among women of child-bearing age working in Hawassa industrial park, Southern Ethiopia 2021: An institution based cross-sectional study. *Clinical Epidemiology and Global Health*, *17*. https://doi.org/10.1016/j.cegh.2022.101122

Baghini, F. K., Iranifard, E., Roudsari, R. L., & Najmabadi, K. M. (2023). The Role of Midwives in Women's Empowerment: A Narrative Review. In *Journal of Midwifery and Reproductive Health* (Vol. 11, Number 3). https://doi.org/10.22038/JMRH.2022.68761.2016

BKKBN. (2022). Laporan Kinerja BKKBN Tahun 2022. In *BKKBN*. https://www.bkkbn.go.id/pages-laporan-kinerja

Dwi Santi Violentina, Y., Yetti, H., & Amir, A. (2020). Analisis Karakteristik Wanita Usia Subur, Dukungan Suami, dan Peran Bidan terhadap Unmet Need Keluarga Berencana di Wilayah Kerja Puskesmas Bungus Kota Padang. *Jurnal Kesehatan Andalas*, *8*(4). https://doi.org/10.25077/jka.v8i4.1144

Erwani, Susanti, D., Yusefni, E., & Faizal, M. (2023). Analisis Faktor dan Upaya Pencegahan Unmet Need KB di Kota Padang. *Jurnal Kesehatan Prima Nusantara*, *14*(1), 47–055. https://doi.org/10.35730/jk.v14i1.980

Firooznia, M., Hamta, A., & Shakerian, S. (2020). The effectiveness of in-service training "pharmacopeia home health" based on Kirkpatrick's model: A quasi-experimental study. *Journal of Education and Health Promotion*, *9*(1). https://doi.org/10.4103/jehp.jehp_170_20

Fitrianingsih, A. D. R., & Deniati, E. N. (2022). Unmet need for family planning and related difficulties among married women of childbearing age in Bandung Slum, Indonesia. *Journal of Public Health in Africa*, *13*(s2). https://doi.org/10.4081/jphia.2022.2398

Habib, M. (2022). Barriers to Family Planning: Challenges in Access Around the World The Global Status of Family Planning. *Population Institute*, (August), 1–4.

Hakizimana, S., & Odjidja, E. N. (2021). Beyond knowledge acquisition: factors influencing family planning utilization among women in conservative communities in Rural Burundi. *Reproductive Health*, *18*(1). https://doi.org/10.1186/s12978-021-01150-7

Irma, A., & Mario, E. (2020). Underlying the Factors of Unmet Need for Family Planning in Indonesia: A Spatial Analysis. *Global Journal of Health Science*, *13*(2). https://doi.org/10.5539/gjhs.v13n2p6

Kaysin, A., Antoniello, P., Agarwal, S., & Perry, H. (2024). Strategies for Sustained Empowerment of Community Health Workers: A Qualitative Analysis of the Comprehensive Rural Health Project in Jamkhed, India. *Inquiry (United States)*, *61*. https://doi.org/10.1177/00469580241235059

Kennedy, I. (2022). Sample Size Determination in Test-Retest and Cronbach Alpha Reliability Estimates. *British Journal of Contemporary Education*, *2*(1). https://doi.org/10.52589/bjce-fy266hk9

Khan, R., MacQuarrie, K. L. D., Sultana, M., & Nahar, Q. (2022). Intermittent Needs for Family Planning among Women with an Internal Migrant Husband in Bangladesh: A Qualitative Study. *Sexual and Reproductive Health Matters*, *29*(2). https://doi.org/10.1080/26410397.2022.2097044

Kim, T. Y., Igras, S., Barker, K. M., Diakité, M., & Lundgren, R. I. (2022). The power of women's and men's Social Networks to catalyse normative and behavioural change: evaluation of an intervention addressing Unmet need for Family Planning in Benin. *BMC Public Health*, *22*(1). https://doi.org/10.1186/s12889-022-12681-4

Levandowski, S. (2025). Adult Learning Theory. In *Routledge Companion to Occupational Therapy: Theories, Concepts and Models*. https://doi.org/10.4324/9781003526766-54

Lubis, P. N., & Sartika, R. A. D. (2025). Unmet contraceptive needs as the risk for unintended pregnancies in Indonesia. *Health Care for Women International*. https://doi.org/10.1080/07399332.2025.2513462

Mulenga, J. N., Bwalya, B. B., Mulenga, M. C., & Mumba, K. (2020). Determinants of unmet need for family planning among married women in Zambia. *Journal of Public Health in Africa*, *11*(1). https://doi.org/10.4081/jphia.2020.1084

Namukoko, H., Likwa, R. N., Hamoonga, T. E., & Phiri, M. (2022). Unmet need for family planning among married women in Zambia: lessons from the 2018 Demographic and Health Survey. *BMC Women's Health*, *22*(1). https://doi.org/10.1186/s12905-022-01709-x

Noviarini, T. (2021). Ideologi Feminisme Pada Hikayat Minangkabau. *Jurnal Inovasi Penelitian*, *14*(1).

Othman, M., & Selnow, G. W. (2025). Community health workers: a narrative review of a curriculum and training program for low-income communities facing limited access to healthcare. *Frontiers in Public Health*, *13*. https://doi.org/10.3389/fpubh.2025.1504490

Pal, B., & Akanda, M. A. S. (2026). The role of individual and community empowerment as drivers of contraceptive use among reproductive aged women in Bangladesh: Insights from multilevel analysis using BDHS 2022. *PLOS ONE*, *21*(1 January). https://doi.org/10.1371/journal.pone.0337499

Pathare, S., Jain, N., Pandit, D., Lohumi, I., Shields-Zeeman, L., & Vijayakumar, L. (2026). Strengthening suicide prevention: Evaluating a capacity building program for community health workers in India. *Cambridge Prisms: Global Mental Health*, *13*. https://doi.org/10.1017/gmh.2026.10188

Piegorsch, W. W., & Bailer, A. J. (2020). Introduction to generalized linear models. In *Statistics for Environmental Biology and Toxicology*. https://doi.org/10.1201/9780203738504-8

Rahayu, A., Suharsih, S., & Julianto, E. A. (2022). Determinants of Unmet Need for Family Planning in Sleman District, Yogyakarta Province, Indonesia. *Journal of Economics and Business*, *5*(3). https://doi.org/10.31014/aior.1992.05.03.453

Rahmatiqa, C., & Patricia, H. (2020). Dominant factors on selection of contraception toward new family planning acceptors in public health center area in Padang. *International*

Journal Of Community Medicine And Public Health, *7*(6). https://doi.org/10.18203/2394-6040.ijcmph20202458

Saputri, E. E., Winarni, L. M., Nuryanti, & Nugraha, R. D. G. (2022). The Factors Affecting the Unmet Need of Family Planning in Banten Province Year 2019. *Kemas*, *17*(3), 362–370. https://doi.org/10.15294/kemas.v17i3.27218

Sharma, M. K., Das, E., Sahni, H., Mirano, J., Graham, K., Kumar, A., & Finkle, C. (2024). Engaging Community Health Workers to Enhance Modern Contraceptive Uptake Among Young First-Time Parents in Five Cities of Uttar Pradesh. In *Global Health Science and Practice* (Vol. 12). https://doi.org/10.9745/GHSP-D-22-00170

Teshale, A. B. (2022). Factors associated with unmet need for family planning in sub-Saharan Africa: A multilevel multinomial logistic regression analysis. *PLoS ONE*, *17*(2 February). https://doi.org/10.1371/journal.pone.0263885

Utami, D. A., & Samosir, O. B. (2021). Women's empowerment and unmet needs for family planning in Indonesia. *IOP Conference Series: Earth and Environmental Science*, *716*(1). https://doi.org/10.1088/1755-1315/716/1/012057

Utomo, B., Sucahya, P. K., Romadlona, N. A., Robertson, A. S., Aryanty, R. I., & Magnani, R. J. (2021). The impact of family planning on maternal mortality in Indonesia: what future contribution can be expected? *Population Health Metrics*, *19*(1). https://doi.org/10.1186/s12963-020-00245-w

WHO. (2020). WHO | Contraception. In *Who*.

WHO. (2023). Investing in sexual and reproductive health and rights: essential elements of universal health coverage. *Who*, *1*(4).

Wolfe, N., Diaz, A., Do-Golden, B., Karpilow, E., Rubio-Diaz, M., & Kipke, M. D. (2025). The Fundamentals of Health Research training for community health workers: a mixed-methods study. *Frontiers in Public Health*, *13*. https://doi.org/10.3389/fpubh.2025.1610413

Yaya, S., Idriss-Wheeler, D., Uthman, O. A., & Bishwajit, G. (2021). Determinants of unmet need for family planning in Gambia & Mozambique: implications for women's health. *BMC Women's Health*, *21*(1). https://doi.org/10.1186/s12905-021-01267-8