“Assessing the Social and Behavioral Barriers towards Safe Deliveries in Hard-to-Reach Areas of Bangladesh, The Role of Skilled Birth Attendants under SHOUHARDO III Plus Activity”

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Abbreviation

ANC	Antenatal care
BDT	Bangladeshi Taka
BPP	Birth Preparedness Planning
CB	CARE Bangladesh
CCS	Community Clinic Staff
CHCP	Community Healthcare Providers
C-IMCI	Community-based Integrated Management of Childhood Illness
CP	Community People
CS	C- Section
CSBA	Community Skilled Birth Attendant
DD	Deputy Director
DH	DG Health
EOC	Emergency Obstetric Care
FGD	Focus Group Discussion
FHA	Female Health Assistants
FPO	Family planning Office
FWA	Family Welfare Assistants
FWV	Family Welfare Visitor
GoB	Government of Bangladesh
HtR	Hard to Reach
ID	Institutional delivery
IDI	In-depth interview
IPTM	Institute of Professionals Training and Management
KII	Key Informant Interview
LSP	Local Service Providers
MHC	Maternal healthcare
MO	Medical Officer
MoHFW	Ministry of Health and Family Welfare
MS Excel	Microsoft Excel
NC	Nursing Council

ND	Normal delivery
NCD	Non-communicable Diseases
OGSB	Obstetrical and Gynecological Society of Bangladesh
OT	Operation theater
PCSBA	Private Community Skilled Birth Attendants
PLW	Pregnant & Lactating Women
PNC	Postnatal care
PS	Program staffs
RL	Religious Leader
SACMO	Sub Assistant Community Medical Officer
SBA	Skilled Birth Attendants
SDG	Sustainable Development Goal
SPSS	Statistical Package for Social Sciences
TBA	Traditional Birth Attendants
UFPO	Upazila Family Planning Officer
UH&FPO	Upazila Health and Family Planning Officer
UH&FWC	Union Health and Family Welfare Center
UHC	Upazila Health Complex
UHO	Upazila Health Officer
USAID	U.S. Agency for International Development
USC	Union Sub Center
VS	Versus
VDC	Village Development Committee

Executive summary

Background: Maternal health is a critical concern in Bangladesh's Char and Haor regions, where access to quality healthcare services remains challenging. Despite strides in improving MHC indicators, many pregnant women face risks due to reliance on untrained birth attendants or home deliveries. This situation is compounded by insufficient awareness about crucial aspects like antenatal, institutional delivery, and postnatal care, especially in ecologically vulnerable hard-to-reach areas. To address these issues, CARE Bangladesh introduced the SHOUHARDO III Plus Program, implementing Private Community Skilled Birth Attendants (PCSBAs) supported by USAID and the Ministry of Health and Family Welfare. These PCSBAs, recognized as skilled birth attendants, aim to fill healthcare gaps in areas with limited government services.

Objectives: An evaluation was essential to assess the program's effectiveness, its impact on healthcare practices, cultural barriers affecting maternal health, and the roles of PCSBAs within existing healthcare facilities. Therefore, this study aimed to examine service quality, cultural influences, healthcare institutes' capacity, experiences of underserved populations, and the roles of PCSBAs in hard-to-reach areas such as Char and Haor to understand maternal health challenges and solutions in those regions. Specific objectives of the study were to: a) Assess how various social and cultural factors influence maternal health; b) Assess the capacity of the existing healthcare institutes to conduct safe deliveries in hard-to-reach areas; c) Draw the experience of the poor and extremely poor in receiving maternal healthcare services at local healthcare institutions; d) Identify the role are the community-based skilled birth attendants playing within and outside the existing healthcare facilities

Methodology: This study used a mixed-method design, including both quantitative and qualitative approach along with a secondary literature review. The study was conducted in fifteen upazilas (sub-districts) of Kurigram, Gaibandha, Netrokona, Kishoreganj, Habiganj, and Sunamganj districts. The study selected 400 respondents as a statistically representative and significant primary sample including pregnant and lactating women, mothers with children under 5, rural community members, and PCSBAs in the study areas. A purposive sampling was used, ensuring an appropriate balance of female and male beneficiaries according to the assessment target. Respondents for the qualitative study (In-depth interviews, key informant interviews, and focus group discussions) include pregnant and lactating women along with their husbands and mothers-in-law, rural community members, PCSBAs, community clinic staff, village development committee, program staff, Upazila Health Complex officer, Family Planning officer, and Ministry officials. The existing secondary data for analyses were background reports, project log frames, monthly and annual monitoring reports, etc.

Key findings:

Demographic information of the respondents

- The majority (75.0%, n=300) of the survey participants belonged to maternal service receivers from rural communities. An equal proportion of program participants (37.5%, n=150) and non-participants (37.5%, n=150) took part in the survey. The remaining (25.0%, n=100) were PCSBAs who serve as the maternal healthcare service providers to the local communities of these HtR areas.
- About 17.0% of the respondents possess the ability to sign but may not have pursued formal education. More than 50.0% of the respondents either completed primary education or up to JSC/equivalent.
- A majority of participants (77.3%, n=300) were found to live in nuclear families with the day laborers being the largest group at 36.8%, followed by farmers at 19.2%, and businessmen at 12.9%. Notably, day laborers are more prevalent in the Haor area (42.6% vs. Char 26.8%), while farming is more common in the Char area (Char 28.6% vs. Haor 13.7%)
- Among the participants surveyed, 42.7% of households reported an average monthly income below BDT 10,000 ($91), while around 47.3% earned between BDT 10,000-19,000 ($91-$173). In terms of expenses, 51.7% spent below BDT 10,000 ($91) on average, while 43% spent between BDT 10,000-19,000 ($91-$173). Notably, food emerged as the top priority for 98.0% of participants in household expenses, followed closely by healthcare at 72.7%. Education was also significant, with 41.3% of households recognizing it as a substantial commitment.

Social and cultural factors influencing maternal health in hard-to-reach areas

- Program participants sought ANC care more often than the non-participants. The Char area had a comparatively higher ANC seeking practices than the Haor regions (Char 97.3%, n=60 VS. Haor 88.9%, n=90).
- Among pregnant women, 88.9% prioritize regular check-ups to monitor the progress of their pregnancies, with 44.4% seeking these check-ups specifically to address concerns or complications.
- The accessibility of healthcare facilities during emergencies is a critical factor, with percentages ranging from 54.5% to 67.9% across groups. Additionally, the distance to institutional healthcare facilities is also a notable barrier, particularly for lactating women with children under 2 (72.7%). The unavailability of female doctors is a shared issue, ranging from 18.2% to 25.0% across groups.
- The study participants mostly prefer ND. The non-participants had a higher trend of seeking C-sections compared to the program participant group. Women from the Char area depended more on the institutional facilities for their ND (Char 27.2%, n=103 VS. Haor 17.0%, n=165). In the study areas, women heavily rely on informal sources for

seeking ND assistance, with program participants turning to PCSBAs and non-participants seeking assistance from Dhaimas.

- Regarding not seeking institutional facilities for ND, healthcare facility availability during emergencies was emphasized by a majority of respondents across all groups, with percentages ranging from 49.0% to 55.9%. The distance to modern healthcare facilities and financial constraints were significant barriers, with percentages ranging from 29.0% to 65.0%. A large percentage in all groups highlights the costs of hospitalization in local healthcare facilities as a significant deterrent, ranging from 44.1% to 75.0%.
- The percentage of women seeking PNC was lower than that of ANC seeking (60%, n=280, VS. 96.0%, n=300). The Char area had a higher percentage of seeking PNC (74.8%, n=107 VS. 50.9, n=173). Notably, across all categories, a substantial focus exists on seeking guidance for breastfeeding-related issues, with percentages ranging from 61.1% to 75.0%. Additionally, monitoring any complications after childbirth is a significant concern, with percentages ranging from 48.7% to 55.6%. Reasons for not seeking institutional PNC included doubts about modern medicine, cultural and social considerations, challenges related to healthcare facility distance, preferences for traditional healing methods, and unavailability of female doctors.
- Only 3.4% of participants could independently make healthcare decisions, while 40.3% stated decisions were made jointly by both husband and wife. Another 4.5% mentioned relying on mothers-in-law for such decisions. In Haor, the situation was more balanced between the husband and the husband and wife both. In Char, the most common reason for excluding women from maternal healthcare decision-making was that women have no income (63%), followed by women are not capable of taking a decision (44.6%). While in Haor, the most common reason was that women are not used to take decision within the household (50%), followed by women have limited experience about the healthcare issues (46.6%), and women are not capable of taking a decision (38.6%).

Capacity of the existing healthcare institutes to conduct safe deliveries in hard-to-reach areas

- Limited services, absence of facilities for routine deliveries, inadequate staffing, and uneven distribution of CCs, particularly in HtR regions, hinder the effectiveness of MHC services. Similar challenges exist in UH&FWCs and USCs, including limited services, absence of facilities for routine deliveries, and inadequate staffing. Accessibility issues due to distance and transportation problems further compound the situation.
- UHCs offer more comprehensive services, including doctors, midwives, and facilities for Emergency Obstetric Care (EOC) and C-sections, accessibility issues persist, and the quality of services varies. Insufficient staff and resources are highlighted as major concerns.

- Participants express greater satisfaction with MHC provided by NGOs, citing lower costs and better quality of care compared to privately-owned clinics. However, limited availability remains a challenge.
- Despite the PCSBAs crucial role within the local healthcare setting, there is a shortage of PCSBAs relative to the area and population, which poses challenges to service delivery, especially in remote areas or during emergencies. Community members and program staff members alike emphasize the need to increase the number of PCSBAs to expedite and enhance services.
- PCSBAs collaborate with local healthcare institutions, including CCs and UH&FWCs, to facilitate ND and provide assistance. However, challenges such as male CHCPs in CCs and limited-service hours of FWVs in UH&FWCs persist. PCSBAs play a vital role in conducting and assisting normal deliveries alongside CHCPs and FWVs. They also serve as a crucial link between the community and healthcare institutions, gathering health information, referring individuals to healthcare facilities, and encouraging institutionalized delivery.
- In Char, the most common issue regarding difficulties in maternal healthcare services during natural disasters was inadequate river-based transportation options (81.3%), followed by damaged or flooded roads (62.5%). In Haor, the most common issue was damaged or flooded roads (68.4%), followed by high transportation costs (60.5%).
- In both Char and Haor regions of Bangladesh, mobile phone accessibility is widespread, with 69.1% and 87.4% of participants having access, respectively. However, internet access remains limited, with only 6.6% in Char and 21.1% in Haor having connectivity. Despite the prevalence of mobile phones, a small percentage of participants receive Maternal Health Information (MHI), with only 3.6% in Char and 8.4% in Haor obtaining such information. Television emerges as the primary source of MHI for participants, followed by YouTube, Facebook, and mobile phones.
- Utilization of telehealth services is minimal, with only 3.9% in Char and 0.6% in Haor reporting their use. Furthermore, a significant majority of participants, 58.3%, are unaware of such services. Awareness of emergency contact numbers for maternity assistance is low, with only 6.4% in Char and 3.2% in Haor being cognizant of these numbers.

Experience of the poor and extremely poor in receiving maternal healthcare services at local healthcare institutions

- Despite the importance of Emergency Obstetric Care (EOC), a significant portion of individuals in both Char (30.0%) and Haor (15.3%) regions did not seek such services in the past five years. Access to EOC at community-level healthcare facilities like CCs and UHFWCs and UCSs was limited, compounded by poor knowledge of danger signs among both community members and healthcare providers. Efforts to address these issues are underway, including enhancing district hospitals to provide community-level EOC.

- Approximately half of the participants from Char (52.8%) and Haor (47.4%) found institutional Maternal Healthcare (MHC) services unaffordable. Financial constraints, including doctor's fees, medication expenses, and transportation costs, were cited as major barriers. However, the introduction of PCSBAs emerged as a cost-effective option for poor and ultra-poor communities seeking ANC, delivery, and PNC services, promoting a habit of seeking care.

Role of the community-based skilled birth attendants playing within and outside the existing healthcare facilities

- In the Haor region, 66.5% of respondents received ANC from PCSBAs, compared to 62.4% in the Char areas. The trend continues in delivery care, with 60.3% of participants in Char areas and 44.3% in the Haor region receiving services from PCSBAs. Regarding PNC, 60.4% of respondents in the Char region received PNC from PCSBAs, while the rate was 32.4% in the Haor region The PCSBAs said that ANC was the most preferred service, followed by PNC and delivery.
- In Char, 93.3% of pregnant women chose to receive delivery assistance from PCSBAs, while in Haor, the rate was lower at 26.7%. A significant proportion of participants across various groups in Char (ranging from 41.2% to 93.3%) received PNC from PCSBAs. In the Haor area, the percentages of individuals received postnatal care were lower compared to Char (ranging from 16.7% to 24.7%).
- The majority of respondents in both Char and Haor regions expressed their perception of the service quality provided by PCSBAs as excellent, with percentages reaching 59.4% and 47.6%, respectively.
- PCSBA services have significantly influenced ANC-seeking behaviors by dispelling social and cultural superstitions and misconceptions prevalent in rural communities. Participants reported a shift in perceptions towards ANC importance and consulting healthcare providers, attributing this change to the guidance and education provided by PCSBAs.
- PCSBAs play a vital role in ensuring safe deliveries, especially in hard-to-reach areas with limited healthcare infrastructure. They address delivery challenges and shortages of trained staff at grassroots-level healthcare institutions, providing emergency services and referrals when needed. The integration of PCSBAs with the government health sector has further enhanced delivery safety.
- The door-to-door approach of PCSBAs has been instrumental in changing postnatal care (PNC)-seeking behaviors among rural communities. They have helped overcome biases and misconceptions about PNC, becoming trusted sources of support for new mothers. PCSBAs' efforts have raised awareness about the importance of PNC for maternal and child well-being, leading to a shift in community perspectives.

Conclusion: The study focusing on maternal healthcare in Bangladesh's Char and Haor regions revealed crucial insights into healthcare patterns, challenges, and the role of Private Community Skilled Birth Attendants (PCSBAs). It highlighted mixed approaches to seeking antenatal, delivery, and postnatal care, emphasizing reliance on PCSBAs, traditional birth attendants, and informal sources. Accessibility hurdles like distance and costs, especially in the Haor region, posed significant barriers, while social and cultural norms, such as patriarchal influences, impacted women's healthcare choices. The PCSBA program showed promise by enhancing ANC use, delivery and postnatal care, garnering community support, and collaborating effectively with healthcare institutions. However, challenges persist, necessitating interventions like mobile clinics, financial aid, continuous training for PCSBAs, community engagement, referral system enhancement, and awareness campaigns to improve healthcare access and quality. Sustained efforts are vital to maximize the program's impact and ensure better healthcare for marginalized communities in these areas.

Recommendations: Based on the findings of this study, we have the following recommendations:

- Reinforce support for the training of PCSBAs by the Government of Bangladesh, ensuring alignment with established program practices and seamless integration with the formal health system for effective referrals and quality oversight.
- Engage with religious leaders, men, and mothers-in-law to challenge and overcome entrenched stereotypes, thereby promoting acceptance and utilization of maternal healthcare services.
- Support Village Development Committees (VDC) in their advocacy efforts with government officials to address transportation barriers faced by individuals seeking institutional deliveries, thereby improving access to care within the community.
- Improve referral systems and training by integrating PCSBAs into government facilities and enhancing training for better emergency response.

1 Introduction

1.1 Background of the study

The Char and Haor regions of Bangladesh face unique challenges in accessing healthcare due to their geographical characteristics, including seasonal flooding, shifting landmasses (Chars), and vast wetland ecosystems (Haors). These challenges are compounded by poverty, limited infrastructure, and a lack of qualified healthcare professionals (Bangladesh Haor and Wetland Development Board, 2012). Existing government health facilities in those regions include Union Health and Family Welfare Centers (UH&FWCs), Community Clinics (CCs), Upazilla Health Complex (UHC) and District Hospitals (Directorate General of Health Services, 2022). In addition to that, there are some Union Sub- center (USC) and Rural Dispensaries (RD) are available. However, their distribution and staffing are often uneven, leaving some areas underserved. Private facilities are mainly concentrated in larger towns, but their affordability can be a barrier for many residents. The "Master Plan of Haor Area" highlights the need for training and involvement of skilled health personnel and Community-based Skilled Birth Attendants (CSBAs) to bridge the gap. Many existing facilities lack essential equipment, medicines, and proper sanitation (Bangladesh Haor and Wetland Development Board, 2012).

Maternal health remains a significant challenge in Southeast Asia and Bangladesh, with numerous social factors contributing to inequitable access to quality care. Extensive research has identified several social factors influencing maternal healthcare utilization in Southeast Asia and Bangladesh. Prevalent myths about pregnancy, childbirth, and healthcare can deter women from seeking essential services (Ahmad et al., 2019). These include beliefs about harmful foods, traditional birth practices, and about the ineffectiveness of modern medicine (Ahmad et al., 2019; Choudhury et al., 2012). Patriarchal norms often limit women's decision-making power regarding their health, making them reliant on husbands or other family members for permission to seek care (Ferdous & Mallick, 2019). Low literacy rates and limited access to health information can hinder women's understanding of their health needs and available services (Sen et al., 2023). Poverty can restrict access to transportation, childcare, and healthcare costs, leading women to prioritize other household needs over their own health (Choudhury & Ahmed, 2011).

Char and Haor regions are unique ecosystems characterized by seasonally inundated landmasses. Remote locations and poor infrastructure, like limited roads and bridges, make it difficult for healthcare providers to reach communities. Floods and seasonal changes can disrupt transportation and damage health facilities, further limiting access during critical periods. Seasonal flooding and lack of proper transportation infrastructure make it difficult for residents to reach healthcare facilities, especially during emergencies (Ministry of Disaster Management and Relief, 2023). Moreover, many Char and Haor residents rely on seasonal fishing and agriculture, making them vulnerable to economic hardship and unable to afford

healthcare costs (Bangladesh Haor and Wetland Development Board, 2012; DM Watch, 2021). The aforementioned factors collectively contribute to the Hard-to-Reach (HtR) status of Char and Haor regions. This classification highlights the unique challenges faced by these communities in accessing essential services, including maternal healthcare (MHC).

Chars are unstable alluvial landmasses emerging from rivers, prone to erosion and flooding. Their healthcare infrastructure is primarily reliant on sub-health centers and community clinics with basic services like maternal healthcare (MHC) care, immunization, and family planning. With doctors are scarce, people often rely on paramedics and community health workers. Frequent flooding disrupts transportation and communication, hindering access to healthcare facilities, especially during emergencies. Budgetary limitations restrict the availability of medicines, equipment, and qualified personnel (Directorate General of Health Services, 2022; Bangladesh Post, 2023). Haors are seasonally flooded wetlands, presenting challenges similar to chars but with distinct features. Healthcare facilities in haors are even more scattered due to the vast, water-dominated landscape, making access even more difficult. Boat travel is often the only option, hampered by unpredictable water levels and inclement weather. Similar to chars, services are primarily focused on MCH, immunization, and basic curative care. Specialized services are often unavailable (Directorate General of Health Services, 2022; M. I. Hossain et al., 2023).

In the 2022 report from Bangladesh Sample Vital Statistics, the maternal mortality ratio (MMR) in Bangladesh stood at 156 per 100,000 live births, while the neonatal mortality rate (NMR) was recorded at 20 deaths per 1,000 live births (Directorate General of Health Services, 2023). However, disparities across regions persist (Chakraborty et al., 2020). The primary contributors to maternal mortality include obstetric complications such as eclampsia, hemorrhage, prolonged labor, or abortion (A. T. Hossain et al., 2023). Maternal and child mortality burdens are notably pronounced in rural areas (National Institute of Population Research and Training (NIPORT); ICF, 2020). One particularly remote area is the haor region situated in the northeastern part of Bangladesh, encompassing Sunamganj, Sylhet, Habiganj, Moulvibazar, Kishoreganj, Netrokona, and Brahmanbaria districts. This region faces geographical vulnerabilities due to prolonged floods during the wet season (approximately six months) and subsequent post-flooding effects in the dry season. The haor region is home to over 19 million people, with more than half of the population classified as poor, marginal farmers (Bangladesh Haor and Wetland Development Board, 2012). Approximately 95% of deliveries in this region occur at home, often assisted by unskilled birth attendants (Haque et al., 2016). While specific statistics for the haor and the char region are unavailable, it is likely that maternal and child mortality rates are considerably elevated.

A skilled birth attendant (SBA) is a healthcare professional who is educated and trained to provide care to women during pregnancy, childbirth, and the postpartum period. SBAs can be doctors, nurses, or midwives. They provide antenatal care, including screening for potential problems and monitoring the mother's and baby's health; they assist with childbirth, including delivering the baby and placenta, and monitoring the mother's and baby's vital signs; provide postnatal care, including checking the mother's and baby's health, and providing

breastfeeding support; and recognize and refer complications to higher levels of care (Utz et al., 2013). Skilled birth attendants (SBAs) play a crucial role in reducing maternal mortality. In Bangladesh, only 53% of women received support from SBAs during childbirth, with urban and rural areas receiving 68.1% and 52.2%, respectively (Afroja et al., 2022). An unskilled birth attendant (UBA) is a person who provides care to women during pregnancy, childbirth, and the postpartum period, but who has not received formal education or training. UBAs are often referred to as traditional birth attendants (TBAs), dais, or grannies. Several risks are associated with UBAs, such as increased maternal and neonatal mortality and morbidity, poor birth outcomes, etc. (Mahfuzur et al., 2022).

To address the challenges and improve the access and quality of MHC services for poor and extremely poor households of the Char and the Haor regions, the SHOUHARDO III Plus Program, implemented by CARE Bangladesh, introduced Private Community Skilled Birth Attendants (PCSBAs) in early 2021. This intervention is supported by USAID and operates under the guidance of the Ministry of Health and Family Welfare (MoHFW). The PCSBA program also collaborates with both public and private sectors working in MHC. PCSBAs are women selected from samesame the communities and serve as Local Service Providers (LSP) in areas with limited or no government services. They are trained and accredited by the Bangladesh Nursing Council as skilled birth attendants. The SHOUHARDO III program has trained 146 PCSBAs to cater to the community's needs, and currently, 128 PCSBAs are working actively in the Char and the Haor regions targeting 168,521 household from 943 villages. They promote institutional delivery and birth preparedness planning and provide skilled assistance for uncomplicated home births. PCSBAs also offer a range of services, such as pregnancy identification and registration, family planning, antenatal and postnatal check-ups, essential newborn care, growth monitoring, and community-based childhood illness management. In addition, they refer women for institutional deliveries in complicated cases. To provide these services, PCSBAs charge a service fee set by the local government authority.

However, there was a need to assess effectiveness and impact of this intervention on the quality and practices of healthcare institutes in the specified regions and the social and cultural barriers that affect MHC services. Exploring the roles of Private Skilled Birth Attendants (PCSBAs) within and outside the existing healthcare facilities was also important. Therefore, this study was essential to evaluate the PCSBA initiative and its implications for maternal and newborn health in the Char and the Haor regions of Bangladesh.

1.2 Objectives of the study

This study aimed to answer the following research questions:

- How do various social and cultural factors influence maternal health in hard-to-reach areas?
- What is the capacity of the existing healthcare institutes to conduct safe deliveries in hard-to-reach areas?

- What is the experience of the poor and extremely poor in receiving maternal healthcare services at local healthcare institutions?
- What role are the community-based skilled birth attendants playing within and outside the existing healthcare facilities?

2 Study methodology

2.1 Study area

The study covers the northeast part of Bangladesh, specifically examining 15 upazilas within Kurigram, Gaibandha, Netrokona, Kishoreganj, Habiganj, and Sunamganj districts, where the program is currently being implemented.

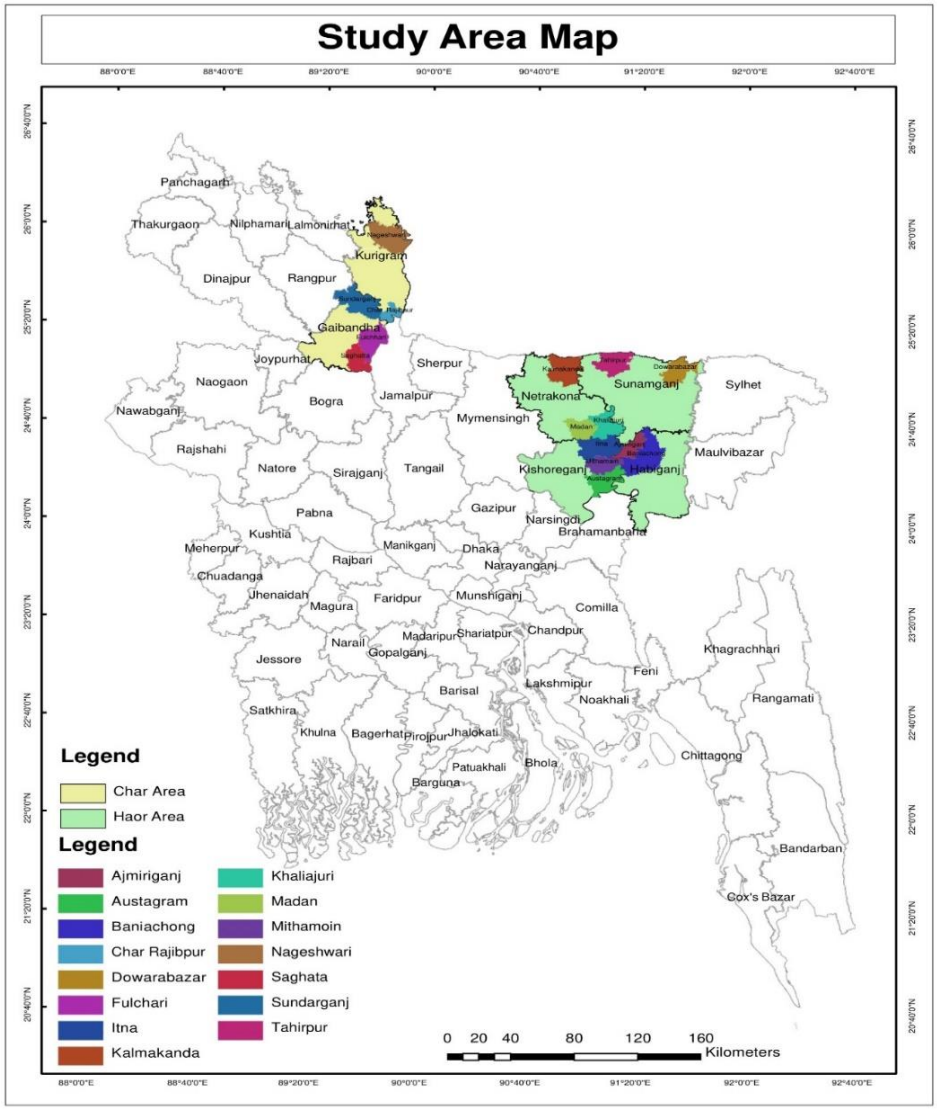

Figure 1: Study area map

2.2 Study approach and sampling

The study used a mixed-methods approach, acquiring qualitative and quantitative data from designated areas and participants. It employed secondary data (background reports, program log frames, monitoring reports) and collected primary data using specified tools. The analysis, exploratory and descriptive, included data triangulation for thorough validation.

2.2.1 Quantitative sample size

To achieve study objectives, sample size was calculated using the widely employed statistical formula by Bill Godden (2004), considering confidence level and precision rate in the program implementing areas.

$$SS = \frac{Z^2 \times p(1-p)}{c^2} \quad \text{..... (1)}$$

Where,

SS = Sample Size

Z = Z-value (e.g., 1.96) at the 95% statistical confidence level

p = percentage picking a choice, expressed as decimal (.5 used for sample size needed)

c = confidence interval/ Margin of Error, expressed as decimal (here 5%)

The sample size was determined based on a 95% confidence level, 50% response distribution, and a 5% margin of error using the Bill Godden (2004) formula. The calculated maximum sample size was 384 for any population size. However, for statistical significance, this study selected 400 participants from pregnant and lactating women, women with children 2-5 years, rural community members, and PCSBAs in the study areas, as mentioned in (***Table 1***).

Table 1: Quantitative sample distribution

Area type	Districts	Areas	Program participants			Total participants	Non-participant	Total (participants and non-participants)	Service provider	Total sample size
			Pregnant women	Lactating women with children U-2	Women with children 2-5		Rural community		PCSBAs	
Char	Kurigram	Char Rajibpur	3	2	5	10	15	25	5	30
		Nageshwari	3	2	5	10	15	25	13	38
	Gaibandha	Fulchari	3	2	5	10	10	20	3	23
		Saghata	3	2	5	10	10	20	3	23
		Sundarganj	3	2	5	10	10	20	4	24
Haor	Netrokona	Kalmakanda	3	2	5	10	10	20	10	30
		Madan	3	2	5	10	10	20	10	30
		Khaliajuri	3	2	5	10	10	20	10	30
	Kishoreganj	Austagram	3	2	5	10	5	15	6	21
		Mithamoin	3	2	5	10	5	15	5	20
		Itna	3	2	5	10	5	15	3	18
	Habiganj	Ajmiriganj	3	2	5	10	10	20	3	23
		Baniachong	5		5	10	10	20	5	25
	Sunamganj	Tahirpur	5		5	10	15	25	8	33
		Dowarabazar	5		5	10	10	20	12	32
Total								**300**	**100**	**400**

2.2.2 Qualitative sample distribution

The study used purposive sampling for qualitative data collection, conducting 60 interviews and discussions (FGDs, IDIs, KIIs) and 2 case studies. Before fieldwork, the team prepared stakeholder lists and developed guidelines, checklists, and formats for FGDs, KIIs, IDIs, and case studies. Detailed of the qualitative data collection has been depicted in (***Table 2***).

Table 2: Qualitative sample distribution

Key Informant Interviews (KIIs)			
Participants	Char	Haor	Total
Community clinic staff	1	2	3
Local /religious leader	2	2	4
Program staff	1	1	2
Upazila Health Complex officer	1	1	2
Family planning officer	2	4	6
Health Ministry DG Health			6
Total KIIs			**23**

In-depth Interviews (IDIs)					
Area types	District	Area Name	PCSBA	UH&FPO	Total IDIs
Char	Kurigram	Char Rajibpur	1	2	**19**
		Nageshwari	1		
	Gaibandha	Fulchari	1		
		Saghata	1		
		Sundarganj	1		
Haor	Netrokona	Kalmakanda	1	2	
		Madan	1		
		Khaliajhuri	1		
	Kishoreganj	Austagram	1		
		Mithamoin	1		
		Itna	1		
	Habiganj	Ajmiriganj	1		
		Baniachong	1		
	Sunamganj	Tahirpur	1		
		Dowarabazar	1		
	Total		15	4	

Focus Group Discussions (FGDs)							
Area	District	Upazila	Pregnant women	Lactating women	Mothers-in-law	Husband	Area wise FGDs
Char	Kurigram	Char Rajibpur		1			2
		Nageshwari			1		
	Gaibandha	Fulchari		1			3
		Saghata				1	
		Sundarganj	1				
Haor	Netrokona	Kalmakanda	1		1		6
		Madan		1		1	
		Khaliajhuri	1			1	
	Kishoreganj	Austagram	1				3
		Mithamoin		1			
		Itna	1				
	Habiganj	Ajmiriganj	1				2
		Baniachong		1			
	Sunamganj	Tahirpur			1		2
		Dowarabazar	1				
Total FGDs			**7**	**5**	**3**	**3**	**18**

2.3 Data collection method and tools

2.3.1 Primary data collection

The study adopted a comprehensive approach to data collection, incorporating both quantitative and qualitative methods. Quantitative data were collected purposively through a survey questionnaire on study objectives, enabling structured numerical analysis. The research objectives were further explored through various qualitative methods, such as FGDs, KIIs, IDIs, and case studies, which provided a comprehensive and detailed insight into the topic (***Annex 10***).

2.3.2 Secondary literature review

Secondary review of the documents was conducted through guided questions. These were as follows:

- What data are being collected by the current data collection system? How are the data collected from the affected community?
- What are the major gaps in the roles and responsibilities of relevant stakeholders responsible for collecting the data for the current system?
- What are the major challenges of the current data collection system?
- How the current data collection system could be improved?

Guided by specific questions, the study team conducted a thorough review of diverse reports and forms within the existing data collection system, as well as national policies, strategies, and guidelines related to disaster-induced displacement. Additionally, the team examined various scientific documents, including the Bangladesh Disaster Management Act 2012, Revised Standing Order on Disaster 2019, National Plan for Disaster Management 2020, BBS Disaster Database 2015, Cyclone Emergency Response Plan, media reports on displacement, and situation reports from the Internal Displacement Monitoring Centre. During the review, common techniques such as keyword searching, scanning, and skimming were applied. To maintain systematic information tracking, an assessment team created a demo table to extract relevant information and identify any gaps in the reviewed documents, which proved valuable during the subsequent analysis.

2.4 Data analysis end ethical clearance

2.4.1 Data analysis

After completing the cleaning and review of quantitative data, a comprehensive assessment was carried out to confirm its usability, reliability, and validity for subsequent analysis. The data was then transformed into appropriate codes suitable for computer-aided analysis. Using tools such as SPSS or Excel, the data underwent analysis and were stored in both CSV and Excel formats, encompassing both raw and processed quantitative and qualitative data. Results are presented in tables and figures. Qualitative data were analyzed thematically and triangulated with quantitative findings and secondary data, where appropriate.

2.4.2 Ethical clearance

Verbal consent was obtained from all participants prior to their participation in the study. Participants' information was kept confidential, and only members of the research team had access to the study data. And ethical approval was obtained from the Bangladesh Medical Research Council (BMRC/NREC/2022-2025/10).

Key Findings of the study

This chapter is structured into five sections, covering various aspects of the study's findings. The first section presents demographic information about the study participants. The second explores

social and cultural factors impacting maternal health in HtR areas. The third assesses the overall capacity of healthcare institutions for safe deliveries in these areas. The fourth delves into the experiences of the poor and extremely poor in accessing MHC services locally and the fifth section examines the roles of PCSBAs within and beyond existing healthcare facilities.

2.5 Socio-demographic characteristics of study participants

2.5.1 Education

A total of 300 respondents from program participants and non-participants were included in the study from the same rural areas. The educational attainment was diverse. Notably, 30.7% completed primary education, 20.3% have up to JSC or equivalent, and 18.3% did not complete primary education, indicating potential areas for educational interventions (**Annex 1**).

2.5.2 Household occupation

A majority of participants (77.3%, n=300) were found to live in nuclear families with the day laborers being the largest group at 36.8%, followed by farmers at 19.2%, and businessmen at 12.9%. Notably, day laborers are more prevalent in the Haor area (42.6% vs. Char 26.8%), while farming is more common in the Char area (Char 28.6% vs. Haor 13.7%) (***Annex 2***).

2.5.3 Economic status

Among the study participants, 42.7% (n=300) of households have an average monthly income below BDT 10,000 ($91), while approximately 47.3% earned between BDT 10,000-19,000 ($91-$173). Regarding expenses, 51.7% of participants spent below BDT 10,000 ($91) on average, while 43% spent in the range of BDT 10,000-19,000 ($91-$173). In the household expenses, food was the top priority for 98.0% of participants. Healthcare closely follows as the second-highest expense (72.7%), emphasizing the significance placed on addressing medical needs. Education claims the third spot in priorities, with 41.3% of the sample identifying it as a considerable commitment to investing in educational pursuits.

2.6 Social and cultural factors influencing maternal health in hard-to-reach areas

2.6.1 Existing practice in receiving ANC

ANC is a preventive healthcare approach for expectant women, involving regular medical check-ups, screenings, and interventions to identify and manage risks, prevent complications, and promote a healthy pregnancy (Ahsan et al., 2019). This study investigated the existing ANC seeking practices in hard-to-reach (HtR) areas. The study findings showed all program participants in antenatal care claiming to have a 100.0% participation rate. However, among the non-program participants of the rural community (n=150) a 16% lower rate of participation in seeking ANC (***Table 3***). Overall, Char area had a comparatively higher antenatal care seeking practices (Char 97.3%, n=60 VS. Haor 88.9%, n=90).

Table 3: Percentage of women seeking ANC

Responses	Program participants				Non-participants	Total
	Pregnant women	Lactating women with children u-2	Women with children 2-5	Total	Rural community	
n	45	30	75	150	150	300
Yes	100.0	100.0	100.0	100.0	84.0	92.0
No	0.0	0.0	0.0	0.0	16.0	8.0

The qualitative study also explored shifts in ANC practices within HtR areas. The findings indicated that the SHOUHARDO III Plus program played a pivotal role in substantially impacting and transforming the community's perception of the significance of seeking ANC. Program participants, along with their husbands, demonstrated increased awareness of the importance of ANC as a result of the program. During the FGDs, it was observed that there was a growing inclination among program participants to consult doctors and PCSBAs for assistance during their pregnancies.

Furthermore, individuals not enrolled in the program also exhibited a significant awareness of the importance of seeking ANC. In this context, alongside various government and non-government initiatives, the SHOUHARDO III Plus program also played a role in shaping their comprehension of ANC during pregnancies. For instance, insights gained from an FGD with lactating women in Baniachong Upazila of Habiganj District revealed that women from these areas recognized the

necessity of MHC for the well-being of both the mother and child, promoting a smooth delivery. They actively sought all three forms of maternity healthcare, including antenatal care. A non-program participant, shared that during her first pregnancy, she lacked awareness about ANC. However, a change in perception occurred when she engaged in discussions with her neighbor, who happened to be a program participant and shared what she had learned from a PCSBA.

The participants in the FGDs also pointed out that not only women but also their husbands and mothers-in-law in these areas have developed an understanding of the importance of MNHCMNHC for ensuring the well-being of both the mother and the child, aiming for a smooth delivery process. The FGD with husbands in Saghata, Gaibandha, highlighted an increased community awareness regarding maternal health—a practice uncommon in their community before. This shift in perspective indicates a change in their perception of the necessity of antenatal care. Concerning these matters, a husband from the same FGD expressed,

> ***"I was not aware of the importance of MHC, although I witnessed many women and children die during childbirth in our areas. However, my wife is a PCSBA program participant. She learned many things from them, which eventually changed my understanding."***

2.6.1.1 Frequency of receiving ANC

The World Health Organization (WHO) recommends a minimum of four prenatal visits for pregnant women. The initial visit is advised within the first three months of pregnancy, followed by visits every 4-6 weeks until the 28th week, every 3 weeks until the 36th week, and weekly thereafter until delivery (WHO, 2016). The study findings reveal a notable trend in ANC attendance within our rural community. Pregnant women predominantly attended antenatal care four or more times (31.1%), indicating strong commitment to prenatal health. Similarly, a significant portion of lactating women with children under 2 (53.3%) and women with children under 5 (61.3%) adhered to this pattern, emphasizing the importance of sustained maternal healthcare. Overall, 42.1% of the rural population sought antenatal care at this frequency, highlighting a consistent engagement with maternal health services (***Figure 2***).

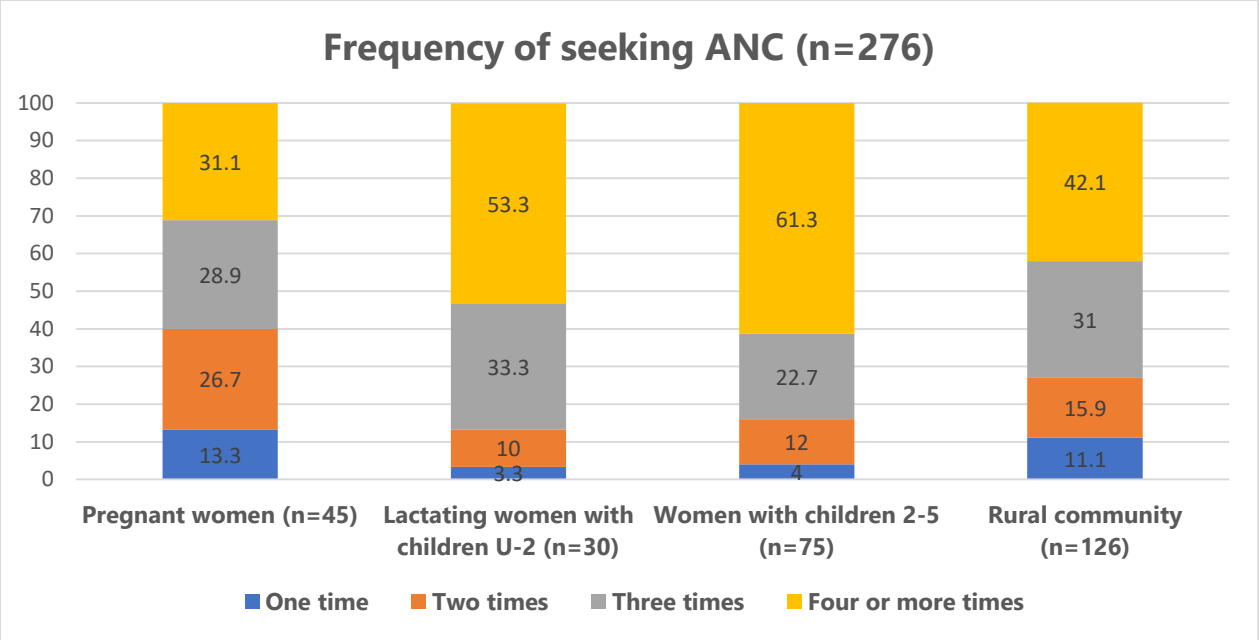

Figure 2: Frequency of seeking ANC

The qualitative study revealed a significant knowledge gap regarding ANC frequency among FGD participants. They sought ANC based on necessity rather than a set schedule. For instance, a participant from Itna upazila, Kishoreganj district, lacked awareness of the recommended frequency and sought PNC only during complications. Similarly, a lactating woman from Madan upazila, Netrokona district, received care multiple times after her child fell ill but was unsure about ANC frequency. This sentiment was echoed by other participants, especially non-program beneficiaries. Insights from a KII with the Civil Surgeon of Sunamganj district further confirmed the widespread lack of understanding about the optimal ANC schedule.

2.6.1.2 Sources of receiving ANC services

Program participants predominantly favor informal care (37.7%) and a combination of both formal and informal sources (36.3%). Institutional healthcare sources are also utilized, but to a lesser extent (26.0%). In contrast, non-participants exhibit a higher reliance on institutional care (64.3%,) and a significant preference for informal sources (22.2%). While a smaller proportion opt for a combination of both institutional and informal healthcare (13.5%) (***Figure 3***).

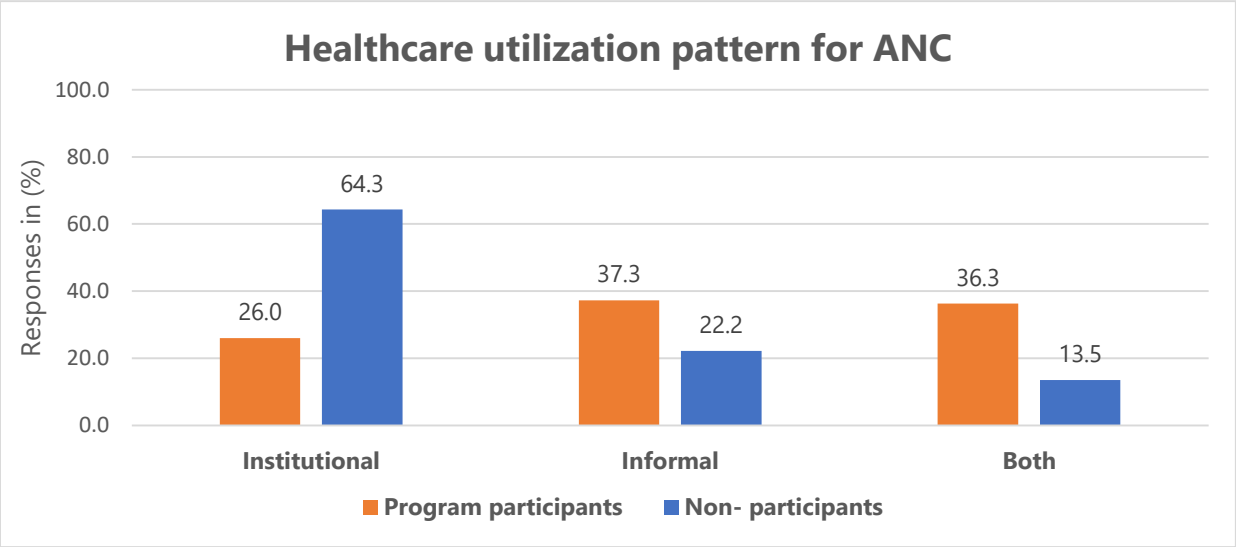

Figure 3: Healthcare utilization pattern for ANC

Among the ***institutional healthcare sources***[1], UHCs emerged as the most favored, with 49.9% of participants and 48.0% of non-participants seeking ANC services there. CCs also played a substantial role, catering to 37.1% of program participants and 29.6% of non-participants ANC visits (***Table 4***). However, ***informal sources***[2] also played a significant role in ANC. Notably, PCSBAs emerged as a prevalent choice, with 91.8% of program participants opting for ANC services from these sources while it was 64.4% for non-participants. Beyond PCSBAs, this study findings indicate a substantial reliance on Dhaima[3] among non-participants (42.2%) as compared to program participants (12.3%) (***Table 4***).

[1] Community clinics, Union healthcare facilities (UH&FWCs and USCs), Upazila health complexes, Privately-owned clinics, NGO run healthcare facilities, and district hospitals.

[2] PCSBAs, Dhaimas, religious healers, traditional healers, trusted relatives/friends, and village doctors.

[3] Dhaimas, recognized as traditional birth attendants, offer assistance to women during the process of childbirth in home settings.

Table 4: Percent distribution of healthcare utilization patterns for ANC

Sources	Responses	Program participants (n=205)				Non-participants (n=143)	Total (n=348)
		Pregnant women	Lactating women with children u-2	Women with children 2-5	Total	Rural community	
Institutional (n=193)	n	25	19	51	95	98	193
	Community clinics	32.0	42.1	37.3	37.1	29.6	33.2
	Union healthcare facilities (UH&FWCs and USCs)	12.0	10.5	25.5	16.0	15.3	17.1
	Upazila health complexes	52.0	52.6	45.1	49.9	48.0	48.2
	Privately-owned clinics	28.0	21.1	31.4	26.8	19.4	23.8
	NGO run healthcare facilities	16.0	5.3	13.7	11.7	16.3	14.5
	District hospitals	0.0	0.0	0.0	0.0	0.5	0.5
Informal (n=155)	n	33	23	54	110	45	155
	PCSBAs	90.9	95.7	88.9	91.8	64.4	83.2
	Dhaimas	15.2	8.7	13.0	12.3	42.2	21.3
	Religious healers	3.0	0.0	1.9	1.6	6.7	3.2
	Traditional healers	0.0	0.0	1.9	0.6	2.2	1.3
	Trusted relatives/friends	3.0	4.3	5.6	4.3	2.2	3.9
	Village doctors	0	0.0	1.9	0.6	0.0	0.6

The qualitative study delved into the ways pregnant women accessed various sources of antenatal care in the study area. According to FGD participants, the preferred choice for ANC is typically the CCs, UH&FWCs and UHCs, with additional consultations from PCSBAs and Dhaima during urgent situations. In emergencies, contact is made with PCSBAs and Dhaima, and for more advanced care, the women opt to visit the UHC, especially when financial and transportation resources permit. A pregnant woman in an FGD in Itna upazila of Kishoreganj district emphasized this approach, stating,

> ***"I usually consult with PCSBAs. When there's a need for advanced care, I prefer going to the UHC, particularly if I have transportation readily available and enough cash to handle the transport and medical bills."***

However, among the program non-participants, there was a continued reliance on informal healthcare providers, notably TBAs, locally known as "Dhaimas,"—a trend mirrored in the quantitative findings. Their dependence on Dhaimas, sustained through enduring relationships and firm beliefs, significantly influences their healthcare-seeking behaviors. Nevertheless, a notable shift has occurred, as most of them were previously not accustomed to seeking ANC from institutional sources and PCSBAs. The change observed now is that, in addition to Dhaima, they have started seeking ANC from these formal sources, believing that it offers a more comprehensive care approach by combining both modern and traditional methods.

2.6.1.3 Why do they mostly rely on informal sources?

Within the study participants, a considerable proportion (30.1%) indicated that they exclusively obtain ANC from informal sources. The decision-making process for seeking ANC exclusively from informal sources is significantly impacted by geographical challenges in HtR areas. The perceived unavailability of services during emergencies (63.9%), geographical barriers (39.8%) and the lack of transportation (16.9%) were identified as key factors hindering access to institutional ANC services. Apart from that, religious and cultural factors have a big impact on decision-making for study participants. The absence of female doctors emerges as a significant (21.7%) deterrent to seeking ANC. for both groups. The cultural practice of maintaining "Purdah" [4] is revealed as crucial, particularly among program non-participants, where 28.6% prioritize it, compared to 7.0% among program participants. This indicates a higher emphasis on cultural considerations related to "Purdah" among non-participants when deciding on ANC options (***Table 5***).

4 Purdah is a custom practiced in some Muslim and Hindu societies, in which women either remain in a special part of the house or cover their faces and bodies to avoid being seen by men who are not related to them. If a woman is in purdah, she lives according to this custom.

Table 5: Percent distribution of not seeking ANC from institutional care

Responses	Program participants				Non-participants	Total
	Pregnant women	Lactating women with children U-2	Women with children 2-5	Total	Rural community	
n	20	11	24	55	28	83
Availability during emergencies	60.0	54.5	66.7	60.4	67.9	63.9
Institutional healthcare facilities are located far away	35.0	72.7	41.7	49.8	28.6	39.8
Female doctors are not available	25.0	18.2	20.8	21.3	21.4	21.7
Unavailability of transportation	30.0	0.0	16.7	15.6	14.3	16.9
To maintain "Purdah"	20.0	0.0	1.0	7.0	28.6	15.7
Family doesn't permit to seek assistance from male doctors	5.0	18.2	12.5	11.9	10.7	10.8
Modern medicine isn't reliable	10.0	9.1	12.5	10.5	7.1	9.6
Familiarity with the local healthcare providers (Traditional/religious)	10.0	9.1	8.3	9.1	7.1	8.4
Cannot afford the cost of the services	5.0	0.0	0.0	1.7	10.0	4.8
Did not feel the need to go to a modern health center as complications were less	5.0	9.1	4.2	6.1	3.6	4.8
Traditional medicine relies on natural remedies and herbs	5.0	0.0	4.2	3.1	7.1	4.8
Traditional/religious healers are more dependable	0.0	0.0	4.2	1.4	0.0	1.2

The study delved into the perspectives of participants engaged in FGDs to gain insight into the underlying motivations driving their community's preference for informal care in meeting ANC needs. Align with the quantitative findings, transportation emerged as a major challenge due to distant healthcare facilities, necessitating extensive travel by various means such as vans, boats, and buses, leading to prohibitively expensive transport costs and hindering timely access to care. A PCSBA from Char Rajibpur upazila, Kurigram district, emphasized the difficulty of reaching the nearest CC 3 kilometers away, while a participant in Saghata FGD, Gaibandha, mentioned challenges despite the nearest healthcare facility being just 1 km away due to poor road conditions. The DD of the Gaibandha District Family Planning Office corroborated this, citing significant challenges due to distance, particularly in areas inaccessible due to rivers, exacerbated during natural disasters like floods.

Additionally, social and religious factors significantly influence healthcare choices. A participant from Fulchari upazila, Gaibandha, expressed familial restrictions preventing hospital visits, fearing a violation of 'Purdah' and committing a sin, stating,

> ***"My family don't allow to go to hospitals, fearing a violation of 'Purdah' and committing a sin."***

Similar sentiments were reiterated in other FGDs, suggesting that social and familial restrictions, particularly from husbands and mothers-in-laws, impede women from seeking MHC, including ANC, from male doctors. In some cases, women also face hindrances in accessing local healthcare institutions alone, as some societies view it as a "sin" and sometimes as "insecure" due to the distance and transport challenges.

Moreover, FGDs revealed that mothers-in-law preferred traditional methods, relying on "Dhaima" assistance during their pregnancies. In their own pregnancies, they either didn't seek ANC or relied on "Dhaima" and local community support, considering it sufficient. Some still maintain these beliefs, as an FGD participant in Tahirpur Upazila of Sunamganj District expressed,

> ***"Back in our days, mothers didn't really go for any services during pregnancy unless there were issues. Usually, women in our area would reach out to the Dhaima or the local elders for help if they needed any assistance."***

During a KII, the Assistant Director of the Department of Women Affairs also emphasized the challenges women face accessing ANC at institutional facilities due to existing social and religious values, including purdah, male guardianship, traditional beliefs, and similar factors.

2.6.1.4 Why does the community not seek ANC

The study noted a positive shift in local ANC access, yet cultural beliefs downplay the need for medical intervention during pregnancy. A mother-in-law from Nageshwari upazila, Kurigram district, highlighted increased pre-delivery care but acknowledged safe deliveries without ANC in the past, stating,

> ***"These days, many women get care even before the delivery, which was not the case in our times. We had no idea about this issue back then. Yet, we were able to deliver our child safely."***

Other mothers-in-law expressed similar misconceptions, with men also viewing ANC as unnecessary. Despite heightened awareness, some still deem consulting a doctor during childbirth unnecessary and distance to healthcare facilities remains a challenge. A VDC member from Astagram, Kishoreganj, highlighted familial reluctance for ANC due to beliefs in Allah's role in childbirth. She expressed,

> ***"Some families believe that childbirth is solely in the hands of 'Allah,' so they think seeking extra services isn't necessary. That's why, even if a woman wants to get care during pregnancy, she might hesitate to tell her family about it."***

A CC staff in the same upazila noted that while community now appreciate the importance of MHC due to various government and non-government programs, some still prefer MHC exclusively during delivery. He observed that low literacy levels within the community hindered understanding the importance of seeking ANC, and financial constraints further restricted their ability to access ANC.

2.6.2 Existing practices in receiving delivery care

Among the study participants, preferences for delivery methods varied significantly across different groups. Pregnant women overwhelmingly favored normal delivery (ND), with a substantial percentage of 97.8%. Lactating women with children u-2 also showed a preference for

ND at 86.7%. Similarly, among women with children 2-5, 92.0% expressed a preference for ND. And among the rural community, the majority (84.0%) preferred ND (***Table 6***).

Table 6: Percent distribution of prefered delivery method

Responses	Program participants				Non-participants	Total
	Pregnant women	Lactating women with children u-2	Women with children 2-5	Total	Rural community	
n	45	30	75	150	150	300
Normal delivery (ND)	97.8	86.7	92.0	92.2	84.0	88.3
C-section	2.2	13.3	8.0	7.8	16.0	11.7

The quantitative findings further revealed a slight variation in C-section preferences for delivery within the Char and Haor regions. Notably, in the Char region, 9.1% of participants expressed a preference for C-section delivery, while in the Haor region, this was slightly higher at 13.2%. Additionally, non-participants in the program exhibited a greater inclination toward opting for C-section deliveries (16.0% vs. 7.8%).

The FGDs also indicated a prevalent preference for ND among participants. A lactating woman, participating in an FGD in Baniachong Upazila, Habiganj district, expressed her viewpoint, stating,

> ***"We prefer normal delivery because it is cheaper and natural. I have seen others giving birth like this."***

The UH&FPO of Nageshwari, Kurigram district, concurred that people in the area still prefer ND. Despite the rising popularity of C-sections driven by medical complications and the fear of natural delivery, the local preference remains grounded in the factors of cost-effectiveness, accessibility, and established tradition.

2.6.2.1 Sources of receiving ND assistance

The study revealed varying preferences in seeking ND care among different demographic groups. While program non-participants showed a slightly higher tendency to seek assistance from ***institutional sources*** compared to program participants (25.0% vs. 19.1%), program participants

leaned somewhat more towards ***informal sources*** compared to non-participants (80.9% vs. 75.0%) (***Figure 4***).

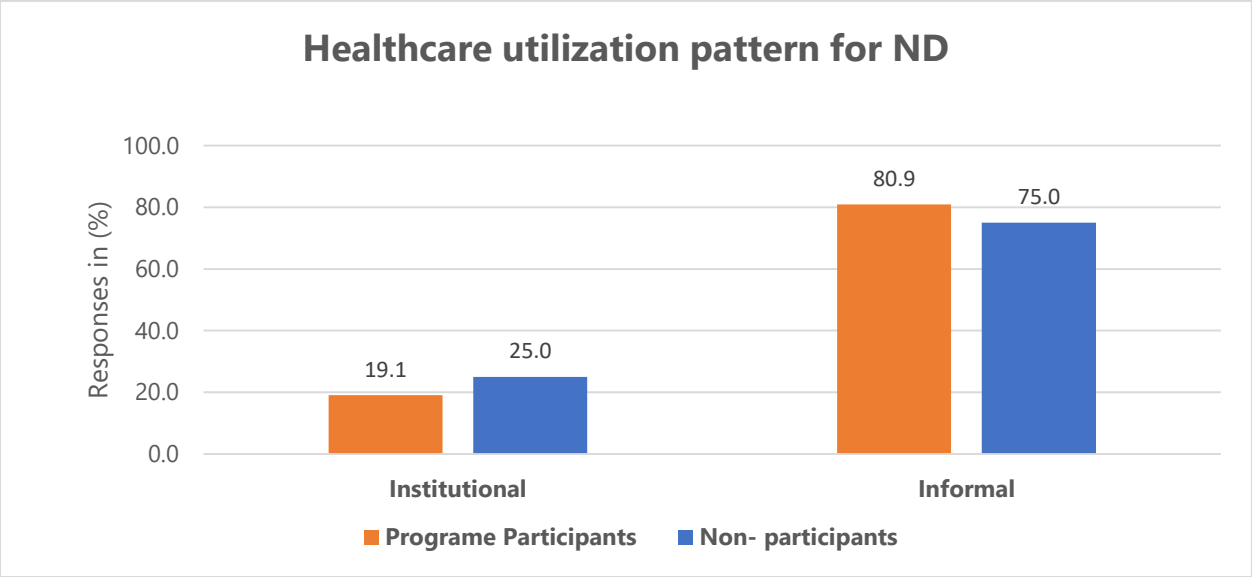

Figure 4: Healthcare utilization pattern for ND

Among program participants, UHCs were the preferred ***institutional source***, chosen by 58.6%, while CCs had a preference of 14.4%. In comparison, within the rural community, UHCs maintained popularity, selected by 40.0% for ND care, with CCs chosen by 16.7% of non-participants. For ***informal sources***, 64.7% of program participants favored PCSBAs, with 27.7% still relying on Dhaima. In contrast, among the rural community, PCSBAs were preferred by 20.2%, while Dhaima remained popular at 67.0% (***Table 7***).

Table 7: Percent distribution of ND care-seeking patterns

Sources	Responses	Program participants (n=136)				Non-participants (n=124)	Total (n=260)
		Pregnant women	Lactating women with children u-2	Women with children 2-5	Total	Rural community	
Institutional (n=53)	n	10	6	7	23	30	53
	Upazila health complexes	40.0	50.0	85.7	58.6	40	47.2
	Community clinics	10.0	33.3	0.0	14.4	16.7	15.1
	NGO run facilities	20.0	0.0	0.0	6.7	20	15.1
	Privately-owned clinics	10.0	0.0	14.3	8.1	16.7	13.2
	Union healthcare facilities (UH&FWCs and UHCs)	10.0	16.7	0.0	8.9	6.7	7.5
	District hospitals	10.0	0.0	0.0	3.3	0	1.9
Informal (n=207)	n	32	20	61	113	94	207
	Dhaima	21.9	30.0	31.1	27.7	67.0	45.9
	PCSBAs	75.0	60.0	59.1	64.7	20.2	44.0
	Trusted relatives/friends	3.1	5.0	9.8	6.0	11.7	9.2
	Village doctors	0.0	5.0	0.0	1.7	1.1	1.0

The study findings underscore a significant reliance on informal sources for ND in the study areas. This dependence arises from the lack of ND services in CCs and UH&FWCs/USCs. Furthermore, the distance of UHCs often poses challenges in accessing urgent and affordable services, as revealed by the insights from the FGDs. So, FGDs participants expressed reliance on these informal facilities, particularly favoring PCSBAs over Dhaimas. A pregnant woman from Dowarabazar emphasized the superiority of PCSBAs in ensuring safe deliveries compared to Dhaimas, stating,

> ***" PCSBAs provide significantly superior services compared to untrained or traditional birth attendants. In my opinion, Dhaimas is highly risky for ensuring a safe delivery, as evidenced by instances of unfortunate delivery incidents in the community."***

However, some participants, especially from the rural community, mothers-in-law, and husbands, maintained faith in Dhaimas due to their longstanding presence and community trust. A husband from Khaliajuri explained,

> ***"Before PCSBAs, the 'Dhaima' was the only one who could assist us with normal vaginal delivery. That's why they have a strong bond with our community."***

Despite institutional delivery achievements, traditional beliefs, low literacy rates, financial constraints, and low awareness still contribute to 30% of the home deliveries, as reported by the DD of the Gaibandha District Family Planning Office.

2.6.2.1.1 Why do they mostly rely on informal sources?

Several factors influence the decision against seeking ND care from institutional facilities. Affordability is a substantial concern for 53.8% of participants, while 51.9% cite availability during emergencies, and 33.0% express concerns about the perceived distance of modern healthcare facilities. Additionally, 14.6% of study participants express worries about local healthcare facilities lacking the necessary facilities for vaginal delivery. Social and religious values also play influential roles in shaping preferences for delivery assistance, mirroring patterns seen in ANC-seeking behavior. Factors such as "Purdah," the availability of female doctors, and family permission are crucial considerations in this decision-making process (***Table 8***)

Table 8: Percent distribution of reasons for not utilizing institutional facilities for ND

Responses	program participants (n=116)				Non-participants (n=96)	Total
	Pregnant women	Lactating women with children u-2	Women with children 2-5	Total	Rural community	
n	**34**	**20**	**62**	**116**	**96**	**212**
Unable to afford the costs	44.1	75.0	48.4	55.8	56.3	53.8
Availability during emergencies	55.9	55.0	53.2	54.7	49.0	51.9
Modern health care is located far away	44.1	40.0	29.0	37.7	30.2	33.0
Traditional healthcare providers are more dependable	26.5	35.0	25.8	29.1	13.5	21.2
To maintain "Purdah"	11.8	15.0	14.5	13.8	25.0	18.9
Female doctors are not available	20.6	10.0	21.0	17.2	12.5	16.0
Local healthcare facilities don't have facilities to perform a vaginal delivery	23.5	15.0	17.7	18.7	9.4	14.6
Traditional medicine relies on natural remedies and herbs	11.8	15.0	11.3	12.7	15.6	13.7
Family doesn't permit to seek assistance from male doctors	11.8	5.0	12.9	9.9	14.6	12.7
Local healthcare providers don't encourage ND	2.9	15.0	12.9	10.3	13.5	11.8
Dhaimas have long experience	0.0	0.0	3.2	1.1	2.1	1.9
Institutional healthcare facilities don't have enough beds for the care seekers	0.0	0.5	0.0	0.2	0.5	0.9
Familiarity with the local healthcare providers	0.0	5.0	0.0	1.7	1.0	0.9

These factors collectively influenced the community's decision-making process regarding seeking ND care. However, the qualitative findings indicate that not withstand their willingness to opt for institutional healthcare facilities, challenges like transportation issues and distance often hinder their utilization. Natural disasters, such as floods, further impede institutional delivery, as emphasized by a woman from the Dowarabazar FGD in Sunamganj,

> ***"It is very hard to get to the closest hospital when the area is under water and storms hit. Sometimes even PCSBA cannot come to the patient's house. So, we have to rely on the untrained or traditional birth attendants for urgent delivery cases."***

Additionally, cost considerations play a significant role. A husband highlighted the expense of hospital charges compared to the convenience and affordability of Dhaimas. As a husband from an FGD in the Khaliajuri upazila of the Netrokona said that he preferred modern health care facilities, but the "Dhaima" was cheaper and more convenient. He explained,

> ***"I would have to spend a lot of money on transport and hospital charges if I chose ND at the UHC. But I just called a 'Dhaima' from, who performed the delivery for a nominal fee, and I also presented her with a 'Shari' as a token of gratitude."***

Despite concerns about health risks, reliance on traditional birth attendants persists, with some expressing trust in divine intervention. Social and religious factors heavily influence delivery assistance choices. In remote areas, the absence of female doctors in modern facilities also lead families to opt for traditional care. A mother-in-law emphasized trust in traditional methods, citing belief in Allah's protection. Addressing these issues, a program staff member highlighted religious influence on maternal healthcare decisions, noting instances where neglect due to religious beliefs led to tragic outcomes, stating,

> ***"A pregnant woman, whose husband was abroad, needed hospital care during delivery. But her mother-in-law neglected it due to religious ignorance. The baby was born at home without adequate medical help and tragically passed away."***

She also added that despite awareness efforts, traditional beliefs persist, leading some to favor traditional maternal practices over formal healthcare services, particularly at the insistence of female relatives like mothers-in-law. The UH&FPO in Nageshwari, Kurigram, acknowledged the enduring influence of traditional beliefs, estimating that around 30% of the population resists hospital visits, especially to avoid male doctors. These views pose significant obstacles to maternal healthcare, fostering reluctance to seek formal services.

2.6.2.2 C-section delivery

Among the study participants, only 11.7% (n=300) preferred C-section delivery, with the majority (68.5%) from the rural community, who are non-participants of the program. Privately owned clinics (71.4%) and district hospitals (22.9%) were the preferred facilities for C-sections.

The qualitative study, mirroring the quantitative findings, highlighted the preference for normal vaginal delivery due to its cost-effectiveness and perceived naturalness. However, limited access to C-section services in local health facilities, particularly public ones, poses a challenge for women. A staff member from a CC staff in Tahirpur emphasized this issue, noting that while C-sections may be necessary in emergencies, they are often inaccessible locally due to cost constraints. Despite the preference for natural childbirth, the FGDs revealed a growing trend towards C-sections due to emerging complications, fears associated with ND, influence from social media, and promotion by private clinics. Acknowledging these concerns, the Civil Surgeon of Sunamganj district underscored a significant need for C-section deliveries due to different health conditions. However, local healthcare facilities such as CCs and UH&FWCs have yet to establish the necessary infrastructure to facilitate C-section deliveries.

2.6.3 Existing practice in receiving PNC

PNC encompasses a range of healthcare services for mothers and newborns, including infection prevention, maternal health management, breastfeeding support, vaccination administration, and congenital disease screening during the first 42 days of life (WHO, 2015). While assessing the PNC seeking practices, within the program participants, pregnant women exhibited a 40.0% engagement in seeking PNC, while 28.9% stated PNC as not applicable, suggesting a prevalence of first-time pregnancies. Lactating women with children u-2 (n=30) demonstrated an increased utilization of PNC, with 80.0% actively seeking PNC. Likewise, mothers of children under 5 (n=75) showed a substantial 64.0% engagement in PNC. On the other hand, within the rural community, only 52.0% accessed PNC, a significantly lower percentage compared to the 61.3% among program participants. Notably, 28.9% of pregnant women in the early stages of their first pregnancy have not yet sought PNC (***Table 9***).

Table 9: Percent distribution of seeking PNC

Responses	Program participants				Non-participants	Total
	Pregnant women	Lactating women with children u-2	Women with children 2-5	Total	Rural community	
n	45	30	75	150	150	300
Yes	40.1	80.0	64.0	61.4	52.0	56.0
No	31.1	20.0	36.0	29.0	43.3	37.3
Not applicable	28.9	0.0	0.0	9.6	4.7	6.7

Furthermore, within the Char area, PNC seeking rates were higher (74.8%, n=107 vs. 50.9%, n=173), highlighting a notable difference in PNC utilization, with only 60% (n=280) of participants accessing PNC compared to ANC (96.0%, n=300). This indicates that many women do not get enough care after delivering a baby, which can impact their health and well-being.

The FGD findings also indicated that PNC holds less significance compared to ANC, mainly due to factors like limited awareness, household chores, and societal and cultural beliefs. However, some beneficiaries of the program exhibited increased awareness regarding PNC. Participants emphasized that PNC is as important as ANC for both mother and child. A lactating woman from Madan upazila, Netrokona district, recounted a tragic incident where a lack of PNC led to maternal mortality, stating,

> ***"There was a woman in our community who suffered severe bleeding but couldn't get medical help, and she died."***

Other FGDs participants also emphasized the significance of PNC in addressing potential child problems such as insufficient milk, respiratory and sleep difficulties, and infections. Findings from FGDs with mothers-in-law in Tahirpur upazila, Sunamganj district, echoed this sentiment, stressing the importance of women utilizing PNC for the well-being of both mother and child, despite some participants in other FGDs still perceiving it as less important. However, the FPO from Itna upazila noted a higher prevalence of ANC compared to PNC in their area due to lack of awareness and

geographical factors. He attributed the increase in PNC to government initiatives aimed at raising awareness and non-government initiatives, including activities by PCSBAs.

2.6.3.1 Frequency of receiving PNC services

As per the NCBI guidelines, mothers and infants are advised to undergo a minimum of three PNC visits (Sharma et al., 2016). In this study, pregnant women demonstrated notable initiation of PNC, with 38.9% seeking care within the first seven days, increasing to 44.4% by the 28th day. Lactating women with children u-2 showed remarkable engagement, with 66.7% seeking PNC during the initial seven days, highlighting the importance of early postnatal attention. Similarly, women with children 2-5 exhibited commendable proactive efforts, with 45.8% seeking PNC within the first seven days. Additionally, the rural community also displayed a significant 53.8% seeking PNC during the first seven days, indicating a collective commitment to early PNC in this setting (***Figure 5***).

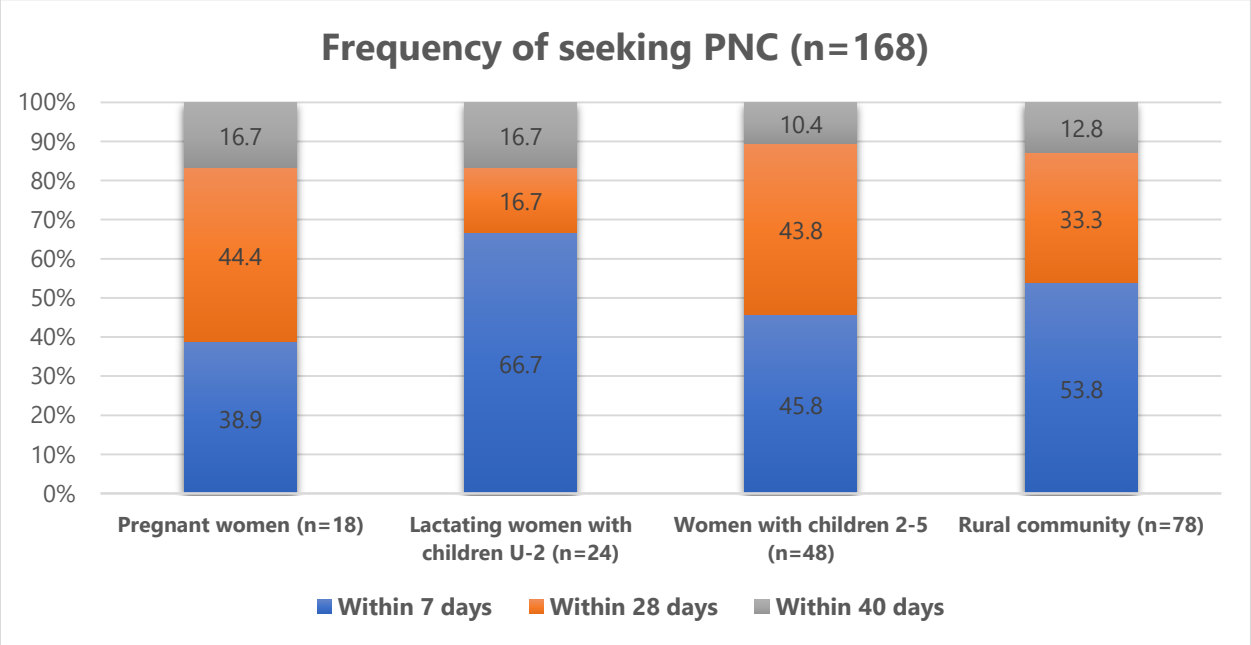

Figure 5: Frequency of seeking PNC

However, the qualitative study revealed a limited understanding of the frequency of PNC among participants in the FGDs, similar to ANC. Non-beneficiary women displayed lower awareness, with husbands and mother-in-law being the least informed. Interestingly, even among women who did receive PNC, there was no established routine schedule. Instead, they sought PNC only in response to complications faced by either themselves or their children. A lactating woman from Madan upazila, Netrokona district, highlighted this in an FGD, stating,

"I didn't know when to get help after my baby was born. But my child was very sick, so I received care multiple times."

2.6.3.2 Sources of receiving PNC services

Among participants, 56.5% accessed PNC through institutional healthcare, while 39.6% relied on informal sources. In contrast, non-participants showed higher reliance on institutional sources (69.2%) and lower utilization of informal healthcare (23.1%). Interestingly, a small proportion of both participants (3.9%) and non-participants (7.7%) adopted a mixed approach, utilizing both institutional and informal sources for their PNC needs ***(Figure 6***).

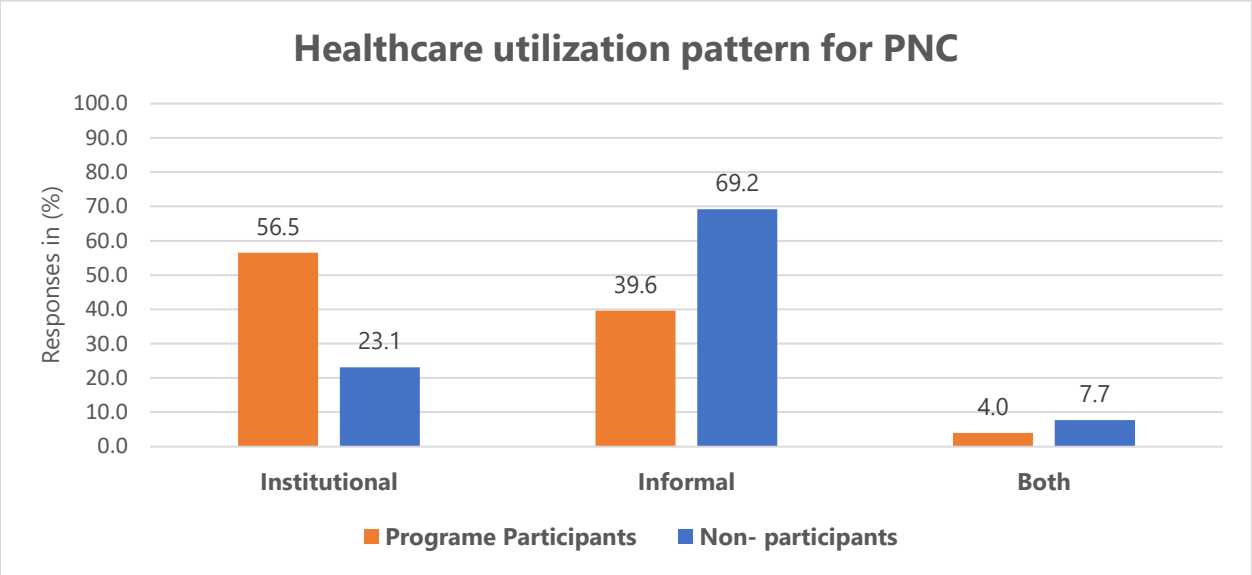

Figure 6: Healthcare utilization pattern for PNC

Within the group of program participants, UHCs were the most frequently utilized ***institutional sources***, accounting for 27.5% of responses. CCs were also common sources, representing 26.7%. Among the rural community members who were not program participants, UHCs were also predominantly utilized (33.3%), followed by CCs (26.3%). Among program participants, an overwhelming 97.0% relied on PCSBAs as ***informal sources***, while Dhaima were utilized at lower rates of 6.3%. In the rural community (n=24), PCSBAs remained significant with a utilization rate of 66.7%, slightly lower than among program participants. Dhaima emerged notably more prevalent, with a utilization rate of 37.5%, while religious healers were more commonly employed in the rural community (12.5%), whereas none of the program participants utilized this source (***Table 10***)

Table 10: Percent distribution of healthcare utilization for PNC

Sources	Responses	Program participants (n=94)				Non-participants (n=84)	Total (n=178)
		Pregnant women	Lactating women with children u-2	Women with children 2-5	Total	Rural community	
Institutional (n=114)	n	12	13	29	54	60	114
	Upazila health complexes	25.0	23.1	34.5	27.5	36.7	33.3
	Privately-owned clinics	25.0	30.8	31.0	28.9	26.7	28.1
	Community clinics	25.0	23.1	27.6	25.2	26.7	26.3
	NGO run healthcare facilities	16.7	0.0	10.3	9.0	21.7	15.8
	Union healthcare facilities (UH&FWCs and USCs)	8.3	38.5	13.8	20.2	11.7	14.9
	District hospitals	8.3	7.7	10.3	8.8	6.7	7.9
Informal (n=64)	n	7	11	22	40	24	64
	PCSBAs	100.0	90.9	100.0	97.0	66.7	83.2
	Dhaimas	14.3	0.0	4.5	6.3	37.5	21.3
	Trusted relatives/friends	14.3	0.0	0.0	4.8	4.2	3.9
	Religious healers	0.0	0.0	0.0	0.0	12.5	3.2
	Traditional healers	0.0	0.0	4.5	1.5	4.2	1.3
	Village doctors	0.0	0.0	1.0	0.3	0.0	0.6

The qualitative findings revealed that the patterns of seeking PNC were similar to those of seeking ANC, which was discussed in a previous section (2.6.1.2). Consistent with quantitative findings, the qualitative study revealed reliance on religious healers, locally known as "Hujur," especially among program non-participants. Mothers seek their assistance for issues like excessive crying and sleep disturbances in children. These healers administer medication using holy oil and water, along with offering sacred texts and spiritual blessings for the well-being of both mother and child. During an FGD with lactating women in Baniachong Upazila of Habiganj District, one participant mentioned,

> ***"For minor issues with children like sleep disturbances and fears, we usually visit 'Hujur.' He provides medication along with spiritual blessings and sacred texts, which I find quite effective."***

The study also identified that these notions persist due to longstanding beliefs within the community.

2.6.3.2.1 Why do they mostly rely on informal sources?

The study revealed various social, cultural, religious, and geographical factors hindering the use of institutional PNC (***Annex 9***), mirroring the patterns observed in seeking institutional ANC, as discussed earlier (2.6.2.1.1).

2.6.3.3 Why does the community not seek PNC?

As previously mentioned, there is a lower inclination to seek PNC compared to ANC, with limited awareness of its importance revealed in FGDs. Despite recognizing the need for PNC, some women, including program participants, faced difficulties accessing it due to family constraints, particularly from husbands and mothers-in-law, who also viewed PNC as unnecessary and financially burdensome. According to the study findings, only 3.4% of participants could independently make healthcare decisions, while 40.3% stated decisions were made jointly by both husband and wife. Another 4.5% mentioned relying on mothers-in-law for such decisions, supporting this the qualitative findings.

However, women faced challenges accessing PNC services due to heavy engagement in household chores and caring for family members post-childbirth. A lactating woman from Mithamoin Upazila, Kishoreganj, expressed difficulties in consulting doctors after her child faced feeding issues, citing family constraints and immediate return to household responsibilities. Moreover, the study findings revealed the prevalent superstition of "Atur Ghar," where mothers and babies are kept in poorly ventilated rooms post-childbirth to ward off evil spirits, hindering access to PNC. The FPO in Ajmiriganj, Habiganj, also noted lower PNC utilization due to

unawareness, financial constraints, and limited literacy. The Civil Surgeon of Sunamganj district recognized distance to healthcare institutions, limited transportation options, and travel costs as discouraging factors for seeking MHC, encompassing ANC and PNC.

2.7 Capacity of the existing healthcare institutes to conduct safe deliveries in hard-to-reach areas

The study's results showed that Emergency Obstetric Care (EOC) services are not offered by community-level healthcare centres such as CCs, UHFWCs, and UCSs. In Haor region there is one doctor for 13,832.24 people, while in Char region there is only one doctor for 29,436.07 people. Additionally, the community need better knowledge of danger signs among people and health workers at CCs and UH&FWs, leading to late care-seeking. Thus, they have yet a high tendency to seek services from TBAs. Among the participants who received ANC, Delivery, and PNC services from formal institutes, respondents were asked questions about the service quality. In response, approximately half of the participants from Char (52.8%) and Haor (47.4%) found institutional Maternal Healthcare (MHC) services inconvenient. Financial constraints, including doctor's fees, medication expenses, a lack of female doctors/ nurses, and transportation costs, were cited as major barriers.

In both Char and Haor, the respondents stated some most common issues regarding difficulties in maternal healthcare services during natural disasters were inadequate river-based transportation options, damaged or flooded roads and high transportation costs.

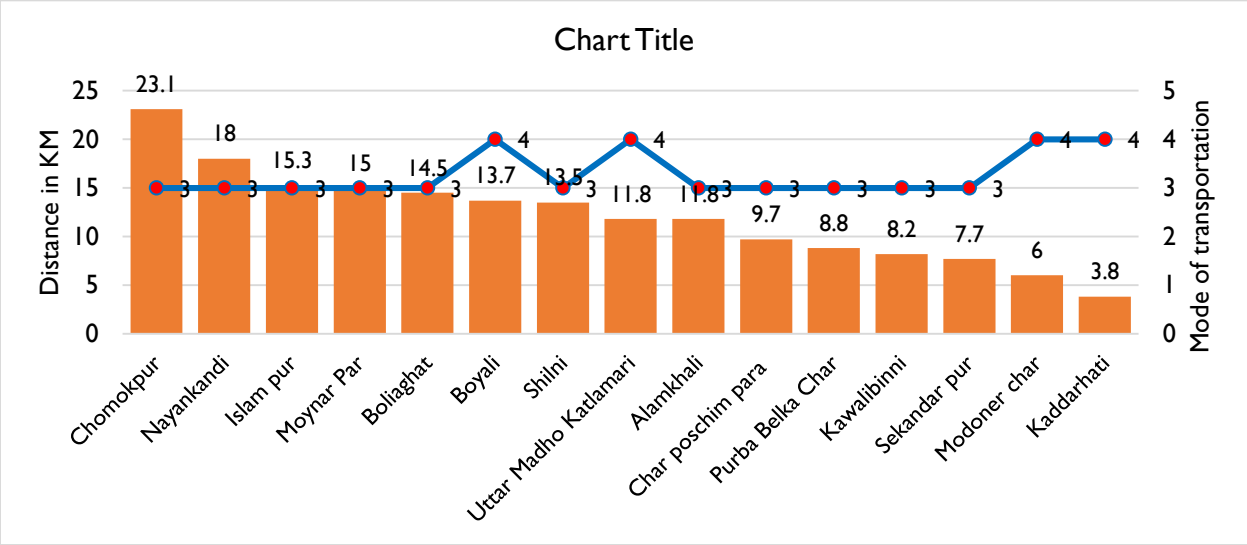

Figure 2: Distance of the nearest UHC from villages, along with transportation

Among the surveyed villages, the distance of the nearest health complex from the community is vital for receiving timely services. Respondents typically need to use more than two modes of transportation (motorbike, electric and compressed natural gas driven three-wheeler, engine boat, horse cart) to reach the nearest health complex and receive delivery services in the most urgent circumstances. Thus, the dependency on informal sources (PCSBAs and TBAs) is comparatively higher in Char and Haor. On average, people of the Upazila must travel 12 kilometres to reach the nearest health complex. Some of them are over 20 km apart, necessitating the use of more than two modes of transportation (figure 3). It increases the time and cost for the service seekers and also poses associated risks for pregnant women.

The respondents identified accessibility of healthcare facilities during emergencies as a critical factor. Distance to the nearest institutional healthcare facilities is also a notable barrier, particularly for pregnant and lactating women. Since they need to be accompanied by another person to visit the local health institute, their mother-in-law or family head usually refuses to take them there.

2.7.1 Primary healthcare facilities in HtR area

In local healthcare settings in Bangladesh, various government facilities such as CCs, UH&FWCs, USCs, and RDsRDs, along with NGOs and private clinics, and PCSBAs offer MHC services. These facilities collectively aim to provide accessible and quality healthcare. However, this study highlighted challenges in availability and accessibility of these services in HtR regions, particularly regarding adequacy of staff and other resources. The following discussion will explore the effectiveness of these settings in delivering MHC.

2.7.1.1 State of CCs

CCs[5] have been introduced in the country to improve healthcare accessibility at the grassroots level. The study underscored challenges within CCs, including limited services, absence of facilities for routine deliveries, inadequate staffing, and areas without any CCs. In the Char area, there are 158 CCs with 156 CHCPs, 81 HAs, and 196 FWAs. None offer EOC, OT for C-section, or ND services crucial for MHC. In the Haor area, there are 219 CCs with 216 CHCPs, 164 HAs, and 251 FWAs.

[5] *The government of Bangladesh started establishing CCs in 1998. Each CC is supervised by a full-time CHCP, with HAs and FWAs alternating every three days a week* (BMSS, 2023). *Women exclusively hold the positions of HA and FWA, while both men and women can become CHCPs. CHCPs undergo a 12-week training program, while FWAs and HAs receive 21 days of training followed by on-the-job training. They deliver health education, promote maternal health, conduct normal delivery, treat minor ailments, and recognize and refer severe cases to hospitals.* (Joardar et al., 2020).

Only 37 CCs provide ND services, and like the Char area, none have EOC or OT for C-section (***Table 11***).

Table 11: CCs in the local healthcare setting

Institutional										Informal
Area type	Districts	Upazilas	Community Clinic							
			Total CCs	CHCP	HA	FWA	EOC	C-section	ND	PCSBAs
Char	Kurigram	Char Rajibpur	**12**	12	12	12	0	0	0	5
		Nageshwari	**50**	48	37	51	0	0	0	13
	Gaibandha	Fulchari	**22**	22	0	24	0	0	0	5
		Saghata	**42**	42	32	45	0	0	0	4
		Sundarganj	**32**	32	0	64	0	0	0	4
	Total		**158**	**156**	**81**	**196**	**0**	**0**	**0**	**31**
Haor	Netrokona	Kalmakanda	**33**	33	3	35	0	0	3	13
		Madan	**20**	21	22	27	0	0	2	15
		Khaliajhuri	**9**	7		17	0	0	2	15
	Kishoreganj	Austagram	**20**	19	18	23	0	0	0	8
		Mithamoin	**18**	18	15	20	0	0	0	8
		Itna	**26**	26	27	20	0	0	2	5
	Sunamganj	Dowarabazar	**26**	26	17	26	0	0	3	3
		Tahirpur	**21**	21	19	21	0	0	21	7
	Habiganj	Ajmiriganj	**17**	16	11	15	0	0	4	11
		Baniachong	**29**	29	32	47	0	0	0	12
	Total		**219**	**216**	**164**	**251**	**0**	**0**	**37**	**97**
Total (Char and Haor)			**377**	**372**	**245**	**447**	**0**	**0**	**37**	**128**

**Based on the information gathered from UH&FPOs, FPOs, and program staffs.*

Upon delving into the qualitative aspects, the results similarly brought to light similar outcomes, pointing to inadequacies in both CC availability and staff skills for MHC. A resident in Ajmiriganj expressed dissatisfaction with the only CC in her area, citing the CHCPs and other staff's inadequate skills for Identification of danger signs during pregnancy. Some participants mentioned their CCs lacking facilities for normal deliveries, often without female staff. Even though some CCs conduct normal deliveries, they are unable to provide assistance after office hours in emergency cases.

A pregnant woman from Austagram upazila, Kishoreganj, shared her experience of waiting for a long time to see the healthcare providers at the CC. Another woman complained that,

> ***"We don't have a CHCP here. We depend on FWA and HAHA who are not always available and not as skilled as CHCP."***

In Mithamoin, a CHCP acknowledged performing regular deliveries but emphasized a limited-service capacity due to room constraints and a shortage of skilled workers. The study revealed that the majority of CCs have only two rooms, which is inadequate for ensuring a safe delivery. However, some CCs staffs also voiced concerns about insufficient essential supplies, including medical kits and tools. Moreover, in areas like Char Rajibpur, an upazila of Kurigram with 99 villages, only 12 CCs are present (***Table 11***), which is inadequate relative to the population size.

The UH&FPO of Char Rajibpur, Kurigram affirmed these challenges, recognizing limitations in infrastructure and logistics for MHC, particularly in ND assistance. He also noted the absence of CCs in every union, with some being destroyed due to erosion, hindering MHC services. Addressing these concerns, a Joint Secretary of MoHFW highlighted that newly recruited CHCPs undergo a 12-week Basic Training covering theoretical and practical aspects, with additional training to address knowledge and skill gaps. Furthermore, an ongoing program aims to certify all female CHCPs as SBAs for normal deliveries.

2.7.1.2 State of union healthcare facilities (UH&FWCs and USCs)

At the basic level of regional administration in Bangladesh, Union Parishads oversee local administration. Within a Union, UH&FWCs fall under the DFP, and USCs under the MoHFW share the same structure and services; they are linked to CCs as advanced facilities6. The study highlighted challenges within these centers, including limited services and the absence of facilities

[6] *They provide family planning, menstrual regulation, vaccinations, and general reproductive and maternal health services six days a week. Sub-Assistant Community Medical Officers (SACMOs) and Family Welfare Visitors (FWVs) primarily deliver these services. Specifically, FWVs are frontline health workers, tasked with providing ANC and PNC, and conducting safe deliveries in a dedicated labor room* (Talukder et al., 2015).

for routine deliveries. Some areas not only lacked these centers but also lacked any structural existence. In the Char region, there are 26 UH&FWCs with just 2 MOs, 9 SACMOs, and 32 FWVs, among which 19 centers offer ND services. Similarly, in the Haor region, there are 47 UH&FPOs with 5 MOs, 10 SACMOs, and 35 FWVs, but only 26 centers provide ND services. Regarding USCs, in the Char area, there are 21 centers with 13 MOs, 8 SACMOs, and 32 FWVs, but only 6 offer ND services. Similarly, in the Haor area, there are 30 USCs with 6 MOs, 16 SACMOs, and 30 FWVs, with only 6 centers providing ND services. However, none of these centers offer Emergency Obstetric Care (EOC) or Operating Theater (OT) for C-section services, which are vital for MHC (Table 12).

Table 12: USCs and UH&FWCs in the local healthcare setting

Institutional																Informal
Area Type	Districts	Upazilas	Union Sub Center							Union Health and Family Welfare Center							
			Total USCs	MO	SACMO	FWV	EOC	C-section	ND	Total UH&FWCs	MO	SACMO	FWV	EOC	C-section	ND	PCSBAs
Char	Kurigram	Char Rajibpur	2*	0	0	6	0	0	0	0	0	0	6	0	0	0	5
		Nageshwari	3	3	2	12	0	0	3	**7**	1	4	12	0	0	7	13
	Gaibandha	Fulchari	1	1	1	4	0	0	0	**4**	0	1	4	0	0	4	5
		Saghata	10*	9	3	3	0	0	0	**8**	1	4	3	0	0	3	4
		Sundarganj	5	0	2	7	0	0	3	**7**	0	0	7	0	0	5	4
	Total		**21**	**13**	**8**	**32**	**0**	**0**	**6**	**26**	**2**	**9**	**32**	**0**	**0**	**19**	**31**
Haor	Netrokona	Kalmakanda	2	0	2	3	0	0	1	**6**	0	2	3	0	0	4	13
		Madan	8*	0	3	8	0	0	0	**6**	0	1	8	0	0	3	15
		Khaliajhuri	1	0	1	1	0	0	0	**5**	0	1	3	0	0	2	15
	Kishoreganj	Austagram	7*	0	0	1	0	0	0	**2**	1	0	1	0	0	2	8
		Mithamoin	1	0	1	2	0	0	0	**4**	1	2	2	0	0	3	8
		Itna	1	0	1	2	0	0	0	**5**	0	3	2	0		1	5
	Sunamganj	Dowarabazar	3	1	3	1	0	0	1	**4**	0	1	2	0	0	1	3
		Tahirpur	1	0	1	0	0	0	1	**4**	0	0	2	0	0	3	7
	Habiganj	Ajmiriganj	4	3	2	2	0	0	2	**2**	2	0	2	0	0	2	11
		Baniachong	2	2	2	10	0	0	1	**9**	1	0	10	0	0	5	12

Institutional																Informal
Area Type	Districts	Upazilas	Union Sub Center							Union Health and Family Welfare Center							
			Total USCs	MO	SACMO	FWV	EOC	C-section	ND	Total UH&FWCs	MO	SACMO	FWV	EOC	C-section	ND	PCSBAs
	Total		30	6	16	30	0	0	6	47	5	10	35	0	0	26	97
Total Char and Haor			51	19	24	62	0	0	12	73	7	19	67	0	0	45	128

**Either proposed or damaged.*

**Based on the information gathered from UH&FPOs, FPOs, and program staffs.*

Findings from FGDs also revealed lower utilization of these centers, with villages situated 4-5 km away from UH&FWCs and UHCs. Participants emphasized accessibility challenges due to distance and transportation issues. Moreover, many centers lack the capacity to provide 24-hour ND services, despite their proximity to most rural women, posing a significant barrier to safe delivery services, including C-sections in emergency cases. A lactating woman shared her experience during an FGD in Baniachong Upazila of Habiganj District, stating,

> ***"I was in severe labor pain. Since the nearby CC doesn't do deliveries, I had to go to the UH&FWC, which is quite far. But when I got there, it was already evening, and they couldn't help me."***

Insufficient knowledge among FWVs regarding pregnancy and delivery complications, as well as the management of essential obstetric complications, was noted in FGDs. Inadequate service providers also emerged as a significant concern, with some centers lacking sufficient staff or being unstaffed during office hours. For example, the study found that in Saghata, Gaibandha, there are 9 UH&FWCs, but only 3 FWVs are available who are crucial for conducting normal deliveries and other MHC services.

Acknowledging these concerns about the availability of these centers and their staff, the Civil Surgeon of Sunamganj district also mentioned ongoing efforts to improve surgical delivery facilities at the Union level. While only Sadar had this capability in 2022, presently, five upazilas can perform c-section deliveries. A Deputy Secretary of the MoHFW also acknowledged these constrains of delivering MHC services in remote areas of Bangladesh. However, she noted that the situation has been gradually improving due to various government initiatives. For instance, nationwide efforts include the establishment of 500 model UHFWCs designed to offer 24-hour institutional ND services.

2.7.1.3 State of UHCs

UHCs are primary healthcare facilities located in sub-districts across Bangladesh. Remarkably, the study revealed concerns with the availability of Doctors, Midwife, EOC, and OT for C-section even within some UHCs. In the Char region, UHCs offer a total of 44 doctors, 27 midwives, 5 EOC facilities, 3 OTs for C-sections, and 6 special rooms for ND services. Conversely, in the Haor region, UHCs provide 83 doctors, 40 midwives, 3 EOC facilities, 13 OTs for C-sections, and 14 special rooms for ND services. It's noteworthy that all 16 UHC facilities have ND services (***Table 13***).

Table 13: UHCs in the local healthcare setting

Institutional								Informal
Area type	Districts	Upazilas	Upazila Health Complex					
			Doctor	Midwife	Room for EOC	C-section	Room for ND	PCSBAs
Char	Kurigram	Char Rajibpur	5	4	1	0	1	5
		Nageshwari	4	4	1	1	1	13
	Gaibandha	Fulchari	9	4	1	1	1	5
		Saghata	16	4	2	0	1	4
		Sundarganj	10	11	0	1	2	4
	Total		**44**	**27**	**5**	**3**	**6**	**31**
Haor	Netrokona	Kalmakanda	12	4	1	1	1	13
		Madan	13	1	0	0	1	15
		Khaliajhuri	6	2	0	0	1	15
	Kishoreganj	Austagram	8	4	0	2	1	8
		Mithamoin	8	5	0	1	1	8
		Itna	5	5	0	1	1	5
	Sunamganj	Dowarabazar	7	7	0	1	1	3
		Tahirpur	6	2	1	5	3	7
	Habiganj	Ajmiriganj	11	6	1	1	3	11
		Baniachong	7	4	0	1	1	12
	Total		**83**	**40**	**3**	**13**	**14**	**97**
Total Char and Haor			**127**	**67**	**8**	**16**	**20**	**128**

**Based on the information gathered from UH&FPOs, FPOs, and program staffs.*

However, most of the FGDs participants said that UHC were not easily accessible due to distance and transportation problems. At the same time, there should be a separate department for MHC services. During an FGD, a husband in Khaliajuri, a upazila of Netrokona said that he had sought MHC assistance from the UHC several times, but he rarely got timely services and he doubted the skills of the doctors and midwives.

Some study participants also raised quality of services provided by UHCs. The president of VDC of Fulchari Upazila, Gaibandha, expressed her opinion on this issue. She said,

"The local UHC does not have enough modern technology, medicine or testing facilities. So, in my opinion, the overall service quality is not satisfactory."

Some participants expressed satisfaction with the competence of doctors and midwives, while others raised concerns about the insufficient number of healthcare professionals, limiting access to timely services. A VDC member in Austagram Upazila, Kishoreganj, noted that local UHCs have skilled personnel, but their numbers are insufficient to meet service demands. The study also revealed that in this UHC, only 4 midwives are available to handle MHC (***Table 13***), and there are no EOC services. This situation is somewhat similar in the other UHCs studied. A KII with the MO of Madan UHC, Netrokona, also highlighted obstacles in delivering MHC, including insufficient staff, operation rooms, and beds. Despite limitations, they offered dedicated ANC services, although similar findings were not consistent across all UHCs in the study area.

2.7.1.4 State of NGOs run and private clinics

The study did not find official data regarding NGOs-operated[7] and private clinics. However, study participants revealed a preference for government-owned facilities and clinics operated by NGOs where available, citing the comparatively lower costs. Notably, the qualitative analysis uncovered that study participants expressed greater satisfaction with MHC provided by NGOs, despite their limited availability. As a VDC member of the Nageshwari upazila, Kurigram claimed that in this area, NGO-run clinics have enough skilled workers to provide MHC, and their quality of care is good.

Participants in the FGDs showed little trust in local privately-owned clinics due to high costs and incidents of mishaps. A pregnant woman from Sundarganj Upazila, Gaibandha, shared a distressing incident where a relative almost lost her life due to substandard treatment during a C-section delivery at a local private clinic. Others echoed similar experiences, citing a lack of oversight in monitoring activities. However, some mentioned that people typically turn to privately-owned clinics for C-section deliveries when needed.

2.7.2 PCSBAs in providing MHC: an integral part of primary healthcare settings

PCSBAs are providing MHC services in remote areas as trained service providers as part of healthcare settings (***Table 1***). They collaborate closely with local healthcare institutions, performing

[7] *Health facilities in Bangladesh, run by non-governmental organizations (NGOs), serve to provide healthcare services to the population, with a focus on rural and hard-to-reach areas.*

normal deliveries, especially when patients are referred from communities or when there is a shortage of nurses in healthcare facilities. However, the study identified a shortfall in their numbers relative to the area and population through IDIs with PCSBAs and FGDs with community members. This shortage often challenges service delivery, particularly in remote areas or during emergencies. In an FGD in Astagram, Kishoreganj, one participant emphasized the need for urgent delivery services from PCSBAs, citing a delay due to residing in a distant village. Similar concerns were raised in other FGDs.

A program staff in Sunadrganj, Gaibandha, emphasized the positive effect of their quality care on the community but underscored the need to increase the number of PCSBAs to expedite and improve services. Addressing these concerns, a representative from CARE mentioned that increasing the number of PCSBAs is not feasible due to the new stance of the Government of Bangladesh regarding institutional delivery.

2.7.2.1 Coordination of PCSBAs and local healthcare institutions

The government of Bangladesh aims to raise the percentage of institutional deliveries from 47 to 70 by the year 2025 (Star, 2022). So, the government has launched an initiative to facilitate normal deliveries at CCs and UH&FWCs. Furthermore, taking into account the geographical challenges in HtR areas, the government has implemented the CSBAs program to ensure the safety of deliveries at home (Islam et al., 2014). Despite efforts to facilitate normal deliveries at CCs and UH&FWCs, the study found that a significant proportion of CHCPs in CCs are male. Additionally, some female CHCPs lack SBA training in certain CCs and inconsistently attend CCs. Not every UH&FWC has FWVs available for normal deliveries, and their service hours are limited. Addressing these gaps, PCSBAs play a vital role by conducting and assisting normal deliveries in CCs and UH&FWCs alongside CHCPs and FWVs. The FPO of Dowarabazar, Sunamganj, has acknowledged the substantial influence of PCSBAs in improving delivery safety through integration with the government health sector.

Moreover, during an FGD in Khaliajuri, a husband shared his wife's need for urgent care during delivery, where a PCSBA assisted with initial complications and guided her to the UHC. Similar experiences were reported in other FGDs, with PCSBAs not only referring patients in complicated cases but also accompanying them to healthcare facilities. An example of such collaboration was highlighted in an FGD with lactating women in Baniachong, Habiganj. However, during an IDI with a PCSBA in Tahirpur, Sunamganj, the collaboration focuses on sharing information and providing a few free medications. Another PCSBA from Char Rajibpur emphasized the collaborative relationship between CCs and PCSBAs. She refers women to the CCs and occasionally to the UHC for emergency assistance.

During a KII with the UH&FPO in Madan, Netrokona, it was revealed that PCSBAs collaborate with local healthcare institutions to enhance MHC. This collaboration involves mutual communication

and coordination between PCSBAs and local healthcare institutions. PCSBAs serve as a crucial link to reach out to the community, gather health information, and refer individuals to healthcare institutions. They also play a role in encouraging institutionalized delivery through outreach efforts. Collaborative efforts between PCSBAs and the local health system were also emphasized in KIIs conducted with healthcare authorities. For instance, in Mithamoin, Kishoreganj, collaboration meetings were held to establish direct communication channels. PCSBAs were given a hotline number for immediate assistance and instructed to promptly refer critical patients to hospitals.

Similarly, in Itna, Kishoreganj, the FPO highlighted collaborative relationships between PCSBAs and local healthcare institutions. While direct contact with PCSBAs was limited, positive interactions with CCs were noted. PCSBAs played a pivotal role in distributing medicine to pregnant mothers and efficiently referring individuals needing medical attention to the clinic. Insights from the Civil Surgeon of Sunamganj, obtained during a KII, revealed occasional communication and referrals with PCSBAs at the upazila level, but no formalized referral system was in place.

2.7.3 State of MHC during natural disasters

Among the study participants, 14.0% from the Char area and 10.0% from the Haor area encountered difficulties in accessing MHC during natural disasters in the past five years. About one-third of them (34.3%, n=35) faced it within a year. The main natural disasters in the Char area were flood (93.8%) and riverbank erosion (87.5%), while in the Haor area there were flood (84.2%) and heavy rainfall (36.8%). The main problem was a lack of river-based transportation, along with damaged or flooded roads, closely followed by expensive transportation (***Annex 6***).

FGDs indicated transportation consistently presents a major challenge for MHC in their localities, exacerbated during natural disasters. Floods, riverbank erosion, droughts, and cyclones hinder transportation via rivers and roads, increasing travel costs. In some areas, pregnant women solely relied on scarce boats for transportation during floods, posing significant challenges for accessing MHC. As a pregnant woman in Austagram upazila, Kishoreganj recounted an incident, stating,

> ***"A pregnant woman tragically died from excessive bleeding as heavy rainfall had damaged the road, preventing her from reaching the hospital."***

FGDs participants also mentioned challenges during the dry season. In Fulchari, Gaibandha, lactating women noted that horse-drawn carts and autorickshaws became the primary modes of

transport in the river-surrounded area during droughts. However, inadequate road conditions made travel uncomfortable and risky for both mothers and children, given the long distance to local healthcare facilities. For example, a pregnant woman from Char Rajibpur, Kurigram, shared her experience,

> ***"I had to go to the UHC on a horse-drawn cart because there was no other transport. It was very hard and risky."***

However, the study found an absence of organized efforts for MHC services during natural disasters, leading participants, especially program participants, to depend on PCSBAs during emergencies. Some women also rely on Dhaima to seek MHC, including ND. A pregnant woman shared in an FGD in Kalmakanda, Netrokona,

> ***"When it floods or rains heavily, getting to the nearest hospital is tough. Then we rely solely on PCSBAs."***

In a KII, a CC staff member in Char Rajibpur, Kurigram, mentioned how natural disasters pose significant challenges for women in need of MHC. Similarly, the UH&FPO of Saghata, Gaibandha, acknowledged the difficulties during such disasters. They proposed the arrangement of a "special water boat" along with a community-based approach. Addressing these challenges, the Civil Surgeon of Sunamganj highlighted the utilization of CCs, UH&FWCs, and USCs, along with paid volunteers, to provide services during disasters. However, he recognized limitations such as transportation challenges, communication issues, and coordination among healthcare providers. In a KII, a Joint Secretary from the MoHFW mentioned these arrangements, including deploying volunteers and converting buildings into shelter houses, but acknowledged their insufficiency.

2.7.4 State of Maternal Health Information (MHI)

Among study participants, mobile phone accessibility was prevalent, with 69.1% in Char and 87.4% in Haor having mobile phones, but internet access was limited to 6.6% in Char and 21.1% in Haor. Regarding MHI, only 3.6% in Char and 8.4% in Haor received information, primarily from television (60.0%), YouTube (50.0%), Facebook (40.0%), and mobile phones (35.0%). A small percentage had received telehealth services (3.9% in Char, 0.6% in Haor), with 58.3% unaware of such services. Emergency contact number awareness for maternity assistance was reported by 6.4% in Char and 3.2% in Haor. The study findings highlight the state of MHI utilization, indicating a lower rate.

FGDs show that participants mostly lack smartphones and televisions for MHIS. Even if accessible, there is infrequent use for seeking MHI. Participants also have limited knowledge of UHCs' emergency contact numbers. These findings are consistent with the results of KIIs conducted with UH&FPOs and FPOs in different upazilas.

2.8 Experience of the poor and extremely poor in receiving maternal healthcare services at local healthcare institutions

2.8.1 Seeking Emergency Obstetric Care (EOC)

Emergency Obstetric Care (EOC) requires immediate medical attention that may occur during pregnancy, labor, or the postpartum period, posing a threat to the lives of both the mother and the child (Ghag et al., 2020). In Char, 30.0% sought EOC in the past five years, and in Haor, it was 15.3%, suggesting many didn't avail such services. However, the study findings revealed that community-level healthcare facilities, including CCs and UHFWCs and UCSs, lacked access to EOC services. Additionally, FGDs showed that another barrier to EOC was the poor knowledge of danger signs among people and health workers at CCs and UH&FWs, leading to late care-seeking. A pregnant woman from Austagram Upazila in Kishoreganj shared her story of not recognizing danger signs and getting delayed care. She later learned about EOC from a PCSBA. Others in FGDs also said they were unaware of danger signs and got informed by PCSBAs and referred to UHCs.

The UH&FPO of Mithamoin Upazila, Kishoreganj, also highlighted the limited understanding among both community members and healthcare providers regarding when to seek EOC services, leading to maternal and child deaths. Furthermore, he recognized the absence of EOC facilities at the community level, including in some UHCs. A Joint Secretary of MoHFW acknowledged these shortcomings due to shortages of skilled healthcare providers and infrastructure. Efforts are underway to address these issues by enhancing district hospitals to community-level clinics.

2.8.2 Affordability of the poor and extremely poor communities

About half of the participants, 52.8% from Char and 47.4% from Haor, found institutional MHC services to be unaffordable. Qualitative findings echoed this sentiment, revealing that communities in HtR areas face financial constraints when accessing MHC services. FGD participants emphasized increased costs due to doctor's fees and medication expenses. Transportation expenses also significantly contribute to the overall financial burden of seeking MHC services. In an FGD with lactating women in Madan, Netrokona, a participant expressed concerns about the affordability of MHC services, stating,

"At government hospitals, the doctor's fee fits my budget, but transportation costs about 1000 taka. Plus, buying medicines adds to the financial strain, surpassing what I can afford. "

Other FGDs also echoed these sentiments, highlighting financial struggles to access nutritious food and essential medications. One participant mentioned their family's sole breadwinner selling their "van" to cover MHC expenses during delivery. In addition, some FGD participants noted receiving insufficient free medicines from government and NGO-operated hospitals, which didn't meet the prescribed dosage.

In this context, PCSBAs are a cost-effective option for poor and ultra-poor communities seeking ANC, delivery, and PNC services compared to local healthcare institutions. Previously, overall expenses deterred individuals from pursuing MHC. However, the introduction of PCSBAs not only provides MHC services but also promotes a habit of seeking care. In an FGD with husbands in Saghata upazila, Gaibandha, participants revealed that they sometimes discouraged their wives from seeking MHC from institutional facilities but not from PCSBAs due to their affordability. They noted that PCSBAs provide care with minimal or no charges.

2.9 Role of the community-based skilled birth attendants playing within and outside the existing healthcare facilities

2.9.1 Services provided by the PCSBAs

In the HtR area, PCSBAs consistently offer a wide range of maternity services, including ANC, PNC, and support for normal vaginal deliveries, ensuring comprehensive care for mothers and child (CARE, 2021).

2.9.1.1 Seeking ANC from PCSBAs

In the Char region, a larger proportion of program participants (85.1%) received ANC compared to non-participants (43.1%). Similarly, in the Haor region, program participants (88.6%) received ANC more than non-participants (42.4%). Overall, ANC coverage was relatively comparable in both regions, with 62.4% in Char and 66.5% in Haor (***Annex 3***).

FGD findings indicate a preference among participants, especially program beneficiaries, for seeking ANC from PCSBAs over other institutional facilities. Participants highlighted the vital role PCSBAs play in advising on diet, cleanliness, and hygiene during pregnancy, as well as providing essential services such as monitoring vital signs and offering childbirth assistance. The door-to-door approach of PCSBAs helps overcome distance, transportation, and financial barriers

associated with accessing institutional ANC services, while also raising awareness among both program participants and non-participants. As in Fulchari, Gaibandha, a lactating woman shared her challenging experience, stating,

> ***"During my pregnancy, I faced financial constraints that prevented me from affording essential care. Fortunately, a PCSBA offered vital support at a minimal cost"***

Findings from an FGD conducted in Dowarabazar, Sunamganj, unveiled that PCSBAs provide counseling on daily routines and dietary habits to lactating women, stressing the importance of sufficient water intake during pregnancy for a safe delivery. Other FGDs participants also emphasized the PCSBAs' pivotal role in engaging with pregnant women's families to facilitate ANC services. Similarly, in Fulchari, Gaibandha, a PCSBA underscored the significance of family involvement in ensuring comprehensive care.

2.9.1.1.1 Frequency of receiving ANC from PCSBAs

The predominant frequency category, "Sometimes" (at least once a month), was cited by 46.0% of women in Char and 50.4% in Haor. A smaller proportion, categorized as "Often," indicated that 25.4% in Char and 22.0% in Haor sought MHC services a few times a month (***Figure 7***).

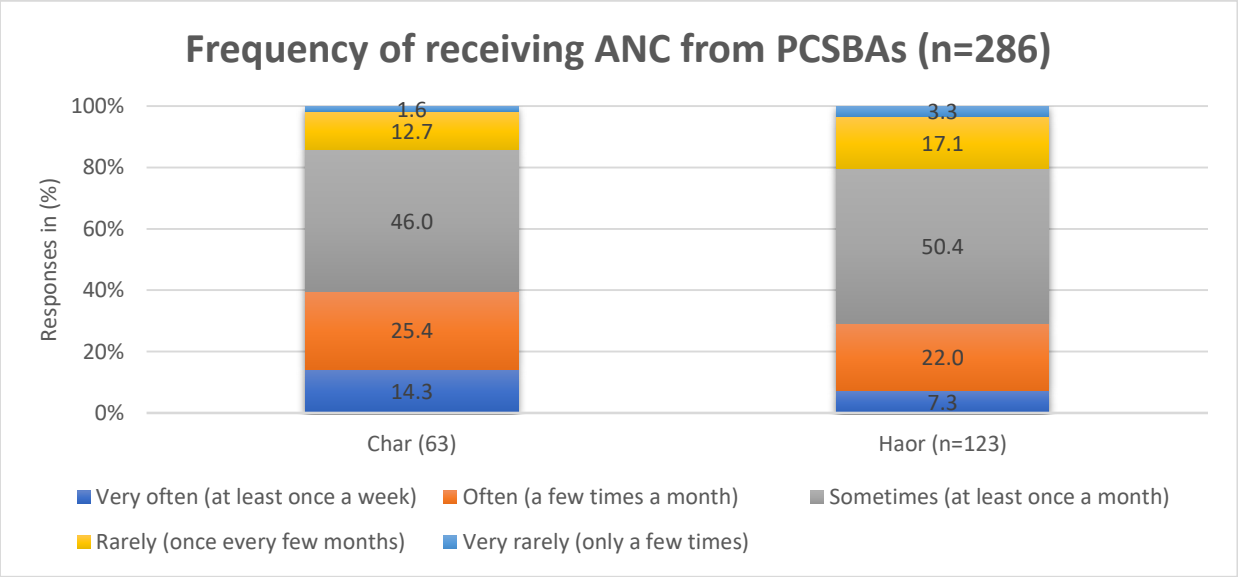

Figure 7: Frequency of receiving ANC from PCSBAs

Furthermore, among the study participants, as expected, program beneficiaries showed a higher preference to seek ANC from PCSBAs (57.3%, n=128 VS. 36.2%, n=58) in the ***"Sometimes"*** category. The primary services, including prenatal check-ups and nutritional guidance, were accessed by 87.6% (n=186) of all participants. Additionally, nearly half of the participants sought nutritional advice, with some variability among groups. Another notable portion (46.8%) sought guidance on pregnancy complications (***Annex 7***).

However, participants in the FGDs did not strongly express a consistent inclination to seek PNC regularly, either often or very often. They explained that their engagement with ANC was influenced by their busy schedules, involving household chores and caring for their other children. Moreover, they emphasized the challenge of receiving cooperation from their families, especially their husbands. A lactating woman in an FGD in Mithamoin, Kishoreganj, shared a similar experience. Similarly, PCSBAs also observed that women might not consistently seek ANC due to various factors, including limited awareness of its importance, concerns about cultural beliefs, and lack of family cooperation, all of which contribute to their irregular involvement with ANC.

2.9.1.2 Seeking delivery assistance from PCSBAs

In Char, 85.1% of program participants and 43.1% of non-participants sought aid from PCSBAs during childbirth, while in Haor, 88.6% of program participants and 42.4% of non-participants sought PCSBA support (***Annex 4***). Furthermore, participants from the Char area exhibit a comparatively higher tendency to seek delivery assistance compared to those in the Haor area (60.4% vs. 44.3%).

The FGD findings emphasize the vital role of PCSBAs in handling complications and ensuring safe childbirth outcomes, particularly in emergencies and natural disasters. Similar insights were shared by husbands in Saghata, Gaibandha, recounting experiences during floods when PCSBAs provided crucial assistance during childbirth. Similarly, in an FGD with a husband in Khaliajuri, Netrokona, it emerged that although he wasn't initially part of the SHOUHARDO III Plus program, he ultimately had to turn to a PCSBA for help during a childbirth complication, stating,

> ***"Initially, we relied on a Dhaima for my wife's delivery. However, when complications arose, we consulted with a neighbor and sought help from a PCSBA, who effectively aided in the delivery."***

Insights from PCSBAs and program staff also shed light on the relatively low utilization of delivery care among rural community members not participating in the SHOUHARDO III Plus program. Additionally, a case study underscores the vital role of PCSBA referrals in ensuring positive childbirth outcomes.

Nargis Begum (pseudonym), a 35-year-old resident of Fulchari, Gaibandha, received invaluable support from a PCSBA throughout her pregnancy journey. During the delivery phase, the PCSBA demonstrated keen awareness, promptly facilitating Nargis's transfer to a hospital. Subsequent to the successful delivery of a single baby, the PCSBA suspected the potential presence of twins, leading to a thorough investigation that uncovered a substantial 4.3kg tumor. Through the PCSBA's proactive approach and insistence on timely surgery, not only was the delivery successful, but Nargis Begum's life was also preserved.

This highlights the vital role of PCSBAs in ensuring positive maternal and childbirth outcomes in remote areas, offering crucial emergency care. A program staff member from Baniachang, Sunamganj, noted that financial constraints, distance to healthcare facilities, and cultural factors often deter individuals from hospital deliveries. However, as PCSBAs are part of the community, people feel more comfortable seeking their assistance instead of relying on "Dhaimas" or relatives. They prefer PCSBAs for their reliable and affordable delivery care services.

2.9.1.3 Seeking PNC from PCSBAs

In Char, a notably higher percentage of program participants (83.8%) sought PNC compared to non-participants (41.2%). Similarly, in Haor, program participants (39.2%) had a higher rate of seeking PNC compared to non-participants (24.7%). Overall, there was a higher incidence of seeking PNC from PCSBAs in the Char area (60.4%) compared to the Haor area (32.4%) (***Annex 5***).

However, the previous insights gathered from the FGDs revealed that PNC was considered less significant than ANC among the study participants. A detailed discussion on this matter was previously conducted in a separate section (2.6.3.3), where the study identified factors such as limited awareness, household responsibilities, familial obligations, and the impact of prevailing social and cultural norms as influential in shaping PNC seeking behaviors.

In Saghata, Gaibandha, a program staff member highlighted social barriers impacting PNC preference. One case involved a family dismissing PNC for a lactating woman due to the mother-in-law's view that it was unnecessary post-childbirth. Beneficiaries demonstrated greater interest in MHC services compared to non-beneficiaries, especially in communities with lower PNC prioritization. During FGDs, women, particularly program beneficiaries, exhibited improved awareness of the importance of PNC. A lactating woman in Mithamoin, Kishoreganj, shared her experience,

"During my first childbirth, I faced issues like weakness and insufficient breast milk. Despite consulting a Dhaima, it wasn't effective. However, for my recent delivery, I turned to a PCSBA for advice, and it was beneficial."

In other FGDs, a similar trend was observed, including among certain program participants. Additionally, superstitions like "Atur Ghar" were prevalent[8], where mothers and babies are kept in dark, poorly ventilated rooms post-childbirth to protect against evil spirits. This practice restricts women's mobility and impacts the utilization of institutional PNC services. In this context, A PCSBA from Nageshwai, Kurigram, highlighted the vital role they play in providing PNC to the local community, replacing traditional practitioners like Dhaimas. Their presence in the community ensures easier access to new mothers' homes, overcoming challenges posed by practices like "Atur Ghar." A VDC president from the same upazila also acknowledges the vital role of PCSBAs in remote areas with limited education and healthcare access, contributing to the reduced? prevalence of such superstitions.

2.9.1.3.1 Frequency of receiving PNC from PCSBAs

Around half of the participants (50.8%) received PNC frequently (at least once a month), with a higher percentage in Char (50.8%) than in Haor (31.7%). PNC "Often" (a few times per month) was more common in Haor (25.0%) than in Char (19.7%) (***Figure 8***). Program participants sought PNC more frequently (44.8%) compared to the rural community (31.0%). Over half of the participants (64.5%) sought PNC to monitor the mother and newborn's health, while approximately half (50.4%) received breastfeeding support and advice from PCSBAs (***Annex 8***).

[8] *"Atur Ghar" is a prevailing superstition, which involves keeping mothers and babies in a traditional, dark, and poorly ventilated room after childbirth. This belief stems from the notion that childbirth does not pollute other family members, requiring the new mother to stay in the Atur Ghar for three to seven days to protect the baby from evil spirits. Some also believe that new mothers remain polluted for almost 40 days.*

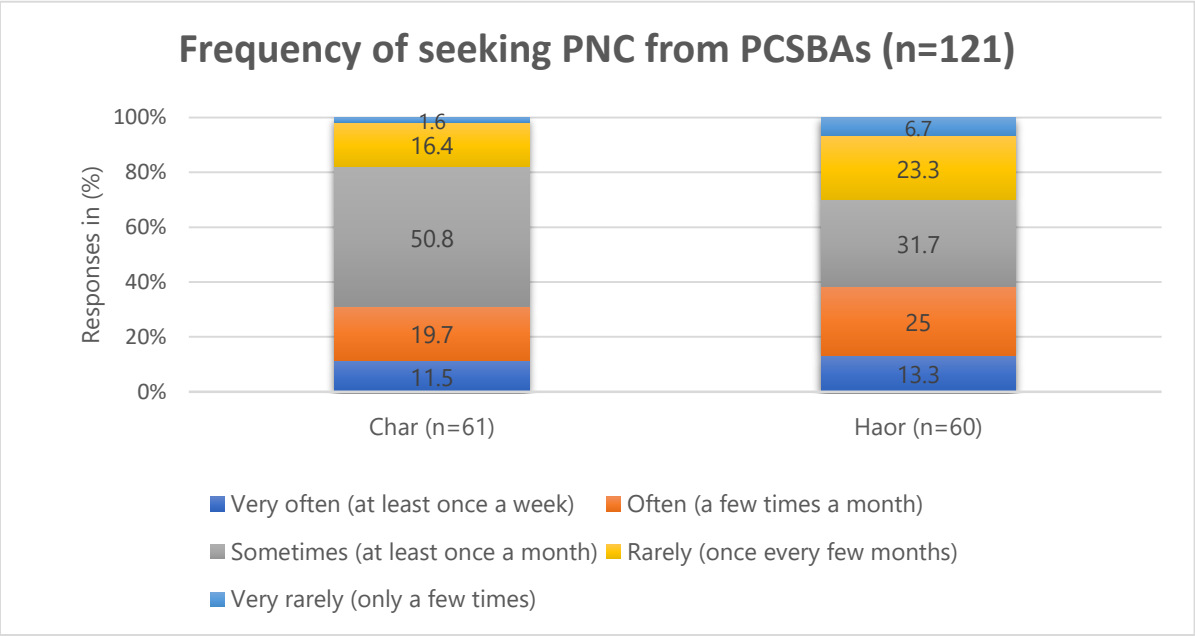

Figure 8: Frequency of seeking PNC from PCSBAs

The qualitative study identified social and cultural norms, household duties, and family non-cooperation as barriers to regular ANC and PNC attendance. These challenges persisted during late pregnancy when women were less involved in chores, but responsibilities increased post-childbirth, affecting PNC attendance. A VDC member from Khaliajuri highlighted the role of family dynamics, especially the mother-in-law, in discouraging PNC seeking, stating,

> ***"Some families think that women should make up for the less work they did at home when they were pregnant. So, after giving birth, women have to go back to doing their household chores right away."***

In Fulchari, Gaibandha, a PCSBA also recognized that while ANC is favored by many in the community, there exists a noticeable gap in understanding, particularly concerning PNC.

2.9.1.4 Perceptions on the service quality of PCSBAs

A large portion of participants who sought assistance from PCSBAs had positive perceptions of the service quality. In both Char and Haor regions, the majority rated the service quality as excellent, with percentages of 59.4% and 47.6%, respectively (***Figure 9***).

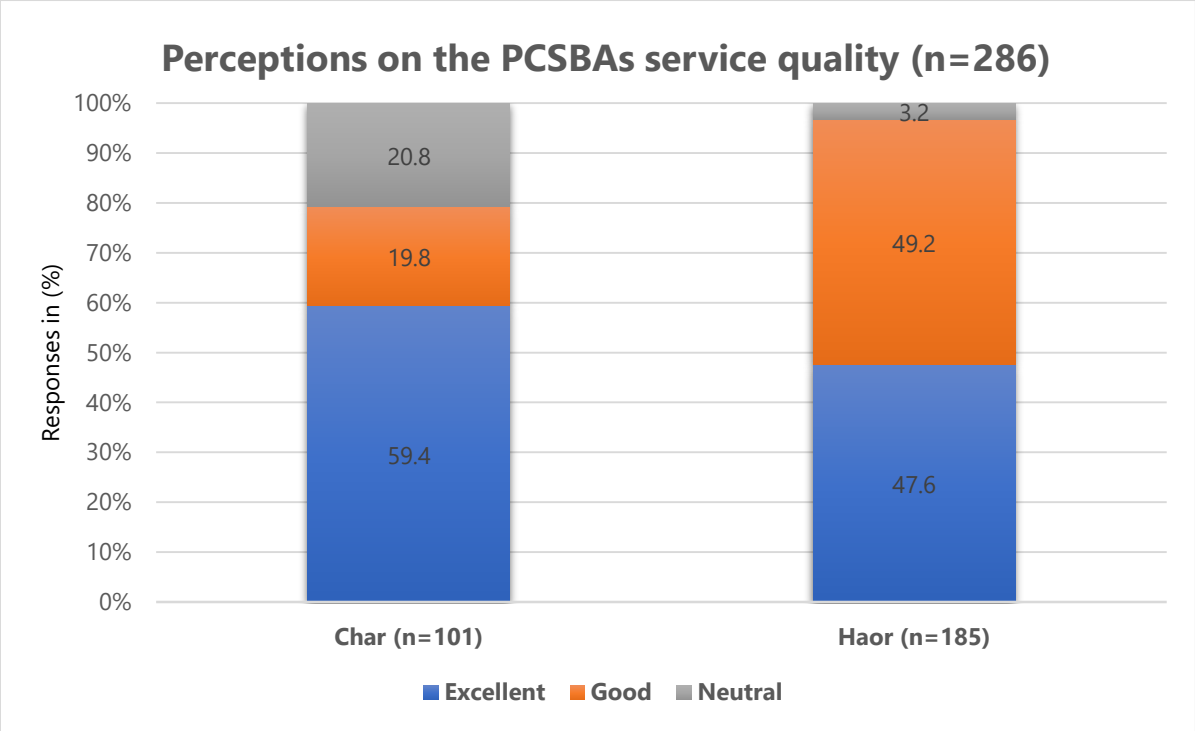

Figure 9: Perceptions on the PCSBAs service quality

FGD findings highlighted instances where MHC services provided by PCSBAs were preferred over institutional care. Factors contributing to this preference include improved accessibility, lower costs, greater comfort, and perceived sincerity in service delivery. In Fulchari, Gaibandha, lactating women emphasized the significant difference compared to Dhaima, highlighting the positive impact of PCSBAs' service quality. As a participant expressed,

> ***"I used to rely on a 'Dhaima' who lacked sufficient skills. For specialized care, requiring to travel far. However, now I can receive quality care from PCSBAs within my community."***

Mothers-in-law in Tahirpur expressed satisfaction with PCSBA services during an FGD, appreciating their doorstep healthcare and responsiveness. Similarly, a VDC representative in Khaliajuri highlighted the quality and sincerity of care provided by PCSBAs. An IDI with the UH&FPO of Mithamoin, Kishoreganj, further emphasized the pivotal role of PCSBAs in providing essential advice and monitoring during maternity. The Civil Surgeon of Sunamganj also acknowledged the vital roles of PCSBAs in ensuring quality healthcare initiatives in HtR areas.

2.9.2 Impact of the PCSBA services on improving MHC

Most participants (93.4%) found PCSBA services improved women's health in their community, with higher satisfaction in the Haor area (98.9% VS. 83.2%). Program participants were found to be more satisfied with the positive impact of PCSBA activities (98.9% VS. 89.7%).

2.9.2.1 Impact on changing the ANC-seeking behaviors

Findings from FGDs underscore the influence of social and cultural superstitions on hindering ANC access, with many participants lacking awareness of its necessity. Additionally, prevailing misconceptions about the nutritional needs of pregnant women were evident, leading to restrictions on food intake. Some believe that consuming less food benefits baby growth, resulting in limitations on foods such as raw vegetables. Myths surrounding foods like milk and pineapple persist, fueled by fears of complications or miscarriage. During an FGD with lactating women in Fulchari, Gaibandha, one participant shared,

> ***"During my first pregnancy, my family discouraged me from consuming milk and beef, thinking it would reduce complications during delivery."***

Interestingly, this woman, though not a program participant, learned about PCSBA services from a neighbor. She mentioned that a PCSBA helped her family understand that good health doesn't mean a complicated pregnancy or delivery; rather, it strengthens them. Other participants in FGDs shared similar experiences, like resisting the consumption of black-colored fish to prevent the child's complexion from darkening, a belief they no longer hold despite its generational transmission.

In Tahirpur, mothers-in-law in an FGD credited PCSBAs for significantly improving MHC and community awareness regarding pregnancy-related understanding. Despite recognizing some beliefs as misconceptions, lingering fears about the unborn child's future persist due to deeply entrenched beliefs. However, due to PCSBAs' efforts, many now dismiss superstitions and recognize the importance of ANC. Additionally, FGD participants noted that PCSBAs not only referred them to local healthcare facilities but also accompanied them on occasions. Some participants acknowledged a shift in their perceptions towards ANC importance and consulting male doctors due to PCSBAs' activities. A program staff member from Sundarganj, Gaibandha, emphasized the significant impact of cultural and religious beliefs on MHC.

2.9.2.2 Impact on ensuring normal safe delivery

The study findings underscore PCSBAs' vital role in addressing delivery challenges and improving MHC services in hard-to-reach areas. It highlights their significant impact on delivery safety,

especially through integration with the government health sector. Despite efforts, grassroots-level healthcare institutions like CCs and UH&FWCs still grapple with shortages of trained staff, hindering their ability to conduct deliveries effectively. This shortage extends to CHCPs and FWVs, impacting delivery services even when staff are available, particularly in high-demand scenarios, as reported by a program staff member from Sundarhanj, Gaibandha.

Additionally, given that CCs and UH&FWCs still lack round-the-clock service delivery, PCSBAs play a crucial role in providing emergency services. In flood-prone areas like Dowarabazar, Habiganj, accessing hospitals during rainstorms becomes challenging, making PCSBAs the primary source of assistance during emergency deliveries. A case study reflects a similar finding.

Sadia Khatun, (pseudonym) a 36-year-old mother from Norsingpur Union, Sunamganj, is dedicated to MHC. With NGO experience and PCSBA training from CARE Bangladesh, she overcame skepticism to become a trusted advocate for safe practices. Over eight years, she has managed various MHC services, including a life-saving intervention during a challenging delivery. Her efforts earned her the government's Joyeeta award, solidifying her status as a reliable healthcare provider in her community.

This case study exemplifies resilience and dedication, bringing about a transformation in MHC within her community. The progression from initial skepticism to earned trust, along with impactful life-saving interventions, highlights the transformative influence of committed PCSBAs.

2.9.2.3 Impact on changing the PNC-seeking behaviors

As previously discussed, local communities hold various biases, myths, and perceptions about PNC. The qualitative study emphasized the substantial influence of PCSBAs' door-to-door approach. Participants in FGDs admitted to having different beliefs about seeking PNC, with some previously considering consulting a doctor after childbirth unnecessary unless it was an emergency, leading to life-threatening situations in some cases. Additionally, during an FGD with lactating women in Khaliajuri upazila, Netrokona district, a participant shared a significant perspective, stating,

"As a mother of four, I faced numerous challenges, resulting in sleep deprivation and increased mental stress. I hesitated to share my struggles due to fear of judgment. However, before my last child was born, a PCSBA Apa provided crucial support during this challenging period."

The study's findings reveal that mental stress among new mothers is not a top priority within rural communities. Traditionally, women seek advice from Dhaimas, elderly women, and religious healers for MHC issues. However, PCSBAs are increasingly recognized as reliable sources for postnatal care, leading to a shift in community perspectives. A PCSBA from Fulchari, Gaibandha, noted the growing awareness of the importance of PNC for maternal and child well-being. Similarly, the UH&FPO in Mithamoin, Kishoreganj, emphasized the positive impact of PCSBAs on program participants and the wider community, particularly in raising awareness about maternal health and providing emergency assistance. Likewise, the DD of the FPO in Gaibandha District echoed these sentiments.

3 Discussion

The study explores MHC practices in HtR areas, highlighting the influence of social, cultural, and economic factors. It discusses shifts in MHC-seeking behaviors, emphasizing increased awareness and utilization of ANC, delivery care, PNC, and essential newborn care among program participants. However, challenges persist due to barriers like insufficient staffing and limited resources at healthcare facilities. PCSBAs emerge as vital in bridging these gaps, offering comprehensive maternity services and improving MHC outcomes. Their integration into the existing healthcare systems contributes to the overall improvement of MHC in HtR regions.

3.1 Unveiling challenges: prejudices, stigmas, and influential factors in MHC practices within HtR areas

The study found that social and cultural practices heavily influence MCH practices in HtR regions. While program interventions have led to changes in ANC seeking behaviors, there's still limited awareness about its importance for MHC outcomes. Poverty, limited education, and gender-based decision-making dynamics were identified as key factors influencing ANC seeking behaviors. The increased utilization of ANC could be attributed to educated women's greater understanding of self-care, autonomy, decision-making authority within households, and awareness of the advantages of recommended ANC services and the risks associated with pregnancy complications as reported by a study (Acharya et al., 2010). Our study also suggests that women with limited education, and from HtR regions are less likely to utilize ANC services. These findings are consistent with a study by Bhoumik et al. (2020) who reported a lower ANC utilization among women, with 22% opting not to receive any ANC during pregnancy.

Additionally, our study found that despite recognizing the importance of ANC, access to healthcare serves as a deterrent due to distance, transportation costs, and logistical challenges. In line with these findings, another study reveals that the distance to healthcare facilities, expenses involved, and restricted transportation options significantly shape MHC seeking behavior, including the utilization of ANC (Chowdhury et al., 2022). Furthermore, our study found religious obstacles exacerbate the constraints on women's mobility and their capacity to access healthcare services, particularly in situations where female doctors are unavailable, as highlighted by another study (Omer et al., 2021).

These factors also influence the frequency of ANC visits and the choice of ANC providers, as highlighted by the study's discovery of limited awareness among individuals in HtR areas regarding the WHO-recommended frequency. Additionally, there is still a reliance on TBAs, especially among program participants. Similar findings have also noted in previous study that women from impoverished and less educated backgrounds in rural regions are less inclined to

seek ANC on the recommended schedule of at least four visits (Talukder et al., 2021). Moreover, evidence suggests that Bangladesh lags considerably in meeting the WHO-recommended four or more ANC visits (BDHS, 2017-18).

When it comes to sources of seeking ANC, in one hand, our study found that program participants exhibit a higher preference for institutional healthcare facilities, aligning with observations from a specific study exploring community-based interventions (Maluka et al., 2023). On the other hand, program non-participants still tend to lean towards informal sources like "Dhaima," as half of the women in rural Bangladesh sought ANC from unskilled healthcare providers (Kamal et al., 2015). Another study also revealed that, within HtR areas, a significant proportion (66.9%) of women opt for ANC from unqualified healthcare providers, such as Dhaimas (Moinuddin et al., 2017). However, our study findings suggested that geographical isolation, socioeconomic status, inadequate healthcare infrastructure, geographical vulnerability, education, cultural norms, and individual preferences collectively shape ANC seeking behaviors; also identified through extensive literature reviews (Moinuddin et al., 2017) (Begum & Hamid, 2023).

This study found a strong preference for home-based ND influenced by the socioeconomic context, which also impacted ANC practices in HtR areas. These factors were examined in another study delving into the rationale behind women's preference for natural delivery at home, attributed to its perceived naturalness and cost-effectiveness, while downplaying the importance of facility births (Perkins et al., 2019). A study also investigated how delivery preferences are often shaped by factors such as illiteracy, poverty, traditional beliefs, limited decision-making authority, natural disasters, restricted access to healthcare facilities, and transportation challenges (Ali et al., 2020).

Religious and social considerations prompt women to opt for home deliveries, including the practice of "Purdah." Additionally, the absence of female doctors in healthcare facilities also influences this decision. Although this study found a notable shift in attitude among program participants. However, in addressing these concerns, SBAs are recognized as trusted and experienced providers in such contexts (Sarker et al., 2016), which is also reflected in this study findings. Additionally, the study findings disclosed the accessibility of C-section deliveries also played a crucial role, while a subsequent study indicate that it influences the prevalence of home deliveries (Karim et al., 2020).

This study findings also indicated that well-preparedness for birth remained uncommon among women, especially those who did not participate in the program. According to a report, only 24.5% of individuals met the criteria, especially in terms of planning for facility delivery and identifying SBAs. Enhanced birth preparedness was strongly associated with educational attainment and wealth status (Moinuddin et al., 2017), consistent with the findings of the study. Program participants predominantly opt for PCSBAs for ND assistance, whereas non-participants still

heavily rely on Dhaimas for support. Despite ongoing program efforts, the prevalence of deliveries assisted by PCSBAs, even within healthcare facilities, remains modest among non-participants in these regions due to entrenched social and religious values, long-lasting trust, availability, and socioeconomic factors, as also discussed in an earlier study (Haque et al., 2020).

This study also revealed a significant disparity in PNC seeking, with fewer participants accessing PNC compared to those seeking ANC. PNC utilization remains notably lower compared to ANC utilization in Bangladesh, as indicated by another study (Biswas et al., 2019). This is even though the postpartum period is acknowledged as a vulnerable time for both new mothers and babies (Moran et al., 2009). The findings of the BDHS survey also indicate that 47.3% of women do not avail themselves of PNC services, while 46.4% fail to access such care for their children from skilled healthcare providers (BDHS, 2017-18). Moreover, in HtR areas, the percentage of PNC seeking remains notably low compared to the national average in Bangladesh (Chowdhury et al., 2022).

This study found that factors hindering PNC were somewhat similar to those affecting ANC. Enhanced utilization of healthcare services for PNC is linked with various factors such as geographic location, educational attainment, and past healthcare experiences. Another study addressed these factors, which impede PNC utilization, including its frequency (Haque et al., 2020). Furthermore, the study indicated a belief that women become impure (napak) or contaminated after childbirth, a notion attributed to the birthing process, as revealed by another study (Blum et al., 2006). Consequently, they observe seclusion following childbirth, confining themselves and their newborns to a single room due to apprehensions of malevolent spiritual influences (Tarafder & Sultan, 2014). This study findings indicated that it also constrained the utilization of PNC services.

This study also revealed that, like ANC, the community had limited understanding and utilization of PNC frequency. Drawing upon data from the DHS report, it also reveals significant differentials in PNC uptake, with only 34.4% of women in hard-to-reach regions receiving PNC within the specified timeframe, contrasting with 42.9% nationally and 54.6% in urban locales. Furthermore, the study uncovers a pronounced gap in PNC for newborns in hard-to-reach areas, where a mere 18.8% receive care within the first two days, compared to 25.5% nationally and 33.7% in urban settings (Misu & Alam, 2023).

This study findings also revealed a continued reliance on Dhaimas and other religious healers for seeking PNC for both mother and child, influenced by similar social and religious factors as ANC and delivery practices. This trend was particularly notable among program non-participants, indicating a heavy dependence on non-trained care providers. This aligns with a report indicating that 28.9% of women in hard-to-reach areas received PNC from a medically trained provider, compared to 37.7% nationally and 49.1% in urban areas (Chowdhury et al., 2022). Women also perceived religious healers as capable of offering effective and economical remedies while

addressing their spiritual and emotional requirements. Consistent with our findings, Haque et al. (2018) discovered that certain women sought the assistance of religious healers for PNC, particularly when encountering complications or challenges such as bleeding, infection, fever, weakness, or jaundice.

A combination of modern and traditional healthcare-seeking behaviors was observed in this study. This variety reflects the intricate health requirements, preferences, and circumstances of rural populations confronting obstacles such as geographical vulnerability, healthcare distance, transportation expenses, and traditional and religious beliefs. These issues have been extensively explored and elucidated in the existing body of literature (Haque et al., 2018). In addition, some communities still preferred TBAs over SBAs while seeking care because of the existing social and cultural beliefs, poor access to health facilities, and financial barriers (Syed et al., 2008).

The program has been instrumental in shaping community perceptions towards MHC, leading to increased awareness and promotion of MHC seeking behaviors. Earlier research emphasizes the beneficial impact of community-based interventions on the utilization of MHC services among those involved in the program (Maluka et al., 2023), which also extends to people not directly participating in the program by imitating others (Nwameme, 2018).

3.2 Exploring shifts: comparative analysis of receiving MHC services

There has been a notable rise in awareness and usage of ANC, especially among program participants. The SHOUHARDO III Plus program significantly influenced community perceptions of ANC, fostering increased awareness and encouraging ANC-seeking behaviors. Both institutional healthcare facilities and informal sources like PCSBAs are favored for ANC, indicating a positive shift towards seeking skilled medical assistance. Our study's results are in line with previous research, showing significant enhancements in dietary intake during pregnancy, adherence to postpartum guidelines, and hygiene practices as a result of the PCSBAs' intervention (Mahmood, 2023). A separate study also suggested that an integrated MHC intervention improved access for marginalized women to receive care from skilled providers throughout pregnancy (Huq et al., 2015).

The trained SBAs provided ANC services to pregnant women in their homes, overcoming barriers such as distance, transportation, and financial constraints. Consistent with the findings of this study, another research underscores the importance of CSBAs in identifying gaps to achieve optimal ANC coverage and quality care, as well as their role in shaping community attitudes (Jo et al., 2019). Moreover, participants in this study show a positive inclination towards seeking the recommended ANC, particularly among program participants. In addition, our study findings reveal that PCSBAs play a vital role in correcting misconceptions about dietary habits during

pregnancy, highlighting the importance of nutritious food choices. Similarly, previous studies highlighted that abstaining from consuming nutritious food during pregnancy could elevate the risks of excessive weight gain and complications during childbirth (Akter, 2008; Collins, 2023).

Similarly, there has been a shift in delivery care-seeking behaviors, with a widespread preference for SBAs during normal deliveries among community members. This study findings highlight the significant impact of PCSBAs in reducing maternal mortality and empowering women in remote Char regions of Bangladesh through safe home birth deliveries. PCSBAs bridge the gap in healthcare services in these areas, where institutional deliveries may not be accessible (CARE, 2024).

In the HtR region, Dhaimas were preferred due to factors such as perceived naturalness, cost-effectiveness, trust, and alignment with religious and cultural beliefs. However, the emergence of PCSBAs has changed this, as SBAs are now recognized as the "single most important factor in preventing maternal deaths" as reported by Islam et. Al. (2014). This is crucial as pregnancy and childbirth often require emergency assistance, particularly in HtR areas lacking in such resources. In this context, as reiterated in this study and emphasized in previous research, the choice of SBAs for safe delivery significantly influences MHC (Islam et al., 2014). This study underscores the vital role of having a PCSBA present during delivery in Bangladesh, where most births occur without skilled assistance. This finding aligns with a prior study, which also highlights the importance of PCSBAs in preventing maternal and newborn morbidity and mortality (Callaghan-Koru et al., 2019).

Regarding PNC, this study explored a significant engagement among program participants, indicating an increased awareness of its importance. The SHOUHARDO III program also focused on PNC services through the trained PCSBAs. Through PNC services, PCSBAs were able to ensure that women received essential postnatal care following childbirth, contributing to improved maternal and neonatal health outcomes in these underserved communities (CARE, 2022). Nevertheless, there remains a comparatively lower utilization of PNC, with cultural, social, and geographical factors playing significant roles. A comprehensive secondary analysis also revealed that ANC is the most commonly provided service by PCSBAs, followed by delivery, with PNC being the least frequently offered service (Callaghan-Koru et al., 2019). Although the percentage of PNC seeking has changed significantly compared to the national average (Chowdhury et al., 2022), especially among program participants.

3.3 Loopholes in the existing healthcare institute settings: barriers to providing MHC services to the community.

This study findings highlight several obstacles to providing quality maternal healthcare services at CCs, including insufficient staffing, restricted service hours, and struggles in maintaining

consistent service provisions. Furthermore, there is a noted lack of necessary arrangements and inadequate staff skills exacerbating the situation. Previous research underscore limited staffing and service hours as significant hurdles in providing quality maternal healthcare services at CCs (South South Galaxy, 2020; Bhuiyan, 2021). Furthermore, a report highlighted persistent challenges in ensuring consistent in-service provisions, attributed to insufficient staff and their willingness (BMSS, 2023).

These observations align with previous research, which consistently emphasized challenges related to the availability and quality of essential medical supplies in healthcare facilities (Riaz et al., 2020). Moreover, the absence of trained female CHCPs for conducting normal deliveries, as highlighted by reports from Bangladesh National Strategy for Maternal Health, exacerbates the situation (BNSMH, 2019-30). Furthermore, a study highlights unsatisfactory quality of ANC and PNC services and inadequate referral rates from grassroots-level providers (Hossain et al., 2022).

Many UH&FWCs offer normal vaginal deliveries, but shortcomings like inadequate resources and training for healthcare providers hinder their ability to provide consistent and emergency maternal healthcare services, as revealed by this study. A study also reported that, in HtR areas, normal deliveries were conducted in 55.6% of the UH&FWCs facilities (Chowdhury et al., 2022). Another study also identified many shortcomings in UHFWCs including not offering 24/7 delivery services, inadequate human resources, with FWVs lacking training in ND and managing obstetric complications, and basic maternal care knowledge (Talukder et al., 2015). These findings parallel the challenges observed in CCs, where shortages of healthcare providers contribute to difficulties in ensuring consistent and emergency services (The Daily Star, 2018).

Our study underscores the limited availability of C-section facilities at sub-district level hospitals. Similar findings were also reported by a study that only 40% health facilities are equipped with caesarean section in hard-to-reach areas; however, no CCs and UH&FWCs offer C-section services (Chowdhury et al., 2022). Moreover, this study found that government healthcare facilities face a critical shortage of personnel, impeding their ability to conduct door-to-door outreach effectively. This type of scarcity is compounded by a lack of skilled field staff, further constraining the department's manpower utilization as reported in a daily newspaper (The Daily Star, 2018). In addition, rural communities face a scarcity of nurses or midwives, with fewer than 0.5 for every 1,000 people (Every Mother Counts, 2024). Furthermore, this study revealed that insufficient infrastructure, equipment, and essential drug supplies pose significant barriers to effectively delivering the MHC services; these findings also align with a previous report (WHO, 2018). As found in our study, challenges related to distance and transportation further contribute to the underutilization of UHCs for maternal healthcare services (Keya et al., 2014).

The government also promotes the establishment of healthcare centers by NGOs and international organizations in remote areas, aiming to enhance access to healthcare services for

people (Banik, 2016). An NGO led network comprising 318 static clinics and 7,814 satellite clinics, catering to 20 million people in regions with limited government healthcare access. Apart from clinic-based services, many NGOs assist female community workers and provide home-based services (Ahmed et al., 2006). Our study indicates that NGOs prioritize community engagement and awareness activities over clinical treatment, although their clinics in hard-to-reach areas significantly impact maternal health. However, they face challenges such as limited resources and bureaucratic hurdles, constraining their service delivery (Chaudhury & Mannan, 2019).

This study findings indicates a reduced reliance on private clinics within the community due to persistent concerns about costly services, substandard treatment, and unethical behavior in the private healthcare sector. These concerns are further supported by a recent report, which highlights discussions on exorbitant fees and questionable practices, particularly in prominent hospitals, following complaints from dissatisfied patients and their families (Bay, 2018). Likewise, a study highlights the prevalent "commission-based marketing mechanisms" in private hospitals clinics, prioritizing profit over patient welfare, which underscore the need for regular government monitoring (TIB, 2018). However, this study underscores persistent challenges in establishing effective maternal service hubs at the grassroots level, citing issues such as staff shortages, limited services, and inadequate arrangements and collaboration hindering their effectiveness. In such situations, PCSBAs could potentially serve as key contributors to maternal healthcare delivery.

3.4 How the PCSBAs play a role in uplifting the healthcare services in HtR areas

This study found PCSBAs are instrumental in uplifting healthcare services in HtR areas through a multifaceted approach that encompasses a wide range of MHC services. These dedicated professionals offer comprehensive maternity services, including ANC, PNC, support for normal deliveries, and Essential Newborn Care, ensuring that pregnant and new mothers receive holistic assistance from prenatal examinations to post-delivery care (CARE, 2021).

This study findings revealed that PCSBAs bridge the gap between communities and healthcare facilities by actively encouraging and providing ANC and PNC through their door-to-door approach, thereby addressing challenges like distance, transport, and financial constraints associated with accessing institutional ANC and PNC services. Consistent with this study findings, a study also found that PCSBAs play a crucial role in changing ANC and PNC-seeking behaviors within communities, dispelling myths and misconceptions through continuous campaign, education, and counseling (Hossain et al., 2020). In the program area, the utilization of PCSBA services during pregnancy and after childbirth is observed among both program participants and non-participants, as revealed by another study findings (Callaghan-Koru et al., 2019). Aligning with this study findings, another study also observed a change in MHC seeking behaviors in the HtR

regions of Bangladesh due to program interventions, resulting in noteworthy shifts in community people's comprehension and utilization (CARE, 2022).

Besides offering ANC and PNC assistance, PCSBAs are integral in identifying and monitoring pregnant women, assisting in the creation of safe birthing plans, collecting community funds to subsidize care for economically disadvantaged households, and facilitating emergency transportation. Corresponding with this study findings, a study underscores the versatile role of PCSBs, which surpasses providing ANC and PNC support to encompass identifying and monitoring pregnant women, aiding in safe birthing plan formulation, and providing emergency support (Hossain et al., 2020).

This study findings indicated that PCSBAs also play a crucial role within existing healthcare systems in childbirth assistance, especially during emergencies and natural disasters, where they ensure safe deliveries and manage complications effectively. Despite challenges like the presence of male CHCPs in some CCs and lack of trained staff in both CCs and UH&FWCs, PCSBAs provide vital support by conducting deliveries and collaborating with healthcare centers. Acknowledging such collaborative efforts in strengthening the local healthcare system, a study suggests engaging the public health system in monitoring, supervision, and support of the PCSBAs. It proposes linking PCSBA reporting to existing government reporting and review systems as a logical step forward (Hossain et al., 2020).

PCSBAs' efforts include guiding patients to appropriate facilities during emergencies and facilitating referrals. This study findings also suggest that the activities of PCSBAs have contributed to reducing maternal and child mortality. Additionally, evidence demonstrates that PCSBAs' emergency assistance significantly facilitates safe deliveries in HtR areas (CARE, 2023). Another study corroborated this narrative of influencing safe deliveries (Kibria et al., 2017). Considering these issues, a study also emphasized the influence of SBAs in HtR areas in addressing delivery challenges stemming from geographical vulnerability, limited access to healthcare, low levels of education, wealth disparities, and similar factors (Nahar et al., 2022).

This study also revealed that PCSBAs are recognized for their quality service delivery, which is often perceived as superior to institutional care due to factors like improved accessibility, affordability, and personalized attention. Despite facing challenges such as social and cultural barriers, PCSBAs continue to make significant strides in improving MHC outcomes in remote areas, earning trust and credibility within their communities through their unwavering dedication and impactful interventions. In line with these findings, a study evaluates the activities of PCSBAs and the care they provide, emphasizing quality with immediate support and minimal expenses (Hossain et al., 2020).

This study revealed that despite the absence of a formalized system, the engagement of PCSBAs in medicine distribution and patient referrals substantially enhances healthcare services, rendering

them indispensable in addressing gaps and enhancing maternal health outcomes. A study also proposes linking PCSBA reporting to existing government reporting and review systems as a logical step forward to enhance overall MHC in HtR areas (Hossain et al., 2020). Moreover, our study observed limited understanding in identifying danger signs, which require EoC. Alarmingly, this was found to be lacking among both community members and local healthcare providers. In this case, as well as in other MHC services, PCSBAs emerge as an important pillar in the healthcare landscape of HtR regions, ensuring every mother and child receives the care they deserve through their commitment and resilience. By employing a door-to-door approach and integrating with government health sectors, PCSBAs improve accessibility and quality of care, serving as vital links between communities and institutional healthcare facilities.

4 Limitations of the study

The study team aimed to minimize the issues or errors by leveraging the assistance of female enumerators and research assistants, who made them familiar with the participants before collecting the data. However, issues within the survey questionnaire design and secondary literature review might have led to biases or missed perspectives in capturing essential information on community healthcare services. The study's findings might have limited generalizability beyond the specific Char and Haor regions of Bangladesh. Given the relatively modest sample size, the results might also not be generalizable; however, the study team anticipates extending the projection of the study findings to a certain extent. Furthermore, the cross-sectional nature of the study introduces several inherent limitations. It overlooks temporal changes and seasonal variations. Selection bias, potential recall bias, and the inability to control confounding variables are other concerns that may affect the generalizability and accuracy of the study findings.

5 Conclusion

In conclusion, the research findings underscore the critical importance of reinvigorating support for the training of PCSBAs by the Government of Bangladesh. By aligning with established program practices and ensuring their seamless integration with the formal health system for effective referrals and quality oversight, we can enhance the healthcare delivery landscape. Furthermore, engaging with religious leaders, men, and mothers-in-law is vital for challenging and overcoming entrenched stereotypes. Supporting Village Development Committees (VDC) in their advocacy efforts with government officials will also play a crucial role in addressing the transportation barriers faced by individuals seeking institutional deliveries. Together, these strategies offer a comprehensive approach to improving health outcomes and access to care within the community**.**

Recommendations

Based on the findings of the study, the team proposes the following recommendations for consideration and discussion:

Reinforcing Support for PCSBA Training: The partnership between PCSBA and local healthcare institutes is vital in addressing key factors influencing maternal health as well as alignment with established program practices and seamless integration with the formal health system. It is recommended to partner with healthcare institutes to improve accessibility by establishing satellite clinics or mobile health units in hard-to-reach areas of Char and Haor. Additionally, targeted training programs should be provided for doctors and midwives in these facilities to enhance emergency obstetric care and safe delivery practices.

Address cultural influences: Despite challenges in acceptance, including cultural preferences and trust issues, PCSBAs have significantly improved women's health indicators in Char and Haor. However, further efforts are needed to engage with religious leaders, men, and mothers-in-law to promoting acceptance and utilization of maternal healthcare services. It is recommended to collaborate with local institutes to promote awareness campaigns and community engagement sessions. These efforts should focus on highlighting the importance of institutional postnatal care (PNC) and dispelling misconceptions about modern medicine. Additionally, encouraging the recruitment and deployment of female doctors or healthcare workers can increase women's comfort and accessibility to healthcare services.

Address affordability and access: Affordability remains a concern for maternal healthcare services. Collaborative efforts between PCSBA, institutes, and local authorities should strive to make these services more financially accessible to the poor and extremely poor segments of the population. Further, to improve emergency response and transportation for maternal healthcare, establishment of emergency transportation services are required. This should include river-based services in Char and road-based services in Haor, developed in collaboration with local institutes to ensure swift access during natural disasters or emergencies. Additionally, advocating for the improvement of damaged roads and reducing transportation costs in Haor is crucial for enhancing healthcare.

Enhance the Importance of Referral Systems and training: PCSBA's integration into government healthcare facilities through referral systems is pivotal in ensuring continuity of care. Training initiatives for PCSBAs and local healthcare providers can improve service quality and emergency response. Furthermore, supporting local healthcare institutes in creating robust information systems for maternal health ensuring widespread awareness of available services, and promoting the utilization of free medications.

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Annex

Annex 1: Percent distribution of study participants educational qualifications

Educational qualification	Responses
Completed primary education (Class 5)	30.7
Up to JSC/equivalent (Class 8)	20.3
Did not complete primary education (Class 1-4)	18.3
Can only sign	17.0
SSC/equivalent (Class 10)	7.0
HSC/Diploma/equivalent (Class 12)	3.3
Did not enroll in any school/learning center	2.0
Masters/Equivalent (Class 17)	1.0

Annex 2: Percent distribution of household occoupation of the participants

Occupation	Responses
Day laborer	36.8
Farmer	19.2
Businessman	12.9
Private employee (private job holder)	9.6
Self-employment	6.3
Fisherman	5.0
Auto driver	4.3
Rickshaw/van puller	3.3
Govt. employee	0.7
Livestock	0.3
Teacher	0.3
Handy craft	0.3
Maid	0.3
Sailor	0.3
Bike driver	0.3

Annex 3: Percent distribution of receiving ANC from PCSBAs

Areas	Program participants (n=150)				Non-participants (n=136)	Total
	Pregnant women	Lactating women with children u-2	Women with children 2-5	Total	Rural community	
n	45	30	75	150	136	286
Char (n=101)	93.3	90.0	72.0	85.1	43.1	62.4
Haor (n=185)	86.7	95.0	84.0	88.6	42.4	66.5

Annex 4: Percent distribution of seeking delivery assistance from PCSBAs

Areas	Program participants (n=150)				Non-participants (n=136)	Total
	Pregnant women	Lactating women with children u-2	Women with children 2-5	Total	Rural community	
n	45	30	75	150	136	286
Char (n=101)	93.3	80.0	68.0	80.4	43.1	60.4
Haor (n=185)	26.7	75.0	62.0	54.6	32.9	44.3

Annex 5: Percent distribution of postnatal care received from PCSBAs

Areas	Program participants (n=150)				Non-participants (n=136)	Total
	Pregnant women	Lactating women with children u-2	Women with children 2-5	Total	Rural community	
n	45	30	75	150	136	286
Char (n=101)	93.3	90.0	68.0	83.8	41.2	60.4
Haor (n=185)	16.7	55.0	46.0	39.2	24.7	32.4

Annex 6: Percent distribution of factors that hinder MHC during disasters

Responses	Char	Haor
n	16	19
Inadequate river-based transportation options	81.3	47.4
Damaged or flooded roads	62.5	68.4
Service interruption due to lack of electricity connection	37.5	31.6
Damage to healthcare facilities buildings	31.3	10.5
Shortages of essential medications and medical supplies	25.0	21.1
Safety risks, such as falling debris or flooding	12.5	0.0
Absence of healthcare providers	12.5	57.9
Inability to provide health care services due to use as a shelter	6.3	10.5
Loss of all communication networks	0.0	5.3

Annex 7: Percent distribution of types of ANC received from PCSBAs

Responses	Program participant				Non-participant	Total
	Pregnant women	Lactating women with children u-2	Women with children 2-5	Total	Rural community	
n	40	28	60	128	58	186
Conducting prenatal check-ups	87.5	85.7	85.0	86.1	91.4	87.6
Providing nutritional advice	72.5	71.4	66.7	70.2	62.1	67.2
Offering advice on pregnancy complications	45.0	64.3	38.3	49.2	48.3	46.8
Monitoring fetal growth and development	0.0	0.0	0.7	0.2	0.0	0.5

Annex 8: Percent distribution of types of PNC received from PCSBAs

Responses	Program participants				Non-participants	Total
	Pregnant women	Lactating women with children u-2	Women with children 2-5	Total	Rural community	
n	14	12	22	48	30	78
Providing postpartum care for mothers	73.7	60.0	55.0	62.9	71.4	64.5
Monitoring the health of the newborn	63.2	60.0	50.0	57.7	50.0	53.7
Offering breastfeeding support and advice	52.6	50.0	47.5	50.0	52.4	50.4
Conducting postpartum family planning counselling	73.7	50.0	42.5	55.4	40.5	47.9

Annex 9: Percent distribution of reasons for not seeking PNC from institutional care

Responses	Program participants (n=35)				Non-participants (n=17)	Total
	Pregnant women	Lactating women with children u-2	Women with children 2-5	Total	Rural community	
n	5	11	19	35	17	52
Institutional healthcare facilities are located far away	40.0	36.4	57.9	44.8	52.9	50.0
Availability during emergencies	20.0	27.3	63.2	36.8	41.2	44.2
Female doctors are not available	20.0	9.1	15.8	15.0	23.5	17.3
To maintain "Purdah"	20.0	18.2	0.0	12.7	29.4	15.4
Family doesn't permit to seek assistance from male doctors	20.0	9.1	15.8	15.0	17.6	15.4
Cannot afford the cost of the services	20.0	18.2	5.3	14.5	17.6	13.5
Familiarity with the local healthcare providers (Traditional/religious)	20.0	9.1	21.1	16.7	5.9	13.5
Modern medicine isn't reliable	20.0	9.1	0.0	9.7	5.9	5.8
Traditional medicine relies on natural remedies and herbs	20.0	9.1	0.0	9.7	5.9	5.8
Traditional/religious healers are more dependable	0.0	0.0	5.3	1.8	5.9	3.8

Annex 10: Qualitative checklist for the study

Topics	Checklists
Introduction	1. Welcome and introduction of the facilitator and note-taker.
	2. Explanation of the purpose of the interview or discussion.
	3. Introduction of participants.
Social and cultural factors regarding maternal health care	4. Influence of traditional practices, beliefs, and gender on maternal health care decisions.
	5. Perception of the importance of maternal health services within local communities.
	6. Factors affecting the acceptance of maternal health services based on income level and educational qualification.
Access to maternal health care	7. Challenges faced by community members in accessing maternal health care services, including geographic barriers and transportation issues.

Topics	Checklists
	8. Availability of safe pregnancy, antenatal, delivery, and postnatal services at local healthcare facilities.
	9. Common delivery methods used by local people and availability of skilled personnel and supplies for safe delivery.
Community experiences and perspectives	10. Quality of maternal health services provided to the poor and very poor, and areas needing improvement.
	11. Barriers faced by marginalized communities in accessing maternal health services, and mechanisms for improving access.
	12. Instances of discrimination faced by women seeking maternal health care and efforts to reduce such discrimination.
	13. Impact of maternal health care costs on marginalized communities and availability of financial assistance or subsidy programs.
Role of Community-Based Skilled Birth Attendants (PCSBAs)	14. Awareness of PCSBA activities, quality of service provided, and impacts on maternal health services.
	15. Collaboration between PCSBAs and local healthcare organizations, including communication and referral systems.

**This checklist demonstrates a general framework. Different checklists were used for different stakeholders during the fieldwork.*