Endline Report

Assessing effectiveness of a person-centered group care model among first-time mothers and their husbands for improving quality and use of maternal, neonatal and family planning services

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ACRONYMS

ANC	Antenatal Care
BF	Breastfeeding
BMC	BRAC Maternity Center
BP	Blood Pressure
BRAC	Bangladesh Rural Advancement Committee
CHX	Chlorhexidine Digluconate
DiD	Difference-in-Difference
ENC	Essential Newborn Care
FGD	Focus Group Discussion
FP	Family Planning
FTF	First-time Father
FTM	First-time Mother
GANC	Group Antenatal Care
GPNC	Group Postnatal Care
HCD	Human-Centered Design
HWHF	Healthy Women Healthy Families
IDI	In-Depth Interview
IEC	Information, Education, and Communication
IUD	Intrauterine Device
IRB	Institutional Review Board
LMIC	Low- and Middle-income Country
MNH	Maternal and Neonatal Health
MSH	Management Sciences for Health
NGO	Non-governmental Organization
NIPORT	National Institute for Population Research and Training
PNC	Postnatal Care
POP	Progesterone-only Pill
PPFP	Postpartum Family Planning
RMC	Respectful Maternity Care
SK	Shasthya Kormi
SS	Shasthya Shebika
TE	Tracer Element
WHO	World Health Organization

EXECUTIVE SUMMARY

Little is known about the effectiveness of group antenatal care and group postnatal care (GANC-GPNC), as medical approaches have dominated the research. To help address this knowledge gap, Management Sciences for Health (MSH), in partnership with the Bangladesh Rural Advancement Committee (BRAC) and SCOPE, implemented a human-centered design GANC-GPNC intervention in two BRAC Maternity Centers from 2021 to 2024 with an evaluation component. The intervention aimed to improve the quality and use of maternal and newborn health (MNH) and family planning (FP) services and information among first-time mothers (FTMs) aged 15–24 years and their husbands in the urban municipality of Tongi, Gazipur, Bangladesh. The Population Council was the project's evaluation partner.

METHODOLOGY

The study used a quasi-experimental pre-post control group design that drew on a mixed methods approach, and the intervention was implemented for 32 months. Respondents were selected from BRAC FTM lists using simple random sampling, while informants for the qualitative study were selected purposively. A total of 4,400 FTMs were interviewed via surveys at baseline and endline, with 2,200 each from intervention and control groups. The intervention was implemented in two BRAC maternity centers (BMCs), and two similar BMCs were used as controls. From each BMC area, on average 550 FTMs (aged 15-24 years) were randomly selected for the questionnaires, each FTM having one living child of one year. Qualitative data were collected only in the intervention area from 12 focus group discussions (FGDs) and 26 in-depth interviews (IDIs). FGDs were conducted with FTMs, first-time fathers (FTFs), and mothers/mothers-in-law. IDIs were conducted with FTMs, FTFs and BMC's service providers (medical officer, midwives, area managers, and program organizers). Twelve job satisfaction surveys were conducted in intervention areas with midwives, program organizers, and area managers. MSH and BRAC both conducted supportive supervision to improve the capacity of the service providers as a part of project monitoring and evaluation framework.

The intervention included five GANC sessions and two GPNC sessions with FTMs, and three group sessions with FTFs/husbands. There were two Reflection Points a year apart (May through August 2022 and May through July 2023) to glean insights into implementation challenges and participants' experience of the sessions to improve the group model. Each GANC and GPNC session included discussion and dissemination of specific areas of pregnancy, delivery, postnatal period, and related topics and messages.

Field workers identified pregnant women in the selected communities. Groups were formed with FTMs at the same stage of pregnancy, and the same groups were maintained from session to session. Each group session was planned for 5–10 people. The first GANC session was conducted within 16 weeks of pregnancy, the second session between 20–24 weeks, the third session between 24–28 weeks, the fourth session between 30–32 weeks, and the fifth session between 36–38 weeks. The first GPNC was held between 06–20 days after delivery and thesecond GPNC between 20-45 days after delivery. The first GANC was around one hour, and the subsequent sessions were about 45 minutes. FTMs were offered physical checkups after each of the GANC-GPNC sessions. The first GANC session with husbands was held within 24 weeks of the woman's pregnancy, the second session after 24 weeks of the woman's pregnancy, and the only third session (GPNC) anytime between 0–45 days after delivery. International and local ethical approval for the study was obtained from the Institutional Review Board of the Population Council and Bangladesh Medical Research Council.

MAJOR FINDINGS

- This research evaluates the effect of a person-centered GANC-GPNC model to improve quality and use of MNH and FP services. Analysis showed that there is no significant difference in background characteristics between the FTMs in control and intervention groups at baseline and endline. One of the intervention's most notable achievements was FTMs' significantly improved knowledge of MNH

danger signs during pregnancy, delivery, and the postnatal period. At baseline, many FTMs in both the control and intervention groups could not correctly identify danger signs during pregnancy, delivery and postpartum period. However, by the endline, the intervention group demonstrated a marked improvement in recognizing these critical indicators. For instance, the percentage of FTMs who could identify three or more danger signs increased significantly in the intervention group, with specific knowledge of severe vaginal bleeding increasing by 28.5 percent. Further analysis found that FTMs who attended five GANC and two GPNC sessions are more knowledgeable (can identify at least three danger signs during pregnancy) compared to the FTMs who attended fewer than seven GANC-GPNC sessions. Similarly, findings revealed that knowledge of three danger signs during delivery and postnatal period, as well as newborn warning signs of complications, progressively increased among FTMs who attended more sessions compared to FTMs who attended fewer sessions. These results suggest that the GANC-GPNC sessions successfully educated FTMs about potential complications and the importance of seeking timely medical care.

- The intervention also had a profound effect on FTMs' knowledge and use of FP methods. While general awareness of FP was already high at baseline, the intervention led to a deeper understanding of specific modern contraceptive methods, including pills, condoms, injectables, and intrauterine devices (IUDs). The number of FTMs who could name three modern FP methods increased significantly in the intervention group compared to the control group, indicating the effectiveness of the education provided during the GANC-GPNC sessions. In addition to increased knowledge, the actual use of modern FP methods in the postpartum period also increased. This was noted in particular with the progesterone-only-pill (POP), with significantly increased usage in the intervention group compared to control group over time. The utilization of BMC's ANC services also increased significantly, with the percentage of FTMs receiving ANC increasing by over 21 percent in the intervention group ($p<0.001$).

- The intervention led to significant improvements in the quality of ANC, delivery, and PNC services provided by the BMCs. Key maternal health checks including crucial activities such as weight measurement, blood pressure monitoring, blood grouping, urine protein testing, and counseling on danger signs during ANC checkup significantly increased in the intervention group compared to the control group. For instance, the percentage of women whose weight was measured increased from 85.8 percent to 93.1 percent, and those receiving urine protein checks rose from 47.7 percent to 82.3 percent. Similarly, the provision of counseling on danger signs during pregnancy increased from 53.4 percent to 92.8 percent (DiD=25.5%, $p<0.001$), and postpartum family planning counseling from 48.9 percent to 79.4 percent in the intervention group compared to the control group (DiD = 25.0%, $p<0.001$). When evaluating the overall quality of services using a composite score, the data indicate a substantial reduction in the proportion of participants receiving low-quality services in the intervention group, from 45.0 percent at baseline to 8.68 percent at the endline (DiD= -25.8%, $p<0.001$). Conversely, the proportion of those receiving high-quality services increased dramatically, from 55.0 percent to 91.3 percent in the intervention group (DiD= 25.8%, $p<0.001$). An example of an increase in "high quality" services is a change from 18.5 percent at baseline to 46.8 percent at endline (DiD of 27.5% ($p<0.001$) of FTMs in the intervention group receiving four or more ANC checkups with all tracer elements (blood pressure monitored, weight measured, blood grouping; urine tested for albumin; and counseled on danger signs) at BMCs. These findings suggest that the intervention led to more comprehensive and consistent maternal health services, ensuring that FTMs received the necessary care and information throughout their pregnancy and postpartum period.

- The association of the intervention with institutional delivery is more limited with a DiD of 0.5% (p=0.863). About 77.4 percent of FTMs in control areas and 79.6 percent in the intervention area had facility delivery with a corresponding decrease in home delivery rate from baseline to endline. However, there was a notable shift in the type of facility used for deliveries in the intervention group at the endline: BMC delivery rose significantly from 13.8 percent at baseline to 22.5 percent at endline (DiD=5.4%, p=0.033), while deliveries at other health facilities (Medical College Hospitals, District Hospitals, Mother and Child Welfare Centers, Upazila Health Complexes, Union Health and Family Welfare Centers, private hospital/clinics, and NGO clinics) decreased from 86.2 percent to 77.5 percent (DiD=-5.4%; p=0.033). The quality score on delivery was high at the baseline and improved just slightly or remained stable at the endline. Although none of the improvements in quality components were statistically significant, the overall trend indicates enhanced satisfaction and quality of care at BMCs, reflecting positively on the efforts to improve delivery services.

- The intervention also showed improvements in quality of care, particularly in the application of 7.1 percent chlorhexidine digluconate to the umbilical cord and the early initiation of breastfeeding within one hour of birth among the FTMs who sought services from BMCs, with DiD=3.4%; p=0.627 and DiD=1.8%, p=0.716, respectively. However, many essential newborn care (ENC[3]) changes, such as practices like sterile cord cutting, drying within four minutes of birth, and delayed bathing for 72 hours, did not reach statistical significance. Exclusive breastfeeding up to 6 months increased in both the control and the intervention groups, but only the latter saw a significant increase, with a DiD of 23.6%, p=0.008. The combined use of any two ENC components improved in the intervention group but was not statistically significant (DiD of 4.1%, p=0.588).

- Respectful maternity care (RMC) was another area where the intervention had a positive impact. FTMs reported significant improvements in the way health care providers treated them during provision of ANC, PNC, and FP services. Service providers were more attentive, compassionate, and responsive to the needs of the mothers, with notable improvements in emotional support, communication, and maintaining patient confidentiality. The intervention led to a significant increase in the proportion of women who felt they received high-quality, respectful care, which is critical for enhancing patient satisfaction and fostering a supportive health care environment. For example, the proportion of women with "high" RMC scores increased notably in the intervention group compared to control groups during FP services, with a DiD=60.3%; p=0.005 and overall satisfaction with FP services including RMC improved significantly, with a DiD=60.3%; p=0.005.

- The intervention also successfully promoted birth preparedness among FTMs, particularly in terms of selecting a delivery location, arranging blood donors, and identifying transportation for delivery. At baseline, 88.7 percent of FTMs in the control group and 84.4 percent in the intervention group reported preparing or developing a birth plan during their first pregnancy, with a significant difference (p=0.003). By the endline, the proportion remained stable at 88.7 percent in the control group but increased to 90.6 percent in the intervention group, a significant increase (DiD of 6.2%, p=0.002). There was a notable increase in the completion of all four key elements of birth preparedness in the intervention group, from 21.8 percent at baseline to 62.2 percent at endline (DiD of 17.2%, p=0.001). Qualitative feedback from FTMs and their husbands confirmed increased awareness and practical application of these preparedness measures, such as saving money and arranging transportation in advance.

- Despite significant successes in many areas, there were also some gaps and challenges. Social support for FTMs during ANC, delivery and PNC, particularly psychological support and couple communication, showed mixed results. The findings indicate that the intervention led to improvements in certain aspects of couple communication and decisionmaking between FTMs and their husbands, particularly in respectful communication and discussions regarding health emergencies; however, discussions about FP decreased slightly. Qualitative interviews highlighted ongoing challenges, such as resistance from family members, particularly mothers-in-law, but also emphasized the positive role husbands played in supporting their wives.

- In comparing participation in GANC-GPNC sessions and knowledge gained between two locations, Tongi and Morkun, the study found that while attendance at GANC-GPNC sessions was high in both areas, Tongi had higher participation in four or more sessions (47.7% vs 38.6%, respectively). Despite this, the knowledge gained was similar at both locations, with most FTMs reporting a solid understanding of key maternal health topics. Nearly all participants found the information, education, and communication (IEC) materials, including cards and brochures used by the Healthy Women, Healthy Families' (HWHF) project intervention, to be highly useful. Satisfaction levels with GANC-GPNC sessions were overwhelmingly positive, with over 99 percent of participants expressing satisfaction with the group sessions and the topics covered. About 18 percent of the FTMs faced challenges attending the GANC-GPNC sessions. The major four challenges include traveling to the facility (47.2 percent), managing time (44.2 percent), finding an escort (33.5 percent), and managing money (21.3 percent), with no significant differences between the two locations.
- At baseline, on average 79 percent of service providers correctly did their practices/activities on ANC, PNC, delivery, ENC and FP. At the endline, this percentage progressively increased to an average of 93 percent—a 14-percentage point or 17.7 percent increase. Some of the practices/activities achieved 100 percent or around 100 percent in some of the quarters.
- Overall, the GANC-GPNC sessions had a significant and positive impact on improving maternal health knowledge, service utilization, and respectful maternity care of FTMs. The results underscore the importance of targeted interventions that have not only improved knowledge but also empowered FTMs to access healthcare services, and these interventions encourage not just increased utilization of services but also improved respectful and dignified care practices. While the intervention achieved substantial gains, particularly in increasing knowledge of danger signs, FP, and service utilization, challenges persist. Ensuring consistent social support and overcoming capacity constraints at healthcare facilities often remain obstacles to achieving long-term, sustainable success. Future efforts using the GANC-GPNC model should focus on addressing these gaps to ensure comprehensive and continuous support for FTMs throughout their maternal health journey.

CONCLUSIONS AND RECOMMENDATIONS

The assessment found that a GANC-GPNC model can be an effective and critical health care intervention as opposed to the traditional individual approach, especially in settings where comprehensive care coverage is low, and the quality of care is poor. However, further improvements and modifications to the model are needed to ensure that challenges are addressed and that the model can be sustained and scaled across the country or other settings.

- **Scale-up the model in other areas:** The tested GANC-GPNC model demonstrated improved performance, and utilization of services for pregnant women and was widely accepted among the first-time parents. While replicating the model in other areas is recommended, the assessment also identified features that would need flexibility and to be tailored to the context in which the model is implemented, such as the number of sessions, the session content, session time, or the modality of engagement. This combination of standard and flexible components is key when planning and designing for implementation across low- and middle-income country (LMIC) settings and scale up. The study findings strongly recommend scaling up in government facilities or elsewhere to get the benefit of it.

Recommendations to improve the GANC-GPNC model's efficacy, relevancy and acceptability include:

- **Reduce waiting time:** In busy peri-urban areas where lower socioeconomic groups engage in multiple economic activities and daily wage-based work, efficient time management and reduced waiting time would be key to retention in group sessions and to minimizing dropouts. Waiting time in the GANC-GPNC model can be minimized by strengthening the communication system to remind women and families about follow-up visits' correct date, distribution of time slot and time (without abrupt changing), checkup before the session, use token for the services and by increased community outreach.
- **Strengthen the component of peer bonding:** Consistency of group members and group leadership is key in peer bonding and fostering relationships, integral to the GANC-GPNC's model of leveraging social support and networking. To that end, strategies and efforts are needed to minimize reshuffling of groups. Several strategies could be investigated: smaller group size, flexibility of the schedule, incentives for consistent participants, connected FTMs in social media/WhatsApp groups etc.
- **Revisit father's engagement strategy:** FTFs' session posed challenges for fathers to attend sessions particularly in workdays. The assessment respondents suggested holding FTF sessions on weekends or outside of office hours or at their workplace by coordinating with factory authorities to increase their participation. Both service recipients and service providers also recommended shortening the length of the FTFs' session.
- **Modify content and modality of session delivery:** Participant feedback suggests that a means to deliver content should be identified that will succinctly deliver the most practical information, such as use of digital content (power point slides), break down complex procedures or include questions, polls, or short quizzes to involve participants and ensure active engagement during sessions. Ensuring the content is concise, practical, and engaging will enhance participant understanding and retention. Bite-size content to take home, such as a one-pager, was also suggested by the beneficiaries.
- **Equip facilities with enough manpower, equipment and tools:** Facilities should be equipped with required human resources, medical equipment and supplies, essential medicine, monitoring and accountability, and referral mechanisms to ensure that providers have the resources to provide high-quality service.
- **Improve the social support system:** More strategies and approaches should be identified to improve the social support system for FTMs such as transportation facilities and community engagement for access to services, and mental health support.
- **Test the model in government facilities:** The GANC-GPNC model holds promise for all mothers in government settings for better meeting the social support and informational needs for improving the quality and uptake of ANC, PNC and delivery care at facilities in resource-poor settings like Bangladesh. The GANC-GPNC model has been implemented and leverages BRAC's existing models and programming in NGO settings which is different from government settings. The next step would be to test it in government settings and adapt as needed to maximize the beneficial outcomes of this model.
- **Model adaptation for government settings:** Tailor the GANC-GPNC model to fit the specific context and needs of government facilities, considering existing protocols, staffing, and resource availability.

3. 7.1% chlorhexidine (CHX) applied to cord, initiated BF within 1 hour of birth, sterile cord cutting, drying within 0-4 minutes of births, and bathing delayed 72 hours or more

1. Introduction

1.1 BACKGROUND

Management Sciences for Health's (MSH) Healthy Women, Healthy Families (HWHF): *Shustha Ma, Shustha Poribar* project seeks to improve the quality and use of maternal, newborn, and child health (MNCH) and family planning (FP) services and information among young women and their husbands in the urban municipality of Tongi subdistrict in Gazipur, Bangladesh. Tongi, the adjacent subdistrict of the capital, Dhaka, is located 20–25 kilometers north of Dhaka and is an industrial area within the newly formed Gazipur City Corporation. Gazipur is densely populated, with a total population of approximately 2.5 million spread over an area of 330 square kilometers. Tongi is characterized by the presence of large informal settlements, and most of its population is migrants employed in the garment or other industries who mostly rely on private facilities for health care with high health care expenditure. [1, 2]

Despite significant progress in improving MNCH-FP outcomes, maternal mortality (163/100,000 live births) and neonatal mortality (30/1,000 live births) in Bangladesh is still very high. [3, 4] Women in Bangladesh marry and begin bearing children early, and the country has the highest adolescent fertility rate in Asia (81.7/1,000 women aged 15–19) [5]). As such, targeting young women and their husbands could help to improve maternal and newborn health outcomes. Though the legal age of marriage for women in Bangladesh is 18, nearly 60 percent of women are married before that. [6] Social and family pressures usually result in childbearing soon after marriage. One study reported that one in ten girls have a child before the age of 15, and one in three becomes a mother or pregnant by the age of 19. [7] Further, approximately half of adolescent mothers (aged 15–19 years) have another child in less than 24 months [8], putting them at increased risk of poor maternal, perinatal, and infant health outcomes such as stillbirth, underweight babies, and maternal and newborn mortality. [9] Postponing first births and extending the interval between births has been shown to improve MNCH outcomes, including decreasing the risk of preterm birth, low birth weight, and death. The 2023 Bangladesh Demographic and Health Survey found that 88 percent of women received at least one antenatal care (ANC) visit from medically trained providers, and 55 percent of mothers received a postnatal care (PNC) visit from a medically trained provider within two days of delivery. While 47 percent of women received four or more ANC visits in 2017–18, this decreased to 41 percent in 2022. Further, only 71 percent of deliveries for women under age 20 in Bangladesh are attended by a medically trained provider, and overall, 65 percent of the deliveries were in health facilities. [10]

Young first-time mothers (FTMs) have unique psychosocial needs during pregnancy. They enter married life with limited information and awareness about their sexual and reproductive health and often lack the agency to decide the timing and spacing of their pregnancies and to use FP and other health services. [9] Following marriage, they also lose supportive networks and family care and face increased household responsibilities and limitations on their mobility, in addition to social and familial pressure to have children. One study found that young women had less decisionmaking authority than older women and owned fewer assets. [11] This lack of agency, social support, and information can result in suboptimal use of MNCH-FP services. [12] Even when accessing care, young FTMs may experience poor attitudes and disrespect from health providers and receive limited or no counseling and psychosocial support. According to the 2023 Bangladesh Demographic and Health Survey, 21 percent of pregnant women receive quality ANC, 13 percent were counseled about postpartum family planning (PPFP), and 87 percent were counseled on exclusive breastfeeding. [10,6] Fewer than 6 percent of women younger than 20 with newborns received information on all essential newborn care practices, including drying the newborn immediately after birth, initiating skin-to-skin contact, and dry cord care, and 65 percent were exclusively breastfed up to six months. [6] The quality and use of health services are further compromised for this vulnerable group when they live in a densely populated urban slum such as Tongi, where health indicators are worse than in rural areas. [2]

The World Health Organization has called for reorganizing health services to focus on the life-course and engage and empower individuals and communities, so that services respect and respond to communities' needs and preferences. [14] Group models that provide integrated, people-centered health services are a promising approach to improve both individuals' and communities' experience of care and health outcomes, including greater levels of health-seeking behavior. Women-centered group ANC models tested in low- and middle-income countries (including Ghana, Kenya, Malawi, Nepal, Nigeria, Tanzania, and Uganda) have demonstrated positive effects on knowledge and practice of healthy behaviors—use of ANC, facility delivery, FP uptake, and birth preparedness—that can contribute to better outcomes ranging from satisfaction with care to improvements in maternal and newborn health. Group ANC programs have been shown to engender feelings of increased social support and self-efficacy, and they demonstrate potential to increase health providers' satisfaction and motivation. At the same time, emerging experience and evidence from first-time parent programs implemented in Africa and South Asia indicate improvements in birth spacing (or delaying second pregnancy) among young married women, knowledge and use of PPFP and other essential health services, and couples' communication and joint decisionmaking. [14]

While group ANC and first-time parent programs have been piloted as separate interventions in Bangladesh [15], these have focused on a specific period of the MNCH continuum of care (e.g., pregnancy or postpartum), rather than using a life-cycle lens and an integrated and holistic approach to meet the needs of young women in first pregnancy and their husbands for information, social support, and high-quality, responsive services. Building on MSH projects in Guatemala, Kenya, and Uganda and an in-depth analysis of the health system in Tongi to understand gaps in care, MSH brought together these promising approaches—person-centered care and a focus on first-time parents—to develop a program that focuses on the continuum of care from pregnancy to postpartum, primarily targeting women under age 25.

There are few studies focusing on group ANC and group PNC, with a traditional one-on-one approach and medical approaches dominating the research. Taking women's experiences seriously during early pregnancy may prevent future suffering during childbirth. [16] Several studies from high-income countries show that group ANC offers an alternative to individual care and is associated with improved attendance to ANC, client satisfaction, and health outcomes for pregnant women and newborns. [17] However, in LMIC settings, evidence on key attributes of a group care model for low-resource settings remains scant. A systematic review on models of group antenatal care in LMICs by Sharma et al. showed that the group model increases the relevance, acceptability, and effectiveness of ANC use in such settings. [17]

The HWHF project aimed to improve both the clinical quality of care and experience of ANC, safe delivery, newborn/infant health, and planning for healthy timing and spacing of the next pregnancy; offer social support for young mothers-to-be and FTMs, especially from their peers; and foster positive engagement from key people in their lives, such as male partners, parents, and in-laws. Using a robust and replicable co-designed process with local stakeholders, HWHF aimed to increase demand for high-quality services among young women in first pregnancy and their husbands and improve healthy behaviors throughout pregnancy, delivery, and the postnatal period. The HWHF project evaluation generated evidence-based recommendations to suggest and adapt ANC, delivery, PNC and neonatal service provision through group model.

1.2 RESEARCH QUESTIONS

The Bangladesh Rural Advancement Committee (BRAC), together with MSH and SCOPE, implemented this quasi-experimental study on the Group ANC-PNC (GANC-GPNC) program in two BRAC health facilities (Tongi and Morkun) for 32 months, and the results were compared with two other BRAC health facilities (Board Bazar and Chourasta) to answer the following questions:

PRIMARY RESEARCH QUESTIONS:

- What is the effect of the group model interventions (using a person-centered model) on the project outcomes such as ANC retention, birth spacing, FP, etc. in intervention sites compared to control sites (using "classical" ANC services)?
- What is the effect of the group model interventions (using a person-centered model) on the quality of ANC and PNC services in the intervention sites compared to control sites (using "classical" ANC services)?
- What is the effect of the group model interventions (using a person-centered model) on adoption of healthy behaviors in the intervention sites compared to control sites (using "classical" ANC services)?

SECONDARY RESEARCH QUESTIONS:

In addition to the primary research questions above, it aimed to explore some secondary research questions through qualitative methods such as:

- What is the experience of care of the group ANC-PNC model among FTMs and health providers?

1.3 STUDY DESIGN

This is a quasi-experimental pretest-post-test control group study that drew on a mixed methods approach. Human-centered design (HCD) was utilized to design the intervention, and the prototype intervention was tested with the BRAC health service providers before implementing the intervention. This pretested HCD intervention in turn aimed to improve maternal and child health outcomes in Tongi subdistrict. HCD is a flexible, but systematic innovation process that enables co-creation with people affected by a problem or involved in its solution. There were two Reflection Points, the first in May through August 2022 and the second in May through July 2023, to learn of implementation challenges and participants' experience of the sessions to improve the service. The intervention was implemented in the Tongi and Mokun area and compared with the control group, Board Bazar and Chourasta.

1.4 INTERVENTION

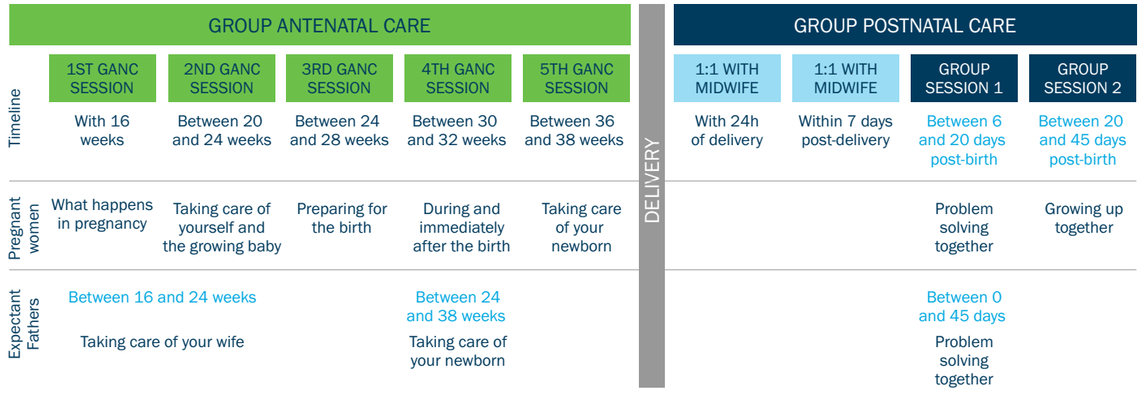
Throughout a woman's pregnancy, BRAC, with support from MSH and Scope, held five group ANC sessions and two group PNC sessions with FTMs, and two group sessions with husbands during ANC and one group session during PNC. At the end of each GANC and GPNC session, the FTMs went for individual ANC or PNC checkups by medical officer or midwife. The project monitoring and evaluation framework inbuilt supportive supervision and job satisfaction assessments of service providers.

Field workers identified pregnant women at the communities surrounding the health facilities. Groups were formed with FTMs at the same gestational age and maintained from session to session. This was required for relationship building among the members, and topic-specific information was shared to ensure that all FTMs get a complete set of information. The program aimed to identify first-time pregnant women before 16 weeks of pregnancy and enroll all eligible mothers in groups. In addition, when sessions were organized in the community locations, groups were organized based on geography, within one to three adjacent *Shasthya Kormis* (SKs), to minimize travel time. Other factors, such as whether women were working, were taken to consideration while forming groups. In the second Reflection Point, sessions were taken with mixed groups of same gestational age participants when turnout was low.

Each group session was planned for 5–10 people. In each group ANC session, specific areas of pregnancy, delivery, the postnatal period, and related topics and messages were discussed and disseminated. The first GANC session was conducted within 16 weeks, the second session between 20–24 weeks, the third session between 24–28 weeks, the fourth session between 30–32 weeks, and the fifth session between 36–38 weeks. The first group PNC was held between 6–20 days after delivery and the second GPNC between 20–45 days after delivery (Figure A). The first GANC ran for one hour and the subsequent sessions for 45 minutes. Each PNC session runs for 45 minutes.

The first GANC session with husbands was held within 24 weeks into the woman's pregnancy, the second GANC session after 24 weeks of the woman's pregnancy, and the only session (GPNC) any time 0-45 days after delivery (Figure A). Each session included tailored information and messages for discussion.

FIGURE A: TIMING OF GANC AND GPNC SESSIONS



1.5 OBJECTIVES OF THE ENDLINE ASSESSMENT

The overall goal of the endline assessment, led by the Population Council, was to evaluate the effectiveness of the person-centered group ANC-PNC model in improving the quality and use of MNH-FP services and information among first-time young mothers aged 15-24 years and their husbands in the study area. The endline assessment objectives were:

1. To document the effect of the group model interventions on the project outcomes such as ANC retention (target: 20 percent increase from baseline), birth spacing and FP, etc. in intervention sites compared to control sites.
2. To measure the effect of the group model interventions on the quality of ANC-PNC services in the intervention sites compared to control sites.
3. To measure the effect of group model interventions on the adoption of healthy behaviors in the intervention sites compared to the control sites.

The objectives of the endline survey of the HWHF project were to measure the degree and quality of change resulting from the implementation of GANC-GPNC in two BRAC health facilities by comparing them with two similar BRAC health facilities over the 32-month intervention period. The endline assessment found several changes which were statistically significant between baseline and endline, providing rigorous evidence on aspects of the GANC-GPNC intervention model that were effective.

Components of the endline assessment included a beneficiary survey, qualitative assessment with beneficiaries and implementers, and a job satisfaction survey with program personnel and service providers. The endline surveys and qualitative interviews with beneficiaries were designed to gather information on changes over time in socio-demographic profiles, knowledge, and practices around MNH and FP, PPFP, birth planning, breastfeeding, essential newborn care (ENC), quality and respectful maternity care, couple communication and decisionmaking.
It also sought to measure social support during the continuum of care that FTMs received from their husbands, and other caregivers,

particularly those FTMs who received health services from BMCs. The endline assessment also gathered FTMs' assessment of the intervention's effectiveness, usefulness of its information, education, and communication (IEC) materials, challenges faced in attending sessions, and their recommendations for improvements and updates to the intervention model.

Information on the following key processes, performance, and outcome indicators were collected and compared with baseline values:

1. Proportion of health workers providing quality ANC-PNC, delivery, and FP services (including respectful care) according to national guidelines
2. Proportion of service providers providing group ANC reporting job satisfaction
3. Proportion of FTMs who stated satisfaction with ANC-PNC and FP services received (including respectful care)
4. Proportion of FTMs receiving four or more ANC visits
5. Proportion of FTMs who can identify at least three danger signs of pregnancy
6. Proportion of FTMs who can identify at least two danger signs of newborn complications
7. Proportion of infants who exclusively breastfeed
8. Proportion of newborns who received at least two ENC components: a) 7.1 percent chlorhexidine digluconate (CHX) applied to cord, and b) initiation of breastfeeding within one hour of birth
9. Proportion of FTMs and newborns who received at least one PNC visit within two days of delivery
10. Proportion of FTMs and newborns who received at least three PNC visits within 42 days of delivery
11. Proportion of FTMs who know modern FP methods
12. Proportion of FTMs completing birth plans
13. Proportion of first-time parents using any modern PPFP methods
14. Proportion of women reporting improved couple communication and shared decisionmaking related to reproductive and child health
15. Proportion of women indicating that they had adequate social support during their pregnancy and postpartum

1.6 STUDY SETTINGS

The intervention sites, Tongi and Morkun, and the control sites, Board Bazar and Chourasta, are approximately 20–25 kilometers north of the capital city of Dhaka, an industrial, densely populated area with mostly migrants and garment workers, and are characterized by the presence of large informal settlements. [1] The intervention area covered by the HWHF project included all slums across five wards of Tongi and four wards of Morkun areas. All slums in five wards of Board Bazar and six wards of Chourasta were selected for control purposes. This study covered approximate populations of 111,050 in Tongi, 103,987 in Morkun, 113,495 in Board Bazar, and 113,590 in Chourasta. All these were BRAC catchment areas for its existing program, which was established prior to the HWHF program.

2. Methodology

The HWHF project endline assessment was a mixed-method study, using both quantitative and qualitative data collection methods. The details of each methodology are described below.

2.1 QUANTITATIVE DATA COLLECTION

SUBJECT POPULATION AND SAMPLE SELECTION

The primary study population was FTMs aged 15–24 with one living child born between November 1, 2020, and October 31, 2021, for baseline survey, and FTMs aged 15–24 with one living child born between May 1, 2023, and April 30, 2024, for endline survey. Additionally, the eligibility of FTMs for the endline survey in the intervention group included attending at least one GANC and/or one GPNC session. Husbands, parents, in-laws, and service providers (facility providers/managers) were selected purposively and considered as the secondary population.

A total of 4,400 randomly selected FTMs were interviewed, 2,200 each in baseline and endline surveys (1,100 from intervention and 1,100 from comparison) (Table A1). BRAC prepared a list of FTMs following the study's eligibility criteria. The respondents were randomly selected from the BRAC-provided lists of 3,677 and 3,538 FTMs in the baseline, and endline surveys, respectively. While random sampling was utilized, it also applied other sampling procedures without any replacement (e.g., waiting for FTMs returning from parents' home) to ensure it reached the adequate number of FTMs for the endline sample. Resampling was employed because many respondents from BRAC lists had migrated, were not available for interview, or did not fulfill the eligibility criteria (Appendix C). Respondents' eligibility criteria included:

- FTM aged 15–24 years (inclusive)
- Only have one child
- Delivered between November 1, 2020, and October 31, 2021 (during baseline survey)
- Delivered between May 1, 2023, and April 30, 2024 (during endline survey)
- Attended at least one GANC and/or one GPNC session (endline survey only, intervention area only)

TABLE A1: DISTRIBUTION OF SURVEYED FTMs

BMC Site		Number of FTMs surveyed	
		Baseline	Endline
Intervention	Tongi	550	554
	Morkun	550	546
Control	Board Bazar	554	550
	Chourasta	546	550
Total		**2,200**	**2,200**

A2: JOB SATISFACTION SURVEY OF SERVICE PROVIDERS AND MANAGERS

Area	Job satisfaction survey	
Tongi	4 midwives, 1 program organizer, 1 area manager	6
Morkun	4 midwives, 1 program organizer, 1 area manager	6
Total		**12**

2.2 QUALITATIVE DATA COLLECTION

To understand the effects of the ANC-PNC group intervention model (GANC-GPNC) on the study communities and to complement our quantitative data, the project also employed qualitative research methods. Qualitative data were collected between June and July 2024.

SAMPLING PROCEDURE AND SAMPLE SELECTION

Table B1 shows the type and number of focus group discussions (FGDs) and in-depth interviews (IDIs) conducted, and number of participants reached. FGDs were conducted with FTMs aged 15-24 years, first-time fathers (FTFs), and mothers-in-law of FTMs. IDIs were conducted with FTMs, FTFs, service providers, and program managers who were directly involved in implementing the GANC-GPNC intervention. At the project endline, 12 FGDs and 26 IDIs were conducted in the intervention site only. FTMs for FGDs and IDIs were selected purposively from the lists BRAC provided based on eligibility criteria by group of respondents, availability, and willingness to participate. FTMs were selected following similar criteria for the quantitative survey respondents and their husbands and mothers-in-laws. Service providers available for IDIs included four midwives and one medical officer from

each intervention area. FGDs and IDIs were conducted to better understand the differences in behaviors and experiences from the baseline, nuanced issues, benefits experienced by young FTMs, FTFs, and their family because of the intervention, and challenges they faced. Service provider, program officer, and area manager IDIs focused on their firsthand experiences providing GANC-GPNC, organizational and programming challenges, their views of the beneficiaries in this group model, and performance of service uptake.

TABLE B1: NUMBER OF FGDs AND IDIS CONDUCTED BY TYPE AND NUMBER OF PARTICIPANTS (CONDUCTED AT ENDLINE ONLY)

Area	FGDs	Number of participants in FGDs	IDIs
FGDs	**6** (3 FTMs, 2 FTFs, 1 mother/mother-in-law)	FTMs: 19 FTFs: 13 Mother/Mother-In-laws: 6	**13** (3 FTMs, 3 FTFs, 5 service providers, 1 program organizer, 1 area manager)
FGDs	**6** (2 FTMs, 3 FTFs, 1 mother/mother-in-law)	FTMs: 16 FTFs: 18 Mothers/Mother-in-laws: 8	**13** (3 FTMs, 3 FTFs, 5 service providers, 1 program organizer, 1 area manager)
Total	**12**	**80**	**26**

STUDY INSTRUMENTS AND PRETESTING

Similar questionnaires were used in both the baseline and endline surveys. An endline intervention evaluation module was added in the endline questionnaire to measure the effectiveness of intervention, and those questions were only administered to intervention group respondents. The data collection tools included: a) a quantitative survey questionnaire, b) FGD guides, c) IDI guides, and d) a quantitative job satisfaction survey questionnaire. The study instruments were guided by research questions and study objectives, as well as drawing on a literature review on a first-time parents' model and globally validated relevant tools. The evaluation team also constructed questions from the expected outcomes of the HWHF project including various domains such as knowledge on ANC and PNC, delivery, FP and PPFP; behavioral measures; quality of care; respectful care; counseling; service uptake and continuation (e.g., uptake of ANC, PNC, and PPFP); birth spacing; newborn care; breastfeeding; social support; outreach activities; group ANC; and partner communication. The team also referred to first-time parent program tools used in other countries.

The draft quantitative and qualitative tools were pretested with a similar group of respondents who were not part of our selected sample to address language inconsistencies, improve understanding and sequencing of questions, and adjust the survey length. All study instruments were translated into Bangla for use in the field. Interviews were conducted in the Bengali language.

2.3 ETHICAL APPROVAL

International and local ethical approval for the study was sought from two institutions: the Institutional Review Board on human research of the Population Council and the Bangladesh Medical Research Council. The Population Council's Institutional Review Board approved the protocol on November 11, 2021 (p989), and the amendment on May 23, 2023, and Bangladesh Medical Research Council approved the protocol on January 19, 2022 (p447 12 10 2021) and the amendment on April 16, 2023. The amendment was requested to increase the duration of the intervention: increasing project duration and also to gather approval for the service providers satisfaction survey, as that was not included in either of the initial submissions.

2.4 DATA COLLECTOR TRAINING

Twenty-four female data collectors, including four supervisors with at least bachelor's degrees, were recruited for collecting quantitative data. A weeklong training session was organized for them. An extra day was added for field practice. The Population Council research team, including the Principal Investigator, trained the data collectors and their supervisors on research ethics and informed consent, the study objectives, procedures to be followed, and tools. Each question was discussed in groups so that the data collectors and their supervisors understood the purpose of the question and were all on the same page. As a part of quality control, all interviewers needed to complete at least one questionnaire maintaining field procedures using the SurveyCTO form on a mobile phone, which ensured that they were as prepared as possible before conducting the main survey.

Four data collectors with a master's in anthropology and experience in conducting qualitative data collection were also recruited for the study. They attended a five-day training course on study objectives, study methods, and data collection techniques; the content of interview guides; consent forms; and research ethics. The interview guide was pretested with a small number of respondents, audio-recorded, evaluated, and revised where necessary. The tools were then adopted based on which wording or types of questions work best, and/or what is the best length of an interview with respondents who have trouble concentrating for an extended time. To be confident in the process of the FGD and quality information collection, mock sessions were held at the training session.

2.5 DATA COLLECTION

Baseline and endline data collection was conducted in a similar fashion. Baseline quantitative data were collected from January 22–March 27, 2022, in Tongi, Morkun, Board Bazar, and Chourasta. Data were collected through mobile phones with GPS trackers using the SurveyCTO platform, which allowed real-time monitoring of data collection progress with GPS location. Qualitative data were collected from January 22–February 28, 2022, with data transcription. FGD and IDI translations were completed by April 30, 2022, and data analysis was completed by May 30, 2022. Endline quantitative data were collected from May 25–July 17, 2024 in Tongi, Morkun, Board Bazar, and Chourasta. Qualitative data were collected from June 1–13, 2024. Transcription and translation of the qualitative data were completed by July 2024. Quantitative data collected through the SurveyCTO platform were downloaded, reviewed, coded, summarized, categorized, and edited for completeness and accuracy.

2.6 CONSENT PROCESS AND DATA MANAGEMENT

The study team has made every effort to protect the privacy of the participants and maintain the confidentiality of all the information they provided. The interview was conducted in a private place, strict audio-visual privacy was ensured during the interview, and ample time was allowed for data collection to maximize privacy and confidentiality. The study team exercised the utmost discretion while collecting data. Data collectors completed training on research ethics as a part of their orientation to the study, including practice obtaining informed consent, and were given clear guidance on how to manage confidential data. Participants' names and contact information were collected during the register review. All respondents were guided through a consent form and signed the forms to provide consent for data collection. The information collected from facilities was not linked to women's identifying information. Aggregate numbers and de-identified data were collected from the registers. Data were

de-identified before analysis. In this report, data that can potentially identify participants or facilities have not been presented.

2.7 DATA ANALYSIS

Quantitative analyses include both descriptive analysis and analytics using frequency distributions, bivariate, and useful models using STATA SE 15.1 and R. A chi-squared test was used to determine the p-value in most cases. Where the sample size was small (<5 responses), Fisher's exact test was used (see Appendix C for more details). The Difference-in-Differences (DiD) method was used to estimate causal effects by comparing the changes in outcomes over time between an intervention and a control.

To present results of some complex indicators (quality of care for ANC, delivery, and PNC; social support for ANC, delivery, and PNC; respectful maternity care; and couple communication), composite scores of selected indicators (Table C1) were developed. To calculate the composite indicator, a composite score using all selected dichotomous elements (yes=1, no=0) median value of the composite scores was then determined. Finally, the composite scores of individual responses were divided into two categories: 0=low (score below median value), and 1=high (score equal to and greater than median value). The elements included in each composite score are described below.

- **Quality of last ANC:** Quality of care received from BMC facilities during the last ANC was measured through a composite score of 21 elements including respectful maternity care during ANC (respectful greetings, explanation given, consent taken, maintaining privacy); history-taking and examination (common history taking, measuring blood pressure [BP], measuring weight, conducting physical examination); lab test done (blood grouping and urine albumin); medication given (iron and folic acid); counseling (discussion of four ANC visits, danger signs of pregnancy, birth preparedness, PPFP, and essential newborn care). Initially, a composite score variable summing up all selected dichotomous elements for each FTM was generated and then the median value was determined (from the baseline data). Later, it categorized the quality of the ANC score into low and high. Overall score, median, and categories of scores (low and high) are presented in Table C1 below.
- **Quality of delivery services:** Quality of care received from BMC facilities on the delivery services was measured through a composite score of three elements: baby received first checkup within two days after delivery, FTMs received respect during delivery, and whether they faced any problems (such as providers paying less attention during/after delivery). Initially, a composite score variable summing up all selected dichotomous elements for each FTM was generated and then the median value was determined (from the baseline data). Later, the quality of the ANC score was categorized into low and high (see Table C1).
- **Quality of last PNC:** Quality of care received from BMC facilities on the last PNC was measured through a composite score of the following 15 elements of quality care: took weight; checked BP; performed abdominal exam; checked anemia; checked urine for albumin; gave chance to ask questions; counseled on danger signs; how to take care of breast; perineum; exclusive breastfeeding; baby's immunization; PPFP; newborn care; and provided iron/folic acid. Initially, a composite score variable summing up all selected dichotomous elements for each FTM was generated and then the median value was determined (from the baseline data). Later, it categorized the quality of the ANC score into low and high (see Table C1).
- **Respectful maternity care (RMC):** RMC during ANC, PNC, and FP are measured through using a composite score of 11 respectful maternity care elements: provider's greeting, warm welcoming, offering a seat, treating FTMs and their companions with compassion, maintaining confidentiality and dignity, listening carefully and responding, providing emotional support, communicating properly, asking the purpose of the visit, taking consent before a physical exam, and maintaining privacy during service provision (see Table C1).
- **Social support:** The elements included in social support are assistance during day-to-day work, cooking, household chores; access to health care; accompaniment to hospital; monetary support; bringing medicine; arranging transportation; and emotional support. The analysis of social support received from mother, mother-in-law, husband, father-in-law, and friends is individually calculated (see Table C1).
- **Couple communication:** Couple communication was analyzed with 14 couple communication elements: spent time together with husband; discussed ANC; discussed delivery; discussed PNC; discussed FP; feared disagreeing with husband; told husband when she disagreed; criticized her husband when required; shouted with husband; husband shouted with her; husband admired her; she admired her husband; discussed where to go in case of health emergencies; and discussed which doctor should be visited (see Table C1).

TABLE C1: COMPOSITE VARIABLES, NUMBER OF ELEMENTS IN EACH VARIABLE, AND MEDIAN VALUE FOR CUTOFF VALUE TO DETERMINE LOW- AND HIGH-LEVEL SCORES

Composite indicator	Indicator elements	Score
Quality of ANC	21 elements mentioned in Table 4	Score range: 1–21; Median: 15, Low considered when score<15, High considered when score >=15.
Quality of delivery care	First three elements mentioned in Table 7	Score range: 0–3; Median: 1, Low considered when score<1, High considered when score >=1.
Quality of PNC	15 elements mentioned in Table 8	Score range: 0–15; Median: 7, Low considered when score<7, High considered when score >=7.
Respectful maternity care at ANC	11 elements mentioned in Table 12	Score range: 0–11; Median:10, Low considered when score<10, High considered when score >=10.
Respectful maternity care at PNC	11 elements mentioned in Table 12a	Score range: 0–11; Median:10, Low considered when score<10, High considered when score >=10.
Respectful maternity care at FP	11 elements mentioned in Table 12b	Score range: 0–11; Median:11, Low considered when score<11, High considered when score >=11.
Couple communication	13 elements mentioned in Table 15	Score range: 0–13; Median:9, Low considered when score<9, High considered when score >=9.
Social support during ANC		
Household support	15 elements mentioned in Table 14 (across all family and friend supporters) and Table A1	Score range: 0–14; Median: 6, Low considered when score<6, High considered when score >=6.High considered when score >=9.
Health care support	15 elements mentioned in Table 14 (across all family and friend supporters) and Table A1	Score range: 0–15; Median: 5, Low considered when score<5, High considered when score >=5.
Psychological support	10 elements mentioned in Table 14 (across all family and friend supporters) and Table A1	Score range: 0–10; Median: 5, Low considered when score<5, High considered when score >=5.
Social support during delivery		
Household support	15 elements mentioned in Table 14a (across all family and friend supporters) and Table A2	Score range: 0–13; Median: 3, Low considered when score<3, High considered when score >=3.
Health care support	15 elements mentioned in Table 14a (across all family and friend supporters) and Table A2	Score range: 0–14; Median: 4, Low considered when score<4, High considered when score >=4.
Psychological support	10 elements mentioned in Table 14a (across all family and friend supporters) and Table A2	Score range: 0–10; Median: 5, Low considered when score<5, High considered when score >=5.

TABLE C1 (continued):

Composite indicator	Indicator elements	Score
Social support during PNC		
Household support	15 elements mentioned in Table 14b (across all family and friend supporters) and Table A3	Score range: 0–13; Median: 4, Low considered when score<4, High considered when score >=4.
Health care support	15 elements mentioned in Table 14b (across all family and friend supporters) and Table A3	Score range: 0–15; Median: 3, Low considered when score<3, High considered when score >=3.
Psychological support	15 elements mentioned in Table 14b (across all family and friend supporters) and Table A3	Score range: 0–10; Median: 5, Low considered when score<5, High considered when score >=5.

Qualitative data were audio recorded, transcribed, and later translated for analysis. NVivo 12 was used for data organization, coding, and thematic analysis. Qualitative data were analyzed thematically, exploring similarities and differences in the access and use of maternal and newborn health and FP services at the endline among young FTMs and FTFs. Perspectives from health care providers and other stakeholders were also analyzed in terms of GANC-GPNC sessions implementation, as well as access to services, etc. Qualitative analysis findings were triangulated among different groups of respondents and with quantitative findings. In the transcripts, 10-15 thematic areas were identified, coded, and explored. Two coders read through all interview responses and then coded five interviews independently and compared results, identifying emergent themes and discussing coding decisions until consensus has been reached. Qualitative analysis focused on the use and practices of healthy behaviors around ANC, delivery and PNC, social support, couple communication of the mothers-to-be/FTMs, and quality of care.

This report presents these findings in conjunction with quantitative data to highlight where these two data sets align in terms of acceptability and efficacy of the model. It also includes additional insights on successful aspects of the intervention model, implementation challenges encountered and recommendations from people in the community and beneficiaries for further improvement of the model.

2.8 LIMITATIONS

The study had several limitations. There were not enough FTMs less than 18 years of age to allow a separate analysis for that group. In addition, the sample size of those who received ANC, PNC, and delivery services from BMC was small and the findings and the significance level need to be taken with caution. Additionally, with the skip logic in use, some of the composite scores were calculated using a smaller sample size, which may limit the power of probability of making a correct decision of a particular variable. These findings should be read with caution and cannot be generalized.

The study used random sampling for selecting respondents. However, the list of FTMs that BRAC provided fell short of what was needed for the assessment because many FTMs migrated, went to their parents' house for deliveries, or did not fulfill the eligibility criteria. Resampling was employed to ensure it reached the number of FTMs needed for the endline survey.

The study was conducted with women who recently delivered (within the previous 12 months), and there is potential for recall bias for some questions, particularly on quality of care of ANC, delivery, and PNC. Social desirability and custom bias may also affect how some mothers report the service as positive experiences.

Two Reflection Points one year apart (May through August 2022 and May through July 2023) sought to learn implementation challenges and participants' experience of the group sessions to improve the service modalities. This may have some influence on the uptake of services. For example, same pregnancy duration FTMs were planned to keep in the same group all through as the target was to provide message for that gestational age FTMs. However, it was not possible to keep lumped/grouped FTMs in the same group throughout the GANC-GPNC journey. FTMs, who had missed their own group, have been merged with the other group with the same gestational age, if there is a low turnout of FTMs. This process may have influence on lack of bonding among FTMs which was intended from the beginning.

3. Findings

3.1 BACKGROUND CHARACTERISTICS

TABLE 1: BACKGROUND/DEMOGRAPHIC CHARACTERISTICS OF FIRST-TIME MOTHERS (FTMs)

Composite indicator	Baseline			Endline			DiD (%)	p-value
	Control, n(%)	Intervention, n (%)	Diff. (p-value)	Control, n (%)	Intervention, n (%)	Diff. (p-value)		
Age in years								
<18	87 (7.9)	105 (9.5)	0.170	102 (9.3)	92 (8.4)	0.499	-2.5	0.136
18–24	1013 (92.1)	995 (90.4)		998 (90.7)	1008 (91.6)		2.5	0.136
Highest level of schooling[Ω]								
Never attended school	22 (2.0)	22 (2.0)	0.460	17 (1.6)	16 (1.5)	0.062	-0.1	>0.900
Nursery/preprimary	24 (2.2)	28 (2.5)		101 (9.2)	69 (6.3)		-3.2	0.012*
Primary	345 (31.4)	335 (30.4)		650 (59.1)	639 (58.1)		-0.1	>0.900
Secondary	573 (52.1)	555 (50.4)		192 (17.5)	217 (19.7)		3.9	0.148
Higher secondary/ college	130 (11.8)	152 (13.8)		115 (10.5)	139 (12.6)		0.2	>0.900
University	6 (0.5)	8 (0.7)		25 (2.3)	20 (1.8)		-0.6	0.358
Age at marriage								
<18	711 (64.6)	657 (59.7)	0.020*	599 (54.5)	549 (49.9)	0.033*	0.4	0.902
18–24	389 (35.4)	443 (40.3)		501 (45.5)	551 (50.1)		-0.4	0.902
Religion[Ω]								
Muslim	1080 (98.2)	1079 (98.2)	0.875‡	1076 (97.8)	1066 (96.9)	0.200	-0.8	0.360
Hindu & others	21 (1.8)	20 (1.8)		24 (2.2)	34 (3.1)		0.8	0.360
Profession*								
Housewife	971 (88.3)	976 (88.7)	0.740	986 (89.6)	962 (87.4)	0.108	-2.6	0.170
Garment worker	134 (12.2)	114 (10.4)	0.180	108 (9.8)	123 (11.2)	0.297	3.2	0.090
Student	22 (2.0)	28 (2.5)	0.390	16 (1.5)	19 (1.7)	0.734	-0.3	0.742
Others (handicrafts, small business & tailoring)	22 (2.0)	19 (1.7)	0.640	20 (1.8)	35 (3.2)	0.055	1.6	0.063
Husband's profession[₸]								
Unemployed	16 (1.5)	27 (2.5)	0.090	17 (1.6)	29 (2.7)	0.074	0.1	0.897
Garment worker	512 (47.2)	424 (39.1)	<0.001***	545 (49.8)	371 (34.3)	<0.001***	-7.4	0.013*
Daily labor	126 (11.6)	158 (14.6)	0.040*	88 (8.0)	82 (7.6)	0.749	-3.4	0.064
Small business	122 (11.2)	122 (11.3)	>0.900	116 (10.6)	104 (9.6)	0.452	-1.0	0.596
Others (factory worker, Shop keeping, Hawker/ peddling, Farmer, Student, Fisherman, Rickshaw/Van driver)	267 (24.3)	307 (27.9)	0.052	321 (29.2)	464 (42.2)	<0.001***	9.4	<0.001***
Overseas employee	5 (0.5)	7 (0.6)	0.85	14 (1.3)	22 (2.0)	0.762	0.6	0.358

TABLE 1 (continued):

Primary decisionmaker on health care expenditures[Ω]							
Self	41 (3.7)	35 (3.2)	0.020‡ *	18 (1.6)	32 (2.9)	<0.001***	1.8	0.070
Husband	426 (38.7)	393 (35.7)		612 (55.6)	503 (45.7)		-6.9	0.019*
Both (Self and husband)	396 (36.0)	389 (35.4)		302 (27.5)	296 (26.9)		0.1	0.974
Parents/other relatives	237 (21.5)	283 (25.7)		168 (15.3)	269 (24.5)		5.0	0.043*
Monthly household expenditure in BDT[Ω]							
<10,000	57 (5.8)	86 (8.5)	0.130‡	13 (1.2)	35 (3.2)	0.001***	-0.7	0.610
10,000-15,000	592 (60.2)	526 (52.0)		393 (36.5)	347 (32.2)		3.9	0.200
15,001-20,000	205 (20.8)	238 (23.5)		378 (35.1)	324 (30.0)		-7.8	0.005**
>20,000	129 (13.1)	161 (15.9)	0.080†	293 (27.2)	373 (34.6)	>0.900†	4.6	0.072
Monthly household expenditure in BDT (mean)	983 (15,957.8)	1011 (16,510.9)		1077 (19818.5)	1079 (20902.7)		531.1[a]	0.024*
Wealth quintiles[4]							
Lowest	293 (26.6)	251 (22.8)	<0.001***	254 (23.1)	186 (16.9)	0.002**	-2.4	0.345
Second	190 (17.3)	155 (14.1)		270 (24.5)	259 (23.5)		2.2	0.362
Middle	232 (21.1)	210 (19.1)		213 (19.4)	220 (20.0)		2.6	0.273
Fourth	213 (19.4)	234 (21.3)		169 (15.4)	196 (17.8)		0.5	0.815
Highest	172 (15.6)	250 (22.7)		194 (17.6)	239 (21.7)		-3.0	0.207
N	**1100**	**1100**	–	**1100**	**1100**	–	–	–

₸ Multiple responses collected for these questions; ‡Cochran–Armitage test, †Student's t-test, without sign p-value generated using Chi-square test, *p<0.05, **p<0.01, ***p<0.001; Ωloss of independence if separate p-values are provided; [a]average value

4. **Definition of Wealth Index:** Wealth Index is a composite measure used to assess the relative economic status of households. It is constructed using principal component analysis (PCA), combining information on various household assets and amenities (toilet facilities) and household expenditure (i.e.: average household expenditure and expenses on health care services in a month). The index ranks households on a continuous scale, and divided into quintiles, where higher scores indicate greater wealth. This index allows for comparison of wealth across different households or regions within the survey population. The composite measure was calculated separately in the baseline and endline.

Table 1 shows the background characteristics of FTMs comparing two groups (control vs intervention) at the baseline and endline. It shows no significant difference in background characteristics (age, age at marriage, religion, profession, and wealth index) between the respondents of baseline survey and endline surveys. For example, age is not significantly different between two groups of respondents, with DiD values of -2.5 for those under 18 and 2.5 for those aged 18–24, both having p-values of 0.136. However, educational attainment showed a notable shift, particularly in pre-primary education, where the intervention group had fewer individuals with only pre-primary education, as indicated by a significant DiD of -3.2 and a p-value of 0.012. A significant change was observed in the employment patterns of husbands, particularly moving away from garment work (DiD=-7.4, p=0.013). In terms of decisionmaking on health care expenditures, there was a significant reduction in husbands being the sole decisionmakers, with an increase in parents/other relatives making decisions. This shift is reflected in the DiD value of -6.9 for husbands and 5 for parents'/other relatives' decisionmaking, with a significant p-value of 0.019 and 0.043, respectively. Household expenditure patterns also changed notably, with an increase in >BDT20,000 expenditures (DiD=4.6, p=0.072) and significant decrease in BDT15,001-20,000 expenditures (DiD=-7.8, p=0.005).

3.2 FTMs' KNOWLEDGE ON DANGER SIGNS OF PREGNANCY, DELIVERY, POSTNATAL PERIOD, AND NEWBORNS

TABLE 2A: FTMs' KNOWLEDGE OF DANGER SIGNS DURING PREGNANCY OVER TIME

Danger signs†	Baseline			Endline			DiD (%)	p-value
	Control, n(%)	Intervention, n (%)	Diff. (p-value)	Control, n (%)	Intervention, n (%)	Diff. (p-value)		
Severe vaginal bleeding	328 (29.8)	354 (32.2)	0.231	405 (36.8)	745 (67.7)	<0.001***	28.5	<0.001***
Severe headache	87 (7.9)	85 (7.7)	0.874	206 (18.7)	503 (45.7)	<0.001***	27.2	<0.001***
Blurry vision	61 (5.6)	74 (6.7)	0.248	115 (10.5)	372 (33.8)	<0.001***	22.2	<0.001***
High fever	53 (4.8)	83 (7.6)	<0.010**	200 (18.2)	625 (56.8)	<0.001***	35.9	<0.001***
Prolonged labor	39 (3.5)	42 (3.8)	0.734	68 (6.18)	185 (16.8)	<0.001***	10.4	<0.001***
FTMs who can tell at least one of the danger signs of pregnancy	464 (42.2)	498 (45.3)	0.144	645 (58.6)	1005 (91.4)	<0.001***	29.6	<0.001***
FTMs who can tell at least three of the danger signs of pregnancy	*15 (1.4)*	*24 (2.2)*	*0.196*	*67 (6.1)*	*450 (40.9)*	*<0.001****	*34.0*	*<0.001****
N	**1100**	**1100**	–	**1100**	**1100**	–	–	–

† Multiple responses collected for this question; without sign p-value generated using Chi-square test, *p<0.05, **p<0.01, ***p<0.001

TABLE 2A1: FTMs' KNOWLEDGE OF DANGER SIGNS DURING PREGNANCY BY ATTENDING NUMBER OF GANC AND GPNC SESSIONS (ENDLINE ONLY)

Attended number of sessions	FTMs who can tell at least one of the danger signs during pregnancy	FTMs who can tell at least three of the danger signs during pregnancy	n
Attended 1 group session	269 (89.1)	130 (43.1)	302
Attended 2 group sessions	139 (88.0)	50 (31.7)	158
Attended 3 group sessions	153 (92.7)	56 (33.9)	165
Attended 4 group sessions	166 (93.3)	72 (40.5)	178
Attended 5 group sessions	143 (91.7)	71 (45.5)	156
Attended 6 group sessions	28 (96.6)	14 (48.3)	29
Attended 7 group sessions	107 (95.5)	57 (50.9)	112

Table 2a compares the knowledge of FTMs on danger signs during pregnancy at two time points: baseline and endline, for both control and intervention groups. It shows a significant increase of knowledge on all five danger signs over time across the two groups. However, a significantly higher knowledge gain on danger signs was observed in the intervention group, as indicated in the DiDs and p values. For example, at baseline, 29.8 percent of FTMs in the control group and 32.2 percent in the intervention group identified severe vaginal bleeding as a danger sign (p=0.231); at the endline, recognition of severe vaginal bleeding as danger sign increased significantly to 36.8 percent in the control group and 67.7 percent in the intervention group (p<0.001), resulting in a significant DiD of 28.5 (p<0.001). The percentage of FTMs who could identify **at least one** danger sign during pregnancy increased from 42.2 percent in the control group and 45.3 percent in the intervention group at baseline (p=0.144) to 58.6 percent the in control group and 91.4 percent in intervention group at endline (p<0.001), with a DiD of 29.6 (p<0.001). Additionally, the percentage of FTMs who could identify **at least three** danger signs during pregnancy rose significantly, from 1.4 percent in control group and 2.2 percent in intervention group at baseline (p=0.196) to 6.1 percent in the control group and 40.9 percent in the intervention group at endline (p<0.001), with a DiD of 34.0 (p<0.001).

Further analysis showed that FTMs' knowledge on at least three danger signs during pregnancy progressively increased, from 43.1 percent in the first session (GANC1) to 50.9 percent in the seventh session (GPNC2).

These results suggest that the GANC-GPNC sessions were highly effective in educating FTMs about multiple potential complications during pregnancy (Table 2a1).

TABLE 2B: FTMs' KNOWLEDGE OF DANGER SIGNS DURING LABOR AND CHILDBIRTH OVER TIME

Danger signs†	Baseline			Endline			DiD (%)	p-value
	Control, n(%)	Intervention, n (%)	Diff. (p-value)	Control, n (%)	Intervention, n (%)	Diff. (p-value)		
Prolonged delivery lasting >12 hours	352 (32.0)	368 (33.4)	0.467	203 (18.5)	288 (26.2)	<0.001***	6.3	0.019*
Baby in wrong position	303 (27.5)	258 (23.4)	<0.031*	272 (24.7)	453 (41.2)	<0.001***	20.5	<0.001***
Seizures/eclampsia	269 (24.4)	255 (23.2)	0.483	448 (40.7)	757 (68.8)	<0.001***	29.4	<0.001***
Severe vaginal bleeding	291 (26.4)	315 (28.6)	0.252	462 (42.0)	608 (55.3)	<0.001***	11.1	<0.001***
Obstructed labor	263 (23.9)	233 (21.2)	0.126	169 (15.4)	206 (18.7)	0.036*	6.1	0.011*
Retained placenta	61 (5.5)	76 (6.9)	0.180	121 (11.0)	108 (9.8)	0.400	-2.5	0.125
Rupture uterus	54 (4.9)	53 (4.8)	0.921	53 (4.8)	55 (5.0)	0.800	0.3	0.834
FTMs who can tell at least one of the danger signs during labor and childbirth	850 (77.3)	812 (74.2)	0.066	835 (75.9)	1031 (93.7)	<0.001***	21.3	<0.001***
FTMs who can tell at least three of the danger signs during labor and childbirth	*172 (15.6)*	*177 (16.1)*	*0.770*	*236 (21.5)*	*421 (38.3)*	*<0.001****	*16.4*	*<0.001****
N	**1100**	**1100**	–	**1100**	**1100**	–	–	–

† Multiple responses collected for this question; without sign p-value generated using Chi-square test, *p<0.05, **p<0.01, ***p<0.001

TABLE 2B1: FTMs' KNOWLEDGE OF DANGER SIGNS DURING LABOR AND CHILDBIRTH BY ATTENDING NUMBER OF GANC AND GPNC SESSIONS (ENDLINE ONLY)

Attended number of sessions	FTMs who can tell at least one of the danger signs during labor and childbirth	FTMs who can tell at least three of the danger signs during labor and childbirth	n
Attended 1 group session	269 (89.1)	130 (43.1)	302
Attended 2 group sessions	139 (88.0)	50 (31.7)	158
Attended 3 group sessions	153 (92.7)	56 (33.9)	165
Attended 4 group sessions	166 (93.3)	72 (40.5)	178
Attended 5 group sessions	143 (91.7)	71 (45.5)	156
Attended 6 group sessions	28 (96.6)	14 (48.3)	29
Attended 7 group sessions	107 (95.5)	57 (50.9)	112

Table 2b compares the knowledge of FTMs on danger signs during labor and childbirth at two time points: baseline and endline, between control and intervention groups. It shows a significant increase of knowledge on five danger signs over time across two groups except the topics of retained placenta and ruptured uterus. Significantly higher knowledge gain on danger signs during labor and childbirth were observed in the intervention group compared to control group as indicated in the DiDs and p values except the last two components mentioned above. For example, at baseline, 33.4 percent of FTMs in the intervention group recognized prolonged delivery (lasting more than 12 hours) as a danger sign, compared to 32.0 percent in the control group, with no significant difference (p=0.467). At the endline, however, recognition in the intervention group improved to 26.2 percent compared to 18.5 percent in the control group, showing a significant positive DiD of 6.3 (p=0.019). The percentage of FTMs who could identify **at least one** danger sign during labor and childbirth increased from 74.2 percent at baseline to 93.7 percent at endline in the intervention group, with a significant DiD of 21.3 percent (p<0.001), while a small decrease was observed in the control group (77.3 percent at baseline, and 75.9 percent at endline). Additionally, the percentage of FTMs who could identify **at least three** danger signs during labor and childbirth rose significantly, from 15.6 percent in the control group and 16.1 percent in the intervention group at baseline (p=0.770) to 21.5 percent in the control and 38.3 percent in the intervention group at endline (p<0.001), with a DiD of 16.4 percent (p<0.001).

Further analysis showed that FTMs' knowledge of at least three danger signs during labor and childbirth progressively increased from 29.1 percent in the first session (GANC1) to 54.5 percent at the seventh session (through GPNC2). These results suggest that the GANC-GPNC sessions were highly effective in educating FTMs about multiple potential complications during labor and childbirth (Table 2b1).

TABLE 2C: FTMs' KNOWLEDGE OF DANGER SIGNS DURING POSTNATAL PERIOD OVER TIME

Danger signs†	Baseline			Endline			DiD (%)	p-value
	Control, n(%)	Intervention, n (%)	Diff. (p-value)	Control, n (%)	Intervention, n (%)	Diff. (p-value)		
Severe vaginal bleeding	421 (38.3)	408 (37.1)	0.567	578 (52.5)	741 (67.4)	<0.001***	16.0	<0.001***
Seizure/eclampsia	157 (14.3)	151 (13.7)	0.712	324 (29.5)	639 (58.1)	<0.001***	29.2	<0.001***
Lower abdominal pain	138 (12.5)	140 (12.7)	0.898	140 (12.7)	68 (6.2)	<0.001***	-6.7	<0.001***
High blood pressure	73 (6.6)	86 (7.8)	0.284	87 (7.9)	165 (15.0)	<0.001***	5.9	0.001**
Severe headache	43 (3.9)	47 (4.3)	0.660	160 (14.5)	280 (25.5)	<0.001***	10.5	<0.001***
High fever	38 (3.4)	46 (4.2)	0.373	168 (15.3)	373 (33.9)	<0.001***	17.9	<0.001***
Foul smelling vaginal discharge	16 (1.4)	20 (1.8)	0.501	53 (4.82)	135 (12.3)	<0.001***	7.1	<0.001***
FTMs who can tell at least one of the danger signs during postnatal period	580 (52.7)	586 (53.3)	0.798	765 (69.5)	966 (87.8)	<0.001***	17.7	<0.001***
FTMs who can tell at least three of the danger signs during postnatal period	*55 (5.0)*	*54 (4.9)*	*0.922*	*195 (17.7)*	*415 (37.7)*	<0.001***	*20.1*	<0.001***
N	**1100**	**1100**	–	**1100**	**1100**	–	–	–

† Multiple responses collected for this question; without sign p-value generated using Chi-square test, *p<0.05, **p<0.01, ***p<0.001

TABLE 2C1: FTMs' KNOWLEDGE OF DANGER SIGNS DURING POSTNATAL PERIOD BY ATTENDING NUMBER OF GANC AND GPNC SESSIONS (ENDLINE ONLY)

Attended number of sessions	FTMs who can tell at least one of the danger signs during postnatal period	FTMs who can tell at least three of the danger signs during postnatal period	n
Attended 1 group session	265 (87.8)	115 (38.1)	302
Attended 2 group sessions	138 (87.3)	43 (27.2)	158
Attended 3 group sessions	140 (84.9)	58 (35.2)	165
Attended 4 group sessions	157 (88.2)	73 (41.0)	178
Attended 5 group sessions	139 (89.1)	65 (41.7)	156
Attended 6 group sessions	27 (93.1)	12 (41.4)	29
Attended 7 group sessions	100 (89.3)	49 (43.8)	112

Table 2c compares the knowledge of FTMs on danger signs during postnatal period at two time points: baseline and endline, for both control and intervention groups. It shows a significant increase of knowledge on all six danger signs (severe vaginal bleeding, seizure/eclampsia, high blood pressure, severe headaches, high fever, and foul-smelling vaginal discharge) over time across two groups except one component (lower abdominal pain). However, significantly higher knowledge gain on danger signs was observed in the intervention group as indicated in the DiDs and p values. For example, at baseline, 38.3 percent of FTMs in the control group and 37.1 percent in the intervention group identified severe vaginal bleeding as a danger sign (p=0.567); at the endline, recognition of severe vaginal bleeding as danger sign increased significantly to 52.5 percent in the control group and 67.4 percent in the intervention group (p<0.001), resulting in a significant DiD of 16.0 (p<0.001). The percentage of FTMs who could identify at least one danger sign during the postnatal period increased from 52.7 percent in the control group and 53.3 percent in the intervention group at baseline (p=0.798) to 69.5 percent in the control group and 87.8 percent in the intervention group at endline (p<0.001), with a DiD of 17.7 (p<0.001). Additionally, the percentage of FTMs who could identify at least three danger signs during the postnatal period rose significantly from 5.0 percent in the control group and 4.9 percent in the intervention group at baseline (p=0.922) to 17.7 percent in the control group and 37.7 percent in the intervention group at endline (p<0.001), with a DiD of 20.1 (p<0.001).

Further analysis showed that FTMs' knowledge of at least three danger signs during postnatal period progressively increased from 38.1 percent in the first session (GANC1) to 43.8 percent in the seventh session (GPNC2). These results suggest that the GANC-GPNC sessions were highly effective in educating FTMs about multiple potential complications during the postnatal period (2c1).

The data indicate that the intervention significantly improved FTMs' knowledge on postnatal danger signs across all measured categories except lower abdominal pain. Qualitative interviews with beneficiaries, both FTMs and FTFs, corroborate findings from the survey. Respondents of all groups unanimously reiterated that knowledge of danger signs for the pregnant mother and newborn were most beneficial to them, and they named those signs spontaneously during the conversation on multiple occasions. One FTM who attended GANC session mentioned, "*I learned the five danger signs for pregnant mothers. If one has any of the five danger signs before having a baby, such as blurred vision and dizziness, she needs to go to the doctor. And if mother sees bleeding, she needs to go to the doctor. And they also told us about the five danger signs after having a baby.*" (FGD with FTM, GANC)

A 28-year-old FTF said, "*What I most recalled from the sessions is the knowledge of five danger signs for pregnant mothers. I understood that when these five signs are seen, pregnant mothers can no longer stay at home. They must quickly visit the nearby medical center or delivery center. I liked the thing the most. Because I didn't know about these symptoms or danger signs earlier. Besides,*

they [midwives] had always encouraged us—the fathers—and I liked that. They told us that there was nothing to panic and if anything happens keep courage. I really appreciate this. Their behavior was also very good. They always advised us and were there for us. They were committed to serving." (IDI with FTF)

TABLE 2D: FTMs' KNOWLEDGE ON DANGER/WARNING SIGNS OF NEWBORN COMPLICATIONS OVER TIME

Danger signs†	Baseline			Endline			DiD (%)	p-value
	Control, n(%)	Intervention, n (%)	Diff. (p-value)	Control, n (%)	Intervention, n (%)	Diff. (p-value)		
Breathing difficulty, irregular/fast (>60 minute)	563 (51.2)	489 (44.4)	0.002**	637 (57.9)	719 (65.4)	<0.001***	14.2	<0.001***
Seizure	152 (13.8)	139 (12.6)	0.410	222 (20.2)	539 (49.0)	<0.001***	30.0	<0.001***
Feeding poorly	121 (11.0)	63 (5.7)	<0.001***	137 (12.5)	233 (21.2)	<0.001***	14.0	<0.001***
Umbilical redness	39 (3.5)	58 (5.3)	<0.050*	67 (6.1)	409 (37.2)	<0.001***	29.4	<0.001***
Hypothermia	47 (4.3)	36 (3.3)	0.220	21 (1.9)	45 (4.1)	0.003**	3.2	0.004**
Lethargy	57 (5.2)	42 (3.8)	0.120	112 (10.2)	200 (18.2)	<0.001***	9.4	<0.001***
FTMs who can tell at least one of the danger signs of newborn	703 (63.9)	608 (55.3)	<0.001***	745 (67.7)	942 (85.6)	<0.001***	26.5	<0.001***
FTMs who can tell at least two of the danger signs of newborn	*227 (20.6)*	*182 (16.5)*	*<0.010***	*334 (30.4)*	*692 (62.9)*	<0.001***	*36.6*	<0.001***
N	**1100**	**1100**	–	**1100**	**1100**	–	–	–

† Multiple responses collected for this question; without sign p-value generated using Chi-square test, *p<0.05, **p<0.01, ***p<0.001

TABLE 2D1: FTMs' KNOWLEDGE ON DANGER/WARNING SIGNS OF NEWBORN COMPLICATIONS BY ATTENDING NUMBER OF GANC AND GPNC SESSIONS (ENDLINE ONLY)

Attended number of sessions	FTMs who can tell at least one of the danger signs of newborn	FTMs who can tell at least three of the danger signs of newborn	n
Attended 1 group session	254 (84.1)	182 (60.3)	302
Attended 2 group sessions	125 (79.1)	84 (53.2)	158
Attended 3 group sessions	136 (82.4)	100 (60.6)	165
Attended 4 group sessions	157 (88.2)	115 (64.6)	178
Attended 5 group sessions	142 (91.0)	105 (67.3)	156
Attended 6 group sessions	27 (93.1)	22 (75.9)	29
Attended 7 group sessions	101 (90.2)	84 (75.0)	112

Table 2d compares the knowledge of FTMs on newborn danger signs/warning signs of complications at baseline and endline for the control and intervention groups. It shows a significant increase of knowledge on all six warning signs of newborn complications (breathing difficulty, seizure, feeding poorly, umbilical redness, hypothermia, and lethargy) over time across two groups. However, a significantly higher knowledge gain on warning signs was observed in the intervention group compared to the control group as indicated in the DiDs and p values. For example, at baseline, 51.2 percent of FTMs in the control group and 44.4 percent in the intervention group identified breathing difficulty as a warning sign in a newborn (p=0.002); at the endline, this increased significantly to 57.9 percent in the control group and 65.4 percent in the intervention group (p<0.001), resulting in a significant DiD of 14.2 (p<0.001). The percentage of FTMs who could identify **at least one** warning sign of newborn complications increased from 63.9 percent in the control group and 55.3 percent in the intervention group at baseline (p<0.001) to 67.7 percent in the control group and 85.6 percent in the intervention group at endline (p<0.001), with a DiD of 26.5 (p<0.001). Additionally, the percentage of FTMs who could identify **at least two** newborn warning signs rose significantly, from 20.6 percent in the control group and 16.5 percent in intervention group at baseline (p<0.010) to 30.4 percent in the control group and 62.9 percent in the intervention group at endline (p<0.001), with a DiD of 36.6 (p<0.001).

Further analysis showed that FTMs' knowledge on at least two danger/warning signs of newborn progressively increased from 60.3 percent in the first session (GANC1) to 75.0 percent at the seventh session (GPNC2). These results suggest that the multiple GANC-GPNC sessions were highly effective in educating FTMs about multiple potential complications of newborn (Table 2d1).

The data demonstrate a significant improvement in FTMs' knowledge of newborn warning signs of complications in the intervention group across all measured categories. In the qualitative interviews, the majority of FTMs and FTFs expressed that for them, major takeaway messages from the PNC sessions pertained to warning signs for the newborn baby. Most respondents recalled learning about warning signs of umbilical infection, seizures, and breathing difficulties and that the baby needs to be taken to the hospital in such cases. One FGD informant said, *"I learned about the danger signs for the first time here [group sessions]. I learned about the danger signs both for me and the baby. If the child has difficulty in breathing, has a high fever, chills, rapid breathing, or have seizures, we should immediately go to a doctor. The danger signs for the mother are dizziness, bleeding, fever, headache, delayed delivery, and the appearance of other body parts before the baby's head."* (FGD with FTMs, attended both ANC and PNC sessions)

An FTF who attended both GANC-GPNC sessions said, *"They [midwives] talked about how to recognize if my child is in danger and when to bring the child to them [health facility]. I learned the danger signs for the baby, such as baby's umbilical area is red and swollen, have seizures, and fever."* (FGD with FTFs, attended both ANC and PNC sessions)

In the PNC sessions, both FTMs and FTFs demonstrated increased understanding of the importance of birth spacing and the need for using PPFP. The baseline qualitative assessment revealed a common misperception in the community that breastfeeding gives full protection for the next pregnancy and that PPFP was not needed. Fear of PPFP side effects, including health of mother and effects on breastmilk quality, were also reported at the baseline, another misperception. Qualitative interviews in the endline survey demonstrated understanding of the benefits of birth spacing and use of PPFP increased considerably because of the intervention, specifically information shared about PPFP in group PNC sessions (Table 17). Qualitative findings reveal that FTMs are now more aware of types of PPFP methods they can use during breastfeeding and beyond. An FTF who attended the GPNC session said, "*At one point, I was a bit negligent about using these methods [PPFP]. But after coming here at the session and hearing about how these things work, I had increased understanding on importance towards it… I realized that having a child too soon after the previous one can be harmful to the mother's health. It puts a lot of strain on her body. If a mother has another child too quickly, the new baby might suffer from malnutrition. So, understanding the importance of spacing between pregnancies is crucial.*" (FGD with FTF, GPNC) Another FTF who attended GPNC session said, "*I learned about family planning, such as taking pills after 42 days, using condoms, or getting injections. You need to take the pill whether you are menstruating or not. I didn't know that before.*" (FGD with FTF, GPNC) (Table 2e)

3.3 KNOWLEDGE AND USE OF FAMILY PLANNING METHODS

TABLE 2E: FTMs' KNOWLEDGE AND CURRENT PRACTICE OF CONTRACEPTION

Composite indicator	Baseline			Endline			DiD (%)	p-value
	Control, n(%)	Intervention, n (%)	Diff. (p-value)	Control, n (%)	Intervention, n (%)	Diff. (p-value)		
FTMs heard about FP methods								
Yes	1100 (100.0)	1100 (100.0)	–	1100 (100.0)	1100 (100.0)	–	0	–
FTMs know the name of any FP methods†								
Pill	1097 (99.7)	1083 (98.4)	0.002**	1049 (95.4)	1062 (96.5)	0.160	2.5	0.008**
Injectables	977 (88.8)	932 (84.7)	0.006**	886 (80.5)	889 (80.8)	>0.900	4.4	0.049*
Condom	765 (69.5)	767 (69.7)	>0.900	818 (74.4)	827 (75.2)	0.659	0.6	0.814
Implant	480 (43.6)	477 (43.4)	0.897	490 (44.5)	542 (49.3)	0.029*	5.0	0.096
Female sterilization	265 (24.1)	219 (19.9)	0.020*	163 (14.8)	212 (19.3)	0.005**	8.6	<0.001***
IUD	113 (10.3)	161 (14.6)	0.002***	99 (9.0)	219 (19.9)	<0.001***	6.5	0.001**
Male sterilization	55 (5.0)	59 (5.4)	0.7773	60 (5.5)	89 (8.1)	0.014**	2.3	0.112
Safe period	68 (6.2)	84 (7.6)	0.207	48 (4.4)	19 (1.7)	<0.001***	-4.1	0.002**
Lactational Amenorrhea Method (LAM)	2 (0.2)	16 (1.4)	0.001**‡	23 (2.1)	31 (2.8)	0.335‡	-0.5	0.475
FTMs know the name of modern FP methods†								
Pill	377 (34.3)	327 (29.7)	0.022*	443 (40.3)	454 (41.3)	0.663	5.5	0.055
Condom	258 (23.4)	232 (21.1)	0.183	277 (25.2)	342 (31.1)	0.002**	8.3	0.002**
Injectables	178 (16.2)	206 (18.7)	0.129	206 (18.7)	326 (29.6)	<0.001***	8.4	0.001**
Implant	65 (5.9)	97 (8.8)	0.011*	112 (10.2)	180 (16.4)	<0.001***	3.3	0.072
IUD	8 (0.7)	16 (1.4)	0.149‡	3 (0.3)	52 (4.7)	<0.001***‡	3.7	<0.001***
Female sterilization	33 (3.0)	40 (3.6)	0.475	29 (2.6)	49 (4.5)	0.028**‡	1.2	0.282
Male sterilization	8 (0.7)	10 (0.9)	0.814‡	9 (0.8)	10 (0.9)	>0.900‡	-0.001	0.869
FTMs know the name of at least one of the modern FP methods	*511 (46.5)*	*457 (41.6)*	*0.020**	*604 (54.9)*	*714 (64.9)*	*<0.001****	*14.9*	*<0.001****
FTMs know the names of at least any three of the modern FP methods	*106 (9.6)*	*126 (11.4)*	*0.165*	*113 (10.3)*	*190 (17.3)*	*<0.001****	*5.2*	*0.008***
FTMs ever discussed with their husband about the use of FP methods to avoid or delay pregnancy								
Yes	**985 (89.5)**	**952 (86.5)**	**0.030***	**923 (83.9)**	**924 (84.0)**	**>0.900**	**3.1**	**0.139**
N	**1100**	**1100**	**–**	**1100**	**1100**	**–**	**–**	**–**

TABLE 2E (continued):

FTMs currently using modern FP (6 months postpartum group only) †								
n	**330**	**394**	**–**	**447**	**493**	**–**	**–**	**–**
Progesterone-only pill (POP)	177 (53.6)	162 (41.1)	0.001***	196 (43.8)	222 (45.0)	0.716	13.7	0.005**
Condom	39 (11.8)	63 (16.0)	0.108	40 (8.95)	78 (15.8)	0.001**	2.7	0.420
Injectables	14 (4.2)	41 (10.4)	0.002**	24 (5.4)	45 (9.2)	0.033*‡	-2.4	0.354
Implant	0	5 (1.3)	0.067‡	1 (0.2)	12 (2.4)	0.004**‡	0.9	0.357
IUD	0	0	–	0	6 (1.2)	0.032*‡	1.2	0.040*
Female sterilization	0	0	–	0	1 (0.2)	0.341	0.2	0.404
Male sterilization	0	0	–	0	1 (0.2)	0.341	0.2	0.404
Use any modern FP during postpartum (6 months postpartum group only)	*230 (69.7)¤¤*	*268 (68.0)¤*	*0.630*	*252 (56.4)*	*315 (63.9)*	*0.019**	*9.2*	*0.052*

† Multiple responses collected for these questions; ‡Fisher exact test, without sign P-value generated using Chi-square test, *p<0.05, **p<0.01, ***p<0.001; ¤= 3 women used POP and condom, ¤¤=one woman used POP and condom and ¤¤¤=4 women used POP and condom.

Table 2e presents FTMs' awareness and use of FP methods at both baseline and endline periods, emphasizing the DiD percentage, which assesses changes in the intervention group relative to the control group over time. All FTMs in both groups had heard about FP methods, with no change over time. They were asked to mention names of FP methods. The four most common methods they mentioned at baseline and endline were pills, injectables, condoms, and implants. Knowledge of names of specific methods varied over time. For instance, knowledge of the name of the pill observed a slight decrease in both groups, but the intervention group had a smaller reduction, leading to a significant DiD of 2.5 percent (p=0.008). Similarly, knowledge of the name of injectables decreased more in the control group, resulting in a significant DiD of 4.4 percent (p=0.049). Knowledge of the name of condom remained stable, with no significant DiD (0.6 percent, p=0.814). The intervention group showed an increase in knowledge of the name of implants, female sterilization, and IUDs, with significant DiDs of 5.0 percent (p=0.096), 8.6 percent (p<0.001), and 6.5 percent (p=0.001), respectively. Notably, knowledge of the safe period method decreased significantly in the intervention group, leading to a negative DiD of -4.1 percent (p=0.002).

FTMs were asked to name modern methods. The four most common methods they named were the pill, condom, injectables, and implants. Analysis revealed that knowledge of modern FP methods improved more in the intervention group, particularly for condoms (DiD = 8.3 percent p=0.002), injectables (DiD = 8.4 percent p=0.001), and IUDs (DiD = 3.7 percent, p<0.001). The intervention group showed a notable increase in FTMs who knew at least one or three modern FP methods, with significant DiDs of 14.9 percent (p<0.001) and 5.2 percent (p=0.008), respectively.

A consistently high proportion of FTMs in both intervention and control groups discussed use of FP methods with their husbands to avoid or delay pregnancy over time. However, at baseline, significantly more FTMs in the control group discussed this compared to FTMs in the intervention group (89.5 percent and 86.5 percent p=0.030); at the endline, the percentage of FTMs who discussed on FP methods with their husbands were the same in both groups (83.9 percent and 84.0 percent, respectively; p>0.900). Overall, there was a small, non-significant decrease in the intervention group (DiD = 3.1 percent, p=0.139) who mentioned discussing FP method with their husbands.

FTMs who used modern FP during the six months post-partum period were taken into consideration for this analysis. Among the six-month postpartum group, the use of modern FP methods varied over time. The intervention group showed increased use of injectables, implants, progesterone-only pills (POPs), condoms, and IUDs, although the DiDs for injectables (DiD=-2.4 percent, p=0.354) and implants (DiD=0.9 percent, p=0.357) were not statistically significant. Use of POP and IUD significantly increased in the intervention group (DiD=13.7 percent, p=0.005 and DiD=1.2; p=0.040, respectively). Overall, the use of any modern FP method during the six-month postpartum period in the intervention group is approaching to significant level of increase (DiD = 9.2 percent, p=0.052), compared to control group.

Qualitative interviews showed similar findings, where both FTMs and FTFs demonstrated increased understanding of the importance of birth spacing and the need for using PPFP. During the baseline qualitative assessment, it was found that a perception prevailed in the community that breastfeeding gives full protection for next pregnancy and needs for PPFP were overlooked. Fear of side effects of PPFP including health of mother and effects on breastmilk quality were also reported at the baseline. Clearly there was a need and knowledge gap there. Qualitative interviews in the endline survey demonstrated that awareness regarding birth spacing and use of PPFP have increased considerably because of the intervention and critical information shared with clarity about PPFP in group PNC sessions. Qualitative findings reveal that FTMs are now more aware of types of PPFP methods they can use during breastfeeding and beyond. An FTF who attended GPNC session said, "*At one point, I was a bit negligent about using these methods [PPFP]. But after coming here at the session and hearing about how these things work, I had increased understanding on importance towards it… I realized that having a child too soon after the previous one can be harmful to the mother's health. It puts a lot of strain on her body. If a mother has another child too quickly, the new baby might suffer from malnutrition. So, understanding the importance of spacing between pregnancies is crucial.*" (FGD with FTF, GPNC)

Furthermore, another FTF who attended GPNC session said, "*I learned about family planning, such as taking pills after 42 days, using condoms, or getting injections. You need to take the pill whether you are menstruating or not. I didn't know that before.*" (FGD with FTF, GPNC)

In terms of PPFP practice, qualitative interviews showed mixed results. High levels of couple communication regarding PPFP were reported in qualitative interviews with FTMs and FTFs, and couples using (or not using) PPFP reported to have mutually decided on it. However, some couples reported that they were practicing abstinence as a method and did not feel the need to use any modern PPFP. One FTF said, "*Actually, I haven't used any methods. Why? I think that if we can manage without using a method, then there's no need for it.*" (IDI with FTF)

On the other hand, another FTF said, "*I must discuss it with her [wife]. …. see, both of us attended the sessions. So, we both learned about the benefits and drawbacks of the gap between having one child and the next. We understood that this was the right thing to do. My wife took an injection. We have made this decision with the consent of both of us. It's our mutual understanding.*" (IDI with FTF)

3.4 KNOWLEDGE AND USE OF HEALTH SERVICES

TABLE 3: FTMs' KNOWLEDGE ON FACILITIES WHERE WOMEN SEEK SERVICES DURING PREGNANCY

Facilities	Baseline			Endline			DiD (%)	p-value
	Control, n(%)	Intervention, n (%)	Diff. (p-value)	Control, n (%)	Intervention, n (%)	Diff. (p-value)		
Government hospital†								
Medical College Hospital	466 (42.4)	452 (41.1)	0.545	307 (27.9)	258 (23.5)	0.017*	-3.2	0.257
District Hospital	662 (60.2)	438 (39.8)	<0.001***	315 (28.6)	178 (16.2)	<0.001***	7.9	0.004*
Mother and Child Welfare Center	704 (64.0)	546 (49.6)	<0.001***	292 (26.6)	270 (24.6)	0.282	12.4	<0.001***
Shaheed Ahsan Ullah Master General Hospital	364 (33.1)	676 (61.4)	<0.001***	267 (24.3)	595 (54.1)	<0.001***	1.5	0.609
Satellite Clinic/EPI center	431 (39.2)	302 (27.4)	<0.001***	187 (17.0)	106 (9.6)	<0.001***	4.4	0.076
City Corporation Health Center	340 (30.9)	331 (30.1)	0.677	189 (17.2)	268 (24.4)	<0.001***	8.0	0.002**
Nongovernment hospital†								
BRAC Maternity Center	912 (82.0)	845 (76.8)	<0.001***	808 (73.5)	1068 (97.1)	<0.001***	29.7	<0.001***
Other NGO static clinic	393 (35.7)	331 (30.1)	0.005**	208 (18.9)	186 (16.9)	0.221	3.6	0.159
Other NGO satellite clinic	232 (21.1)	144 (13.1)	<0.001***	104 (9.5)	102 (9.3)	0.884	7.8	<0.001***
Private hospital††								
Private hospital/clinic	1041 (94.6)	1015 (93.4)	0.025*	977 (88.8)	856 (77.8)	<0.001***	-8.6	<0.001***
Private medical college	444 (40.4)	321 (29.2)	<0.001***	235 (21.4)	157 (14.3)	<0.001***	4.1	0.114
Don't know	5 (0.6)	3 (0.3)	0.507‡	6 (0.6)	3 (1.0)	>0.900‡	0.2	0.654
N	**1100**	**1100**	–	**1100**	**1100**	–	–	–

† Multiple responses collected for these questions; Fisher exact test, p-value generated using Chi-square test, *p<0.05, **p<0.01, ***p<0.001

Table 3 presents data on the knowledge of facilities where women seek services during pregnancy, comparing the baseline and endline responses between control and intervention groups. Findings indicate a complex pattern of changes in awareness of facilities where pregnancy-related services are available. While awareness of certain facilities, particularly government hospitals and NGO clinics, increased, declined, or showed no significant improvement, there was a significant increase in awareness of BMCs (DiD=29.7 percent, p<0.001) in the intervention group as a facility where women seek pregnancy-related services compared to the control group.

TABLE 3A: FTMs' KNOWLEDGE AND USE OF HEALTH SERVICES FROM BRAC MATERNITY CENTER

Knowledge of BRAC Maternity Center (BMC)	Baseline			Endline			DiD (%)	p-value
	Control, n(%)	Intervention, n (%)	Diff. (p-value)	Control, n (%)	Intervention, n (%)	Diff. (p-value)		
Heard about BRAC Maternity Center								
Yes	912 (82.9)	845 (76.8)	<0.001***	923 (83.9)	1100 (100.0)	<0.001***	22.2	<0.001***
N	**1100**	**1100**	–	**1100**	**1100**	–	–	–

TABLE 3A (continued):

Information that was heard about BMC†								
It provides ANC, PNC, delivery, and FP services to women	877 (96.2)	782 (92.5)	0.001**	865 (93.7)	1044 (95.0)	0.246	4.8	0.001**
It provides ANC, PNC, delivery, and FP services to adolescent women	741 (81.2)	592 (70.1)	<0.001***	620 (67.2)	852 (77.6)	<0.001***	21.5	<0.001***
It provides general health services to women	471 (51.6)	469 (55.5)	0.105	396 (42.9)	629 (57.2)	<0.001***	10.4	0.001**
It provides FP services to women	494 (54.2)	438 (51.8)	0.328	344 (37.3)	651 (59.2)	<0.001***	24.2	<0.001***
Use of any health services from BMC								
Yes	352 (38.6)	396 (46.9)	<0.001***	510 (55.3)	1100 (100.0)	<0.001***	35.9	<0.001***
N	**912**	**845**	–	**923**	**1100**	–	–	–
Types of services received from BMC†								
ANC	245 (69.6)	260 (65.5)	00.204	292 (57.3)	807 (73.8)	<0.001***	20.9	<0.001***
Delivery	82 (23.3)	106 (26.8)	0.275	119 (23.3)	197 (18.0)	0.016*	-8.8	0.011*
PNC	51 (14.5)	54 (13.6)	0.738	91 (17.8)	235 (21.5)	0.100	4.5	0.200
Neonatal health services	17 (4.8)	33 (8.3)	0.055	12 (2.4)	85 (7.8)	<0.001***	1.9	0.382
Medicines	28 (8.0)	30 (7.6)	0.847	174 (34.1)	322 (29.4)	0.059	-4.3	0.248
PPFP	5 (1.2)	14 (3.5)	0.101‡	8 (1.6)	131 (12.0)	<0.001***	8.3	0.001***
n	**352**	**396**	–	**510**	**1094a**	–	–	–

† Multiple responses collected for these questions; Fisher exact test, without sign p-value generated using Chi-square test, *p<0.05, **p<0.01, ***p<0.001; a6 no responses

Table 3a presents findings on the knowledge and use of health services from the BMC among women in control and intervention groups, comparing baseline and endline data. At baseline, 82.9 percent of women in the control group and 76.8 percent in the intervention group had heard about BMC, with a significant difference between the two groups (p<0.001). By the endline, awareness had increased significantly in the intervention group, with 100 percent of women having heard about BMC, compared to 83.9 percent in the control group. This resulted in a substantial DiD of 22.2 percent (p<0.001), indicating a marked improvement in awareness about BMCs due to the intervention. Most women in both groups were aware that BMC provides ANC, PNC, delivery, and FP services. At baseline, 96.2 percent of women in the control group and 92.5 percent in the intervention group were aware of these services (p=0.001). By the endline, awareness slightly increased, particularly in the intervention group, resulting in a DiD of 4.8 percent (p=0.001).

The use of any health services from BMCs increased significantly in the intervention group from 46.9 percent at baseline to 100 percent at endline (p<0.001), compared to a smaller increase in the control group. This large increase in the intervention group led to a significant DiD of 35.9 percent (p<0.001). Among the five important maternal health services (ANC, delivery, PNC, neonatal, and PPFP), use of three maternal health services (ANC, delivery, and PPFP) in the intervention area increased significantly compared to the control area. For example, at baseline, 69.6 percent of women in the control group and 65.5 percent in the intervention group received ANC services from a BMC. By the endline, ANC use increased significantly in the intervention group to 73.8 percent compared to 57.3 percent in control group, resulting in a DiD of 20.9 percent (p<0.001). Conversely, the use of delivery services decreased significantly (DiD=-8.8 percent, p=0.011) in the intervention group by the endline (18.0 percent) compared to the control group (23.1 percent). It is to be noted that delivery service was stopped at BMCs as of March 2024. PNC service use slightly increased in both groups from baseline to endline, with a small, non-significant DiD of 4.5 percent (p=0.200). The use of PPFP services saw a significant increase in the intervention group from 3.5 percent at baseline to 12.0 percent at endline, resulting in a significant DiD of 8.3 percent (p=0.001).

Overall, the intervention had a positive impact on both the awareness and use of BMC services. The findings suggest that the intervention effectively enhanced the knowledge and utilization of its services. Qualitative interviews also suggest that the intervention had some positive influence on decisions on facility delivery. At the baseline, preference for home delivery was common, and major reasons cited were comfort of home privacy and fear of a likely unnecessary cesarean section at a facility. The latter perception persisted in the endline, and people trusted midwives for normal delivery. It was a noteworthy positive shift from the baseline to the endline. One mother-in-law at a FGD said, "*Those who don't need it (caesarean section) are forced to undergo it. There is no need for a caesarean section when going to midwives. Midwives do it normally, the cost is low, and a mother stays healthy. A mother's life changes when her womb is cut open. Here mothers try for four to five to six hours to see if it will be normal delivery.*" Nonetheless, many respondents also reported that they changed their decision about home delivery at villages.

Qualitative interviews with FTMs and FTFs shed some light on challenges regarding BMCs, particularly around their delivery facility. Respondents highlighted challenges regarding unavailability of a doctor, lack of oxygen supply, lack of ambulance support, referral complications, and shortage of service providers to deal with multiple delivery clients at a time, especially at nighttime. Some of the respondents also mentioned the discomfort of expectant mothers in the labor room due to not having enough space to walk and/or preserving privacy. An FTF during an FGD said: "*They say delivery is free here, there is free treatment; that is why poor people come here. They speak well, understand, come to our house, even pay the fare and say, come to our facility and take us there [BMC]. When they talk to you in the session, in theory, everything is good. They tell you how to do what, how to take care of mother and baby— all is good! But it has been seen that when people come here for delivery, a good doctor was not found there, that was problematic. And if two delivery patients come here at the same time, then God forbid what happens! When it comes to the practical time for delivery, there is a problem with the doctor. There is also a problem with oxygen support. Many times, there is no oxygen. I think I came four times for the ANC visits for my wife, many times I saw people suffering from not getting oxygen. I also saw that the one who sweeps the floor is also doing delivery work there. I also saw Rehana Apa [pseudonym used for anonymity]; I don't know if she's a doctor, but she's a BRAC worker. She also went there and provided delivery service. Also, when others come for general services such as fever, or something else... since there is only one doctor, and she goes for delivery, as a result, other patients are being neglected. It takes a long time. Also, an ambulance is needed there.*" (FGD with FTF, GANC)

Qualitative interviews also revealed that discontinuation of delivery at BMC has discouraged people. They found it hard to see the benefits of only receiving group sessions if BMCs are not performing deliveries. Some miscommunications about promised services vs. money also came out in the interviews with beneficiaries. One FTF said, "*There was a lack of facilities at BMC. They explained well what needs to be done and what shouldn't be done [in sessions]. We found it advantageous that we were getting all the information from BMC, we developed trust in them. When the delivery time came, I took my wife there, but the delivery didn't happen at that place. This was very disappointing for me. They then referred us to a nearby medical center. We didn't have the same level of trust there. Also, this process caused a lot of hassle. It would be better if there were delivery facilities at BMC.*" (IDI with FTF)

TABLE 3B: FTMs RECEIVED HEALTH SERVICES FROM ANY FACILITY AND MEDICALLY TRAINED PROVIDERS¥ (WITHOUT TRACER ELEMENTS∞)

Types of services received	Baseline			Endline			DiD (%)	p-value
	Control, n(%)	Intervention, n (%)	Diff. (p-value)	Control, n (%)	Intervention, n (%)	Diff. (p-value)		
ANC	904 (82.2)	904 (82.2)	>0.900	944 (85.9)	965 (87.7)	0.186	1.9	0.381
Facility delivery	748 (68.0)	767(69.7)	0.382	851 (77.4)	875 (79.6)	0.213	0.5	0.863
PNC including newborn within 2 days	711 (64.6)	698 (63.4)	0.564	718 (65.3)	758 (68.9)	0.070	4.8	0.093
N	**1100**	**1100**	–	**1100**	**1100**	–	–	–

P-value generated using Chi-square test; *p<0.05, **p<0.01, ***p<0.001; ¥Medically trained providers are doctor/nurse/midwives/paramedics/ Family Welfare Visitor/Sub-assistant Community Medical Officer /Community Skilled Birth Attendant /BRAC doctor/BRAC midwives. ∞Tracer elements included BP checked, weight taken, blood grouping; urine checked for albumin, and counseled on danger signs.

Table 3b shows the findings of FTMs' use of health services from any facility and medically trained providers in control and intervention groups, comparing baseline and endline data. At baseline, 82.2 percent of FTMs each in both groups received ANC from any facility and medically trained providers, and this figure rose to 85.9 percent in the control group and 87.7 percent in the intervention group without significant difference (DiD=1.9 percent p=0.381). At baseline, 68.0 percent of FTMs in the control group and 69.7 percent in the intervention group delivered at any facility by medically trained providers, and this figure rose to 77.4 percent in the control group and 79.6 percent in the intervention group without significant difference (DiD=0.5 percent p=0.683). Similarly, at baseline, 64.6 percent of FTMs in the control group and 63.4 percent in the intervention group received PNC including newborns within 2 days from any facility and medically trained providers, and this figure rose to 65.3 percent in the control group and 68.9 percent in the intervention group without significant difference (DiD=4.8 percent p=0.093).

3.5 ANC, DELIVERY, AND PNC SERVICES AND QUALITY OF CARE

TABLE 4: QUALITY OF CARE IN THE LAST ANC SERVICES RECEIVED FROM THE BRAC MATERNITY CENTERS

Variables	Baseline			Endline			DiD (%)	p-value
	Control, n(%)	Intervention, n (%)	Diff. (p-value)	Control, n (%)	Intervention, n (%)	Diff. (p-value)		
Elements of last ANC received								
1. Took weight	196 (80.0)	223 (85.8)	0.085	245 (80.6)	750 (93.1)	<0.001***	6.7	0.066
2. Checked blood pressure	204 (83.3)	224 (86.2)	0.367	260 (85.5)	764 (94.8)	<0.001***	6.4	0.055
3. Performed abdominal examination	233 (95.1)	243 (93.5)	0.428	273 (89.8)	757 (93.9)	0.026*	5.8	0.040*
4. Checked for anemia	168 (68.6)	193 (74.2)	0.159	233 (76.6)	713 (88.5)	<0.001***	6.2	0.152
5. Explained anemia in pregnancy	144 (85.7)	179 (92.8)	<0.030*	229 (75.3)	698 (86.6)	>0.900	-7.4	0.004**
6. Listen to the baby's heartbeat	228 (93.1)	234 (90.0)	0.218	288 (94.7)	784 (97.3)	0.038	5.6	0.021*
7. Checked urine for protein	131 (53.5)	124 (47.7)	0.194	220 (72.4)	663 (82.3)	<0.001***	15.7	0.001**
8. Told about the progress of pregnancy	211 (86.1)	232 (89.2)	0.287	257 (84.5)	751 (93.2)	<0.001***	5.5	0.099
9. Gave chance to ask questions	197 (80.4)	204 (78.5)	0.589	278 (91.4)	743 (92.2)	0.687	2.7	0.452
10. Told how to identify danger signs	116 (47.4)	139 (53.4)	0.170	186 (61.2)	748 (92.8)	<0.001***	25.5	<0.001***
11. Told about when to come back for PNC	156 (63.3)	182 (70.0)	0.131	249 (81.9)	758 (94.0)	<0.001***	5.8	0.141
12. Asked about previous medical history	145 (59.2)	139 (53.5)	0.195	195 (64.1)	658 (81.6)	<0.001***	23.2	<0.001***
13. Told about hypertensive disorder	171 (69.8)	186 (71.5)	0.667	233 (76.6)	753 (93.4)	<0.001***	15.0	<0.001***
14. Told about pre-eclampsia/eclampsia	87 (35.5)	127 (48.9)	0.002**	143 (47.0)	676 (83.9)	<0.001***	23.5	<0.001***
15. Performed blood grouping	155 (63.3)	153 (58.9)	0.309	199 (65.5)	622 (77.2)	<0.001***	16.1	0.001**
16. Provided iron/folic acid	196 (80.0)	213 (81.9)	0.582	244 (80.3)	703 (87.2)	0.004**	5.0	0.218
17. Counseled for 4 ANC visits	197 (80.4)	216 (83.1)	0.437	206 (67.8)	767 (95.2)	<0.001***	24.7	<0.001***
18. Counseled on danger signs during pregnancy	125 (51.0)	155 (59.6)	0.052	137 (45.1)	717 (89.0)	<0.001***	35.3	<0.001***
19. Counseled on birth preparedness	144 (58.8)	158 (60.8)	0.648	193 (63.5)	755 (93.7)	<0.001***	28.2	<0.001***
20. Counseled on PPFP	79 (32.2)	127 (48.9)	<0.001***	115 (37.8)	640 (79.4)	<0.001***	25.0	<0.001***
21. Counseled on newborn care	97 (39.6)	121 (46.5)	0.115	161 (53.0)	691 (85.7)	<0.001***	25.8	<0.001***
FTMs received quality services in the last ANC, using composite score								
Low	125 (51.0)	117 (45.0)	0.176	123 (40.5)	70 (8.68)	<0.001***	-25.8	<0.001***
High	120 (49.0)	143 (55.0)		181 (59.5)	736 (91.3)		25.8	<0.001***
N	**245**	**260**	–	**304**	**806**	–	–	–

P-value generated using Chi-square test, *p<0.05, **p<0.01, ***p<0.001

Table 4, which examines the quality of care in the last antenatal care (ANC) services from BMCs, highlights significant improvements in the quality of care provided over time. Various aspects of ANC services were compared between the control and intervention groups, both at baseline and endline, and presented through DiD percentages and p-values to indicate the statistical significance of these changes. Notable improvements were observed in most components of ANC services in the intervention group compared to the control group. For instance, the percentage of women whose weight was measured increased from 85.8 percent at baseline to 93.1 percent at endline, reflecting a DiD of 6.7 percent. Similarly, the rate of BP checks improved significantly from 86.2 percent to 94.8 percent (p<0.001), with a DiD of 6.4 percent. While abdominal examinations improved modestly, from 93.5 percent to 93.9 percent, it was still statistically significant (p = 0.040). Additionally, the proportion of women who had their urine checked for protein rose substantially from 47.7 percent at baseline to 82.3 percent at endline, with a DiD of 15.7 percent (p=0.001). Counseling on danger signs during pregnancy saw a remarkable increase from 53.4 percent at baseline to 92.8 percent at endline in the intervention group (DiD = 25.5 percent, p<0.001). PPFP counseling also showed a significant rise from 48.9 percent to 79.4 percent (DiD=25.0 percent, p<0.001).

When evaluating the overall quality of services using a composite score, the data indicate a substantial reduction in the proportion of participants receiving low-quality services in the intervention group, from 45.0 percent at baseline to 8.68 percent at endline (DiD= -25.8 percent, p<0.001). Conversely, the proportion of those receiving high-quality services increased dramatically from 55.0 percent to 91.3 percent in the intervention group (DiD=25.8 percent, p<0.001). These findings are statistically significant and suggest that BMCs' interventions have had a positive and substantial impact on the quality of ANC services provided. This improvement is particularly evident in critical areas such as counseling on danger signs during pregnancy, postpartum family planning, and overall service quality, underscoring the effectiveness of targeted interventions in enhancing maternal health care.

Qualitative interviews with FTMs and FTFs also corroborated survey findings and the positive impact of the intervention. Major benefits identified by the respondents were knowing of danger signs for pregnant women and newborns and steps taken to prepare for birth. Almost all of them reported improved knowledge and awareness as first-time parents on how to take care of the physical and mental well-being of the mother and the newborn. Many women mentioned of taking good care of nutrition and water intake as an outcome of counseling from midwives during group sessions and as per doctor's advice during checkups. Mothers also emphasized that they learned about vaccinations and proper ways of breastfeeding. Respondents expressed increased awareness related to birth spacing and importance of PPFP, which they would not discuss otherwise with anyone out of shyness. Mothers also appreciated free doctor check-ups after each session and less expensive ultrasounds compared to other facilities. One FTM who had ANC said, "*We had physical checkups. They check our blood pressure and blood sugar. They also check the baby's heartbeat. They did diabetes tests, urine tests, and blood tests; but if anyone feels there is a problem, they can come for a checkup [for] whatever they need to. For example, they can see a doctor, have an ultrasound, or have a checkup. With sessions, we got one free checkup. We had to pay for the ultrasound once.*" (FGD with FTM)

Another FTM who attended GPNC sessions mentioned, "*I didn't know much about these things before. For example, I learned more about vaccinations, baby care, and what procedures to follow. After attending these sessions, I now know when vaccinations should be given, how long the baby should be breastfed, and what foods to introduce and how to care for the newborn. I can share this knowledge with others now." (FGD with FTM, GPNC) Another FTM said, "I learned that I needed to eat better; I started to take iron and calcium tablets and drink enough water. My blood pressure was low, and the doctor told me what to eat to manage it. They explained everything well.*" (FGD with FTM, attended both ANC and PNC sessions)

TABLE 5: FTMs RECEIVED ONE ANC AND 4+ ANC FROM ANY FACILITY AND MEDICALLY TRAINED PROVIDERS¥ (WITHOUT TRACER ELEMENTS∞)

Number of ANC service	Baseline			Endline			DiD (%)	p-value
	Control, n(%)	Intervention, n (%)	Diff. (p-value)	Control, n (%)	Intervention, n (%)	Diff. (p-value)		
At least one ANC service from medically trained providers	904 (82.2)	904 (82.2)	>0.900	944 (85.9)	965 (87.7)	0.186	1.9	0.381
4+ ANC services from medically trained providers	509 (46.3)	540 (49.1)	0.186	600 (54.5)	830 (75.4)	<0.001***	18.1	<0.001***
N	**1100**	**1100**	–	**1100**	**1100**	–	–	–

P-value generated using Chi-square test; *p<0.05, **p<0.01, ***p<0.001; ¥Medically trained providers are doctor/nurse/midwives/paramedics/ Family Welfare Visitor/Sub-assistant Community Medical Officer /Community Skilled Birth Attendant /BRAC doctor/BRAC midwives. ∞Tracer elements included BP checked, weight taken, blood grouping; urine checked for albumin, and counseled on danger signs

Table 5 presents data on the receipt of ANC service from any facility and medically trained provider without tracer elements. The finding that FTMs received at least one ANC visit from medically trained providers was consistent from baseline to endline between both the control and intervention groups. At baseline, 82.2 percent of FTMs each in both groups received ANC from such providers, and this figure rose to 85.9 percent in the control group and 87.7 percent in the intervention group without significant difference (DiD=1.9 percent p=0.381). The data revealed a significant increase in the percentage of FTMs in the intervention group who received four or more ANC visits from any facility and medically trained providers. Findings show that 46.3 percent of FTMs in the control group at baseline received four or more ANC checkups from any facility and medically trained providers, and this rose to 54.5 percent at endline; the corresponding figures for the intervention group were 49.1 percent of FTMs at baseline and 75.4 percent at the endline, with a significant DiD of 18.1 percent, p<0.001.

TABLE 5A: FTMs RECEIVED 4+ ANC FROM MEDICALLY TRAINED PROVIDERS¥ BY NUMBER OF GROUP ANC SESSIONS ATTENDED

ANC check-up	Group ANC sessions				
	1 ANC session	2 ANC sessions	3 ANC sessions	4 ANC sessions	5 ANC sessions
4+ANC check-up	189 (62.0)	112 (71.8)	135 (77.6)	154 (81.9)	234 (87.0)
n	**305**	**156**	**174**	**188**	**269**

¥ Medically trained providers are doctor/nurse/midwives/paramedics/Family Welfare Visitor/Sub-assistant Community Medical Officer /Community Skilled Birth Attendant /BRAC doctor/BRAC midwives.

Table 5a shows that FTMs who received 4+ ANC checkups are related with the increasing numbers of GANC sessions attended. It shows that 62.0 percent of FTMs received 4+ ANC checkups who attended one GANC session, which increased to 71.8 percent FTMs who attended two GANC sessions, 77.6 percent FTMs who attended three GANC sessions, 81.9 percent FTMs who attended 4 GANC sessions and 87.0 percent FTMs who attended five GANC sessions. These findings indicate that receiving 4+ ANC checkups progressively increased with the number of GANC sessions attended.

TABLE 6: FTMs RECEIVED A PROPORTION OF ANC WITH ALL TRACER ELEMENTS (TE)∞ FROM BRAC MATERNITY CENTER

Proportion of ANC	Baseline			Endline			DiD (%)	p-value
	Control, n(%)	Intervention, n (%)	Diff. (p-value)	Control, n (%)	Intervention, n (%)	Diff. (p-value)		
FTMs received at least one ANC checkup from BMC (from medically trained providers£) with all TEs	57 (23.3)	53 (20.4)	0.433	106 (34.9)	442 (54.8)	<0.001***	30.9	<0.001***
FTMs received 4+ ANC checkups from BMC (from medically trained providers£) with all TEs	48 (19.6)	48 (18.5)	0.746	74 (24.3)	377 (46.8)	<0.001***	27.5	<0.001***
n	**245**	**260**	–	**304**	**796**	–	–	–

∞ Tracer elements included BP checked, weight taken, blood grouping; urine checked for albumin, and counseled on danger signs, without sign P-value generated using Chi-square test, *p<0.05, **p<0.01, ***p<0.001, £Doctors and midwives provide ANC at BMC.

Table 6 highlights the significant improvements in the quality and comprehensiveness of ANC services provided to FTMs at BMCs, specifically focusing on the inclusion of all tracer elements (TEs) in checkups. TEs are essential components of ANC and include blood pressure checks, weight measurement, blood grouping, urine tests for albumin, and counseling on danger signs. At baseline, 20.4 percent of FTMs in the intervention group received at least one ANC checkup with all TEs from medically trained providers at BMCs. By the endline, this figure had increased significantly to 54.8 percent, reflecting a substantial improvement with a DiD of 30.9 percent (p<0.001). While the control group also showed an increase from 23.3 percent at baseline to 34.9 percent at endline, the increase in the intervention group was greater (from 20.4 percent at baseline to 54.8 percent at endline, DiD 30.9 percent; p<0.001). Additionally, the percentage of FTMs in the intervention group receiving four or more ANC checkups with all TEs at BMCs rose from 18.5 percent at baseline to 46.8 percent at endline, representing a significant improvement with a DiD of 27.5 percent (p<0.001). The control group, by contrast, showed a smaller increase from 19.6 percent to 24.3 percent over the same period. These data suggest that the intervention at BMCs was effective in enhancing the comprehensiveness and quality of care, ensuring that essential health checks and counseling were more consistently provided during ANC visits. The statistically significant improvements in the intervention group underscore the positive impact of these targeted interventions on maternal health care quality.

TABLE 6A: FACILITY DELIVERY OF FTMs

Place of delivery	Baseline			Endline			DiD (%)	p-value
	Control, n(%)	Intervention, n (%)	Diff. (p-value)	Control, n (%)	Intervention, n (%)	Diff. (p-value)		
Facility delivery	748 (68.0)	767(69.7)	0.382	851 (77.4)	875 (79.6)	0.213	0.5	0.863
N	**1100**	**1100**	–	**1100**	**1100**	–	–	–
Type of facility								
BRAC Maternity Center[5]	82 (10.9)	106 (13.8)	0.065	119 (14.0))	197 (22.5)	<0.001***	5.4	0.033*
Other health facilities∞	666 (89.1)	660 (86.2)		732 (86.0)	678 (77.5)		-5.4	0.033*
n	**748**	**767**	–	**851**	**875**	–	–	–

∞ Other facilities included medical college hospitals, district hospitals, Mother and Child Welfare Centers, Upazila Health Complex, Union Health & Family Welfare Center, private hospital/clinic, and NGO clinic; P-value generated using Chi-square test, *p<0.05, **p<0.01, ***p<0.001

5. Facility normal delivery stopped at BMCs from March 2024

Table 6a presents data on the facility delivery rates of FTMs at baseline and endline, comparing the control and intervention groups and breaking down the type of facility where deliveries occurred. Among all FTMs at baseline, 69.7 percent in the intervention group and 68.0 percent in the control group delivered in a facility, with no significant difference between the groups (p=0.382). By endline among all FTMs, facility deliveries increased slightly, to 79.6 percent in the intervention group and 77.4 percent in the control group, but this difference was not statistically significant (p=0.213), and the overall DiD was minimal (DiD=0.5 percent). However, facility delivery in the intervention group at the endline rose significantly, from 13.8 percent at baseline to 22.5 percent at endline in BMCs (DiD=5.4 percent p<0.033), while deliveries at other health facilities decreased from 86.2 percent to 77.5 percent. Qualitative interviews also suggest the intervention has some positive influence on decisions to deliver at a health facility. An FTF in in-depth interview said, "*Initially, I had considered sending my wife to my village before starting this session. We planned that she would stay at my father-in-law's house and deliver there. As I attended these meetings and gained a better understanding of the topic, I realized my previous thoughts were completely wrong. Seeking health care services, consulting with doctors, and receiving medical care would all be beneficial. So later I kept her with me and delivered in [a] facility.*" (IDI with FTF) *A service provider noted, "Home delivery has decreased … now the delivery is done at the facility [BMC], or the mothers go to different hospitals for delivery. This is one of the changes that have happened. As ANC and PNC checkups have increased, they are also realizing the importance of consuming iron and calcium.*" (IDI with service provider)

TABLE 6B: FTMs RECEIVED FACILITY DELIVERY SERVICE BY NUMBER OF GROUP ANC SESSIONS ATTENDED

Place of delivery	Group ANC sessions				
	1 ANC session	2 ANC sessions	3 ANC sessions	4 ANC sessions	5 ANC sessions
Home	71 (23.3)	38 (24.4)	30 (17.2)	34 (18.1)	50 (18.6)
Facility	234 (76.7)	118 (75.6)	144 (82.8)	154 (81.9)	219 (81.4)
n	**305**	**156**	**174**	**188**	**269**

Receiving facility delivery by numbers of GANC sessions attended shows mixed results. Table 6b shows that 76.7 percent of FTMs delivered at facility who attended one GANC session, which decreased to 75.6 percent FTMs who attended two GANC sessions, and then increased to 82.8 percent of FTMs who attended three GANC sessions, then decreased to 81.9 percent FTMs who attended 4 GANC sessions and then 81.4 percent of FTMs who attended five GANC sessions. These findings indicate that FTMs who attended three GANC sessions had a greater number of facility deliveries compared to the FTMs who attended less than 3+ ANC GANC sessions.

TABLE 7: QUALITY SCORE OF BMCs' DELIVERY SERVICE

Elements of quality	Baseline			Endline			DiD (%)	p-value
	Control, n(%)	Intervention, n (%)	Diff. (p-value)	Control, n (%)	Intervention, n (%)	Diff. (p-value)		
Elements of quality delivery care								
1. Baby received first checkup within 90 minutes after delivery	75 (91.5)	87 (82.1)	0.064	106 (89.1)	179 (90.9)	0.605	11.2	0.060
2. FTMs received respect during delivery	43 (52.4)	54 (50.9)	0.839	63 (52.9)	135 (68.5)	0.006**	17.1	0.062
3. Did not face any problem after the delivery of first child	70 (85.4)	81 (76.4)	0.126	116 (97.5)	193 (98.0)	0.774	5.5	0.374
4. Satisfied with BMC service during delivery	75 (91.5)	98 (92.4)	0.804	113 (95.0)	187 (94.9)	>0.900	–1.0	0.821
5. Will recommend a friend or relative to come to BRAC for delivery	78 (95.1)	100 (94.3)	0.813	116 (97.5)	193 (98.0)	>0.900	1.3	0.707
Quality of delivery care score								
Low	0	2 (1.9)	0.506‡	0	0	–	–1.9	0.109
High	82 (100.0)	104 (98.1)		119 (100.0)	197 (100.0)		1.9	0.109
n	**82**	**106**	–	**119**	**197**	–	–	–

‡ Fisher exact test, p-value generated using Chi-square test, *p<0.05, **p<0.01, ***p<0.001

Table 7 presents the quality score of delivery services at BMCs, comparing baseline and endline data between control and intervention groups across various aspects of delivery care. Findings indicate several improvements in the intervention group. For instance, the percentage of babies receiving their first checkup within 90 minutes after delivery increased from 82.1 percent at baseline to 90.9 percent at endline, with a DiD of 11.2 percent; this change is approaching statistical significance (p=0.060). Similarly, the proportion of FTMs who reported receiving respect during delivery rose from 50.9 percent at bassline to 68.5 percent at endline in the intervention group, and the DiD was 17.1 percent (p=0.062), which was also approaching statistical significance. The responses on the other aspects of quality delivery care (did not face any problems after the delivery of their first child, satisfied with BMC service during delivery, and will recommend a friend or relative to go to BRAC for delivery) was high at baseline between intervention and control groups and remained consistently high over time. Overall, quality of delivery care was rated as "high" at 98.1 percent at baseline, rising to 100.0 percent by the endline in the intervention group, with a small, non-significant improvement (DiD=1.9 percent, p=0.109). Although none of these improvements were statistically significant, the overall trend indicates enhanced satisfaction and quality of care at BMC, reflecting positively on the efforts to improve delivery services.

TABLE 8: QUALITY OF THE LAST PNC SERVICES PROVIDED AT THE BMCs

Elements of quality PNC	Baseline			Endline			DiD (%)	p-value
	Control, n(%)	Intervention, n (%)	Diff. (p-value)	Control, n (%)	Intervention, n (%)	Diff. (p-value)		
1. Took weight	25 (49.0)	23 (41.8)	0.457	33 (35.5)	164 (70.1)	<0.001***	41.8	<0.001***
2. Checked blood pressure	28 (54.9)	33 (60.0)	0.596	67 (72.0)	199 (85.0)	0.022*	7.9	0.409
3. Performed abdominal examination	26 (51.0)	28 (50.9)	>0.900	52 (55.9)	162 (69.2)	0.069	13.4	0.227
4. Checked eye for anemia	22 (43.4)	25 (45.5)	0.810	33 (35.5)	156 (66.7)	<0.001***	28.9	0.009**
5. Checked urine for protein	7 (13.7)	6 (10.9)	0.659‡	27 (29.0)	118 (50.4)	0.002**	24.2	0.021*
6. Gave chance to ask question	29 (56.9)	27 (49.1)	0.423	62 (66.7)	188 (80.3)	0.031*	21.4	0.035*
7. Told how to identify danger signs in postnatal period	15 (29.4)	18 (32.7)	0.713	37 (39.8)	186 (79.5)	<0.001***	36.4	<0.001***
8. Told about pre-eclampsia/eclampsia	12 (23.5)	16 (29.1)	0.516	34 (36.6)	170 (72.6)	<0.001***	30.5	0.004**
9. Told how to take care of breast	28 (54.9)	25 (45.5)	0.331	53 (57.0)	197 (84.2)	<0.001***	36.6	<0.001***
10. Told how to take care of perineum	28 (54.9)	29 (52.7)	0.822	59 (63.4)	194 (82.9)	<0.001***	21.6	0.031*
11. Told about exclusive breastfeeding	40 (78.4)	42 (76.4)	0.799	72 (77.4)	215 (91.9)	<0.001***	16.5	0.040*
12. Told about baby's immunization	39 (76.5)	36 (65.5)	0.213	67 (72.0)	216 (92.3)	<0.001***	31.3	<0.001***
13. Provided iron/folic acid	40 (78.4)	40 (72.7)	0.495	68 (73.1)	196 (83.8)	0.078	16.3	0.078
14. Counseled on PPFP	19 (37.3)	22 (40.0)	0.722	36 (38.7)	188 (80.3)	<0.001***	38.9	<0.001***
15. Counseled on newborn care	23 (45.1)	26 (47.3)	0.822	43 (46.2)	195 (83.3)	<0.001***	34.9	<0.001***
Overall quality-of-care score at last PNC								
Low	21 (41.2)	24 (43.6)	0.790	33 (35.5)	24 (10.3)	<0.001***	-27.7	0.003*
High	30 (58.8)	31 (56.4)		60 (64.5)	210 (89.7)		27.7	0.003*
n	**51**	**55**	–	**93**	**234**	–	–	–

‡ Fisher exact test, without sign P-value generated using Chi-square test, *p<0.05, **p<0.01, ***p<0.001

Table 8 presents data on various elements of PNC quality delivered at baseline and endline, comparing control and intervention groups. Key findings include several significant improvements in PNC service quality elements in the intervention group compared to the control group. For instance, the proportion of FTMs whose weight was taken during their last PNC visit increased significantly from 41.8 percent at baseline to 70.1 percent at endline in the intervention group (DiD=41.8 percent, p<0.001). There were also significant increases in the other aspects of quality of care. The overall quality of care scores revealed that the proportion of low-quality care decreased significantly in the intervention group (DiD= -27.7 percent, p=0.003), while high-quality care increased significantly (DiD=27.7 percent, p=0.003). This indicates a substantial improvement in the quality of BMCs' PNC services following the intervention.

Qualitative findings resonate with survey findings, and both FTMs and FTFs emphasized learning to identify danger signs of the newborn, correct breastfeeding and immunization practice, and PPFP. FTMs expressed that knowing that baby should not be bathed in the first 72 hours was new information to them. One FTF who attended both ANC and PNC sessions said, "*In the PNC meetings, they advise on issues like breastfeeding difficulties, sores in the baby's mouth, breathing problems, or high fever. They instructed us to take the baby to an emergency doctor immediately in case of these danger signs, which is very reassuring.*" (FGD with FTF, attended both ANC and PNC sessions)

An FTM who attended a GPNC session said, "*I learned that if the baby is sick, go to the doctor quickly. If the baby's navel is swollen, or if there is phlegm or cough, or difficulty in breastfeeding, take them to the doctor immediately. They talked about when the child should get vaccinations, how often they should be fed …Mothers need to breastfeed, and after six months, we should give children weaning foods. I've learned about family planning, that we should wait two or three years before having another baby. They discussed family planning and the proper timing for different methods. Many people use injections, condoms, and pills. They discussed these options.*" (FGD with FTM, GPNC)

Another FTM who attended a GPNC session said, "*I think the most important thing is what I must pack before delivery. And at PNC sessions I learned what the danger signs of the baby are, and I learned that the baby should not be bathed before three days, this is a new information to us.*" (FGD with FTM, attended both ANC and PNC sessions)

TABLE 9: PROPORTION OF FTMs AND NEWBORNS WHO RECEIVED PNC AFTER DELIVERY FROM ANY FACILITY AND MEDICALLY TRAINED PROVIDERS INCLUDING BMC

Variables	Baseline			Endline			DiD (%)	p-value
	Control, n(%)	Intervention, n (%)	Diff. (p-value)	Control, n (%)	Intervention, n (%)	Diff. (p-value)		
From any facility								
FTMs who received at least one PNC checkup within 2 days of delivery from any facility and medically trained providers	727 (66.1)	709 (64.4)	0.420	765 (69.6)	798 (72.6)	0.121	4.6	0.098
FTMs who received at least 3 PNC checkups within 42 days of delivery from any facility	273 (24.8)	309 (28.1)	<0.082	289 (26.3)	366 (33.3)	<0.001***	3.7	0.168
Newborns who received at least one PNC checkup within 2 days of delivery from any facility and medically trained providers	703 (63.9)	675 (61.4)	0.217	757 (68.8)	782 (71.1)	0.245	4.8	0.090
N	**1100**	**1100**	–	**1100**	**1100**	–	–	–

TABLE 9 (continued):

Variables	Baseline			Endline			DiD (%)	p-value
	Control, n(%)	Intervention, n (%)	Diff. (p-value)	Control, n (%)	Intervention, n (%)	Diff. (p-value)		
From BMC								
FTMs who received at least one PNC checkup within 2 days of delivery from BMC	45 (88.2)	41 (74.5)	0.070	78 (83.9)	184 (78.6)	0.357	8.5	0.355
FTMs who received at least 3 PNC checkups within 42 days of delivery from BMC	3 (5.9)	10 (18.2)	0.122‡	13 (14.0)	71 (30.3)	0.001‡**	4.1	0.665
Newborns who received at least one PNC checkup within 2 days of delivery from BMC	42 (82.3)	38 (69.1)	0.113	77 (82.8)	180 (76.9)	0.243	7.4	0.439
n	**51**	**55**	–	**93**	**234**	–	–	–

‡ Fisher exact test, without sign P-value generated using Chi-square test, *p<0.05, **p<0.01, ***p<0.001; Medically trained providers- Doctor, MWV; Any facility- Government/private hospital/clinic, NGO, BMC.

Table 9 presents data on the PNC services received by FTMs and their newborns, comparing baseline and endline figures across control and intervention groups. The proportion of FTMs who received at least one PNC checkup within two days of delivery from any facility and by medically trained providers increased from 64.4 percent at baseline to 72.6 percent at endline in the intervention group, and from 66.1 percent to 69.6 percent in the control group with a DiD of 4.6 percent (p=0.098). On the other hand, the proportion of newborns who received at least one PNC checkup within two days of delivery from any facility and medically trained providers increased from 61.4 percent at baseline to 71.1 percent at endline in the intervention group, and from 63.9 percent to 68.8 percent in the control group with a DiD of 4.8 percent (p=0.090). However, neither of these changes was statistically significant.

The proportion of FTMs who received at least one PNC checkup at a BMC within two days of delivery slightly increased in the intervention group from 74.5 percent at baseline to 78.6 percent at endline, while the same decreased in the control group from 88.2 percent to 83.9 percent with a DiD of 8.5 percent (p=0.355). The proportion of newborns receiving at least one PNC checkup within two days from BMCs also showed a small increase in the intervention group from 69.1 percent to 76.9 percent (not statistically significant), while the control group essentially remained unchanged (82.3 percent at baseline and 82.8 percent at endline), with a DiD of 7.4 percent (p=0.439). However, the proportion of FTMs who received at least three PNC checkups within 42 days of delivery from BMCs in the intervention group saw a marked increase from 18.2 percent at baseline to 30.3 percent at endline, while the same also increased in the control group from 5.9 percent at baseline to 14.0 percent at endline with a DiD of 4.1 percent (p=0.665), though these improvements are not statistically significant. This may be because of the small sample size.

TABLE 9A: FTMs RECEIVED 2+PNCs BY NUMBERS OF GROUP SESSIONS ATTENDED

PNC check-up	Group ANC sessions						
	1 session	2 sessions	3 sessions	4 sessions	5 sessions	6 sessions	7 sessions
2+PNC check-ups	147 (48.7)	79 (50.0)	74 (44.9)	99 (55.6)	92 (59.0)	18 (62.1)	90 (80.4)
n	**302**	**158**	**165**	**178**	**156**	**29**	**112**

Receiving 2+PNC checkups relates to the increasing numbers of GANC sessions attended except for those who had attended three GANC sessions. Table 9a shows that 48.7 percent of FTMs received 2+PNC who attended one GANC session, which increased to 50.0 percent who attended two GANC sessions, and then decreased to 44.9 percent who attended three GANC sessions, then again increased to 55.6 percent who attended four GANC sessions, then 59.0 percent who attended five GANC sessions, then 62.1 percent who attended sixth session (GPNC1) and then 80.2 percent who attended seventh session (GPNC2). These findings generally indicate that FTMs who attended a greater number of GANC and GPNC sessions received a greater percentage of 2+PNC checkups.

TABLE 10: BRAC FIELDWORKERS' (SHASTHYA SHEBIKA [SS] AND SHASTHYA KORMI [SK]) VISITATION DURING POSTNATAL PERIOD AT HOUSEHOLD LEVEL

Variables	Baseline			Endline			DiD (%)	p-value
	Control, n(%)	Intervention, n (%)	Diff. (p-value)	Control, n (%)	Intervention, n (%)	Diff. (p-value)		
BRAC workers went to FTMs' home to check at PNC								
Yes	13 (25.5)	24 (43.6)	0.053	37 (39.8)	151 (64.5)	<0.001***	3.6	0.683
N	**51**	**55**	–	**93**	**234**	–	–	–
Health workers discussed the following activities during PNC visits†								
Taking care of your health	13 (100.0)	20 (83.3)	0.276‡	36 (97.3)	144 (95.4)	0.602‡	14.7	0.092
Taking care of baby	13 (100.0)	23 (95.8)	>0.900‡	35 (94.6)	142 (94.0)	>0.900‡	3.6	0.683
Breastfeeding	13 (100.0)	21 (87.5)	0.538‡	35 (94.6)	137 (90.7)	0.742‡	8.6	0.429
Immunization	13 (100.0)	19 (79.2)	0.140‡	31 (83.8)	129 (85.4)	0.800‡	22.5	0.106
Contraception	10 (76.9)	15 (62.5)	0.476‡	22 (59.5)	122 (80.8)	0.006**	35.8	0.033
Level of satisfaction with PNC visits								
Satisfied	13 (100.0)	23 (95.8)	>0.900‡	37 (100.0)	146 (96.7)	0.700	0.9	0.892
n	**13**	**24**	–	**37**	**151**	–	–	–
One major reason for satisfaction								
Provided good service/ no complaints	7 (53.8)	14 (60.9)	0.398‡	16 (43.2)	83 (56.9)	0.352‡	6.6	0.083
Providers behaved well	2 (15.4)	6 (26.1)		11 (29.7)	35 (24.0)		-16.4	0.329
Provided good advice or information	3 (23.1)	1 (4.3)		10 (27.0)	26 (17.8)		9.6	0.603
Less expensive	1 (7.7)	2 (8.7)		0	2 (1.4)		0.4	0.053
n	**13**	**23**	–	**37**	**146**	–	–	–

† Multiple responses collected for these questions; Fisher exact test, without sign P-value generated using Chi-square test; *p<0.05, **p<0.01, ***p<0.001

Table 10 presents the findings on BRAC fieldworkers' (SS, SK and midwife) PNC household visits, comparing baseline and endline data for control and intervention groups. At baseline, 25.5 percent of women in the control group and 43.6 percent in the intervention group reported that BRAC workers came to their homes to provide PNC, with the difference approaching significance (p=0.053). By the endline, this figure increased to 39.8 percent in the control group and 64.5 percent in the intervention group (p<0.001). However, the DiD for this outcome was 3.6 percent, which was not statistically significant (p=0.683).

Regarding the issues discussed during PNC visits, most women in both groups reported that health workers discussed taking care of their health, taking care of the baby, breastfeeding, immunization, and contraception. However, except for contraception, there were no significant changes observed in terms of what was discussed. For contraception, in the control group, 76.9 percent FTMs at baseline and 59.5 percent FTMs at endline reported that fieldworkers discussed contraception, while in the intervention group 62.5 percent FTMs at baseline and 80.8 percent FTMs at endline reported the same, resulting in a DiD of 35.8 percent (p=0.033) which is statistically significant. In terms of satisfaction with PNC visits, a high proportion of women reported satisfaction in both groups at both time points. Overall, the data indicate that the intervention contributed to a significant increase in BRAC fieldworkers' household visits for PNC and discussions around contraception, while satisfaction with PNC services remained the same across both groups with minimal changes over time.

TABLE 11: INFANTS' BREASTFEEDING (BF) AND ESSENTIAL NEWBORN CARE (ENC) PRACTICES AMONG WOMEN WHO DELIVERED AT BMCS AND ANY OTHER PLACES

Breastfeeding and NEC practices	Baseline			Endline			DiD (%)	p-value
	Control, n(%)	Intervention, n (%)	Diff. (p-value)	Control, n (%)	Intervention, n (%)	Diff. (p-value)		
FTMs delivered at any other places								
Infants who were exclusively BF up to 6 months	549 (49.9)	601 (54.6)	<0.026*	606 (55.1)	697 (63.4)	<0.001***	3.5	0.235
Newborns received components of ENC								
7.1% chlorhexidine (CHX) applied to cord	644 (58.5)	727 (66.1)	<0.001***	720 (65.5)	825 (75.0)	<0.001***	2.0	0.480
Initiated BF within 1 hour of birth	849 (77.2)	861 (78.3)	0.539	841 (76.5)	906 (82.4)	0.001**	4.8	0.051
Sterile cord cutting	1018 (92.5)	1026 (93.3)	0.506	1042 (94.7)	1053 (95.7)	0.271	0.3	0.848
Drying within 0-4 minutes of birth	934 (84.9)	927 (84.3)	0.679	1054 (95.8)	1062 (96.6)	0.373	1.4	0.434
Bathing delayed 72 hours or more	769 (69.9)	811 (73.7)	0.047*	812 (73.8)	878 (79.8)	0.001**	2.2	0.406
Combined 2 components used (applying 7.1% CHX to the cord, early initiation of BF within one hour)	*480 (43.6)*	*563 (51.2)*	*<0.001***	*551 (50.4)*	*680 (61.9)*	*<0.001***	*4.2*	*0.162*
Received all ENC components	355 (32.3)	432 (39.3)	0.001**	421 (38.3)	562 (51.1)	<0.001***	5.8	0.047*
N	**1100**	**1100**	–	**1100**	**1100**	–	–	–
FTMs delivered at BMCs								
Infants who were exclusively BF up to 6 months	46 (56.1)	56 (52.8)	0.656	67 (56.3)	151 (76.7)	<0.001***	23.6	0.008**

TABLE 11 (continued):

Breastfeeding and NEC practices	Baseline			Endline			DiD (%)	p-value
	Control, n(%)	Intervention, n (%)	Diff. (p-value)	Control, n (%)	Intervention, n (%)	Diff. (p-value)		
Newborns received components of ENC								
7.1% chlorhexidine (CHX) applied to cord	67 (81.7)	92 (86.8)	0.338	92 (77.3)	169 (85.8)	0.054	3.4	0.627
Initiated BF within 1 hour of birth	73 (89.0)	98 (92.4)	0.416	108 (90.8)	189 (95.9)	0.060	1.8	0.716
Sterile cord cutting	80 (97.6)	100 (94.3)	0.278	119 (100.0)	194 (98.5)	0.176	1.7	0.533
Drying within 0-4 minutes of births	75 (91.5)	96 (90.6)	0.832	117 (98.3)	193 (98.0)	>0.900‡	0.5	0.888
Bathing delayed 72 hours or more	63 (76.8)	83 (78.3)	0.810	81 (68.1)	158 (80.2)	0.015*	10.7	0.180
Combined 2 components used (applying 7.1% CHX to the cord, early initiation of BF within one hour	*61 (74.4)*	*87 (82.1)*	*0.202*	*85 (71.4)*	*164 (83.3)*	*0.013**	*4.1*	*0.588*
Received all ENC components	43(52.4)	63 (59.4)	0.338	56 (47.1)	130 (66.0)	0.001**	11.9	0.194
n	**82**	**106**	–	**119**	**197**	–	–	–

p-value generated using Chi-square test, *p<0.05, **p<0.01, ***p<0.001

Table 11 presents that among the FTMs who delivered at any location, including a BMC, the proportion of infants who were exclusively breastfed (BF) up to six months was significantly higher in the intervention group compared to control group (54.6 percent vs 49.9 percent, respectively; p<0.026) at baseline, and at endline, the rate of exclusively BF significantly increased in both groups (55.1 percent in control and 63.4 percent in intervention groups, p<0.001), with a DiD of 3.5 percent, (p=0.235), although the difference is not significant. For newborns receiving ENC components, the application of 7.1 percent chlorhexidine (CHX) to the cord in the intervention group increased significantly from 66.1 percent at baseline to 75.0 percent at endline (p<0.001), while the control group increased from 58.5 percent at baseline to 65.5 percent at the endline with a DiD of 2.0 percent, which was not significant (p=0.480). Early initiation of BF (within one hour of birth) improved significantly in the intervention group from 78.3 percent at baseline to 82.4 percent at endline (p=0.001), with a DiD of 4.8 percent, approaching statistical significance (p=0.051). Practices like sterile cord cutting, drying within 0-4 minutes of birth, and delaying the first bath for 72 hours or more also showed improvements, but with non-significant DiDs of 0.3 percent, 1.4 percent, and 2.2 percent and p-values equal to 0.848, 0.43 and 0.434, respectively. A significant increase was observed in the combined use of two ENC components (CHX application and early initiation of BF) in the intervention group, from 51.2 percent at baseline to 61.9 percent at endline (p<0.001), with a non-significant DiD of 4.2 percent (p=0.162). The use of all ENC components increased significantly in the intervention group from 39.3 percent at baseline to 51.1 percent at endline (p<0.001), yielding a significant DiD of 5.8 percent (p<0.047).

Among the FTMs who delivered at BMC, the proportion of infants who were exclusively breastfed up to six months was higher in the control group compared to intervention group (56.1 percent vs 52.8 percent respectively; p=0.656) at baseline. At endline, the rate of exclusive BF increased in both groups, but the change was only statistically significant in the intervention group (56.3 percent in control and 76.7 percent in intervention groups), with a DiD of 23.6 percent, (p=0.008). The application of 7.1 percent CHX to the cord, early initiation of breastfeeding, and other ENC practices, such as sterile cord cutting and drying within 0-4 minutes, were high in both groups with no significant DiDs (p-values ranging from 0.533 to 0.888). However, delaying the first bath for 72 hours or more showed a notable improvement in the intervention group (80.2 percent) by endline compared to 68.1 percent in the control group, although the DiD of 10.7 percent was not statistically significant (p=0.180). The combined use of two ENC components (CHX application and early initiation of breastfeeding) increased significantly in the intervention group (83.3 percent) at endline compared to 71.4 percent in the control group, with a non-significant DiD of 4.1 percent (p=0.588). The use of all ENC components rose from 59.4 percent to 66.0 percent in the intervention group from baseline to endline, with a DiD of 11.9 percent, but this was not statistically significant (p=0.194).

TABLE 12: RESPECTFUL MATERNITY CARE (RMC) DURING ANC AT THE BRAC MATERNITY CENTERS

Elements of RMC	Baseline			Endline			DiD (%)	p-value
	Control, n(%)	Intervention, n (%)	Diff. (p-value)	Control, n (%)	Intervention, n (%)	Diff. (p-value)		
1. BRAC providers greeted the woman in a friendly way	212 (86.5)	220 (84.6)	0.541	299 (98.4)	797 (98.9)	0.482	2.4	0.314
2. BRAC provider warmly welcomed the woman with self-introduction	185 (75.5)	167 (64.2)	0.006**	268 (88.2)	750 (93.1)	0.008**	16.2	<0.001***
3. BRAC provider offered a seat to the woman	222 (90.6)	231 (88.9)	0.514	293 (96.4)	789 (97.9)	0.153	3.3	0.171
4. BRAC provider treated the woman and her companion with compassion	230 (93.9)	227 (87.3)	0.012*	294 (96.7)	793 (98.4)	0.080	8.2	<0.001***
5. BRAC providers had maintained confidentiality and dignity of the patient	224 (91.4)	232 (89.2)	0.404	297 (97.7)	800 (99.3)	0.031*	3.8	0.074
6. BRAC provider listened carefully to the patient's complaints and responded	224 (91.4)	231 (89.2)	0.332	287 (94.4)	781 (96.9)	0.052	5.1	0.048*
7. BRAC provider offered emotional support that is sensitive to needs	207 (84.5)	200 (76.9)	0.032*	291 (95.7)	798 (99.0)	<0.001***	10.9	<0.001***
8. BRAC provider communicated with the patients properly	222 (90.6)	229 (88.1)	0.357	293 (96.4)	798 (99.0)	0.003**	5.2	0.023*
9. BRAC providers asked the purpose of the patient's visit	205 (83.7)	216 (83.1)	0.857	252 (82.9)	706 (87.6)	0.042*	5.3	0.179
10. BRAC providers took consent from the patients before the physical examination	196 (80.0)	191 (73.5)	0.083	282 (92.8)	772 (95.8)	0.040*	9.6	0.004**
11. BRAC providers had maintained privacy during service provision	229 (93.5)	240 (92.3)	0.612	292 (96.1)	801 (99.4)	<0.001**	4.5	0.022*

TABLE 12 (continued):

Elements of RMC	Baseline			Endline			DiD (%)	p-value
	Control, n(%)	Intervention, n (%)	Diff. (p-value)	Control, n (%)	Intervention, n (%)	Diff. (p-value)		
Respectful maternity care score								
Low	70 (28.6)	105 (40.3)	0.005**	59 (19.4)	71 (8.8)	<0.001***	-22.4	<0.001***
High	175 (71.4)	155 (59.6)		245 (80.6)	735 (91.2)		22.4	<0.001***
FTMs stated satisfaction with ANC including respectful maternity care	*115 (46.9)*	*111 (42.7)*	*0.340*	*199 (65.5)*	*617 (76.6)*	*0.006**	*15.3*	*<0.001****
n	**245**	**260**	–	**304**	**806**	–	–	–

Without sign p-value generated using Chi-square test; *p<0.05, **p<0.01, ***p<0.001

Table 12 shows the status of various elements of RMC provided during ANC at BMCs. Several components have shown significant changes over time. For example, at baseline, significant changes were observed in the percentage of FTMs who were warmly welcomed with an introduction from the provider, rising from 75.5 percent at baseline to 88.2 percent at endline in the control group and from 64.2 percent at baseline to 93.1 percent at endline in the intervention group, with a significant DiD of 16.2 percent (p<0.001). Similarly, the percentage of women who felt treated with compassion increased significantly from 93.9 percent to 96.7 percent in the control group and from 87.3 percent to 98.4 percent in the intervention group, with a notable DiD of 8.2 percent (p<0.001). The intervention also contributed to improving other aspects of RMC. The practice of maintaining patient confidentiality and dignity rose slightly, with a significant increase in the intervention group (from 89.2 percent to 99.3 percent, p=0.031) and a non-significant DiD of 3.8 percent.

Overall, the RMC score, which measures the quality and respectfulness of maternity care during ANC, reflected substantial improvement. The proportion of women with a low RMC score decreased significantly in the intervention group from 40.3 percent to 8.8 percent, with a DiD of -22.4 percent (p<0.001), while those with a high RMC score increased from 59.6 percent to 91.2 percent, showing a DiD of 22.4 percent (p<0.001). Similarly, satisfaction with ANC services, including RMC, improved significantly in the intervention group, rising from 42.7 percent at baseline to 76.6 percent at endline (p=0.006*). These findings indicate that the intervention significantly enhanced the respectful and dignified care provided to women during maternity services, as evidenced by improvements across multiple elements of RMC, including emotional support, communication, consent practices, and overall patient satisfaction.

Qualitative findings corroborated quantitative findings and depicted unanimous satisfaction with the behaviors of midwives. Similar findings have been documented from service provider interviews as well. A trusted and amicable relationship was built beyond the sessions and beyond just receiving services. One FTM said, "*The midwives' mannerisms are very nice. I would like to mention their cooperation and other things. Speaks in a pleasant manner. This is satisfying as well, and based on what I'm learning from them, I know that they are content as well. I've found this to be useful.*" (IDI with FTM) A service provider mentioned, "*I follow a mother from the beginning of her pregnancy until her child is born. Even after the child is born, they keep communicating, sometimes they bring the child here six months later. Delivery took place a year ago, then she's bringing the child here, shares with me how she is dealing with motherhood. That connection is very rewarding. I feel very good.*" (IDI with service provider)

TABLE 12A: RESPECTFUL MATERNITY CARE DURING PNC AT BRAC MATERNITY CENTERS

Elements of RMC	Baseline			Endline			DiD (%)	p-value
	Control, n(%)	Intervention, n (%)	Diff. (p-value)	Control, n (%)	Intervention, n (%)	Diff. (p-value)		
1. BRAC providers greeted the patient in a friendly way	43 (84.3)	44 (80.0)	0.563	48 (51.6)	195 (83.3)	<0.001***	36.0	<0.001***
2. BRAC provider warmly welcomed the patient with self-introduction	31 (60.8)	34 (61.8)	0.913	48 (51.6)	192 (82.1)	<0.001***	29.4	<0.004**
3. BRAC provider offered a seat to the woman	44 (86.3)	47 (85.4)	>0.900‡	49 (52.7)	197 (84.2)	<0.001***	32.3	<0.001***
4. BRAC provider treated the woman and her companion with compassion	47 (92.2)	50 (90.9)	>0.900‡	49 (52.7)	197 (84.2)	<0.001***	32.7	<0.001***
5. BRAC providers had maintained confidentiality and dignity of the patient	48 (94.1)	52 (94.5)	>0.900‡	50 (53.8)	198 (84.6)	<0.001***	30.4	<0.001***
6. BRAC provider listened carefully to the patient's complaints and responded	47 (92.2)	47 (85.4)	0.363‡	49 (52.7)	193 (82.5)	<0.001***	36.5	<0.001***
7. BRAC provider offered emotional support that is sensitive to needs	44 (86.3)	44 (80.0)	0.390	48 (51.6)	195 (83.3)	<0.001***	38.0	<0.001***
8. BRAC provider communicated with the patient properly	45 (88.2)	48 (87.3)	0.880	48 (51.6)	197 (84.2)	<0.001***	33.5	<0.001***
9. BRAC providers asked the purpose of the patient's visit	38 (74.5)	47 (85.4)	0.158	45 (48.4)	186 (79.5)	<0.001***	20.2	0.040*
10. BRAC providers took consent from the patients before the physical examination	40 (78.4)	43 (78.2)	0.975	49 (52.7)	194 (82.9)	<0.001***	30.5	0.002**
11. BRAC providers had maintained privacy during service provision	47 (92.2)	52 (94.5)	0.709‡	50 (53.8)	196 (83.8)	<0.001***	27.6	0.002**
Respectful maternity care score								
Low	19 (37.2)	19 (34.5)	0.771	45 (48.4)	45 (19.2)	<0.001***	-26.4	0.010*
High	32 (62.7)	36 (65.4)		48 (51.6)	189 (80.8)		26.4	0.010*
FTMs stated satisfaction with PNC, including respectful maternity care	*19 (37.2)*	*22 (40.0)*	*0.770*	*34 (36.6)*	*111 (47.4)*	*0.037**	*8.0*	*0.042*
n	**51**	**55**	–	**93**	**234**	–	–	–

‡ Fisher exact test, without sign p-value generated using Chi-square test; *p<0.05, **p<0.01, ***p<0.001

Table 12a shows the status of various elements of RMC during PNC at BMCs over time. Results show that all the RMC components during PNC have significant positive changes over time. For example, at baseline, significant changes were observed in the percentage of FTMs who were greeted in a friendly way by the service providers at BMCs. At baseline, 84.3 percent of FTMs in the control group and 80.0 percent in the intervention group reported being greeted in a friendly way by the providers. At the endline, this percentage decreased to 51.6 percent in the control group and increased to 83.3 percent in the intervention group, with a significant DiD of 36.0 percent (p<0.001). Similarly, the percentage of women who were warmly welcomed with a self-introduction increased from 61.8 percent at baseline to 82.1 percent at endline in the intervention group, reflecting a significant DiD of 29.4 percent (p<0.004).

Overall, the RMC score indicated substantial improvements in the quality of care during PNC. The proportion of women with a low RMC score decreased from 34.5 percent to 19.2 percent in the intervention group, with a significant DiD of -26.4 percent (p=0.010), while those with a high RMC score increased from 65.4 percent to 80.8 percent, showing a significant DiD of 26.4 percent (p=0.010). Similarly, satisfaction with PNC services, including RMC, improved significantly in the intervention group, rising from 40.0 percent at baseline to 47.4 percent at endline (p=0.037). These findings demonstrate the effectiveness of the intervention in enhancing various dimensions of RMC during PNC at BMCs.

TABLE 12B: RESPECTFUL MATERNITY CARE ON FP SERVICE AT BRAC MATERNITY CENTERS

Elements of RMC	Baseline			Endline			DiD (%)	p-value
	Control, n(%)	Intervention, n (%)	Diff. (p-value)	Control, n (%)	Intervention, n (%)	Diff. (p-value)		
1. BRAC providers greeted the patient in a friendly way	6 (100.0)	14 (93.3)	>0.900‡	8 (100.0)	148 (99.3)	>0.900‡	6.0	0.347
2. BRAC provider warmly welcomed the patient with self-introduction	5 (83.3)	12 (80.0)	>0.900‡	8 (100.0)	148 (99.3)	>0.900‡	2.7	0.778
3. BRAC provider offered a seat to the woman	6 (100.0)	13 (86.7)	>0.900‡	7 (87.5)	145 (97.3)	>233‡	23.1	0.049*
4. BRAC provider treated the woman and her companion with compassion	6 (100.0)	14 (93.3)	>0.900‡	8 (100.0)	149 (100.0)	–	6.7	0.134
5. BRAC providers had maintained confidentiality and dignity of the patient	5 (83.3)	14 (93.3)	>0.500‡	8 (100)	148 (99.3)	>0.900‡	-10.7	0.163
6. BRAC provider listened carefully to the patient's complaints and responded	5 (83.3)	14 (93.3)	>0.500‡	7 (87.5)	149 (100.0)	0.051	2.5	0.737
7. BRAC provider offered emotional support that is sensitive to needs	6 (100)	13 (86.7)	>0.900‡	7 (87.5)	148 (99.3)	0.100	25.2	0.004**
8. BRAC provider communicated with the patient properly	6 (100)	15 (100)	–	8 (100.0)	149 (100.0)	–	–	–
9. BRAC providers asked the purpose of the patient's visit	6 (100.0)	14 (93.3)	>0.900‡	8 (100.0)	142 (93.3)	>0.900‡	2.0	0.876
10. BRAC providers took consent from the patients before the physical examination	5 (83.3)	10 (66.7)	>0.623‡	3 (37.5)	142 (93.3)	<0.001***	74.5	<0.001***
11. BRAC providers had maintained privacy during service provision	5 (83.3)	13 (86.7)	>0.900‡	3 (37.5)	149 (100.0)	<0.001***	59.2	<0.001***
Respectful maternity care score								
Low	3 (50.0)	7 (46.7)	>0.900‡	6 (75.0)	17 (11.4)	<0.001***	-60.3	0.005**
High	3 (50.0)	8 (53.3)		2 (25.0)	132 (88.6)		60.3	0.005**
FTMs stated satisfaction on FP, including respectful maternity care	*3 (50.0)*	*8 (53.3)*	>0.900‡	*2 (25.0)*	*132 (88.6)*	<0.001***	*60.3*	*0.005***
n	**6**	**15**	–	**8**	**149**	–	–	–

‡ Fisher exact test, without sign p-value generated using Chi-square test; *p<0.05, **p<0.01, ***p<0.001; $DiD might show irrelevant outcome because of too small sample size

Table 12b shows the status of various elements of RMC during FP service provision. Results show that almost all the RMC components of FP service provision at baseline in both control and intervention groups were high and had little room for improvement. One notable change pertained to privacy: 86.7 percent of the service providers had maintained privacy during FP service provision at baseline in intervention BMCs, and this increased to 100 percent at the endline; in contrast, control group showed a drop from baseline to endline, from 83.3 percent to 37.5 percent with a DiD of 59.2 percent (p < 0.001).

In terms of overall respectful maternity care scores, the intervention group experienced a significant increase in high scores from 53.3 percent at baseline to 88.6 percent at endline (p=0.005), compared to a decrease in the control group. Similarly, satisfaction with FP services, including RMC, improved significantly in the intervention group, rising from 53.3 percent at baseline to 88.6 percent at endline (p<0.001). Overall, the intervention had a meaningful impact, particularly in enhancing emotional support, privacy, consent practices, and patient satisfaction. While some elements of care remained unchanged, the significant improvements in these areas suggest that the intervention effectively improved the quality of respectful maternity care and satisfaction with FP services.

Qualitative interviews with FTMs and FTFs demonstrated their unanimous appreciation for the respectful behavior and caring attitude of service providers at the BMCs. One FTF who attended both ANC and PNC sessions said, "*I liked that they explained everything to us with much care. The instructors explained everything well to us. Because if we had gone elsewhere, we would have had to pay, and they wouldn't care about us as much. But here, they care about us. They are concerned about new mothers, which is why we attended meetings here.*" (FGD with FTF, attended both ANC and PNC sessions)

3.6 BIRTH PREPAREDNESS

TABLE 13: BIRTH PREPAREDNESS AMONG ALL FTMs

Birth planning	Baseline			Endline			DiD (%)	p-value
	Control, n(%)	Intervention, n (%)	Diff. (p-value)	Control, n (%)	Intervention, n (%)	Diff. (p-value)		
FTMs prepared/ developed a birth plan during first pregnancy	976 (88.7)	928 (84.4)	0.003**	976 (88.7)	996 (90.6)	0.162	6.2	0.002**
N	**1100**	**1100**	–	**1100**	**1100**	–	–	–
Elements of birth preparedness†								
1. Selected a delivery place	757 (77.6)	709 (76.4)	0.548	823 (84.3)	924 (92.8)	<0.001***	9.6	<0.001***
2. Saved money for delivery	793 (81.2)	762 (82.1)	0.627	853 (87.4)	919 (92.3)	<0.001***	4.0	0.071
3. Arranged blood donor	388 (39.7)	421 (45.4)	<0.013*	576 (59.0)	749 (75.2)	<0.001***	10.6	0.001**
4. Identified mode of transportation	472 (48.4)	434 (46.8)	0.484	606 (62.1)	766 (76.9)	<0.001***	16.4	0.001***
Completed all four birth preparedness elements	*246 (22.4)*	*240 (21.8)*	*0.742*	*433 (44.4)*	*620 (62.2)*	*<0.001****	*17.2*	*0.001****
n	976	928	–	976	996	–	–	–

† Multiple responses collected for this question; Without sign p-value generated using Chi-square test, *p<0.05, **p<0.01, ***p<0.001

Table 13 presents the birth preparedness among all FTMs, comparing baseline and endline data between the control and intervention groups. At baseline, 88.7 percent of FTMs in the control group and 84.4 percent in the intervention group reported preparing or developing a birth plan during their first pregnancy, with a significant difference (p=0.003). By the endline, the proportion remained stable at 88.7 percent in the control group but increased to 90.6 percent in the intervention group, resulting in a significant DiD of 6.2 percent (p=0.002). Regarding four elements of birth preparedness, there were significant improvements in the intervention group in all four birth preparedness elements, with the percentage of FTMs completing all four elements of birth preparedness increasing markedly in the intervention group, from 21.8 percent at baseline to 62.2 percent at endline (p<0.001). This reflects a significant DiD of 17.2 percent (p=0.001). In conclusion, the data indicate that the intervention significantly enhanced birth preparedness among FTMs, particularly in selecting a delivery place, arranging blood donors, and identifying transportation.

Qualitative interviews with FTMs and FTFs demonstrated increased awareness regarding birth preparedness. One FTM mentioned, "*They talked about saving money and arranging transportation. Many people do not save money, but because of what was said here, many people now save money cautiously. They also suggested arranging a driver in advance.*" (FGD with FTM, attended both ANC and PNC sessions)

3.7 SOCIAL SUPPORT

TABLE 14: SOCIAL SUPPORT RECEIVED BY FTMs DURING ANC

Support elements	Baseline			Endline			DiD (%)	p-value
	Control, n(%)	Intervention, n (%)	Diff. (p-value)	Control, n (%)	Intervention, n (%)	Diff. (p-value)		
Household support								
Low	498 (45.3)	558 (50.7)	0.010**	487 (44.3)	580 (52.7)	<0.001***	3.0	0.318
High	602 (54.7)	542 (49.3)		613 (55.7)	520 (47.3)		-3.0	0.318
Healthcare support								
Low	688 (62.6)	621 (56.5)	0.030*	531 (48.3)	501 (45.6)	0.200	3.4	0.260
High	412 (37.5)	479 (43.6)		569 (51.7)	599 (54.5)		-3.4	0.260
Psychological support								
Low	338 (30.7)	412 (37.4)	0.001**	486 (44.2)	545 (45.6)	0.012*	-1.4	0.642
High	762 (69.3)	688 (62.5)		614 (55.8)	555 (50.5)		1.4	0.642
Composite score of all social support								
Low	486 (44.2)	536 (48.7)	0.033*	447 (40.6)	505 (45.9)	0.013*	0.7	0.808
High	614 (55.8)	564 (51.3)		653 (59.4)	595 (54.1)		-0.7	0.808
N	**1000**	**1000**	–	–	**1000**	–	–	–

[a] Social network included mother, mother-in-law, husband, father-in-law, and friends; Household support included assistance during day-to-day work, cooking, and household chores; Healthcare support included bringing medicine, and arranging transportation; Psychological support included emotional and financial support; P-value generated Chi-squared test; *p<0.05, **p<0.01, ***p<0.001

Composite scores were developed and calculated for Table 14, which illustrates the support FTMs received during ANC from their social networks, which include husbands, other family members and friends. All social support during ANC decreased over time, though these declines are not statistically significant. For example, "high" category household support decreased from 49.3 percent at baseline to 47.3 percent at endline in the intervention group, while in the control group the same category slightly increased from 54.7 percent to 55.7 percent, with a negative DiD of -3.4 percent (p=0.318), during ANC period. The overall composite score for all social support during ANC indicates a small increase from baseline to endline in the "high" category for both the intervention and control groups (from 51.3 percent to 54.1 percent in the former, and 55.8 percent to 59.4 percent in the latter), with a negative DiD of -0.7 percent (p=0.808), neither of which is statistically significant.

TABLE 14A: SOCIAL SUPPORT RECEIVED BY FTMs DURING DELIVERY

Support elements	Baseline			Endline			DiD (%)	p-value
	Control, n(%)	Intervention, n (%)	Diff. (p-value)	Control, n (%)	Intervention, n (%)	Diff. (p-value)		
Household support								
Low	419 (38.1)	354 (32.2)	0.010**	100 (9.1)	95 (8.6)	0.764	5.5	0.021*
High	681 (61.9)	746 (67.8)		1000 (90.9)	1005 (91.4)		-5.5	0.021*

TABLE 14A (continued):

Support elements	Baseline			Endline			DiD (%)	p-value
	Control, n(%)	Intervention, n (%)	Diff. (p-value)	Control, n (%)	Intervention, n (%)	Diff. (p-value)		
Healthcare support								
Low	577 (52.5)	514 (46.7)	0.007**	373 (33.9)	347 (31.6)	0. 237	3.4	0.250
High	523 (47.6)	586 (53.3)		727 (66.1)	753 (68.5)		-3.4	0.250
Psychological support								
Low	481 (43.7)	494 (44.9)	0.580	570 (51.8)	646 (58.7)	0.001**	5.7	0.056
High	619 (56.3)	606 (55.1)		530 (48.2)	454 (41.3)		-5.7	0.056
Composite score of all social support								
Low	539 (49.0)	496 (45.1)	0.060	341 (31.0)	308 (28.0)	0.123	0.9	0.752
High	561 (51.0)	604 (54.9)		759 (69.0)	792 (72.0)		-0.9	0.752
N	**1100**	**1100**	–	**1100**	**1100**	–	–	–

[a] Social network included mother, mother-in-law, husband, father-in-law, and friends; Household support included assistance during day-to-day work, cooking, and household chores; Healthcare support included bringing medicine, and arranging transportation; Psychological support included emotional and financial support; P-value generated Chi-squared test; *p<0.05, **p<0.01, ***p<0.001

Composite scores were developed and calculated for Table 14a, which illustrates the support FTMs received during delivery from their social networks, which include husbands, other family members and friends. The findings indicate that during the delivery period, FTMs reported that "high" category household support rose significantly from 67.8 percent at baseline to 91.4 percent at endline in the intervention group. The control group also had an increase in the "high" category from 61.9 percent at baseline to 90.9 percent at endline, resulting in a significant negative DiD of -5.5 percent (p=0.021), which indicates "high" category household support during delivery significantly decreased over time. The overall composite score for all social support during delivery indicates a substantial increase in the "high" category from baseline to endline for both the intervention and control groups, from 54.9 percent 72.0 percent for the former and 51.0 percent to 69.0 percent for the latter (negative DiD of -0.9 percent, p=0.752).

TABLE 14B: SOCIAL SUPPORT RECEIVED BY FTMs DURING PNC

Support elements	Baseline			Endline			DiD (%)	p-value
	Control, n(%)	Intervention, n (%)	Diff. (p-value)	Control, n (%)	Intervention, n (%)	Diff. (p-value)		
Household support								
Low	453 (41.2)	477 (43.4)	0.030	280 (25.5)	322 (29.3)	0.45*	1.6	0.564
High	647 (58.8)	623 (56.6)		820 (74.5)	778 (70.7)		-1.6	0.564
Healthcare support								
Low	652 (59.3)	563 (51.2)	<0.001***	375 (34.1)	274 (24.9)	<0.001***	-1.1	0.704
High	448 (40.7)	537 (48.8)		725 (65.9)	826 (75.1)		1.1	0.704
Composite score of all social support								
Low	464 (42.2)	524 (47.6)	0.010**	517 (47.0)	599 (54.5)	0.034*	2.0	0.505
High	636 (57.8)	576 (52.4)		583 (53.0)	01 (45.5)		-2.0	0.505

TABLE 14B (continued):

Support elements	Baseline			Endline			DiD (%)	p-value
	Control, n(%)	Intervention, n (%)	Diff. (p-value)	Control, n (%)	Intervention, n (%)	Diff. (p-value)		
Composite score of all social support								
Low	461 (41.9)	471 (42.8)	0.670	285 (25.9)	294 (26.7)	0.663	-0.1	0.976
High	639 (58.1)	629 (57.2)		815 (74.1)	806 (73.3)		0.1	0.976
N	**1100**	**1100**	–	**1100**	**1100**	–	–	–

[a] Social network included mother, mother-in-law, husband, father-in-law, and friends; Household support included assistance during day-to-day work, cooking, and household chores; Healthcare support included bringing medicine, and arranging transportation; Psychological support included emotional and financial support; P-value generated Chi-squared test; *p<0.05, **p<0.01, ***p<0.001

Composite scores were developed and calculated for Table 14b, which illustrates the social support FTMs received during PNC from their social networks, which include family members and friends. Findings indicate that during the PNC period, FTMs reporting "high" category household support in the intervention group rose substantially from 56.6 percent at baseline to 70.7 percent at endline, while the control group "high" category also increased from 58.8 percent at baseline to 74.5 percent at endline, resulting in a negative DiD of -1.6 percent (p=0.564), which indicates "high" category household support during PNC period decreased over time. The overall composite score for all social support during PNC period indicates substantial increase in "high" category from 57.2 percent at baseline to 73.3 percent at endline in the intervention group while it also substantially increased in control group "high" category from 58.1 percent at baseline to 74.1 percent at endline, with a DiD of 0.1 percent (p=0.976).

Qualitative findings suggest that overall, husbands are supportive of wives for attending sessions and health checkups and they also accompany wives to BMC. However, some respondents also mentioned resistance or reluctance from other family members, particularly from the mothers-in-law, and intervention from husbands and health workers were required in some cases. One midwife said, "*The challenge is that the husband was interested in his wife taking the sessions but often it was seen that there are some mothers-in-law or elder sisters of the family who resists. Still, it seemed that many such people had given support after persuasion or mostly when husband explained and convinced the family and then they came.*" (IDI with midwife)

An FTF said, "*After attending the sessions and explaining things to my mother, she would initially question who would take her [wife] and bring her back. My mother worried about the challenges of crossing streets and traveling, as my wife was pregnant. At first, she said it wasn't necessary to do so much and suggested I took my wife for check-ups only on my free days. But I explained to my mother that it was essential. And convinced she should sometimes accompany my wife to BMC if needed. I'd tell my mom that she might not always understand my wife's condition, so if my wife tells her something is wrong, and/or recognize any danger sign, we need to act immediately. Initially, my mom resisted, but later she no longer had any issues with it.*" (IDI with FTF)

The qualitative interviews with the FTMs and FTFs revealed that there was targeted messaging to husbands and mothers-in-laws for extending support to the new mother. Respondents noted counseling on taking care of mother's nutrition intake, proper rest, and medicines needed. Sessions also sensitized the caregivers and gatekeepers about the importance of mother's mental well-being and how to nurture positive relationships.

An FTF said, "*In the session, they encouraged to take more care of the wife, to talk happily with the wife, and to occasionally take her out. Then there's discussion about providing nutritious food. They mentioned about providing green vegetables and small river fish, milk, and eggs.*" (IDI with FTF)

Another FTF said, "*During the meetings, they provided various pieces of advice, such as identifying potential problems during pregnancy like dizziness, nausea, or vomiting, and what medication to take. They also discussed how to care for the mother. They emphasized that pregnant women might have mood swings, so they advised us to avoid arguments and instead take the mother for walks or give her fruits.*" (FGD with FTF, attended both ANC and PNC sessions)

A mother-in-law said, "*Here, the husband and wife come together, they listen and bring the mother-in-law. They listen to these words and take time to understand. For this, they care a lot about their daughter and daughter-in-law. They take care of all aspects of eating, drinking, working, and resting. It's been great.*" (FGD with mothers-in-laws)

3.8 COUPLE COMMUNICATION AND DECISIONMAKING

TABLE 15: COUPLE COMMUNICATION AND DECISIONMAKING AMONG ALL SURVEYED FTMs

Elements	Baseline			Endline			DiD (%)	p-value
	Control, n(%)	Intervention, n (%)	Diff. (p-value)	Control, n (%)	Intervention, n (%)	Diff. (p-value)		
1. Discussed child health with husband	1058 (96.2)	1057 (96.1)	>0.900	1062 (96.6)	1052 (95.6)	0.271	-0.8	0.483
2. Discussed reproductive health (ANC, delivery, PNC) issues with husband	869 (79.0)	874 (79.4)	0.793	995 (90.5)	996 (90.5)	>0.900	-0.4	0.865
3. Discussed FP with husband	1004 (91.3)	955 (86.8)	0.001**	991 (90.1)	981 (89.2)	0.484	3.5	0.057
4. Did not fear disagreeing with husband	857 (77.9)	743 (67.6)	<0.001***	813 (73.9)	774 (70.4)	0.064	6.8	0.011*
5. Told husband when she disagrees	862 (78.4)	791 (71.9)	<0.001***	787 (71.6)	728 (66.2)	0.007*	1.1	0.686
6. Did not criticize husband when there was an issue	684 (62.2)	583 (53.0)	<0.001***	837 (76.1)	715 (65.0)	<0.001***	-1.9	0.503
7. Husband did not criticize her when there was an issue	710 (64.6)	612 (55.6)	<0.001***	887 (80.6)	765 (69.6)	<0.001***	-2.2	0.431
8. Did not shout/talk loudly with husband	588 (53.5)	561 (51.0)	0.249	687 (62.5)	661 (60.1)	0.255	0.1	>0.900
9. Husband did not shout/talk loudly with her	607 (55.2)	539 (49.0)	0.004**	671 (61.0)	688 (62.6)	0.456	7.7	0.009**
10. Husband admired you when there was good work	1030 (93.6)	1017 (92.4)	0.276	1034 (94.0)	1014 (92.2)	0.093	-0.6	0.678
11. She admired your husband when there was good work	1054 (95.8)	1045 (95.0)	0.359	1042 (94.7)	1032 (93.8)	0.359	-0.1	0.946
12. Discussed with husband where to go in case of health emergencies	824 (74.9)	826 (75.1)	0.922	824 (74.9)	922 (83.8)	<0.001***	8.7	0.001**
13.Discussed with husband which doctor should be visited	888 (80.7)	843 (76.6)	0.019*	826 (75.1)	911 (82.8)	<0.001***	11.8	<0.001***
Composite score of couple communication								
Low	203 (18.5)	296 (26.9)	<0.001***	176 (16.0)	189 (17.2)	0.456	-7.3	0.002**
High	897 (81.6)	804 (73.1)		924 (84.0)	911 (82.8)		7.3	0.002**

TABLE 15 (continued):

Elements	Baseline			Endline			DiD (%)	p-value
	Control, n(%)	Intervention, n (%)	Diff. (p-value)	Control, n (%)	Intervention, n (%)	Diff. (p-value)		
Decisionmaking on which doctor should be visited in case of health emergencies								
Self	27 (2.5)	48 (4.4)	<0.001***Ω	31 (2.8)	46 (4.2)	0.001** Ω	-0.5	0.620
Husband	302 (27.5)	268 (24.4)		327 (29.7)	271 (24.6)		-2.0	0.452
Jointly (husband and wife)	544 (49.5)	581 (52.8)		586 (53.3)	584 (53.1)		-3.5	0.239
Parents/in-laws	187 (17.0)	142 (12.9)		132 (12.0)	162 (14.7)		6.8	0.001**
Other relatives (sister/ brothers-in-law/others)	27 (2.5)	50 (4.5)		18 (1.6)	16 (1.5)		-2.3	0.016*
Not sure	13 (1.2)	11 (1.0)		6(0.6)	21 (1.9)		1.5	0.017*
N	**1100**	**1100**	–	**1100**	**1100**	–	–	–

p-value generated using Chi-square test, *p<0.05, **p<0.01, ***p<0.001 ΩLoss of independence if separate p-values are provided

Table 15 presents data on couple communication and decisionmaking among FTMs in both control and intervention groups, comparing baseline and endline outcomes. Discussions about child health with husbands remained largely unchanged, showing minimal impact from the intervention (DiD=-0.8 percent, p=0.483). However, there was a significant improvement in respectful communication, with more FTMs in the intervention group reporting that they did not fear disagreeing with their husbands (DiD=6.8 percent, p=0.011), though the ability to express disagreement showed only a modest change (DiD=1.1 percent, p=0.686). The data also revealed improvements in the proportion of FTMs who refrained from criticizing their husbands during issues and vice versa, though the significance varied.

Regarding discussions on reproductive health and family planning, discussions on the former remained stable, while FP discussions slightly decreased (DiD=3.5 percent, p=0.057). Notably, there were significant positive changes in decisionmaking related to health, with increased discussions about where to go in case of health emergencies (DiD=8.7 percent, p=0.001) and which doctor to visit (DiD=11.8 percent, p<0.001). Additionally, the composite score of couple communication saw a marked improvement, with a higher proportion of couples achieving a high communication score in the intervention group from baseline to endline (DiD=7.3 percent, p=0.002). Overall, the data suggest general improvements in couple communication and joint decisionmaking among FTMs in the intervention group, particularly in respectful communication and health-related discussions, although the significance of these changes varied. Although parents'/in-laws' roles as a decisionmaker regarding which doctor should be visited in case of health emergencies have increased, other relatives' (sister, brothers-in-law, and others) roles as a decisionmaker have decreased. One FTM said, "*We talked about not having another child now, maybe later after this one grows up and we would be more stable. We make decisions equally. I suggest something, and he agrees, or he suggests something, and I agreed. …I usually told him what was discussed in the session. During our conversations, we talked about handling finances, deciding which hospital to go to, and who would accompany me. If there's any medication needed, he took care of arranging it.*" (IDI with FTM)

Qualitative interviews demonstrated that couples talked and made decisions together. Interviews with FTMs and FTFs suggest that couples commonly discussed choosing a doctor and health facility, the need for support on checkups, and medications. One FTF mentioned, "*I took care of my wife, spent some time with her, when she needed medicine, when she needs something, okay—I tried to do that. I did not let her do any heavy work; I would take that responsibility myself.*" (FGD with FTF)

4. Intervention evaluation

TABLE 16: PARTICIPATION IN GROUP ANC-PNC SESSIONS

Variable	Tongi, n (%)	Morkun, n (%)	Overall, n (%)	p-value
Heard about Healthy Women Health Families (HWHF) Project				
Yes	528 (95.3)	537 (98.4)	1,065 (96.8)	<0.001***
Attended any session				
Yes	554 (100.0)	546 (100.0)	1,100 (100.0)	>0.900
Number of sessions attended				
1	134 (24.2)	168 (30.8)	302 (27.5)	<0.001***
2	78 (14.1)	80 (14.7)	158 (14.4)	
3	78 (14.1)	87 (15.9)	165 (15.0)	
≥4	264 (47.7)	211 (38.6)	475 (43.2)	
Which session attended†				
GANC-1	314 (56.7)	314 (57.5)	628 (57.1)	0.800
GANC-2	409 (73.8)	373 (68.3)	782 (71.1)	0.046*
GANC-3	375 (67.7)	343 (62.8)	718 (65.3)	0.100
GANC-4	347 (62.6)	296 (54.2)	643 (58.5)	0.005**
GANC-5	261 (47.1)	204 (37.4)	465 (42.3)	0.001**
GPNC-1	84 (15.2)	54 (9.9)	138 (12.5)	0.008**
GPNC-2	110 (19.9)	79 (14.5)	189 (17.2)	0.020
N	**554**	**546**	**1100**	–
Number of times attended physical check-up after group session				
1	125 (24.5)	156 (31.6)	281 (28.0)	0.009**
2-3	143 (28.0)	147 (29.8)	290 (28.9)	
≥4	243 (47.6)	191 (38.7)	434 (43.2)	
N	**511**	**494**	**1005**	–

† Multiple responses collected for this question; Without sign p-value generated using Chi-square test, *p<0.05, **p<0.01, ***p<0.001

Table 16 presents data comparing participation rates in GANC and GPNC sessions between two locations, Tongi and Morkun. Most FTMs in both locations had heard about the HWHF project, with 95.3 percent in Tongi and 98.4 percent in Morkun. While all FTMs attended at least one session, the number of sessions they attended varied by locations, with a higher percentage of FTMs having attended one session in Morkun BMC (30.8 percent, vs 24.2 percent Tongi) and four or more than four sessions in Tongi BMC (47.7 percent, vs 38.6 percent in Morkun). Additionally, more than two-fifths of the FTMs had their physical checkups four or more than four times at the facilities after GANC-GPNC sessions.

TABLE 17: FTMs RECEIVED KNOWLEDGE FROM GANC-GPNC SESSIONS

Variable	Tongi, n (%)	Morkun, n (%)	Overall, n (%)	p-value
Knowledge gathered†				
What happens in pregnancy	195 (35.2)	201 (36.8)	396 (36.0)	0.600
How to take care during pregnancy, childbirth, and postpartum period	452 (81.6)	430 (78.8)	882 (80.2)	0.300
Taking care of yourself and the baby in the womb	441 (79.6)	425 (77.8)	866 (78.7)	0.500
Preparation needed for childbirth	347 (62.6)	345 (63.2)	692 (62.9)	0.900
Importance of ANC, PNC and facility delivery	299 (54.0)	321 (58.8)	620 (56.4)	0.110
How to take care of newborn	247 (44.6)	220 (40.3)	467 (42.5)	0.200
Other	9 (1.62)	2 (0.37)	11 (1.00)	0.064
Session was useful				
Yes	548 (98.9)	544 (99.6)	1,092 (99.3)	0.300
N	**554**	**546**	**1100**	–

† Multiple responses collected for this question; Without sign p-value generated using Chi-square test, *p<0.05, **p<0.01, ***p<0.001

FTMs at both project locations were asked what they learned from attending GANC-GPNC sessions (Table 17). A similar proportion of FTMs in both locations reported learning about various topics, including what happens during pregnancy (Tongi: 35.2 percent, Morkun: 36.8 percent), how to take care of themselves and their babies during pregnancy, childbirth, and postpartum (Tongi: 81.6 percent, Morkun: 78.8 percent), importance of ANC, PNC, and facility deliveries (Tongi: 54.0 percent, Morkun: 58.8 percent), and how to take care of newborn (Tongi: 44.6 percent, Morkun: 40.3 percent). Almost all participants in both locations found the sessions useful, with 98.9 percent in Tongi and 99.6 percent in Morkun affirming this, resulting in an overall usefulness rating of 99.3 percent.

TABLE 18: USEFULNESS OF IEC MATERIALS USED IN GANC-GPNC SESSIONS

Variable	Tongi, n (%)	Morkun, n (%)	Overall, n (%)	p-value
Cards were useful to understand the message				
Yes	548 (98.9)	541 (99.1)	1,089 (99.0)	>0.900
Brochure was useful				
Yes	548 (98.9)	544 (99.6)	1,092 (99.3)	0.300
N	**554**	**546**	**1100**	–

p-value generated using Chi-square test, *p<0.05, **p<0.01, ***p<0.001

Usefulness of the GANC-GPNC IEC materials was evaluated (Table 18). Respondents in both locations found the cards to be highly useful for understanding the messages conveyed during the GANC-GPNC sessions (99.0 percent agreement). Similarly, 98.8 percent of participants in both locations agreed that the brochure was useful. Qualitative interviews with beneficiaries support these findings, with several explaining that the visual presentation of information helps to absorb information easily and participatory engagement in the sessions spurred interest among them. An FTF who attended both GANC and GPNC sessions mentioned, *"I liked that they explained things through pictures. They showed various catalogs/posters, and it was easy to catch the information. I learned new things like the importance of drinking plenty of water, eating vegetables, and having a nutritious diet for mothers. In the second meeting, they talked about how to keep mentally refreshed and*

how to support the wife and family. In the last meeting, the group PNC session, I liked the quiz competition about what we learned in the previous sessions. They gave a gift to those who answered the most questions. They also raised awareness about vaccinations and family planning. These were the things I liked." (FGD with FTFs, both sessions)

TABLE 19: FTMs' SATISFACTION LEVEL IN JOINING THE GANC-GPNC SESSIONS AND THEIR HUSBAND'S PERCEPTION ON GANC AND GPNC REPORTED BY FTMs

Variable	Tongi, n (%)	Morkun, n (%)	Overall, n (%)	p-value
Husband attended GANC-GPNC session				
Yes	350 (63.2)	346 (63.4)	696 (63.3)	>0.900
Husband liked GANC-GPNC session				
Yes	342 (97.7)	345 (99.7)	687 (98.7)	0.038*
N	**554**	**546**	**1100**	–
Husband satisfied with GANC-GPNC session				
Yes	338 (97.7)	340 (98.8)	678 (98.3)	0.400
n	**350**	**346**	**696**	–
FTMs satisfaction level				
Satisfied with group discussion	549 (99.1)	540 (98.9)	1,089 (99.0)	0.500
Satisfied coming to the facility in a group	543 (98.0)	539 (98.7)	1,082 (98.4)	0.300
Liked topics discussed in group sessions	551 (99.5)	546 (100.0)	1,097 (99.7)	0.200
Will recommend friends/relatives to attend group session	542 (97.8)	536 (98.2)	1,078 (98.0)	0.800
N	**554**	**546**	**1100**	–

p-value generated using Chi-square test, *p<0.05, **p<0.01, ***p<0.001; $all responses reported by FTMs.

Table 19 shows that the same proportion of husbands attended the GANC-GPNC sessions in Tongi and Morkun, (63.2 percent and 63.4 percent, respectively), for an overall attendance rate of 63.3 percent. FTMs reported that nearly all husbands who attended the sessions liked the sessions, with 97.7 percent in Tongi and 99.7 percent in Morkun, resulting in a statistically significant difference (p=0.038). Additionally, satisfaction levels of husbands with GANC-GPNC were extremely high, with 97.7 percent of husbands in Tongi and 98.8 percent in Morkun reported by FTMs, yielding an overall satisfaction rate of 98.3 percent.

FTMs' satisfaction levels in joining the GANC-GPNC were measured to understand the usefulness of the GANC-GPNC sessions. Table 19 shows that almost all the FTMs were satisfied attending the session(s), satisfied coming to the facility in a group, liked the topics discussed in the sessions, and were happy to refer friends or relatives to join in the GANC-GPNC sessions.

TABLE 19A: CHALLENGES/DIFFICULTIES FACED IN ATTENDING GROUP ANC-PNC SESSIONS

Variable	Tongi, n (%)	Morkun, n (%)	Overall, n (%)	p-value
Faced any difficulty attending GANC-GPNC session				
No	448 (80.9)	455 (83.3)	903 (82.1)	0.030
Yes	106 (19.1)	91 (16.7)	197 (17.9)	
N	**544**	**546**	**1100**	–
Type of difficulties faced to attend GANC-GPNC session†				
It was difficult to travel to the facility	49 (46.2)	44 (48.4)	93 (47.2)	0.800
It was difficult to manage time	40 (37.7)	47 (51.6)	87 (44.2)	0.061
It was difficult to find escorting person	37 (34.9)	29 (31.9)	66 (33.5)	0.800
It was difficult to manage money	23 (21.7)	19 (20.9)	42 (21.3)	>0.900
Opposition from relatives	8 (7.55)	11 (12.1)	19 (9.64)	0.300
Other	12 (11.3)	7 (7.69)	19 (9.64)	0.500
n	**106**	**91**	**197**	–

† Multiple responses collected for this question; Without sign p-value generated using Chi-square test, *p<0.05, **p<0.01, ***p<0.001

TABLE 19A1: FTMs FACED DIFFICULTY IN ATTENDING THE GANC-GPNC SESSIONS OR NOT BY NUMBER OF SESSIONS ATTENDED

Faced difficulty	Number of group ANC-PNC sessions attended							p-value
	ANC1	ANC2	ANC3	ANC4	ANC5	PNC1(6)	PNC2(7)	
No	233 (77.2)	119 (75.3)	141 (85.5)	155 (87.1)	138 (88.5)	27 (93.1)	90 (80.4)	0.002**
Yes	69 (22.9)	39 (24.7)	24 (14.6)	23 (12.9)	18 (11.5)	2 (6.9)	22 (19.6)	
n	**302**	**158**	**165**	**178**	**156**	**29**	**112**	–

p-value generated using Chi-square test, *p<0.05, **p<0.01, ***p<0.001

Table 19a shows that most participants did not face any difficulties attending the GANC-GPNC sessions, with 80.9 percent in Tongi and 83.3 percent in Morkun BMCs, resulting in an average of 82.1 percent (p-value = 0.300). Among those who did face challenges (17.9 percent overall), the most common difficulties were traveling to the facility (47.2 percent) and managing time (44.2 percent), with slightly higher percentages in Morkun. Finding an escort, managing money, and opposition from relatives were less frequently cited problems, with no significant differences between the two locations. Further analysis showed that more FTMs faced difficulties in attending ANC1, ANC2 and PNC2 (Table 19a1).

In the qualitative interviews, almost everyone complained about the long waiting time for starting the group session. FTFs faced the additional challenge of reporting back to their office; they also mentioned being bored. One FTF mentioned, "*The only thing I disliked was the time. It was difficult to sit for so long. It created a sense of anxiety about having to respond to office work.*" (FGD with FTF, GPNC)

An FTM mentioned, "*I like everything except that the time is a bit long. It is a lot of trouble to sit in one place for a long time when you're pregnant. I used to sit and listen to everyone else [FTMs] say why is it so late!*" (IDI with FTM)

A service provider said, "*There is inconvenience which is time they spend. They come at a specific time, thinking they'll only be there for about an hour. But during the session, with check-ups and seeing the doctor, if ultrasound is also done, it takes more of their time. Mothers often get bored. Also, they worry that they'll have to hear a lot of things at home.*" (IDI with service provider)

Another service provider said, "*The session time for father was set for one and a half hours. But fathers don't want to sit for that long. It would have been better if the GANC-PNC sessions for fathers were shorter. Also, many fathers come with their wives for check-ups and meetings, and they get impatient if they have to stay for a long time. We try to keep the mothers on one side and the fathers on the other, but that isn't always possible. The fathers become impatient and don't want to sit. Sometimes they even get up and leave the meeting, saying they don't want to participate.*" (IDI with service provider)

TABLE 20: RECOMMENDATION TO RELATIVES/FRIENDS AND SUGGESTIONS TO IMPROVE QUALITY OF GANC-PNC SESSIONS

Variable	Tongi, n (%)	Morkun, n (%)	Overall, n (%)	p-value
FTM will recommend friends/relatives to attend group ANC-PNC session	542 (97.8)	536 (98.2)	1,078 (98.0)	0.800
Suggestions to improve the quality of group ANC-PNC session				
No suggestion as the quality is good	536 (96.8)	534 (97.8)	1070 (97.3)	–
N	**554**	**546**	**1100**	**–**
Arrange a larger room for GANC-GPNC	5 (27.7)	3 (25.0)	8 (26.7)	
Add more details on FP/delivery/newborn care/ pregnancy symptoms	4 (22.2)	3 (25.0)	7 (23.3)	
Advertise about group ANC-PNC session	2 (11.1)	2 (16.7)	4 (13.3)	
Add 2nd/3rd-time mother in the session	3 (16.7)	1 (8.3)	4 (13.3)	>0.900
Decrease the session duration	2 (11.1)	1 (8.3)	3 (10.0)	
Add family group session at FTMs house	1 (5.5)	1 (8.3)	2 (6.7)	
Assign more service providers (midwives/ Pediatricians)	1 (5.5)	1 (8.3)	2 (6.7)	
n	**18**	**12**	**30**	**–**

p-value generated using Chi-square test, *p<0.05, **p<0.01, ***p<0.001

Table 20 highlights the feedback from FTMs regarding their likelihood of recommending GANC and GPNC sessions to friends or relatives, as well as their suggestions for improving the quality of these sessions. Almost all FTMs said that they would recommend GANC-GPNC sessions, with 97.8 percent in Tongi and 98.2 percent in Morkun, resulting in an overall recommendation rate of 98.0 percent. Regarding suggestions to improve the quality of group ANC-PNC sessions, most participants (96.8 percent in Tongi and 97.8 percent in Morkun) had no suggestions, indicating general satisfaction with the sessions. However, about 3 percent of participants did provide recommendations for session's improvements. Among those who provided suggestions for improving group sessions, 26.7 percent suggested arranging a larger room, 23.3 percent suggested adding more details on FP/delivery/newborn care and pregnancy symptoms, 13.3 percent suggested advertising about GANC-GPNC sessions and adding second- or third-time mothers in the session, 10.0 percent suggested decreasing session's duration, 6.7 percent suggested adding a family session at the FTM's house and 6.7 percent suggested assigning more service providers such as midwives and pediatricians.

Qualitative interviews with the FTMs and FTFs probed several dimensions of the intervention model. Respondents' recommendations included providing more detailed discussion on topics and minimizing session opening rituals such as mat opening and introduction, improving management of the queue for check-ups and token/slip for maintaining serial, improving time management for session start and waiting time, and shortening the fathers' session time. One service provider suggested that "*Opening the mat for five minutes and then spending 10 minutes bonding with mother takes long time. It creates a rush afterwards. Instead of doing this, it would be better to discuss on topics openly and in details.*" (IDI with service provider)

An FTM said, "*At reception, the persons behind the line frequently issue the receipt (token) for serial first. I'll leave it out. Those who arrive first should be given priority when it comes to issuing receipts.*" (IDI with FTM)

Respondents highlighted the importance of time management for session starts and how well topics can be delivered in a succinct manner in limited time. They suggested that session speakers should be prepared to ensure that topics and lectures are not repetitive, and that time is well managed. They also suggested prioritizing session dates and times based on respondents' availability. One FTF mentioned, "*First, I would maintain the time set for the session so long wait does not happen. Also, if I were you, I would consider the time of those attending the meeting and not the centers. Second, if I were conducting the meeting, I would note down my topics and deliver the information as quickly as possible to maximize learning. I wouldn't repeat things.*" (FGD with FTF, GPNC)

In qualitative interviews, respondents suggested BRAC needs improved physical visibility and improved communication on different platforms, including use of communication applications and digital media about their services. One FTF said, "*If they had more staff and were more proactive in informing people about what services are available, it would help. More workers or a prominent signboard would help. The local community would then know there's a center and that they could benefit from it.*" (FGD with FTM, no sessions)

One FTM also mentioned difficulties in finding the BMC: "*BRAC is in a narrow lane, and it's hard to find. We had to ask for directions to get here. If there were signs along the road, it would be easier to find, more people would notice and come to see what it's about. Many people don't know that.*" (FGD with FTM, no sessions)

One FTF suggested, "*Many places now create software. For example, at my workplace, we use specific software that isn't available in every factory. I suggest that BRAC should create an app with all the necessary information. Since everyone uses Android phones nowadays, an app could help people understand that something valuable is happening here. I believe that such an initiative could increase interest.*" (FGD with FTF, attended both ANC and PNC sessions)

Regarding feedback on ways to improve services, the qualitative interviews demonstrated a desire to reinstate delivery services. The respondents also cited the need for an ambulance in the facility, adequate provision of oxygen, and an adequate number of doctors and service providers to handle multiple clients. Respondents also suggested inclusion of C-section provision to avoid the hassle of referral and transferring to another health facility and trust issues with new providers in other facilities.

5. Supportive supervision

HWHF project inbuilt supportive supervision in the project monitoring and evaluation framework. Both MSH and BRAC's supervisors carried out continuous supportive supervision during the intervention period. It was carried out in a respectful and non-authoritarian way with a focus on using supervisory visits and filling up a checklist for each person and each practice area/activity supervised. The objective of supportive supervision was to promote quality outcomes by improving knowledge, strengthening communication, focusing on problem-solving, facilitating teamwork, and providing leadership and support to empower health providers to monitor and improve their own skills and performance.

Supportive supervision was carried out in the intervention facilities with two types of service providers—medical officer (2) and midwives (8)—and the practices were observed in the services which include ANC, delivery, PNC, ENC and FP. Each of the midwives received at least one supervision visit by supervisors (Medical Officer/Sr. Medical Officer (SMO) on every module/service area in each two months cycle, and same was applied for the medical officers where supervision was done by the SMOs and Project Manager (medically trained person). Midwives received supervision on all the listed services whereas Medical Officers received supervision on ANC, PNC and FP services. During supportive supervision a structured checklist was filled up for each service measuring knowledge and skills in the practices they perform. The project carried out targeted numbers of supervisory visits and documented the visits outcomes in checklists quarterly. Successes, gaps, performances and challenges were identified, and feedback provided on the spot. These checklists' data were aggregated and analyzed, and aggregated feedback were provided on a quarterly basis. Each of the supportive supervision checklists comprises of different numbers of observations. ANC checklist had 36 observation, delivery and postpartum care checklists had a total of 58 observations, Immediate and Essential Newborn Care (I&ENC) checklist had a total of 27 observations, PNC checklist had 38 observations for both the woman and the newborn, and the Family Planning checklist had 40 observations under different sections. For each of the checklists, the observations were weighed on a scale of 100. Observations were recorded as "Done Properly", "Not Done" and "Not Applicable (NA)". The sum of the "Done properly" and "NA" responses were measured against the full scale and scored accordingly.

Analysis of the aggregated checklists (771) shows that for the 32 months intervention period, most of the supervisory visits were carried out with eight midwives (722) on ANC (212), delivery (102), PNC (191), FP (124) and ENC (93) who provided most of the services and 49 supervisory visits were carried out with two medical officers on ANC (32), PNC (8) and FP (9) (Table 21).

Table 21a shows that before the intervention at baseline, on average 79 percent of service providers correctly did their practices/ activities on ANC, PNC, delivery, ENC and FP. At the endline, this percentage progressively increased to an average of 93 percent—a 14-percentage point or 17.7 percent increase. Some of the practices/activities achieved 100 percent or around 100 percent in some of the quarters. However, delivery and ENC services were stopped during the last two quarters of the project period. (Table 21a).

TABLE 21: NUMBER OF SUPPORTIVE SUPERVISIONS CARRIED OUT BY TYPES OF SERVICE PROVIDERS AND TYPES OF SERVICES

Service observed	MO	MW	Grand Total
ANC	32	212	244
Delivery		102	102
PNC	8	191	199
FP	9	124	133
ENC		93	93
Grand Total	**49**	**722**	**771**

TABLE 21A: PERCENTAGE OF SERVICE PROVIDERS ACHIEVED SCORING IN EACH SERVICE OBSERVED BY QUARTER

Timing of observation	ANC (%)	PNC (%)	Delivery (%)	ENC (%)	FP (%)	Average (%)
April' 22 (Baseline)	75	78	83	80	77	**79**
Quarter 1* (May–June'22)	89	86	87	85	83	**86**
Quarter 2 (July–Sept'22)	89	86	92	88	90	**89**
Quarter 3 (Oct–Dec'22)	90	89	96	96	95	**93**
Quarter 4 (Jan–Mar'23)	92	90	99	97	96	**95**
Quarter 5 (April–June'23)	94	94	98	95	95	**95**
Quarter 6 (Jul–Sept'23)	99	98	100	100	99	**99**
Quarter 7 (Oct–Dec'23)	94	94	98	95	95	**95**
Quarter 8 (Jan–Mar'24)	96	95	99	100	95	**97**
Quarter 9 (Apr–June'24)	95	97	–	–	96	**96**
Quarter 10 (Jul–Sept'24)	99	98	–	–	98	**98**
Average	**92**	**91**	**95**	**93**	**93**	**93**

* Perform an ANOVA test comparing the percentage of values (like ANC, PNC, etc.) over time. The p-value is derived from the F-statistics generated by this comparison. A low p-value (typically < 0.05) indicates that the differences in percentage are statistically significant, meaning they are unlikely to have occurred by chance.

6. Assessment of job satisfaction

Job satisfaction surveys were administered to BMC service providers (doctors, midwives, program organizers, area managers) in two intervention areas (Tongi and Morkun) in August 2022 (baseline) and Jun-July 2024 (endline). Face-to-face interviews were conducted in intervention areas. The analysis of service providers' responses across eight key areas—daily activities and clinic environment, supervision quality, job security and safety, validation of job activities, professional growth opportunities, adaptive management and peer support, group ANC-PNC session satisfaction, and salary and overall job satisfaction—offers significant insights into their experiences and perceptions. Responses were documented using a three-point Likert scale: 1) satisfied, 2) neither satisfied nor dissatisfied, and 3) dissatisfied. A total of 11 service providers at baseline and 12 service providers at endline, including related program organizer and area managers, were interviewed.

Overall, job satisfaction levels improved across most domains between the baseline and endline. Improvements were seen in terms of work environment and scheduling, particularly in satisfaction with working hours and support for maternity leave, though dissatisfaction with time spent with family increased. Supervision quality showed marked progress, with more providers feeling respected and supported by their supervisors and co-workers. However, satisfaction around coordination and decisionmaking between supervisors and other stakeholders saw some declines.

Perceptions about job security and personal safety also improved, with higher satisfaction regarding safety in the workplace, especially protection from harassment and threats. In terms of validation of job activities, respect from the community, co-workers, and supervisors remained high, and there was an increase in providers' perceived ability to improve health outcomes in their communities.

Providers reported positive experiences with professional growth opportunities, particularly in the consideration of their ideas by supervisors and stakeholders, though there was a decline in their perceived opportunities to contribute to service improvement. Peer support was a strong area, with high levels of cooperation and mutual respect among colleagues. However, the GANC-GPNC sessions presented mixed results—while providers were generally satisfied with logistics, educational outcomes for mothers, and conducting the sessions, they reported challenges in organizing father group sessions, particularly at community level.

Finally, overall job satisfaction was overwhelmingly positive at the endline, with 91.7 percent of providers expressing satisfaction with their jobs. However, some providers expressed dissatisfaction about wages. In conclusion, the service providers experienced positive developments in supervision, safety, peer support, and salary, but they noted areas, such as workload, coordination with stakeholders, and challenges in organizing and documenting group sessions, that need attention for further improvement.

7. Discussion on key findings

This quasi-experimental study on Group ANC-PNC aimed to improve the quality and use of MNCH and FP services and information among young women and their husbands in the urban municipality of Bangladesh. The evaluation of this study provides a detailed and comprehensive understanding of the intervention's effect on several aspects of maternal health and health care utilization among FTMs. The discussion below covers findings and outcomes with respect to FTM demographics, knowledge of maternal and neonatal danger signs during ANC, delivery and PNC, knowledge and use of FP methods, social support, and engagement with health care services, particularly those offered by the BRAC Maternity Center.

Using DiD, the analysis of baseline and endline data found no significant difference in background characteristics (e.g., age, age at marriage, religion, profession, and wealth index) between the FTMs who participated in the baseline survey and endline surveys except pre-primary and secondary schooling and monthly household expenditure. Increased pre-primary schooling and decreased secondary level schooling may be due to the chances that more FTMs are recruited in the endline survey who are below secondary level of education. Increased monthly expenditure of the family in the endline survey (BDT 20,903 at endline, from BDT 16,511 at baseline) likely reflects increased purchasing power of the family over time. However, it is much lower than the national average of BDT 41,424. [18]

One of the most significant impacts of the intervention was improving FTMs' knowledge of danger signs during pregnancy, delivery, neonates and the postnatal period (Tables 2a, 2a1, 2b, 2b1, 2c, 2c1, 2d and 2d1). FTMs who attended five ANC sessions were found to be more knowledgeable (can identify at least one danger sign during pregnancy) compared to the FTMs who attended fewer than five GANC-GPNC sessions. Similar findings are also revealed on knowledge of three danger signs during pregnancy, one and three danger signs during delivery and postnatal period and newborn complications. FTMs who attended two GPNC sessions were also found to be more knowledgeable (can identify at least one danger sign and three danger signs during postnatal period) and newborn complications (two warning signs of newborn complications) compared to the FTMs who attended fewer than two GPNC sessions. All these findings indicate that GANC-GPNC sessions have significantly contributed to improving the knowledge of FTMs on danger signs of pregnancy, delivery, postnatal period, and newborn complications. Conversely, a study conducted in a maternity hospital in Bangladesh among pregnant women attending an ANC clinic found that only 64 percent and 22 percent women knew at least one and three danger signs of pregnancy, respectively, [19] however, another study conducted in Bangladesh reported that 26 percent and 23 percent participants having knowledge on three or more danger signs during pregnancy and delivery, respectively, were recognized as having "good knowledge" while the knowledge on these two components are much higher in this study. [20]

The intervention has also significantly improved FTMs' knowledge and use of FP methods (Table 2e). While general awareness of FP was already high at baseline, the intervention led to a further increase in the specific knowledge of modern FP methods, such as condoms, injectables, and IUDs. Not only did knowledge increase, but women's actual use of modern FP methods—predominantly POP—in the postpartum period also increased. POP use significantly increased in the intervention arm compared to the control arm over time. This trend can most likely be attributed to the fact that most women in Bangladesh use short-acting methods of contraception such as pills, condoms, and injectables for birth spacing and limiting. [10] These findings indicate that the intervention helped to bridge the gap between knowledge and action, encouraging more women to adopt family planning methods that could prevent closely spaced pregnancies and improve maternal and child health outcomes.

One of the intervention's major achievements was the significant increase in FTMs' utilization of the BRAC Maternity Center's health services (Table 3a). For instance, the percentage of FTMs who received antenatal care from BMC increased by over 21 percent in the intervention group, while the use of post-partum family planning services at BMC increased by 8.3 percent. This increase may be attributed to attending group services during GANC and GPNC sessions. However, the data also revealed some challenges, particularly around the use of delivery services at BMC. Despite an increase in awareness, the use of delivery services decreased slightly in the intervention group, and qualitative interviews highlighted concerns about the availability of doctors, payment for delivery, oxygen support, complicated delivery, and the overall capacity of BMC to handle multiple deliveries simultaneously. Some respondents reported dissatisfaction with the referral process when BMC was unable to provide delivery services, indicating a potential area for improvement. It is important to note here that this decrease may be due to the cessation of delivery service at BMCs as of March 2024.

The intervention also contributed to improved quality of ANC services at BMCs across several indicators (Table 4). Key aspects such as weight measurement, blood pressure checks, abdominal examination, urine protein testing, anemia counseling, and anemia checks all saw notable increases. For instance, the percentage of women whose weight was taken increased from 85.8 percent at baseline to 93.1 percent at endline. Similarly, the percentage of women who had their urine checked for protein increased from 47.7 percent to 82.3 percent. These improvements reflect a more thorough and consistent delivery of critical ANC services in the intervention group compared to the control group. Additionally, the intervention increased the provision of counseling on danger signs during pregnancy from 53.4 percent to 92.8 percent and PPFP counseling from 48.9 percent to 79.4 percent. A significant improvement has been observed in the ANC checkup (one ANC and 4+ ANC visits) with all tracer elements (blood pressure checks, weight measurement, blood grouping, urine tests for albumin, and counseling on danger signs) from medically trained providers over time (Table 6). The improvements may be the result of women becoming more knowledgeable of what services should look like, and the service providers receiving routine and frequent supportive supervision on ANC and PNC.

Facility delivery at the national level in urban areas is 76 percent. [10]. This intervention slightly contributed to facility deliveries, with a DiD of 0.5 percent (p=0.863), which indicates non-significant slight improvements in facility delivery (Table 6a). About 77.4 percent of FTMs in the control area and 79.6 percent in the intervention area delivered at a facility. Although the percentage of facility deliveries is similar to national findings, facility deliveries in the intervention BMCs increased significantly compared to control BMCs (22 percent vs 14 percent, respectively). This finding suggests that the intervention may have influenced mothers choosing BMCs over other options, reflecting a growing preference for or trust in BRAC's services, even though the overall facility delivery rates remained relatively stable. Increased facility delivery may be due to the incentives provided to the FTMs for attending GANC-GPNC sessions. However, the cessation of deliveries at BMCs starting in March 2024 likely had an impact on the total number of deliveries conducted at the BMCs. While the quality score was very "high" at the baseline for delivery, this has not improved too much or remained stable at the endline (Table 7). Although none of the improvements in the quality components were statistically significant, the overall trend indicates enhanced satisfaction and quality of care at BMC, reflecting positively on the efforts to improve delivery services.

The quality of the last PNC services reported by FTMs also improved significantly, particularly in terms of health monitoring and counseling (Table 8). For example, weight measurement significantly increased at the endline compared to baseline between intervention and control groups, with a DiD of 41.8 percent, p<0.001. Similarly, eye checks for anemia rose from 45.5 percent at baseline to 66.7 percent at endline, and urine protein checks increased from 10.9 percent to 50.4 percent at endline. The overall quality score significantly increased from 56.4 percent to 89.7 percent at endline, with a DiD of 27.7 percent, p=0.003. The improvements may be linked to women becoming more knowledgeable of what services should look like and the service providers receiving routine and frequent supportive supervision on ANC and PNC.

Although not significant, the proportion of FTMs who received at least one PNC checkup within two days of delivery at a BMC increased from 74.5 percent at baseline to 78.6 percent at endline, with a DiD of 8.5 percent, p=0.355. FTMs who received at least three PNC checkups within 42 days of delivery from BMC increased significantly in both the groups, but the overall increase was not statistically significant (DiD=-4.1 percent; p=0.665). Similar findings are also observed in the case of newborns (DiD=7.4 percent; p=0.439). Additionally, FTMs who received at least one PNC checkup within two days of delivery from any facility and medically trained providers increased in both groups, but the results were not statistically significant (DiD=4.6 percent; p=0.098) (Table 9). However, the percentage is much above the national level (55 percent). [10]

The study evaluated the impact of the intervention on breastfeeding and ENC practices among FTMs at BMCs and other locations. The intervention showed some improvements among the FTMs and newborns who went to BMCs, particularly in the application of 7.1 percent CHX to the umbilical cord and the initiation of breastfeeding within one hour of birth, with non-significant DiDs equal to 3.4 percent (p=0.627) and 1.8 percent (p=0.716), respectively. Exclusive breastfeeding up to six months significantly increased in the intervention group (76.7 percent) compared to control group (56.3 percent) with a DiD of 23.6 percent (p=0.008). While there is a sharp decline in the exclusive breastfeeding from 65 percent in 2018 to 53 percent in 2022 at the national level, it is encouraging that about 77 percent FTMs exclusively breastfed their children who have participated in the GANC and GPNC sessions at BMCs. [10] Many ENC practices like sterile cord cutting, drying the newborn within four minutes of birth, and delayed bathing increased over time but did not reach statistical significance. The combined use of any two ENC components improved in the intervention group but often without significant DiD of 4.1 percent (p=0.588). Overall, there were positive increasing trends in newborn care practices, indicating that the interventions are effective in changing ENC behaviors (Table 11). The percentage of ENC practices was much higher in the intervention group compared to the national level (sterile cord cutting 98.5 percent vs 96.9 percent; 7.1 percent CHX applied; 85.8 percent vs 41.2 percent; BF initiated within 1 hour: 95.9 percent vs 51.7 percent; bathing delayed 72 hours: 80.2 percent vs 43.8 percent). [10]

The intervention revealed significant improvements in various elements of RMC across ANC, PNC, and FP services following an intervention in BMCs. ANC saw marked improvements in women feeling warmly greeted, with providers introducing themselves increasing significantly in the intervention group. Compassionate treatment also rose, and providers were more attentive and responsive to patient needs. Emotional support and proper communication from providers showed substantial gains, and maintaining patient confidentiality and obtaining consent before physical examinations significantly improved. These changes were reflected in the overall RMC score, where a significant increase in the proportion of women with "high" RMC scores was noted (DiD=22.4 percent; p<0.001), suggesting enhanced respectful care, which was also reflected in the satisfaction level with ANC (DiD=15.3 percent; p<0.001) (Table 14). The intervention also led to positive changes in PNC services, with significant gains in friendly greetings, introductions, emotional support, communication, and maintaining patient privacy. The proportion of women with "high" RMC scores increased notably in the intervention group compared to control groups (DiD=26.4 percent; p=0.010), and overall satisfaction on PNC, including RMC among FTMs, improved significantly (DiD=8.0 percent; p=0.042) (Table 14b). Similarly, in FP services, the intervention enhanced emotional support and dramatically improved practices related to obtaining consent and maintaining privacy, leading to a notable rise in "high" RMC scores (DiD=60.3 percent; p=0.005) and overall satisfaction with FP services (DiD=60.3 percent; p=0.005) (Table 12b). Qualitative interviews further corroborated these findings, as FTMs and their families expressed appreciation for the respectful and caring behavior of service providers, noting their attentiveness, clear communication, and

genuine concern for new mothers. Overall, the intervention improved the quality of respectful maternity care at BMCs, enhancing patient satisfaction and fostering a supportive environment for women and their families. Some of these findings can also be attributed to women being more aware of what RMC should look like after being part of the HWHF program. The study underscores the importance of integrating respectful and dignified care practices in maternal health services to improve patient outcomes and experiences.

The intervention significantly enhanced birth preparedness among FTMs at BMCs, particularly in selecting a delivery place, arranging for blood donors, and identifying transportation for delivery. There was a notable increase in the completion of all four key elements of birth preparedness in the intervention group from 21.8 percent at baseline to 62.2 percent at endline ($p<0.001$) with a significant DiD of 17.2 percent ($p=0.001$), reflecting a more comprehensive approach to planning for childbirth. These improvements indicate that the intervention successfully raised awareness and encouraged proactive preparations, contributing to safer and more organized maternal care experiences. Qualitative feedback from both FTMs and first-time fathers (FTFs) confirmed increased awareness and practical application of these preparedness measures, such as saving money and arranging transportation. Overall, the findings underscore the importance of targeted interventions in promoting effective birth preparedness practices among young mothers. The findings of this study in terms of birth preparedness are a significant addition to the literature on this topic in Bangladesh. For example, a study in Bangladesh conducted by Parvin et al. reported that about 12 percent of the participants were “well prepared” for birth, which was measured by planning for at least two components, for skilled childbirth, and emergency obstetrics complications. [20]

However, while the intervention achieved significant successes in many areas, there were also some gaps and challenges (Table 14, 14a and 14b). The findings indicate that social support for FTMs during the continuum of care—pregnancy, delivery, and postnatal periods—varied significantly. Household and health care support showed notable improvements in the intervention group, particularly during the delivery phase, but overall gains across all types of support were inconsistent. Psychological support and composite social support scores did not significantly improve over time. However, opposite picture was reported by Dr. Sultana et al. in a group prenatal care study in Bangladesh. She reported that women in the group faced difficulties in convincing other family members to come for check-ups, though the participants were able to make them understand the importance of maternal health care after attending the sessions, later reporting that their family member no more prevented them from going for check-ups after realizing their importance. [15] Couple communication also saw mixed results, with positive shifts in respectful communication and decisionmaking around health emergencies, but a decrease in discussions about family planning. Qualitative insights highlighted challenges in overcoming family resistance, especially from mothers-in-law, but underscored the positive role of husbands in supporting their wives. Despite progress in some areas, targeted efforts are needed to ensure consistent and comprehensive support for FTMs throughout their maternal journey.

The findings from couple communication indicate that the intervention led to improvements in certain aspects of couple communication and decisionmaking among FTMs, particularly in respectful communication and discussions regarding health emergencies (Table 15). There were significant positive changes in FTMs’ comfort in disagreeing with their husbands and joint decisionmaking about health care. However, discussions on family planning saw a slight decline, and overall, not all aspects of communication improved consistently. Qualitative interviews supported these findings, emphasizing the importance of shared decisionmaking on key health issues between couples.

The intervention evaluation compared participation, knowledge gained, and experiences of FTMs in group ANC and group PNC sessions between two locations, Tongi and Morkun (Table 16). Most participants in both areas were aware of the HWHF project, with 100 percent attending at least one session. However, attendance patterns varied, with more participants in Tongi attending four or more sessions compared to Morkun, reflecting significant differences ($p<0.001$). Specific sessions such as GANC-4, GANC-5, and GPNC-1 also showed lower attendance in Morkun. Despite these differences, the knowledge gained was largely similar across both locations, with most mothers reporting an understanding of key topics like self-care during pregnancy and postpartum, as well as the importance of ANC and facility deliveries. Nearly all participants found the IEC materials, including cards and brochures, to be highly useful. In the qualitative interview, respondents shared that they would have appreciated a summary of learning points for each session to bring back home as a reminder of healthy practices and noted that this would also help them to communicate with family members back home. Some also suggested using slides with pictures during sessions, which would interest them more and help register the learnings in their mind easily.

Satisfaction levels with the group discussions were overwhelmingly high, with over 99 percent of participants in both locations expressing satisfaction with the topics covered and the sessions overall (Table 19). Furthermore, nearly all participants indicated that they would recommend the sessions to friends or relatives. While follow-up check-ups after the sessions varied slightly between locations, with fewer check-ups in Morkun, most participants attended multiple check-ups. The most common difficulties reported by the respondents were poor time management and long waiting times, difficulty with travel, and sometimes sessions being too long and repetitive in topics (Table 19a).

In terms of family involvement, around 63 percent of husbands attended the sessions, and their feedback was positive, with nearly all expressing satisfaction. Only minor suggestions were provided for improving the sessions, such as adding more topics, involving more service providers, and reducing session duration. Overall, the evaluation reflects high participation, satisfaction, and usefulness of the group ANC-PNC sessions, with some room for slight adjustments to further enhance the experience for participants. About 18 percent of the FTMs faced challenges attending the GANC-GPNC sessions. The four major challenges included traveling to the facility (47.2 percent), managing time (44.2 percent), finding an escort (33.5 percent), and managing money (21.3 percent), with no significant differences between the two locations. Further analysis revealed that FTMs who attended GANC2, GANC1 and GPNC2 have faced most difficulties in attending group ANC and group PNC sessions (Table 19a1).

At baseline, on average 79 percent of service providers correctly did their practices/activities on ANC, PNC, delivery, ENC and FP. At the endline, this percentage progressively increased to an average of 93 percent—a 14-percentage point or 17.7 percent increase. Some of the practices/activities eventually achieved 100 percent or around 100 percent in some of the quarters by endline. (Table 21 and Table 21a). Analysis of supportive supervision checklists suggest that supportive supervision decreased job stress that interferes with their work performance and provided nurturing conditions that improved their knowledge, skills and encouraged self-efficacy. This increased knowledge and skills are reflected in the increased level of performance of project result indicators at the endline compared to the baseline level of performance.

Among providers, overall job satisfaction was overwhelmingly positive at the endline survey, with 91.7 percent expressing satisfaction with their jobs (Appendix B4). However, dissatisfaction remained about wages. Supervision quality showed marked progress, with more providers feeling respected and supported by their supervisors and co-workers. Personal safety improved, with higher satisfaction regarding safety in the workplace, especially protection from harassment and threats. In terms of validation of job activities, respect from the community, co-workers, and supervisors remained high, and there was an increase in providers’ perceived ability to improve health outcomes in their communities. Peer support was a strong area, with high levels of cooperation and mutual respect among colleagues.

8. Conclusions and recommendations

A mixed-methods approach was used to assess the effectiveness and acceptability of a GANC-GPNC model with first-time parents. The model was tested in an urban area of Gazipur district with a population mostly comprising recent migrants from throughout rural Bangladesh who are highly mobile, belong to a lower socio-economic group, and in most cases, the FTMs are young (below age 25). Below are the highlights of several key attributes that worked well or did not work well in terms of the effectiveness, acceptability and relevance of GANC-GPNC model.

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WHAT WORKED WELL?

Information shared in GANC-GPNC sessions resulted in significant improvement of FTM's knowledge and healthy behaviors

Changes from the baseline to endline assessment showed a significant improvement in FTMs' knowledge of dangers signs during pregnancy, delivery, and the postnatal period, including newborns (Tables 2a, 2a1, 2b, 2b1, 2c, 2c1, 2d, and 2d1). Qualitative interviews demonstrated that both FTMs and FTFs highly valued what they learned through the GANC-GPNC sessions. FTMs valued information on danger signs, FP methods, and birth preparedness, the practical tips about maintaining their health and nutritious food, including vegetables, protein, calcium, and mineral rich food in the diet, the importance of sleep, water intake, cord cleaning, and not bathing the newborn for 72 hours, and breastfeeding guidelines.

ATTITUDINAL AND BEHAVIOR SHIFTS

FTMs in the intervention group demonstrated increased awareness and use of various services, especially in areas such as ANC, delivery, PNC, and FP at BMCs (2e, 3a and 6a). Qualitative interviews showed a positive attitudinal shift among FTFs to support a healthy pregnancy, healthy mother, and healthy newborn. FTFs, apart from taking care of physical health needs of mother and baby, also demonstrated improved awareness of the mental well-being of the mother and maintaining a supportive and nurturing attitude toward the pregnant and new mothers.

After the GANC-GPNC model intervention, the use of modern family planning methods postpartum also increased considerably, indicating that the intervention successfully addressed fears and dispelled misconceptions around PPFP to some extent, such as the commonly held belief that breastfeeding gives full protection from next pregnancy and PPFP was not needed, or that PPFP could have side effects that would compromise the health of mother or the quality of breastmilk. This understanding encouraged more couples to adopt postpartum family planning methods that would prevent closely spaced pregnancies and improve maternal and child health outcomes. FTMs and FTFs in the intervention group also showed improved completion of all four key elements of birth preparedness (saving money, arranging vehicles, arranging blood donors, arranging transport) from baseline to endline surveys, reflecting a more comprehensive approach to planning for childbirth (Table 13).

EFFECT ON ANC AND PNC RETENTION AND FACILITY DELIVERY

The assessment demonstrated significant improvement in ANC and PNC retention and facility delivery at BMCs in the intervention group (Table 6a and Table 9). A significant improvement has been observed in the ANC checkup (one ANC and 4+ ANC) with all tracer elements (blood pressure checks, weight measurement, blood grouping, urine tests for albumin, and counseling on danger signs) from medically trained providers over time (Table 6). A significant improvement was found in the PNC checkup within two days. Weight checks, blood pressure measurement, urine albumin tests, and anemia tests during PNC visits improved considerably in the intervention group over time (Table 9).

SATISFACTION WITH CARE AND SERVICES AT BMCS

Most of the FTMs were satisfied with the services provided to them as well as with the group sessions. During the qualitative interviews, FTMs and their families expressed great appreciation for the respectful and caring behavior of service providers, noting their attentiveness, clear communication, and genuine concern for new mothers (Table 12, 12A). Respondents also appreciated free doctor check-ups after each session and ultrasounds offered at a lower price compared to other facilities. They also appreciated covering the transport money to come to the center for GANC-GPNC sessions by the project.

SUPPORTIVE SUPERVISION

BRAC and MSH conducted supportive supervision during the intervention. Supportive supervision showed that the quality of service provision, clinical performance, and respectful maternity care have improved substantially, with more providers feeling respected and supported by their supervisors and co-workers to perform their job efficiently (Table 7 in Appendix).

WHAT DID NOT WORK WELL/CHALLENGES

Despite the positive outcomes described, several challenges were also noted. Many respondents are highly mobile and engaged in factory work or time bound activities, which posed a challenge in terms of session scheduling and time management (Table 19a). Ensuring participation of fathers in GANC-GPNC was a great challenge. Mothers faced additional socio-cultural-related challenges including commuting, as well as the need for accompanying support and permission of in-laws.

Waiting times for delays in starting the GANC-GPNC was problematic for FTMs, as often some women (and men as well) would come to the facility early and then would have to wait for other members to arrive, and for the session to begin. In addition, some facilities were short-staffed, and the health providers had to respond to emergency situations, which delayed the start of the group sessions. At the facility and service level, when asked about improvements, beneficiaries discussed the staff shortage to handle multiple deliveries, shortage of equipment and tools at BMCs, discontinuation of delivery services at BMC, small meeting rooms, and complications related to referrals to other facility during delivery.

The assessment also found that the model fell short in realizing the benefit of group counseling and peer bonding among FTMs and FTFs. Due to being a highly mobile population, reshuffling of group members (in subsequent meetings) was often necessary, which limited continuous interaction with the same members across sessions and peer bonding as intended in the model's design. It was therefore difficult for members to maintain any relationships outside the group sessions or connect over phone or through any social apps.

The model included targeting fathers to engage them in supporting mothers and newborn care through community sessions. Although there were some positive improvements among the fathers in increased awareness about taking care of mother's and baby's nutrition intake, health emergencies, and so forth, overall social support (from parents, mother/father-in-law and friends) did not change at the endline survey.

RECOMMENDATIONS AND NEXT STEPS

The assessment found that introducing a GANC-GPNC model provided by qualified health care professionals can be an effective and critical health care intervention for young new mothers as opposed to the traditional individual ANC, especially in settings where coverage of comprehensive care is low, and the quality of care is poor. However, further improvements and modifications to the model are needed to address some challenges and help sustain and scale the model across the county or other settings.

- **Scale up the model in other areas:** The tested GANC-GPNC model demonstrated improved delivery, performance, and utilization of services for pregnant women and was widely accepted by first-time parents. While replicating the model in other areas is recommended, the assessment also identified attributes of the GANC-GPNC intervention model that required flexibility and to be tailored to the context in which the model is implemented such as the number of sessions, the session content, session time, and/or the modality of engagement. This combination of standard and flexible components is key when planning and designing for implementation across LMIC settings and scale up.

Recommendations from the assessment that can be considered to improve the model's efficacy, relevance, and acceptability include:

- **Reduce waiting time:** In busy peri-urban areas where lower socioeconomic groups engage in multiple economic activities and daily wage-based work, efficient time management and reduced waiting time would be key to retention at group sessions and minimizing dropouts. Waiting time in the GANC-GPNC model can be minimized by strengthening communication to remind women and families about follow-up visits' correct date and distribution of time slot (without confusion and abrupt changing), checkup before the session, use token for the services and by increased community outreach.
- **Strengthen the component of peer bonding:** Consistency of group members and group leadership is key in peer bonding, and fostering relationships, integral to the GANC-GPNC's model of leveraging social support and networking. To that end strategies and efforts are needed to minimize reshuffling of groups. Several strategies could be investigated: smaller group size, flexibility of the schedule, incentives for consistent participants, connected FTMs in social media/WhatsApp groups etc.
- **Revisit father's engagement strategy:** FTFs' session posed challenges for fathers to attend sessions particularly in workdays. The assessment respondents suggested holding FTF sessions on weekends or outside of office hours or at their workplace by coordinating with factory authorities to increase their participation. Both service recipients and service providers also recommended shortening the length of the FTFs' session.
- **Modify content and modality of delivery:** Participant feedback suggests that a means to deliver content should be identified that will succinctly deliver the most practical information, such as use of digital content (power point slides), break down complex procedures or include questions, polls, or short quizzes to involve participants and ensure active engagement during sessions. Ensuring the content is concise, practical, and engaging will enhance participant understanding and retention. Bite-size content to take home, such as a one-pager, was also suggested by the beneficiaries.
- **Equip facilities with enough manpower, equipment and tools:** Facilities should be equipped with required human resources, medical equipment and supplies, essential medicine, monitoring and accountability and referral mechanisms to ensure that providers have the resources to provide high-quality service.
- **Improve social support system:** More strategies and approaches should be identified to improve the social support system for FTMs such as transportation facilities and community engagement for access to services, and mental health support.
- **Test the model in government facilities:** The GANC-GPNC model holds promise for all mothers in government setting for better meeting the social support and informational needs for improving the quality and uptake of ANC, PNC and delivery care at facilities in resource-poor settings like Bangladesh. The GANC-GPNC model has been implemented and leverages BRAC's existing models and programming in NGO settings which are different from government settings. The next step would be to test it in government settings and adapt as needed to maximize the beneficial outcomes of this model. The government has facilities all over the country, with service providers posted who enjoy job security. Many are specialists with resources available once they are budgeted. However, they lack counselors, trained manpower on GANC and GPNC, and a tested manual.

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Appendix A: HWHF project result indicators list and endline values

1. PROPORTION OF HEALTH WORKERS PROVIDING QUALITY ANC-PNC, DELIVERY, AND FP SERVICES (INCLUDING RESPECTFUL CARE) ACCORDING TO NATIONAL GUIDELINES

Services	Baseline (%)	Endline (%)	p-value
ANC (n=244)	75	96	0.002
Delivery (n=102)	83	99	0.002
PNC (n=199)	78	98	<0.001
ENC (n=93)	80	100	0.002
Family planning (n=133)	77	98	0.005

2. PROPORTION OF SERVICE PROVIDERS PROVIDING GROUP ANC-PNC REPORTING JOB SATISFACTION (ENDLINE)

Elements of satisfaction	Satisfied, n (%)
Satisfied in conducting the group ANC-PNC session	8 (100.0)
Satisfied with the start off time for group ANC-PNC session	4 (50.0)
Satisfied with logistics and resources provided for group ANC-PNC session	8 (100.0)
Satisfied documenting details of group ANC-PNC participants in register book	5 (62.5)
Satisfied in achieving educational goal of group ANC-PNC by mother	8 (100.0)
Stated high level of satisfaction	**6 (75.0)**
n*	8
Satisfied in arranging father group ANC-PNC session at facility	1 (50.0)
Satisfied in arranging FTMs group ANC-PNC session at facility	1 (50.0)
Satisfied in arranging FTFs group ANC-PNC session at community level	0
Satisfied in arranging FTMs group ANC-PNC session at community level	1 (50.0)
n**	**2**

* A composite score was calculated by combining the 5 elements of job satisfaction providing group ANC-PNC sessions which include conducting GANC&GPNC session, start off time of GANC & GPNC session, logistics and resources provided for GANC & GPNC session, documenting the details of GANC & GPNC session and achieving the educational goal of GANC & GPNC session. If they are satisfied, we assign a value 1 otherwise 0 for each of the 5 elements. We then count the number of satisfactions stated for each of 8 midwives and this a composite score. It was found that median of the composite score was 4 and we consider high level of satisfaction if the composite score is greater than or equal the median. About 75% of service provides stated high level of satisfaction.

3. PROPORTION OF FTMS WHO STATED SATISFACTION WITH ANC-PNC AND FP SERVICES (INCLUDING RESPECTFUL CARE) RECEIVED[a]

Variables	Baseline			Endline			DiD (%)	p-value
	Control, n(%)	Intervention, n (%)	Diff. (p-value)	Control, n (%)	Intervention, n (%)	Diff. (p-value)		
FTMs stated satisfaction with ANC including respectful maternity care	115 (46.9)	111 (42.7)	0.340	199 (65.5)	617 (76.6)	0.006*	15.3	<0.001***
n	**245**	**260**	–	**304**	**806**	–	–	–
FTMs stated satisfaction with PNC including respectful maternity care	19 (37.2)	22 (40.0)	0.770	34 (36.6)	111 (47.4)	0.037	8.0	0.042
n	**51**	**55**	–	**93**	**234**	–	–	–
FTMs stated satisfaction with FP including respectful FP services	3 (50.0)	8 (53.3)	0.890	2 (25,0)	132 (88.6)	<0.001***	60.3	<0.001***
n	**6**	**15**	–	**8**	**149**	–	–	–

[a] Among only FTMs who have received services from BMC; *p<0.05, **p<0.01, ***p<0.001

4. PROPORTION OF FTMS WHO RECEIVED ONE AND FOUR OR MORE ANC VISITS FROM BMC (MEDICALLY TRAINED PROVIDERS)

Variables	Baseline			Endline			DiD (%)	p-value
	Control, n(%)	Intervention, n (%)	Diff. (p-value)	Control, n (%)	Intervention, n (%)	Diff. (p-value)		
FTMs received at least one ANC visit from medically trained providers (BRAC doctor and midwives) from BMC with all tracer elements[∞]	57 (23.3)	53 (20.4)	0.433	106 (34.9)	442 (54.8)	<0.001***	30.9	<0.001***
FTMs received 4+ ANC£ checkups from BMC (from medically trained providers) with all TEs	48 (19.6)	48 (18.5)	0.746	74 (24.3)	377 (46.8)	<0.001***	27.5	<0.001***
n	**245**	**260**	–	**304**	**796**	–	–	–

[∞] Tracer elements included BP checked, weight taken, blood grouping, urine checked for albumin, and counseled on danger signs, without sign P-value generated using Chi-square test, *p<0.05, **p<0.01, ***p<0.001

5. PROPORTION OF FTMS WHO CAN IDENTIFY AT LEAST THREE OF THE DANGER SIGNS OF PREGNANCY[a]

Variables	Baseline			Endline			DiD (%)	p-value
	Control, n(%)	Intervention, n (%)	Diff. (p-value)	Control, n (%)	Intervention, n (%)	Diff. (p-value)		
FTMs who can tell at least three of the danger signs of pregnancy	15 (1.4)	24 (2.2)	0.196	67 (6.1)	450 (40.9)	<0.001***	34.0	<0.001***
N	**1100**	**1100**		**1100**	**1100**	–	–	–

[a] Danger signs: severe vaginal bleeding, severe headache, blurry vision, high fever, prolonged labor; *p<0.05, **p<0.01, ***p<0.001

6. PROPORTION OF FTMS WHO CAN IDENTIFY AT LEAST TWO OF THE WARNING SIGNS OF NEWBORN COMPLICATIONS[a]

Variables	Baseline			Endline			DiD (%)	p-value
	Control, n(%)	Intervention, n (%)	Diff. (p-value)	Control, n (%)	Intervention, n (%)	Diff. (p-value)		
FTMs who can tell at least two of the danger signs of newborn	227 (20.6)	227 (20.6)	<0.010**	334 (30.4)	692 (62.9)	<0.001***	36.6	<0.001***
N	1100	1100	–	1100	1100	–	–	–

[a] Warning signs of newborn complications: breathing difficulty, irregular or fast breathing (>60 minute), seizure, feeding poorly, umbilical redness, hypothermia, and lethargy; *p<0.05, **p<0.01, ***p<0.001

7. PROPORTION OF INFANTS WHO EXCLUSIVELY BREASTFEED

Variables	Baseline			Endline			DiD (%)	p-value
	Control, n(%)	Intervention, n (%)	Diff. (p-value)	Control, n (%)	Intervention, n (%)	Diff. (p-value)		
Infants who exclusively breastfeed up to 6 months	549 (49.9)	601 (54.6)	<0.026*	226 (20.6)	231 (21.0)	0.793	−4.3	0.119
N	**1100**	**1100**	–	**1100**	**1100**	–	–	–

* p<0.05, **p<0.01, ***p<0.001

8. PROPORTION OF NEWBORNS WHO RECEIVED AT LEAST TWO ENC COMPONENTS: 1. 7.1% CHX APPLIED TO CORD AND 2. INITIATION OF BREASTFEEDING WITHIN 1 HOUR

Variables	Baseline			Endline			DiD (%)	p-value
	Control, n(%)	Intervention, n (%)	Diff. (p-value)	Control, n (%)	Intervention, n (%)	Diff. (p-value)		
7.1% chlorhexidine (CHX) applied to cord	644 (58.5)	727 (66.1)	<0.001***	720 (65.5)	720 (65.5)	<0.001***	2.0	0.480
Initiated BF within 1 hour of birth	849 (77.2)	861 (78.3)	0.539	841 (76.5)	841 (76.5)	0.001**	4.8	0.051
Combined 2 components used (applying 7.1% CHX to the cord, early initiation of BF within one hour	*480 (43.6)*	*563 (51.2)*	*<0.001****	*551 (50.4)*	*551 (50.4)*	*<0.001****	*4.2*	*0.162*
N	**1100**	**1100**	–	**1100**	**1100**	–	–	–

* p<0.05, **p<0.01, ***p<0.001

9. PROPORTION OF MOTHERS AND NEWBORNS WHO RECEIVED AT LEAST ONE PNC WITHIN TWO DAYS OF DELIVERY (FROM MEDICALLY TRAINED PROVIDERS)

Variables	Baseline			Endline			DiD (%)	p-value
	Control, n(%)	Intervention, n (%)	Diff. (p-value)	Control, n (%)	Intervention, n (%)	Diff. (p-value)		
FTMs who received at least one PNC checkup within 2 days of delivery from any facility and medically trained providers	727 (66.1)	709 (64.4)	0.420	765 (69.6)	798(72.6)	0.121	4.6	0.098
Newborns who received at least one PNC checkup within 2 days of delivery from any facility and medically trained providers	703 (63.9)	675 (61.4)	0.217	757 (68.8)	782 (71.1)	0.245	4.8	0.090
N	**1100**	**1100**	–	**1100**	**1100**	–	–	–

* p<0.05, **p<0.01, ***p<0.001

10. PROPORTION OF MOTHERS AND NEWBORNS WHO RECEIVED AT LEAST THREE PNC VISITS WITHIN 42 DAYS OF DELIVERY FROM ANY FACILITY

Variables	Baseline			Endline			DiD (%)	p-value
	Control, n(%)	Intervention, n (%)	Diff. (p-value)	Control, n (%)	Intervention, n (%)	Diff. (p-value)		
FTMs and newborns who received at least 3 PNC checkups within 42 days of delivery from any facility	211 (19.2)	268 (24.4)	<0.001***	289 (26.3)	366 (33.3)	<0.001***	−1.8	0.571
N	**1100**	**1100**	–	**1100**	**1100**	–	–	–

* p<0.05, **p<0.01, ***p<0.001

11. PROPORTION OF FIRST-TIME MOTHERS WHO KNOW MODERN FP METHODS[a]

Variables	Baseline			Endline			DiD (%)	p-value
	Control, n(%)	Intervention, n (%)	Diff. (p-value)	Control, n (%)	Intervention, n (%)	Diff. (p-value)		
FTMs know the name of at least one of the modern FP methods	511 (46.5)	457 (41.6)	0.020*	604 (54.9)	714 (64.9)	<0.001***	14.9	<0.001***
N	**1100**	**1100**	–	**1100**	**1100**	–	–	–

[a] Modern FP methods: pill, condom, injectables, implant, IUD, female sterilization, male sterilization; *p<0.05, **p<0.01, ***p<0.001

12. PROPORTION OF FIRST-TIME PARENTS COMPLETING BIRTH PLANS[a]

Variables	Baseline			Endline			DiD (%)	p-value
	Control, n(%)	Intervention, n (%)	Diff. (p-value)	Control, n (%)	Intervention, n (%)	Diff. (p-value)		
Completed all four birth preparedness elements	246 (22.4)	240 (21.8)	0.742	433 (44.4)	620 (62.2)	<0.001***	17.2	<0.001***
n	**976**	**928**	–	**976**	**996**	–	–	–

[a] Select a delivery place, save money for delivery, arrange blood donor, and identify mode of transportation; *p<0.05, **p<0.01, ***p<0.001

13. PROPORTION OF FIRST-TIME PARENTS USING ANY MODERN PPFP METHODS (6 MONTHS POSTPARTUM)[a]

Variables	Baseline			Endline			DiD (%)	p-value
	Control, n(%)	Intervention, n (%)	Diff. (p-value)	Control, n (%)	Intervention, n (%)	Diff. (p-value)		
Use any modern FP during postpartum period	230 (69.7)	268 (68.0)	0.630	252 (56.4)	315 (63.9)	0.019*	9.2	0.052
n	**330**	**394**	–	**447**	**493**	–	–	–

* p<0.05, **p<0.01, ***p<0.001; aNumber of samples is small due to survey skip logic

14. PROPORTION OF WOMEN REPORTING COUPLE COMMUNICATION AND SHARED DECISIONMAKING RELATED TO REPRODUCTIVE AND CHILD HEALTH

Variables	Baseline			Endline			DiD (%)	p-value
	Control, n(%)	Intervention, n (%)	Diff. (p-value)	Control, n (%)	Intervention, n (%)	Diff. (p-value)		
Reported couple communication[a]	625 (56.8)	665 (60.4)	0.083	481 (43.7)	570 (51.8)	<0.001***	4.5	0.136
Shared decisionmaking in which doctor should be visited in case of emergencies								
Jointly (husband and wife)	544 (49.5)	581 (52.8)	<0.001***	586 (53.3)	584 (53.1)	0.001**	-3.5	0.239
N	**1100**	**1100**	–	**1100**	**1100**	–	–	–

[a] Composite score of high couple communication; *p<0.05, **p<0.01, ***p<0.001

15. PROPORTION OF WOMEN INDICATING THAT THEY HAD HIGH SOCIAL SUPPORT§ DURING THEIR PREGNANCY, DELIVERY, AND POSTPARTUM PERIOD

Variables	Baseline			Endline			DiD (%)	p-value
	Control, n(%)	Intervention, n (%)	Diff. (p-value)	Control, n (%)	Intervention, n (%)	Diff. (p-value)		
ANC	614 (55.8)	564 (51.3)	0.033*	653 (59.4)	595 (54.1)	0.013*	-0.7	0.808
Delivery	561 (51.0)	604 (54.9)	0.060	759 (69.0)	792 (72.0)	0.123	-0.9	0.752
PNC	639 (58.1)	629 (57.2)	0.670	815 (74.1)	806 (73.3)	0.663	0.1	0.974
N	**1100**	**1100**	–	**1100**	**1100**	–	–	–

* p<0.05, **p<0.01, ***p<0.001; aSocial support included assistance during day-to-day work, cooking, household chores, access to health care, accompaniment to hospital, financial support, bringing medicine, arranging transportation, and emotional support. ₸Mother, mother-in-law, husband, father-in-law, and friends. §High social support deemed when composite score goes beyond median score; below median score falls into inadequate social support.

Appendix B: Job satisfaction surveys of service providers

JOB SATISFACTION (BASELINE AND ENDLINE SURVEY)

Job satisfaction surveys of BMC service providers (doctors, midwives, program organizers, area manager) in two intervention areas (Tongi and Morkun) were conducted in August 2022 (baseline) and Jun-July 2024 (endline). They were conducted through face-to-face interviews only in intervention areas. The set of items covered in the survey include daily/weekly activities and clinic environment, quality of supervision, job security, validation of job activities, professional growth opportunity, adaptive management and support, peer respect and support, compensation, group ANC-PNC session, and overall job satisfaction. Responses were documented using a five-point Likert scale, 1) very dissatisfied, 2) dissatisfied, 3) neither satisfied nor dissatisfied, 4) satisfied, and 5) very satisfied. Later, the scale decreased to three: 1) satisfied, 2) neither satisfied nor dissatisfied 3) dissatisfied. A total of 11 service providers at baseline and 12 service providers at the endline survey, including related program organizer and area managers, were interviewed.

TABLE B1: NUMBER OF PROVIDERS PARTICIPATED IN JOB SATISFACTION SURVEY BY INTERVENTION AREA

Area	Baseline	Endline
Tongi	6 (Doctors 02, Midwives 04)	6 (Midwives 04, Program Organizer 01, Area Manager 01)
Morkun	5 (Doctors 01, Midwives 04)	6 (Midwives 04, Program Organizer 01, Area Manager 01)
Total	**11**	**12**

TABLE B2: SERVICE PROVIDERS SATISFACTION AND DISSATISFACTION ON DAILY OR WEEKLY ACTIVITIES AND CLINIC ENVIRONMENT

Variables	Baseline			Endline		
	Satisfied, n (%)	Neither satisfied nor dissatisfied, n (%)	Dissatisfied, n (%)	Satisfied, n (%)	Neither satisfied nor dissatisfied, n (%)	Dissatisfied, n (%)
Working hours are specified for each day	8 (72.7)	3 (27.3)	0	9 (75.0)	3 (25.0)	0
Number of hours you worked in a typical day	8 (72.7)	2 (18.2)	1 (9.1)	8 (66.7)	3 (25.0)	1 (8.3)
Holidays you enjoyed per week	6 (54.5)	4 (36.4)	1 (9.1)	6 (50.0)	2 (16.7)	4 (33.3)
Working on weekends	4 (36.4)	3 (27.3)	4 (36.4)	6 (50.0)	5 (41.7)	1 (8.3)
Time you spend with your family	5 (45.5)	3 (27.3)	3 (27.3)	5 (41.7)	3 (25.0)	4 (33.3)
N	**11**			**12**		
Maternity leave you receive	5 (45.5)	6 (54.5)	0	6 (84.7)	1 (14.3)	0
n	**11**			**12**		
In addition to your normal clinic activities, the additional time you spent	8 (72.7)	2 (18.2)	1 (9.1)	9 (90.0	1 (10)	0
n	**11**			**12**		

TABLE B2 (continued):

Variables	Baseline			Endline		
	Satisfied, n (%)	Neither satisfied nor dissatisfied, n (%)	Dissatisfied, n (%)	Satisfied, n (%)	Neither satisfied nor dissatisfied, n (%)	Dissatisfied, n (%)
The facilities you have in the clinic for conducting GANC-PNC	6 (54.5)	3 (27.3)	2 (18.2)	11 (91.7)	1 (8.3)	0
The facilities you have in clinic for providing ANC	10 (90.9)	1 (9.1)	0	10 (83.3)	2 (16.7)	0
The facilities you have in the clinic for normal delivery	9 (81.8)	1 (9.1)	1 (9.1)	7 (58.3)	4 (33.3)	1 (8.3)
The facilities you have in clinic for providing PNC	10 (90.9)	1 (9.1)	0	10 (83.3)	2 (16.7)	0
The facilities you have in the clinic for patient referral	4 (36.4)	3 (27.3)	4 (36.4)	7 (58.3)	4 (33.3)	1 (8.3)
The facilities you have in the clinic for providing PPFP	8 (72.7)	3 (27.3)	0	8 (66.7)	4 (33.3)	0
The level of communication you performed with clients	9 (81.8)	1 (9.1)	1 (9.1)	9 (75.0)	1 (8.3)	2 (16.7)
The level of communication you performed with supervisors	9 (81.8)	2 (18.2)	0	12 (100.0)	0	0
The clerical/ documentation activities you performed each day	5 (45.5)	4 (36.4)	2 (18.2)	12 (100.0)	0	0
The time you have in planning clinic activities in addition to service provider	6 (54.5)	5 (45.5)	0	9 (75.0)	2 (16.7)	1 (8.3)
The time you spent in office meeting in addition to service provision	9 (81.8)	0	2 (18.2)	10 (83.3)	2 (16.7)	0
N	**11**			**12**		

Table B2 shows the satisfaction levels of service providers across various aspects of their work and clinic environment at two different points in time: baseline and endline. At the baseline, most respondents (72.7 percent) were satisfied with their specified working hours, a sentiment that slightly increased to 75.0 percent at the endline, with no dissatisfaction recorded at either time. Regarding the number of hours worked per day, satisfaction dropped from 72.7 percent to 66.7 percent, with a slight increase in those neither satisfied nor dissatisfied. There was notable dissatisfaction with the holidays per week, increasing from 9.1 percent at the baseline to 33.3 percent at the endline survey, indicating a decline in satisfaction (from 54.5 percent to 50.0 percent). Weekend work satisfaction improved, with the percentage of dissatisfied individuals dropping from 36.4 percent to 8.3 percent. Satisfaction levels concerning time spent with family showed a slight decline (from 45.5 percent to 41.7 percent), and dissatisfaction rose from 27.3 percent to 33.3 percent. In terms of clinic-related aspects, satisfaction with facilities for GANC-PNC showed a significant increase, from 54.5 percent at the baseline to 91.7 percent at the endline survey. Satisfaction with facilities for normal delivery, however, declined, with fewer respondents satisfied at the endline (58.3 percent) compared to the baseline (81.8 percent).

Communication with supervisors improved markedly, with 100 percent satisfaction at the endline compared to 81.8 percent at baseline, and documentation activities also saw full satisfaction (100 percent) at the endline.

Finally, participation in office meetings and time spent in clinic activity planning both saw improvements in satisfaction levels at the endline survey (Table B2).

TABLE B3: SERVICE PROVIDERS' SATISFACTION AND DISSATISFACTION WITH QUALITY OF SUPERVISION

Variables	Baseline			Endline		
	Satisfied, n (%)	Neither satisfied nor dissatisfied, n (%)	Dissatisfied, n (%)	Satisfied, n (%)	Neither satisfied nor dissatisfied, n (%)	Dissatisfied, n (%)
Frequency of official meetings with your supervisor to discuss problems and solution	6 (54.5)	4 (36.4)	1 (9.1)	9 (75.0)	2 (16.7)	1 (8.3)
Respectful behavior you received from supervisors	7 (63.6)	3 (27.3)	1 (9.1)	12 (100.0)	0	0
Support you received from your direct supervisor in carrying out your work	10 (90.9)	1 (9.1)	0	11 (91.7)	0	1 (8.3)
Level of responsibilities you feel/received from your supervisors	10 (90.9)	1 (9.1)	0	10 (83.3)	2 (16.7)	0
Level of responsibilities you feel/received from your co-workers	8 (72.7)	3 (27.3)	0	12 (100.0)	0	0
Fairness with which your performance is measured	6 (54.5)	4 (36.4)	1 (9.1)	10 (83.3)	1 (8.3)	1 (8.3)
Coordination between your supervisor, community health leaders and stakeholder	9 (81.8)	1 (9.1)	1 (9.1)	6 (50.0)	4 (33.3)	2 (16.7)
Ease with which you can communicate with your supervisors	10 (90.9)	1 (9.1)	0	11 (91.7)	1 (8.3)	0
Appreciation shown by your supervisor for your work	8 (72.7)	2 (18.2)	1 (9.1)	11 (91.7)	1 (8.3)	0
Feedback you received from your supervisor	8 (72.7)	2 (18.2)	1 (9.1)	9 (75.0)	3 (25.0)	0
Supportive supervision you received from your supervisors	NA	NA	NA	10 (83.3)	2 (16.7)	0
N	**11**			**12**		

Table B3 presents the quality of supervision reported by service providers at baseline and endline across several variables. At baseline, 54.5 percent of providers were satisfied with the frequency of official meetings with their supervisor, which increased to 75.0 percent at endline, showing improvement in communication frequency. Dissatisfaction remained low at both time points (9.1 percent and 8.3 percent, respectively). A significant improvement was observed in respectful behavior from supervisors, with satisfaction rising from 63.6 percent at baseline to 100 percent at endline, indicating that all respondents felt respected by their supervisors by the endline. Similarly, the support received from supervisors remained high, with a small increase from 90.9 percent to 91.7 percent, though there was a slight increase in dissatisfaction at the endline (8.3 percent). The level of responsibility felt was given by supervisors decreased slightly, with satisfaction dropping from 90.9 percent to 83.3 percent. However, there was a marked

improvement in the perceived responsibility from co-workers, where satisfaction rose from 72.7 percent to 100 percent.

Regarding fairness in performance measurement, satisfaction increased significantly from 54.5 percent to 83.3 percent, and dissatisfaction slightly fell from 9.1 percent to 8.3 percent. In contrast, the coordination between supervisors, community health leaders, and stakeholders saw a decrease in satisfaction, dropping from 81.8 percent to 50.0 percent, while dissatisfaction increased from 9.1 percent to 16.7 percent. The ease of communication with supervisors remained consistently high, with slight improvement (90.9 percent to 91.7 percent). Appreciation from supervisors also improved, rising from 72.7 percent to 91.7 percent by the endline, with no dissatisfaction reported at the endline. Satisfaction with feedback from supervisors remained stable, with 72.7 percent at baseline and 75.0 percent at endline. Lastly, 83.3 percent were satisfied with the supportive supervision at the endline, indicating strong supervisor support (Table B3).

TABLE B4: SERVICE PROVIDER SATISFACTION ON PERSONAL SAFETY

Variables	Baseline			Endline		
	Satisfied, n (%)	Neither satisfied nor dissatisfied, n (%)	Dissatisfied, n (%)	Satisfied, n (%)	Neither satisfied nor dissatisfied, n (%)	Dissatisfied, n (%)
Your personal safety while working in the maternity center	8 (72.7)	2 (18.2)	1 (9.1)	11 (91.7)	1 (8.3)	0
Your personal safety while working in the community	8 (72.7)	2 (18.2)	1 (9.1)	11 (91.7)	1 (8.3)	0
Your safety from sexual harassment in your workplace	11 (100.0)	0	0	12 (100.0)	0	0
Your safety from any physical threats (hooligan, mastan, threat of physical)	8 (72.7)	1 (9.1)	2 (18.2)	10 (83.3)	1 (8.3)	1 (8.3)
N	**11**			**12**		

Table B4 displays service providers' perceptions of personal safety at the baseline and endline. In terms of personal safety while working in the maternity center, satisfaction increased significantly from 72.7 percent at baseline to 91.7 percent at endline. Dissatisfaction dropped to zero, with only a small percentage (8.3 percent) being neutral at the endline. A similar trend is seen regarding personal safety while working in the community, where satisfaction improved from 72.7 percent to 91.7 percent, and dissatisfaction dropped to zero at the endline. Service providers unanimously felt safe from sexual harassment, with 100 percent satisfaction at both baseline and endline. Regarding safety from physical threats (e.g., hooligans or other threats), there was an improvement in satisfaction, rising from 72.7 percent at baseline to 83.3 percent at endline, although dissatisfaction remained present, decreasing slightly from 18.2 percent to 8.3 percent. Overall, these results indicate an improvement in both job security (where data are available) and personal safety across the board from baseline to endline.

TABLE B5: SERVICE PROVIDER SATISFACTION AND DISSATISFACTION WITH VALIDATION OF JOB ACTIVITIES

Variables	Baseline			Endline		
	Satisfied, n (%)	Neither satisfied nor dissatisfied, n (%)	Dissatisfied, n (%)	Satisfied, n (%)	Neither satisfied nor dissatisfied, n (%)	Dissatisfied, n (%)
Respect you received from community for doing this work	9 (81.8)	1 (9.1)	1 (9.1)	10 (83.3)	2 (16.7)	0
Respect you received from your co-worker for doing this work	10 (90.9)	1 (9.1)	0	10 (83.3)	2 (16.7)	0
Respect you received from your supervisors for doing this work	9 (81.8)	2 (18.2)	0	10 (83.3)	1 (8.3)	1 (8.3)
Your roles in planning of service provision in this catchment area	8 (72.7)	3 (27.3)	0	10 (83.3)	2 (16.7)	0
Your ability to improve health and well-being in your working community	7 (63.6)	3 (27.3)	1 (9.1)	12 (100.0)	0	0
The freedom to use your own judgment for providing services	8 (72.7)	2 (18.2)	1 (9.1)	11 (91.7)	1 (8.3)	0
Award for good performance	8 (72.7)	1 (9.1)	2 (18.2)	8 (66.7)	2 (16.7)	2 (16.7)
N	**11**			**12**		

Table B5 presents the validation of job activities for service providers at both baseline and endline. For the respect received from the community, satisfaction slightly increased from 81.8 percent to 83.3 percent, with dissatisfaction eliminated at the endline (0 percent). However, respect from co-workers saw a small decline in satisfaction, dropping from 90.9 percent at baseline to 83.3 percent at endline, while neutrality increased. The respect from supervisors showed a modest improvement in satisfaction from 81.8 percent to 83.3 percent, although dissatisfaction also appeared at the endline (8.3 percent). Regarding service providers' roles in planning service provision, satisfaction improved, rising from 72.7 percent at baseline to 83.3 percent at endline, with no dissatisfaction reported at either time.

A substantial improvement was seen in providers' perception of their ability to improve health and well-being in their working community, where satisfaction jumped from 63.6 percent to 100.0 percent at the endline. Providers also experienced an increased sense of freedom to use their own judgment, with satisfaction rising from 72.7 percent to 91.7 percent by the endline. Dissatisfaction dropped to 0 percent, reflecting more confidence in decisionmaking. Finally, regarding awards for good performance, satisfaction decreased slightly from 72.7 percent to 66.7 percent, while dissatisfaction increased from 18.2 percent to 16.7 percent, showing some decline in recognition for performance over time (Table B5).

TABLE B6: SERVICE PROVIDERS' SATISFACTION AND DISSATISFACTION WITH PROFESSIONAL GROWTH

Variables	Baseline			Endline		
	Satisfied, n (%)	Neither satisfied nor dissatisfied, n (%)	Dissatisfied, n (%)	Satisfied, n (%)	Neither satisfied nor dissatisfied, n (%)	Dissatisfied, n (%)
Opportunities to update work-related health knowledge	9 (81.8)	2 (18.2)	0	10 (83.3)	2 (16.7)	0
Opportunities to contribute your ideas to improve service provision	9 (81.8)	2 (18.2)	0	8 (66.7)	4 (33.3)	0
Consideration/valuation of your views and ideas by SK/SS	7 (63.6)	4 (36.4)	0	11 (91.7)	1 (8.3)	0
Consideration/valuation of your views and ideas by stakeholders	8 (72.7)	2 (18.2)	1 (9.1)	10 (83.3)	2 (16.7)	0
Opportunities for social contact at work	8 (72.7)	3 (27.3)	0	11 (91.7)	1 (8.3)	0
N	**11**			**12**		

Table B6 highlights the professional growth opportunities experienced by service providers at the baseline and endline. For opportunities to update work-related health knowledge, satisfaction remained high, slightly improving from 81.8 percent at baseline to 83.3 percent at endline, with no dissatisfaction recorded at either point. However, for opportunities to contribute ideas to improve service provision, satisfaction dropped from 81.8 percent to 66.7 percent, while neutrality increased to 33.3 percent at the endline, indicating a decrease in perceived contribution opportunities.

The consideration of views and ideas by SK/SS (supervisors) saw a notable improvement, with satisfaction increasing from 63.6 percent to 91.7 percent at endline, showing a greater recognition of service providers' input. Similarly, consideration by stakeholders improved, with satisfaction rising from 72.7 percent to 83.3 percent, and dissatisfaction disappearing at endline. Lastly, opportunities for social contact at work saw a significant increase, with satisfaction improving from 72.7 percent to 91.7 percent at endline, reflecting enhanced social interactions in the workplace.

TABLE B7: SERVICE PROVIDERS' SATISFACTION AND DISSATISFACTION WITH ADAPTIVE MANAGEMENT AND PEER SUPPORTS

Variables	Baseline			Endline		
	Satisfied, n (%)	Neither satisfied nor dissatisfied, n (%)	Dissatisfied, n (%)	Satisfied, n (%)	Neither satisfied nor dissatisfied, n (%)	Dissatisfied, n (%)
Leadership from higher authorities	8 (72.7)	1 (9.1)	2 (18.2)	10 (83.3)	1 (8.3)	1 (8.3)
Leadership from higher authorities (Central level)	NA	NA	NA	11 (91.7)	1 (8.3)	0
Timeliness with which decisions made at meetings are implemented	NA	NA	NA	9 (75.0)	1 (8.3)	2 (16.7)
Supportive supervision received from immediate supervisor	NA	NA	NA	11 (91.7)	0	1 (8.3)
Supportive supervision received from central level supervisor	NA	NA	NA	9 (75.0)	3 (25.0)	0

TABLE B7 (continued):

Variables	Baseline			Endline		
	Satisfied, n (%)	Neither satisfied nor dissatisfied, n (%)	Dissatisfied, n (%)	Satisfied, n (%)	Neither satisfied nor dissatisfied, n (%)	Dissatisfied, n (%)
Processes by which decisions are made by area / district manager	8 (72.7)	3 (27.3)	0	10 (83.3)	2 (16.7)	0
Processes by which decisions are communicated by area / district manager	8 (72.7)	3 (27.3)	0	10 (83.3)	2 (16.7)	0
Process of communication with higher authorities	8 (72.7)	3 (27.3)	0	9 (75.0)	2 (16.7)	1 (8.3)
Support you received from your co-workers (doctors/midwives)	10 (90.9)	1 (9.1)	0	11 (91.7)	1 (8.3)	0
Attitude shown by colleagues toward your ways of service delivery (in this case, doctor, managers, and midwives)	9 (81.8)	1 (9.1)	1 (9.1)	11 (91.7)	1 (8.3)	0
Respect you received from other doctors/ midwives on good performance	9 (81.8)	1 (9.1)	1 (9.1)	11 (91.7)	1 (8.3)	0
Cooperation exists amongst doctors/ midwives	10 (90.9)	1 (9.1)	0	12 (100.0)	0	0
Mutual trust exists among doctors/ midwives	10 (90.9)	1 (9.1)	0	11 (91.7)	1 (8.3)	0
N	**11**			**12**		

Table B7 focuses on adaptive management and peer support among service providers, comparing baseline and endline satisfaction levels. For leadership from higher authorities, satisfaction improved from 72.7 percent to 83.3 percent, with a decrease in dissatisfaction from 18.2 percent to 8.3 percent. Additionally, at the endline, 91.7 percent were satisfied with central-level leadership. Regarding the timeliness of decision implementation following meetings, 75.0 percent were satisfied at endline, but there was some dissatisfaction (16.7 percent). Supportive supervision from both immediate and central-level supervisors saw high satisfaction at endline, with 91.7 percent and 75.0 percent satisfied, respectively.

Satisfaction with the decisionmaking processes by area/district managers increased from 72.7 percent to 83.3 percent, with no dissatisfaction. Similarly, satisfaction with how decisions are communicated by managers improved, with an increase from 72.7 percent to 83.3 percent. In terms of peer support, cooperation among doctors and midwives reached 100 percent satisfaction at endline, while mutual trust remained consistently high, with satisfaction slightly increasing to 91.7 percent. Support from co-workers, attitudes toward service delivery, and respect for good performance all saw improvements, with satisfaction levels reaching over 90 percent at the endline and no dissatisfaction recorded (Table B7).

TABLE B8: SERVICE PROVIDERS' SATISFACTION AND DISSATISFACTION WITH GANC AND GPNC SESSIONS (ENDLINE ONLY)

Variables	Satisfied, n (%)
Conduct group ANC-PNC session	8 (100.0)
Start off time for group ANC-PNC session	4 (50.0)
Logistics and resources provided for group ANC-PNC session	8 (100.0)
Documenting details of group ANC-PNC participants in register book	5 (62.5)
Achieving educational goal of group ANC-PNC by mother	8 (100.0)
n*	**8**
Arrange father group ANC-PNC session at facility	1 (50.0)
Arrange mother group ANC-PNC session at facility	1 (50.0)
Arrange father group ANC-PNC session at community level	0
Arrange mother group ANC-PNC session at community level	1 (50.0)
n**	**2**

*Midwives (Tongi BMC 4, Morkun BMC 4); **Program Organizer (Tongi BMC 1, Morkun BMC 1).
Note: Two respondents (area managers) were not included in the analysis as questions were not relevant for them.

The endline survey assessed service providers' satisfaction with group ANC and group PNC sessions (Table B8). All respondents (100 percent) were satisfied with conducting GANC-GPNC sessions, and the logistics and resources provided. However, only half (50 percent) were satisfied with the kick-off time for these sessions. When it came to documenting the details of GANC-GPNC participants in the register book, only 62.5 percent of the service providers expressed satisfaction. All service providers (100 percent) felt that the educational goals of the GANC-GPNC sessions were achieved by the mothers.

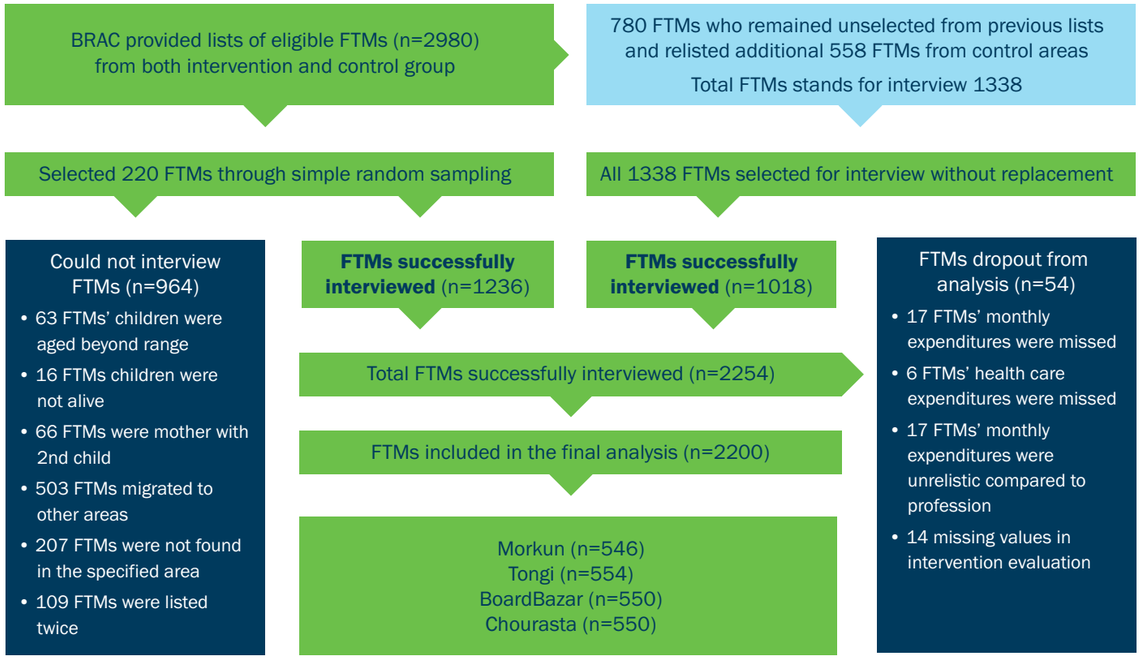
In terms of organizing father and mother GANC-PNC sessions at the facility and community levels, only two organizers provided their opinions. Only one organizer each was satisfied with arranging FTFs and FTMs GANC and GPNC sessions at the facility level while no one was satisfied in arranging FTFs GANC and GPNC sessions at community level. Only one organizer was satisfied with arranging FTMs GANC and GPNC sessions at the community.

TABLE B9: SERVICE PROVIDER SATISFACTION WITH WAGES AND OVERALL JOB SATISFACTION

Variables	Baseline			Endline		
	Satisfied, n (%)	Neither satisfied nor dissatisfied, n (%)	Dissatisfied, n (%)	Satisfied, n (%)	Neither satisfied nor dissatisfied, n (%)	Dissatisfied, n (%)
Amount of total wages you received	4 (36.4)	3 (27.3)	4 (36.4)	8 (66.7)	1 (8.3)	3 (25.0)
Your workload in relation to the time you have	5 (45.5)	3 (27.3)	3 (27.3)	5 (41.7)	4 (33.3)	3 (25.0)
Satisfied, neither satisfied nor dissatisfied, dissatisfied with your overall job	NA	NA	NA	11 (91.7)	1 (8.3)	0
N	**11**			**12**		

Table B9 focuses on wages and overall job satisfaction of service providers at the baseline and endline. Regarding the amount of salary received, satisfaction improved significantly, rising from 36.4 percent at baseline to 66.7 percent at endline. About one-third to one-fourth of service providers at the baseline and endline, respectively, were dissatisfied with the wages they received. For workload in relation to time, about one-fourth of service providers were dissatisfied at both baseline and endline. However, 91.7 percent of service providers at the endline were satisfied with the overall job.

Appendix C: Flowchart on endline sampling



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