Network linkages between TBAs and other providers having a role in childbirth care in rural Bangladesh

by

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Abstract

Introduction: Though the number of deliveries by skilled birth attendants and at facilities has increased in Bangladesh, still many deliveries are occurring at home. More than half of all deliveries in rural areas of Bangladesh are assisted by traditional birth attendants (TBAs). Despite their critical role in maternal health, the network linkages between TBAs and other providers engaged in childbirth care in rural Bangladesh has not been well explored.

***Objectives*:** The aim of this study was to explore the coordination or communication between TBAs and other health care workers providing health care services to the women during childbirth or after delivery in rural Bangladesh.

Methods: A qualitative approach was used to explore the coordination and communication between TBAs and other providers of health care services to the women during childbirth or after delivery in rural Bangladesh. Seventeen practicing TBAs, 9 "village doctors", 8 obstetricians and 3 transport people were purposefully selected from 4 upazilas (sub-districts), in the districts of Jashore and Kushtia. Data were collected through semi-structured in-depth, individual interviews. They were conducted in Bangla and then translated and transcribed into English and analyzed.

***Results*:** Themes emerging from the interviews included TBA's work as part of a childbirth care network, quality of care and patient safety, working relationships between TBA and village doctors, and relationship of TBA with obstetricians.

***Conclusion*:** This study explored the critical role of TBAs and other providers of their network involved in maternal health service delivery in rural areas of Bangladesh. TBAs are working in coordination with other providers. A strong referral network including TBAs will better serve mothers and newborns in rural Bangladesh.

Preface

This thesis is an original work completed by Mridul Kanti Ghosh and supervised by Dr Stephen Hodgins. Mridul undertook the conceptualization and design of the project with support and guidance from Dr Stephen Hodgins. The supervisory committee consisted of Professor Stephanie Yanow, Professor Zubia Mumtaz, Professor Rajshree Jha, and Dr Stephen Hodgins.

The fieldwork for this thesis was conducted in Bangladesh. Data collection occurred in four upazilas of Jashore and Kushtia District of Bangladesh.

The research project, of which this thesis is a part, received research ethics approval from the University of Alberta Research Ethics Board, Project Name “Informal networks of health care during and after delivery in rural Bangladesh: perspectives from the TBAs”, No. Pro00102186, September 6, 2022.

Dedication

For the memory of my beloved Father, Rabindranath Ghosh, whose thoughts, and values have shaped my life. Rest well, Bapi.

For my loving Mother, Annapurna Ghosh, for being the source of inspiration and strength when I thought of giving up and providing moral, spiritual, and emotional support.

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I am grateful to all the Bangladeshis who volunteered their time and life experiences as research participants. The health managers and health workers of the study area deserve gratitude for helping with participant identification. I am grateful to my lovely wife Pooja, for her unwavering support, prayers, and encouragement. Thank you for being such a wonderful source of strength and inspiration.

Finally, I am grateful to my friends and family for all their support.

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List of Symbols

LMICs	Low- and Middle-Income Countries
MMR	Maternal Mortality Ratio
SBA	Skilled Birth Attendant
TBA	Traditional Birth Attendant
WHO	World Health Organization

Glossary of Terms

Traditional Birth Attendant (TBA)	a person who assists a mother during childbirth and who initially acquired her skills by delivering babies herself or through apprenticeship to other TBAs (according to WHO)
Obstetrician	An obstetrician is a physician that specializes in delivering babies and caring for people during pregnancy and after they give birth. They treat medical conditions unique to pregnancy and perform surgeries related to labor and delivery.
Village doctors in Bangladesh	Village doctors are informal healthcare providers and / or drug vendors practicing allopathic medicine especially in rural areas in Bangladesh.

Introduction

Despite efforts and advocacy to improve access to maternal health care services, it remains a major challenge in global health. According to a recent WHO estimate, 287,000 mothers died during pregnancy, delivery, and the postnatal period around the world in 2020 and the estimated Maternal Mortality Ratio (MMR) was 223 per 100,000 live births.[1] Two major indicators of target 5A during the Millennium Development Goals era were MMR and the proportion of births attended by appropriately trained health professionals, "skilled birth attendants" (SBA). These two indicators have been retained in the Sustainable Development Goals, under target 3. The targets to be achieved by 2030 are <70 per 100,000 live births and all births to be attended by SBAs. To reach this SDG target for MMR, there would need to be a threefold decrease from current levels.

Women around the world are dying due to complications of pregnancy and childbirth which are preventable; approximately 87% occur in Sub-Saharan Africa and Southern Asia. The contribution of South- and South-East Asia is around 16% of global maternal deaths.[1] Globally, about 1 in every 4 births still occur outside the health facility—most attended by TBAs.[2] According to WHO, a traditional birth attendant (TBA) is defined as "a person who assists a mother during childbirth and who initially acquired her skills by delivering babies herself or through apprenticeship to other TBAs."

Over the past 2 decades there has been considerable emphasis in global health on ensuring the presence of SBAs. Before that time, TBAs were the main providers of antenatal, childbirth, and postnatal care. While the number of deliveries in the formal health care system has increased, home deliveries remain very common in some regions and most of these deliveries are assisted by TBAs. Although TBAs lack formal training and recognition by medical authorities, the majority of

births in some countries are attended by TBAs.[3] Most TBA-attended deliveries are in rural areas, but such deliveries are also common among the urban poor in some countries.

Over the period 2014-2019, 81% of births globally were attended by SBAs. However, the proportions were lower in Sub-Saharan Africa, 60%, and South Asia, 77%. Proper care and the presence of a skilled birth attendant during pregnancy, childbirth and postnatal period can save the lives of millions of mothers and newborns.[4]

In 2020, World Bank estimated the MMR in Bangladesh as 123 per 100,000 live births (modeled estimate).[5] According to Bangladesh Maternal Mortality and Health Care Survey 2016, 69% of maternal deaths occur during the postpartum period i.e. up to 42 days after the birth and 7% during delivery. So, more than three fourths of maternal deaths in Bangladesh happen during and after delivery. Thus, the importance of proper care during and after delivery.

According to the recent Bangladesh Demographic and Health Survey [6], almost half of deliveries occurs at home. More than half (50.2%) are attended by TBAs. Only 7% of mothers and newborns having home delivery receive postnatal care within 2 days of delivery from a medically trained provider.

Another member of the informal health care system in Bangladesh is the “village doctor”. For this study, village doctors were defined as informal i.e. “uncredentialed healthcare providers and/or drug vendors practicing allopathic medicine especially in the rural areas of Bangladesh. We focused on those village doctors whose role includes assisting TBAs during childbirth. Village doctors practicing traditional medicines or homeopathy were not included in the study.

A study from Tanzania (Hussein et al., 2005)[7] revealed that while dealing with obstetrics complications, TBAs seek help from other TBAs and health workers in their locality or refer women with complications to the health facility. These informal networks help TBAs to save the lives of mothers and children. Even if a TBA recognizes an obstetrical complication this does not guarantee that a referral to a formal health facility will occur. Working relationships between TBAs and other health care workers and emergency transportation arrangements are also important.[8]

A referral network developed by the Manoshi project in urban Bangladesh engaged community health workers who helped in securing access to emergency obstetric care in referral health facilities [27] (Kearns et al., 2015). As reported in a review by van der Werf et al. [9], studies from China, Kenya, Somalia, and Sierra Leone have identified strategies used for engaging TBAs as liaisons and supporters to laboring women; these approaches were found to improve outcomes.

In a review of TBAs by Garces et al, [3] the authors report that it is not uncommon for them to act as a link between the community and formal health system. In a qualitative study from China,[29] (Jiang et al., 2015) reported that TBAs successfully acted as the link between women and the health system. They promoted perinatal care and institution-based delivery by acting at the lowest level of the rural health network. Government and non-governmental organizations were also engaged in this network. A study by Isenalumbe et al.[30] reported that TBAs in Bendel State, Nigeria, were integrated with formal health care, to support pregnant mothers to deliver in their own homes with assistance from a trained midwife and to refer those with risks or complications to health facilities for delivery.

A study in Nepal[11] found that even when TBAs do recommend referral to a health facility for managing complications, pregnant mothers are not always able to go to the recommended facilities, due to delays in decision-making and lack of affordable transport. Timely recognition of complications and appropriate referral by TBAs has certainly saved lives. Some studies in Asia, have documented TBAs acting as important decision makers for referrals and transportation arrangements.[12] TBAs and community health workers have been engaged to act as liaison between the community and the health system in some settings [China, Kenya, Somalia, and Sierra Leone].[9]

In Somaliland (Somalia) and Sierra Leone[31], a project was implemented that included training of TBAs as "health promoters" and "birth companions" and linked them with specific maternal-child health centers to facilitate referral and increase delivery by SBAs. In Lagos State, Nigeria, another initiative (with minimal external financial input) linked TBAs in a network with the formal health system and contributed to reducing preventable maternal and neonatal deaths.[13]

A case study from Nepal documented the establishment of a network of care addressing reproductive health needs of women in remote areas of the country, which was implemented through a collaboration between local-level health and government workers.[14]

A study in Kenya[15] documented that TBAs managed cases of retained placenta using potentially harmful practices like manual extraction, uterine massage, inducing vomiting by putting beads down the mother's throat and applying herbal products (lantana leaves). However, they also reported that TBAs referred mothers to health facilities for obstetrical emergencies including bleeding, obstructed labor, prolonged labor, retained placenta and seizures. The quality of their

relationships with providers at local health facilities was a factor facilitating referral for complications, indicating the presence of an informal network of care comprised of TBAs and the local health facility in this setting.

Various studies have documented positive impact of referral networks for childbirth care, characterized by a collaborative relationship between TBAs and skilled birth attendants. Two studies from Indonesia[16,17] found positive changes resulting from deployment of village midwives. Women in the program area had more antenatal visits and were more likely to deliver in a health facility or with an SBA. Fauveau et al.[18] also demonstrated the positive impact of engaging villages midwives which resulted in reduced maternal mortality in program villages. While evaluating a community-based strategy for improving maternal health services in Eastern Burma, Mullany et al.[19] reported that the 3-tier network of providers (TBAs, Health Workers and Maternal health Workers) contributed to a significant increase in delivery by SBAs.

In the relevant published literature, authors address TBA practices during and after delivery, the impact of TBA training, the capacity of TBAs in recognizing complications during and after delivery. But there has been little work published to date exploring the network linkages between TBAs and other providers responsible for childbirth care in rural Bangladesh. Exploration of the coordination and communication between TBAs and other healthcare providers may help program managers in better planning of interventions for reducing maternal and neonatal deaths in such settings. This study was designed to contribute to better understanding of the network linkages between TBAs and other providers serving in childbirth care in rural Bangladesh.

Study Objectives

To explore coordination or communication between TBAs and other health care workers providing health care services to the women during childbirth or after delivery in rural Bangladesh.

Research Methods

Study Design

This study used an exploratory qualitative design to address the research objective. Data collection method was in-depth individual interviews with TBAs, village doctors, obstetricians, and transport people in 2 different districts in different parts of Bangladesh, focusing on TBAs practicing in rural areas. These interviews explored the coordination or communication between TBAs and other health care workers providing health care services to the women during childbirth or after delivery in rural Bangladesh. This process afforded a deeper understanding of emerging themes. After formulating the research objectives, main concepts relevant to the research objectives were identified. Then a set of codes that reflect the concepts were developed. A codebook was developed which guided the crafting of the interview guides (Interview guides are given in Appendices). The codebook is given below:

Code	Definition	Example
Engagement with mothers	Any situation when TBAs get first contact with pregnant women	"I get called by the family members when the mother complains labor pain"
Complications/risk factors	Any complication/ risk factor observed by the TBAs	"The mother was having convulsions"
Management of complications	Any process followed by TBAs to manage the complications to pregnant women	"I referred the mother to hospital without taking any further risk"
Seeking Help	Any situation when TBAs seek help from other health care providers	"I called the obstetrician to take her advice"

Referral decision	Any reason for referring a case to health facility by TBAs	"Profuse bleeding is a danger sign and mother need to be sent to hospital"
Referral Facility/ Provider	Any reason for choosing a specific facility/provider for referral by TBAs	"I refer to this hospital because I know the manager over there"
Transportation	How the pregnant mothers are taken to referral facility and how it is decided	"I called the ambulance driver and requested to come as soon as possible"
Inter Provider Relationship	Relationship between TBAs and other health care providers	"I get cases from village doctors"
Functionality of TBAs Network	Whether TBAs network is functional or not	"I call the obstetrician before I refer the case to her clinic"

Study Setting

This study was carried out in the districts of Jashore and Kushtia, in different parts of the country. According to the Bangladesh Population and Housing Census 2011[24], the population of Jashore is 88% Muslim and 12% Hindu; in Kushtia, the population is 97% Muslim, and 3% Hindu. In both Jashore and Kushtia, 2 subdistricts (upazilas) were purposively selected, the district headquarters upazila and a distant upazila (Sarsha upazila in Jashore and Daulatpur upazila in Kushtia). As this study explored the coordination or communication between TBAs and other health care workers providing health care services to the women during childbirth or after delivery in rural Bangladesh, selection of the central upazila and a distant upazila gave a more comprehensive, representative picture of the situation across each district. Some previous studies on TBAs [28] (Sibley et al., 2012) have documented that they are more numerous in rural areas and in areas with fewer health care facilities.

Study Population and Sampling Method

Sample

Participants were recruited purposefully. Upazila health managers and health workers assisted the researcher in identifying service providers practicing in their upazilas. In each of the 4 study upazilas, those interviewed included: 4-5 TBAs, 2-3 "village doctors", 2 obstetricians and 1 transport person. The following inclusion criteria were used for recruiting study participants.

Inclusion Criteria

For TBAs:

a) >15 years childbirth care experience

b) attended ≥10 births in the last year.

For village doctors:

a) >10 years' experience assisting TBAs at childbirth.

b) attended ≥five births in the last year.

c) priority given to those also providing at least some antenatal services.

For obstetricians:

a) providing obstetrics services for > five years.

b) has had ≥five referrals from TBAs in the last year.

For transport people:

a) providing transportation services for > five years.

b) has had at least one referral from TBAs in the last year.

Data Generating Strategies

Semi-structured individual interviews were conducted with selected TBAs, village doctors, and obstetricians using provider-specific interview guides. The researcher was not known to any of the participants. Prior to data collection, the researcher obtained verbal authorization from the relevant local health managers. The interview guide was pretested before being used for interviews. Appointments were scheduled with individuals for the interview. Information on the study was shared with participants using an informed verbal consent form prior to the interview and their verbal consent was obtained. The interview guide included questions inquiring about identification and management of complications, referral decisions, communication and coordination between TBAs and other health workers engaged in the care of women during and after delivery in rural areas of Bangladesh. Semi-structured interviews were appropriate for this study as detailed insights were required from the participants. Interviews were done face-to-face with participants at a time and place convenient to them. All interviews were audio-recorded with prior permission of the participants. Interviews were conducted in Bangla (local language) which were simultaneously translated and transcribed into English by the investigator. To check for accuracy, 6 of the transcripts were back translated into Bangla. The investigator compared the Bangla and English versions for differences and similarities while listening to the original interview recordings. The interviews lasted 40 to 45 minutes.

Ethical Issues

Ethical approval of the study was obtained from the Research Ethics Board (REB) of the University of Alberta. Verbal authorization from the local health authorities (upazila health managers) of Bangladesh was taken prior to the data collection process. Informed verbal consent was obtained from all participants prior to the interview, which was documented via audio recording, with permission from the participants. Privacy and confidentiality were strictly maintained: by conducting the interviews in settings where intrusion by others would be controlled and only the researcher would have access to the data. Anonymity of the data was ensured by not documenting the full name and personal identifying information of participants.

The information provided by the participants was used to inform the investigator's thesis work, relevant research articles and presentations only. There is no risk of a breach of confidentiality. The investigator did not link the participant's name to transcript material or in the text of the thesis or any other publications.

Participant's de-identified information was not used or shared with other researchers. After the study is done, data will be securely stored in a password protected secured online drive for a minimum of 5 years.

Data management and analysis

Audio-recorded interviews (taken in Bangla) were simultaneously translated and transcribed into English. After transcription of interview data, it was checked repeatedly against the audio-recordings for accuracy. During the transcription phase, anonymization of the participants' identities was done. Prior to the data collection process, main concepts relevant to the research objectives were identified and a set of codes that reflect the concepts were developed. A codebook was created (codebook is given in "Study Design" Section) which guided the development of the interview guides (Interview guides are given in Appendices). Rereading of the transcripts was done several times to be familiarized with the data and to identify the pattern. The pre-defined codes (from codebook) were applied to the interview data by highlighting and assigning codes to relevant segments of the text. These codes were explored and compared to identify similarities and differences and to identify exclusive findings. Further clarification of similar themes was done with the help of literature reviews. Codes were then clustered into categories of subthemes and finally were grouped into emerging themes. While reviewing the transcripts to find additional supporting evidence and to understand the contexts of the codes, these themes were consulted. To come up with suitable themes, themes were renamed and discarded several times. Until the data provided a meaningful interpretation, the codes were grouped into suitable themes and were revisited multiple times. Finally, the codes were summarized in narratives and appropriate verbatim quotes from the participants were assigned under the relevant themes.

Results

Four (4) themes emerged from the data analysis regarding the coordination or communication between TBAs and other health care providers providing health care services to the women during childbirth or after delivery in rural Bangladesh:

(i) Characteristics of care network of TBA,

(ii) Quality of care and patient safety,

(iii) Working relationships between TBA and village doctors,

(iv) Relationship of TBA with Obstetricians

We also described the participant profile.

Participant Profile:

In Bangladesh, TBAs usually serve without any formal training. They mostly earned this skill by shadowing other TBAs who were their relatives. They are female and follow local customs and practices. TBAs charge modest fees for their services.

The village doctors in Bangladesh are another cadre of the informal healthcare network who are not formally trained and are highly numerous in rural areas. Many own drug shops or have a working relationship with drug shops in the local market.

Obstetricians in Bangladesh undergo rigorous medical education and training in obstetrics and gynecology. They specialize in the care of pregnant women, including prenatal care, childbirth, and postpartum care. They work in govt. hospitals, private clinics, and healthcare facilities across the country.

The ambulance services in Bangladesh are engaged in transporting patients to and from the facilities. These transport people provide emergency services for the pregnant women as well. The main advantage of this service is their availability whenever there is a need.

37 in-depth individual interviews were conducted and have been included in the analysis, 17 with TBAs, 9 with village doctors, 8 with obstetricians, and 3 with transport/ambulance people engaged for emergency referral to healthcare facilities in rural Bangladesh.

All the TBAs and obstetricians were female (typical for Bangladesh) whereas all the village doctors and transport people were male. Most of the TBAs and village doctors were over 45 years old. Most of the obstetricians interviewed were over 40; all had worked in this role for over 5 years. All the transport people were under 30 years of age. Most of the participants (36 out of 37) were Muslims. More than half of the TBAs (13 out of 17) had completed 6 to 8 years of primary education and the remainder, 1 to 5 years. Level of education among the village doctors was generally higher than the TBAs. Almost all the village doctors (8 out of 9) had passed the secondary school certificate exam and learned the skills by shadowing (as an assistant) a licensed medical practitioner or by working in large drug shops. None of the ambulance/transport people had received formal education.

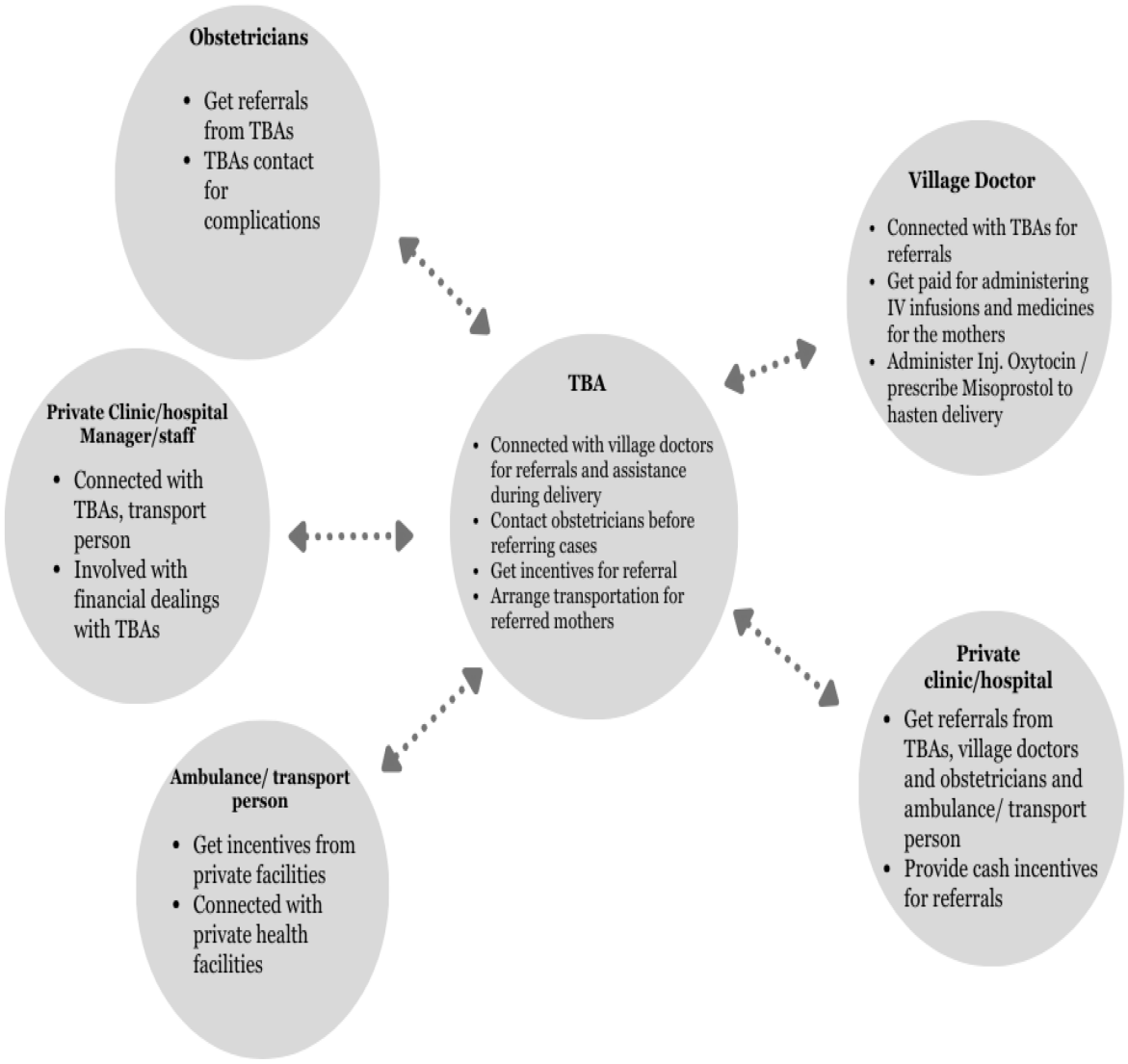

Figure 1: TBA Care Network Map

TBA's work as part of a childbirth care network

In rural Bangladesh, TBAs are not serving alone. They have connections with the village doctors who assist them in managing pregnant women. TBAs are well acquainted with the managers and staff of private clinics/hospitals of their areas. Practicing obstetricians are also within TBAs network to whom they refer mothers with high risk or with complications.

Though TBAs assist home deliveries, there are many occasions when they decide to refer pregnant mothers having complications to health facilities or provider of their network. Convulsions, hemorrhage (PPH mostly), and retained placenta are some of the complications prompting TBAs to refer pregnant mothers. Usually, TBAs try to manage pregnant mothers on their own but refer when they face difficulties.

> *"Excess bleeding after delivery is a red signal for me to refer a mother to hospital." (TBA, 47 years old, 20 years in service)*

If the TBAs are not confident and if the woman's situation started getting worse, they would ask the family members to take the pregnant woman to a health facility. Whenever TBAs decide to refer pregnant mothers to hospital/clinic, they always consult with the family of pregnant mothers. TBAs generally have served for a long period of time in the community. So, most of the time their referral decisions are respected by the family members. TBAs also consult with their accompanying village doctors while deciding the referrals. Sometimes TBAs also contact the obstetricians with whom they are acquainted when they are struggling with the management of a pregnant mother.

> *"I discuss with the family of that mother, describing the situation and the necessity of referring to a clinic or hospital." (TBA, 51 years old, 23 years in service)*

In case of referral facilities, TBAs prioritize to take the pregnant women to those private clinics/hospitals where they have some prior connections either with the manager or staff. TBAs also prefer to take the pregnant women to those private clinics where there are obstetricians they are already acquainted with. Past good experience and an expectation of high quality care (based on past experience) are the two major factors mentioned by the TBAs for choosing the referral facilities. Having prior connection with the manager or staff would help the TBAs in ensuring the availability of a doctor or operation theater in case an operation is needed.

> *"But I suggest to (family members, specific) private clinics or hospitals where I want to refer the mother for better care. I try to take the mother to that clinic or hospital because of my confidence in them. And as I have good contacts with them, I can ensure that the mother gets the best care they can provide." (TBA, 46 years old, 22 years in service)*

> *"If you ask about the TBAs and village doctors, then I would say that mainly they have contact/ communication with the clinic manager/staff." (obstetrician, 10 years of service as a specialist doctor)*

Receiving commissions from the private clinics/hospitals is also an important factor acknowledged by TBAs for choosing a referral facility. Most TBAs are not financially well off. They expect a good incentive for their service. But TBAs do not receive substantial incentives for the service from the family of pregnant mothers. So, any additional commission from the private clinic/hospital can be a factor influencing them in referring the pregnant women to that facility.

> *"Most of the time, we are not paid that much by the mother's family. But if we refer to the private clinic or hospital, then we get some money from them." (TBA, 49 years old, 26 years in service)*

In rural Bangladesh, there is lack of awareness among families and most of the time they do make any prior arrangements for transport for the pregnant mother to be taken to the health facilities. Rather, the families prefer home deliveries and rely on TBAs. TBAs serve pregnant mothers with utmost sincerity, and they do care about the mothers. These TBAs have transport people they are acquainted with, who they draw on when they find a pregnant mother difficult to manage at home and need referral and transportation to the health facility. TBAs also accompany the pregnant mothers to the referral facility (preferably TBA's connection) to support them and to ensure the best available care.

> *"Often, the woman's family does not have any arrangement for transporting the mother to the hospital for complications. I use my connections with the transport providers at that time to ensure a quick referral to a hospital/clinic." (TBA, 45 years old, 17 years in service)*

TBAs are an important player of the informal network of health care service delivery for pregnant women in rural Bangladesh and they are not new to the community. Along with the village doctors who assist the TBAs in managing pregnant women during delivery and who refer cases to TBAs, there are other health care providers in the community. TBAs are in contact with all of these health care providers (government health workers, family planning workers and NGO workers) and report a relationship of mutual respect.

> *"I know most of the village doctors, government health workers, family planning workers and NGO workers who are providing services to pregnant women, at childbirth or after delivery. I have contact with most of them." (TBA, 47 years old, 20 years in service)*

The whole care network of TBAs is built on mutual benefits. TBAs get referrals from village doctors and engage them (village doctors) while managing a pregnant mother. Thus, the village doctor is also getting financial benefits by charging for the services of administering injections and intravenous infusions (when needed) and selling medicines to the pregnant mothers. When a referral is needed for a complicated case, TBAs refer the pregnant mother to those private clinics where they have prior contacts and have chances of receiving commissions for referring cases. These clinics are also getting revenue as TBAs are referring complicated cases that need operations and sometimes long hospital stays. TBAs display their commitment to pregnant mothers by arranging transportation for those in need of referral. Engaging transportation for these referrals is also beneficial for those transport drivers as they can also expect to receive incentives from those clinics, along with the charges to the patient's family for transport.

Quality of care and patient safety

TBAs do not have any formal medical qualifications. But they are serving in rural Bangladesh and have been assisting pregnant mothers for a long time. So, it may not be realistic to expect TBAs to adhere to the standards one might expect of a credentialed medical practitioner. Likewise for village doctors. These workers also lack any formal medical qualifications. Whatever they do is based on what they have learned from their practical experience of working in a physician's chamber or in a large medicine shop. TBAs engage the village doctors to administer injections of oxytocin or misoprostol tablets to pregnant women to hasten delivery. This is an inappropriate and unsafe practice. None of the TBAs and village doctors interviewed are using oxytocin injections or misoprostol tablets according to evidence-based recommendations. This practice appears to be common and illustrates that there are remaining serious safety issues and questions of quality of care in rural Bangladesh.

"Many of the TBAs (with whom I'm connected) contact me to give oxytocin injection to hasten labor." (village doctor, 15 years of service)

Another important safety issue for the TBA service is delays in referral. TBAs are sought to conduct home deliveries by the families of pregnant mothers who are not interested in having the mothers deliver in health facilities. Most of the time, TBAs try to conduct the deliveries at home. They only make a decision to refer when they are struggling with a complication. Then comes the problem with arranging transportation. Generally, families who engage TBAs do not arrange transport. So, when the TBA decides to send the pregnant mother to the health facility, often delays happen in arranging transportation and getting the mother to hospital/clinic. These last-minute referrals can risk the lives of mothers and neonates.

Working relationships between TBA and village doctors

TBAs are not competent in administering injections and intravenous infusions; the village doctors associated with TBAs do, however, have these competencies. Moreover, most village doctors own medicine shops in the local market and are a known face in the community; their presence at birth can give the TBAs some additional level of confidence and sometimes protection.

The development of a mutually integrated referral system facilitates access to care at birth. TBAs and village doctors share a strong working relationship while serving the pregnant mothers in rural Bangladesh. It is a mutually beneficial relationship where both TBAs and village doctors refer cases to each other. TBAs generally have three to four village doctors in their network to draw on, whenever they may be needed. TBAs are mostly trained through their acquaintances through assisting deliveries with other TBAs. But they are not expert in administering injections or IV infusions and prescribing drugs. TBAs receive help of the village doctors in speeding up

deliveries using oxytocin injections or misoprostol tablets. TBAs decide to refer a pregnant mother to hospital or private clinic after careful consultation with the village doctor who may be present with them at a delivery. TBAs seek help from village doctors whenever they find difficulties in managing a pregnant mother with complications. Both TBAs and village doctors work in a collaborative network and complement each other while serving the pregnant mothers.

Relationship of TBA with Obstetricians

The relationship between TBAs and obstetricians is unilateral, in the sense that TBAs refer pregnant mothers to private hospitals or clinics but do not receive referrals from them. TBAs have the contact details of the obstetricians whom they call when they determine that the women, they're caring for are at risk or have complications too difficult for the TBA to manage. Sometimes TBAs contact obstetricians before referring a pregnant mother with complications to the respective hospital/clinic. TBAs refer cases to private clinics/hospitals where there are obstetricians with whom they're already acquainted. Thus, TBAs are acting as a good source of referrals for obstetricians they're acquainted with. TBAs also get the chance to showcase their relationship with obstetricians in front of the pregnant mothers' family which helps them (TBAs) in building confidence and commitment of their services to the pregnant mothers under their care.

> *"Sometimes the TBAs call me when they are struggling to manage a complicated case during or after delivery." (one obstetrician, 43 years old, 6 years serving as consultant)*

Discussion

This study has sought to cast light on the network linkages between TBAs and other providers engaged in childbirth related care work in rural Bangladesh. There is a paucity of published evidence on this phenomenon. The present study has found they are playing an important role serving pregnant women and they work in coordination with other providers.

Our study shows that village doctors and obstetricians are the most important actors in TBAs network of care during childbirth in rural Bangladesh. This study found that TBAs and village doctors have an organic relationship which developed naturally over time. Both the TBAs and village doctors value each other's expertise, opinions, and contributions. They work as a team to achieve their common goals of serving pregnant women in rural Bangladesh and saving the lives of mothers and newborns. TBAs and village doctors have complimentary skills. TBAs perform deliveries and do not possess the skill of administering injections or prescribing basic medicines. On the contrary, village doctors cannot perform deliveries and any such practice by male providers would not be accepted in rural Bangladesh. But they fill a gap, rendering a service that TBAs cannot, administering injections and prescribing medicine. Both TBAs and village doctors benefit from working together. Village doctors refer cases to TBAs while TBAs contact village doctors when the labor is prolonged, or they need assistance in handling a complication. By doing this, village doctors incur income through prescribing medicines and selling logistics (injections, instruments for deliveries). The relationship between TBAs and village doctors has developed over time with working together and supporting each other. During interviews, both TBAs and village doctors mentioned consulting together before deciding on the need for referrals. Both TBAs and village doctors receive financial benefits through this relationship.

Another important aspect of this study is the relationship between TBAs and obstetricians which is more asymmetrical in nature. Our study participants (TBAs and obstetricians) said that the communication between TBAs and obstetricians is generally one-sided. TBAs contact the obstetricians only when they face difficulty in managing a case with complications and decide to refer the case to the health facility where that obstetrician of their network is engaged. This shows the dependency of TBAs towards obstetricians in better management of their clients. TBAs benefit from this connection while obstetricians serve within their regular capacity. It also indicates a limited autonomy within this relationship where obstetricians enjoy the authority of freedom of choice, and the ability to act independently.

This study also identifies that the relationship between TBAs and private clinic managers are somewhat mutually beneficial. TBAs refer cases to these clinics and get some incentives and for managers these referrals act as a source of revenue. The connection between TBAs and transportation people is one-sided. TBAs contact them only when they need to arrange transportation for a referred case.

According to our study results, TBAs are making referrals to health facilities whenever complications arise or when they are having difficulties in handling a case. TBAs generally expressed confidence in their ability to recognize and manage complications during and after childbirth. They reported enquiring about risk factors at their first contact with pregnant mothers, including questions on previous pregnancies, history of caesarean section/surgery, convulsions, miscarriage, twin pregnancies, and bleeding problems. Some of the most common scenarios for referrals by TBAs are postpartum hemorrhage, prolonged or obstructed labor, retained placenta and convulsions. This is consistent with a study by Kaysin, Alexander et al. (2020) that reported obstructed labor and postpartum hemorrhage being the main causes of immediate referrals to

health facility by TBAs.[32] A study conducted on referrals to facilities in Bangladesh by Justin et al. (2007) had similar findings: in case of complications, the informal health care providers referred cases to health facilities.[26]

Our study found that TBA decisions on where to refer are influenced by several factors. TBAs refer to those facilities where they have some prior connections with the manager or staff. They are more likely to refer women to clinics where they feel welcomed, valued, and supported by the staff, and where they can maintain their role and status in the community. This is similar to results of a study by Miller et al. (2017) which found that TBAs tend to refer to those facilities where they were recognized and had good connection with the staff.[33] TBAs also prioritize those clinics/hospitals where the serving obstetrician is someone they already know, someone with whom they have an established trust and relationship is built over time through positive outcomes for referred cases. This helps the TBAs in ensuring good services for their clients and maintaining their status of guaranteeing good care in the community.

This study also identifies the preference of private clinics/hospitals over public facilities by TBAs for referrals. TBAs may have perceived or experienced that private facilities are more responsive to the needs and care of the patients. Availability of skilled medical professionals and resources can be the influencing factors for TBAs to prefer private clinics over public. A qualitative study by Turinawe et al. (2016) has similar findings: private clinics were seen to be superior to public with regard to accessibility and convenience.[34]

According to the responses of our study participants, receiving commissions from the private clinics/hospitals is an important factor for TBAs when choosing a referral facility. Most TBAs are not financially well off. They expect a good incentive for their service. But TBAs do not generally

receive substantial incentives for the service from the family of pregnant mothers. So, any additional commission from the private clinic/hospital is a factor influencing them to refer the pregnant women to that facility. A study in Bangladesh by Justin O Parkhurst et al. (2007) also identified links between incentives and referral practices by non-professional health practitioners.[26] Chukwuma et al. (2019) conducted research in Nigeria and found similar results of linkages between monetary incentives and referral practices among TBAs.[35]

The performance of the referral system described in this study can be improved. One major step could be strengthening the linkages and collaboration between TBAs and government health facilities and integration of TBAs into the health systems as a referral point and to utilize their stronghold in the community to motivate the pregnant mothers to seek antenatal and delivery services from skilled birth attendants. Another important step can be engaging the community and religious leaders in addressing the socio-cultural and religious barriers to facility delivery in Bangladesh, especially in rural areas. Providing incentives and subsidies to TBAs for referrals to health facilities, not only for complications but for routine deliveries, could be a game changer.

In this study, village doctors were found routinely to be assisting TBAs during home deliveries, notably those with long labors. Village doctors administering injections or IV infusions (as needed) and dispense medications to pregnant women. This finding is consistent with other studies in Bangladesh. Sarker et. al (2016) reported that TBAs and village doctors work together to assist home deliveries in rural Bangladesh.[36]

During the interviews, both TBAs and village doctors mentioned hastening the deliveries by administering injections of oxytocin and/or misoprostol tablets. Oxytocin stimulates uterine

contraction which speeds up labor. Outside of a hospital setting, oxytocin should only be used after delivery for the prevention or treatment of post-partum hemorrhage, not for the induction or augmentation or labor. Untimely use of oxytocin can result in complications to the mother and fetus. As Clark (2009) reported, administering oxytocin can cause serious complications like uterine tachysystole and impairment of fetal heart rates to the mother and the child.[37] This practice of the village doctors of administering oxytocin or misoprostol to women in labor is an important issues of patient safety in rural Bangladesh.

This study found that TBAs are readily accepted for the role they play in assisting in deliveries in rural Bangladesh. They are linked with pregnant mothers potentially interested in their service, through previous clients, close acquaintances, and village doctors. Village doctors, in effect, provide something like an on-call service, upon the request from TBAs to assist in managing deliveries, particularly when labor is prolonged.

Findings of the present study suggest that TBAs generally accompany mothers to the referral health facility to take care of her and ensure the best services are provided. Similar findings have been reported in Ghana where TBAs arranged transportation and accompanied pregnant women to health facilities for delivery.[21] A study by Wilunda et al. (2017) in South Sudan reported similar services by TBAs, accompanying pregnant women to health facilities.[22] Another study in Burundi, and northern Uganda by Chi et al. (2018) also reported pregnant women being accompanied by TBAs to health facilities for delivery.[23] TBAs, in such settings, need to be acknowledged as referral agents in their communities who are also providing valued psychological support to the women they accompany.

All providers interviewed in this study (obstetricians, TBAs and village doctors) reported the existence of good communication and relationships between TBAs and other healthcare providers including transportation providers in the community. Obstetricians stated that TBAs generally have well-established, effective working relationships with village doctors, managers and staff at the referral facilities, and with transport providers. They also reported that TBAs have good functional links with other healthcare providers (*Health Assistants, Family Planning Workers, and the NGO workers)*. TBAs mentioned having strong links with village doctors and also with obstetricians, private clinics, and hospitals, all falling within their networks for managing high-risk or complicated cases. The village doctors reported well-developed links with TBAs, transportation providers, clinics, and hospitals.

It appears that, generally, good communication & relationships exist between TBAs & other health workers as well as with community transport providers. Most of the participants in this study felt that it was important to improve communication and coordination between TBAs and other health care providers engaged in care around childbirth in rural areas of Bangladesh with the formal health system. In that way a strong referral network will be established to better serve the mother and neonates especially in rural Bangladesh which will help in progress towards achieving the target of reducing maternal mortality as indicated by the Sustainable Development Goals (SDG).

Limitations of the study

Study participants included only TBAs, village doctors, obstetricians, and transport people. Additional insights could have been gained interviewing other key stakeholders, notably women and their close relatives who have used these services and private clinic managers/staffs. The study was conducted in two districts of Khulna Division. But Bangladesh has a diversity in social and cultural practices in different areas. So, findings from this study cannot be considered generalizable to all Bangladesh. Further studies in other areas of Bangladesh may provide a more comprehensive picture, and more diverse practices. As this topic has not been much reported in the peer-reviewed literature, few studies were found to compare the findings.

Strengths of the study

Despite these limitations, this study provides valuable information about the network linkages between TBAs & other service providers in rural Bangladesh. It also provides insights into factors facilitating or hindering timely decision making related to managing complications during and after childbirth managed by TBAs in rural Bangladesh.

An important strength of this study was familiarity of the researcher with the language and culture of the respondents which enabled him to gain the trust of the respondents. The researcher's familiarity with the health system of Bangladesh helped facilitate access to the community with the help of the local health managers.

Conclusion

Bangladesh is still struggling with major challenges related to the Sustainable Development Goals, including reducing maternal and newborn mortality. A large proportion of deliveries, especially in rural areas, are still conducted at home assisted by TBAs. Given this situation, it would be beneficial to establish a well-supported referral pathway where TBAs can be included considering their engagement and acceptance in rural community, to improve maternal and perinatal outcomes. Improving access to care during pregnancy and labor in areas with poor SBA coverage can form part of the solution to meet the targets of SDG.

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Appendices

Appendix I Interview Guide for TBAs

1. *I understand that you attend deliveries in your area. Can you describe your role in this regard?*
    a) *At what point in the pregnancy do you normally first have contact with the family? Who refers families to you? Do you ever get pregnant women referred to you by other service providers in the community?*
    b) *In addition to assisting the women at the time of birth, do you give service to the women throughout pregnancy? If so, do you ask questions to determine if this case may be of higher risk? e.g., past miscarriages or still-births, past cesarean births, ultrasound showing twins, bleeding during pregnancy. If you learn of such complications, how does that affect your decisions about care to the woman? If you hear of such risks, do you refer some of these cases to a hospital, clinic, or physician? If so, are there specific hospitals, clinics, or physicians you refer clients to?*
    c) *When are you usually contacted by the families for delivery?*
    d) *Are you usually called only when the delivery is about to happen, or early in labor?*
    e) *Does it happen that you only get called after the delivery has already happened? If so, under what circumstances would that happen?*

2. *Sometimes labor can go very slowly.*
    a) *How do you decide when labor has been going too slowly?*
    b) *Are there any substances you give to the mother to speed up the delivery? If so, what are they?*
    c) *Are there substances you are aware of that other TBAs use to speed up the labor? If so, what are they?*
    d) *If labor is going too slowly, do you, sometimes, call a local village doctor for assistance? Is there a particular village doctor you normally deal with?*
    e) *For this kind of a case, what treatments would the village doctor normally use? Misoprostol tablets? Oxytocin injections?*
    f) *Under what circumstances would you decide that the woman needs to be taken to hospital? Is this a decision that the village doctor is also involved with?*
    g) *For such cases needing referral, are there particular hospitals or clinics or doctors you would direct your clients to? Or would you leave that to the family to determine?*
    h) *Is it ever the case for such complications that you would phone a physician, either for advice or to help facilitate a transfer?*
    i) *For cases needing transfer, are you normally involved in helping arrange transport? If so, are there particular transport providers you know that you would contact?*
    j) *For cases needing transfer to hospital, are there circumstances in which you would accompany the women to the hospital?*

k) *What about for other complications—e.g., excessive bleeding, delayed delivery of the placenta, indications of infection, problems experienced by the newborn, seizures, suggestions that the woman may have very high blood pressure—do you call the village doctor for any of these problems? Do you phone a doctor? Do you refer the case to a specific hospital, clinic, or doctor? Or do you just leave it to the family to determine where they should go?*

l) *What about other TBAs? What do you know of their practices about referrals of complicated cases? From your knowledge, is it common that commissions are paid for at least some kinds of referral? Please elaborate.*

3. *Apart from TBAs like you, there are some other health care providers who serve the pregnant women during or after delivery. Also, there are times when the pregnant women need to be taken to health facilities for managing the complication. Being an active member in serving the pregnant women in the community you can give a better insight about this.*
    a) *Apart from you, who are the other providers offering healthcare-related services to women during pregnancy or childbirth in the community?*
    b) *Is there any connection among all of you who are providing health care services to the women during pregnancy, childbirth or after delivery? Is there any coordination or communication among all of you?*
    c) *To your knowledge, are there specific people in the community engaged in transportation of such cases having a relationship either with other TBAs or with other providers or with the health facility?*
    d) *Would you say that, in some sense, there is an informal "network of care" for such cases? Are there ways in which there are some coordination or communication concerning such cases?*
    e) *To what extent would you say that current arrangements are (or are not) reasonably functional? What could be done to improve coordination and communication, to achieve better patient outcomes?*

4. *I hope you would not mind if I asked you some personal detail.*
    a) *I am interested to know about your age and education.*
    b) *Did you receive any formal training from any organization? If yes, then please describe in detail about the training as far as you can remember.*
    c) *I understand there are government field workers (FWA)/ other NGO workers responsible for providing reproductive services to the mothers in the area you work.*
        i. *Do you have a good working relationship with them?*
        ii. *Are they respectful towards you and your work?*
        iii. *Have you ever taken any advice/ help from them? If yes, can you describe the situation?*
        iv. *Have you ever referred any case to these health workers or vice versa? If yes, can you describe the situation?*

Appendix II Interview Guide for Village Doctors

1. *I understand that you are sometimes called to assist TBAs during deliveries in your area. I want to have a better idea how this works.*
    a) *Please give the examples of some situations when you are usually contacted by the TBAs for assisting in delivery?*
    b) *Apart from the contact by the TBAs during or after delivery, can you please describe some situations when you are contacted by the pregnant women/ by their family members before or after delivery?*
    c) *Are you connected with specific TBAs in the area who routinely call you to provide service for complicated cases or to whom you refer the clients?*
2. *In situations where labor is going very slow.*
    a) *How is it determined that it is too slow? Is that up to the TBA to decide or are you involved in this assessment? Please elaborate.*
    b) *What is done for such cases? Do you prescribe Misoprostol tablets? Do you administer Oxytocin injections during labor?*
    c) *What are some other substances you are aware of that the TBAs use to speed up the labor?*
    d) *For such cases, would you be involved in decisions about referring them to the hospital or is that the TBAs responsibility to decide?*
    e) *From your understanding, what are the signs that the woman needs to be taken to hospital?*
3. *Are you sometimes contacted for cases where women are very slow to deliver the placenta or where there's heavy bleeding indications of infection?*
    a) *How did you manage this case? In what ways are you involved in the assessment or decision-making?*
    b) *Have you ever referred/ suggested the TBA to refer any such case to the health facility?*
    c) *What made you decide to refer the case to higher facility?*
    d) *If you have not dealt with such a case in the past, yourself, if it did happen what would you do?*
    e) *What do the TBAs do in managing any such case?*
4. *I hope you would not mind if I asked you some personal detail.*
    a) *I am interested to know about your age and education.*
    b) *Did you receive any formal training from any organization? If yes, when and detail of the training as far as you can recall.*
    c) *How do you get payment for the services you provide to assist the TBAs during delivery? Do the TBAs give any payment to you, or you need to take it from the mother's family?*
    d) *Do you provide any service to the pregnant mothers before delivery? If yes, then what are those services? Do you measure weight, blood pressure, and assess anemia to all the pregnant women visiting your centre/shop? Do you prescribe any medication to them?*

e) *Do you provide any ultrasonography services to the pregnant women? If yes, then from where you have learnt it? Do you practice doing ultrasonography to all the pregnant women coming to your centre/shop?*
f) *Are there other providers (including TBAs, OBSTETRICAN and other providers) who refer the pregnant women to you for health care services? If yes, then who does the most referrals to you?*
g) *Are there any commission needs to be paid if any provider refers any client to you?*
h) *Do you refer the pregnant women to any other health care providers (including TBAs, OBSTETRICAN and other providers) or health facility? If yes, then to whom you do the most referrals?*
i) *Are there any commission paid if you refer any client to other health care providers or health facility?*

5. *Other than you and the TBAs there are some other health care providers who serve the pregnant women during or after delivery. Also, there are times when the pregnant women need to be taken to health facilities for managing the complication. Being an active member in serving the pregnant women in the community you can give a better insight about this.*
    f) *Apart from you and the TBAs, who are the other providers offering healthcare-related services to women during pregnancy or childbirth?*
    g) *Is there any connection among all of you who are providing health care services to the women during pregnancy, childbirth or after delivery? Is there any coordination or communication among all of you?*
    h) *To your knowledge, are there people in the community engaged in transportation of such cases having a relationship either with the TBAs or with other providers or with the health facility?*
    i) *Would you say that, in some sense, there is an informal "network of care" for such cases? Are there ways in which there are some coordination or communication concerning such cases?*
    j) *To what extent would you say that current arrangements are (or are not) reasonably functional? What could be done to improve coordination and communication, to achieve better patient outcomes?*
6. *I hope in the area you work there are Government field workers/ other NGO workers responsible for providing reproductive services to the mothers.*
    a) *Do you have a good working relationship with them?*
    b) *Are they respectful towards you and your work?*
    c) *Have you ever taken any advice/ help from them? If yes, can you describe the situation?*
    d) *Have you ever referred any case to these health workers or vice versa? If yes, can you describe the situation?*

Appendix III Interview Guide for Obstetricians

I understand that you have a mix of patients. Some you see through ANC you provide and when the time comes for delivery, they come to your health facility, and you care for them. In other cases, there may be patients you have not previously seen who receive service from TBAs at the time of childbirth and then, if there are difficulties or complications (hemorrhage, infection, pregnancy-induced hypertension, obstructed labor, retained placenta etc.), they end up coming to your health facility and you provide care. I am wanting to get a better idea how this works.

1. *From which category of health care providers do you usually get these referrals?*
2. *Do you have any contact with them? Do you know who they are?*
3. *Are there particular TBAs in the area who routinely refer such cases to you or to your health facility?*
4. *Do they demand/receive any incentives for referring these cases to your health facility?*
5. *Can you give me an idea about the place of delivery and the health care providers who conduct these deliveries (for those cases having complications after delivery)?*
6. *Do the providers (especially TBAs) who conduct/assist these deliveries accompany the mother to your health facility?*
7. *Does it happen sometimes that TBAs will call you or others at your health facility concerning a complicated case they are managing, either for advice or for arranging a referral?*
8. *Can you give an insight about the intervention/techniques that are used by these providers (especially TBAs) to manage these cases on their own?*
9. *Apart from you and the TBAs, who are the other providers offering healthcare-related services to women during pregnancy or childbirth?*
10. *Are there people in the community offering obstetrical ultrasound services?*
11. *How are such services during pregnancy, childbirth or after delivery connected with TBAs or clinics or hospitals? Is there any coordination or communication among these services?*
12. *To your knowledge, are there people in the community engaged in transportation of such cases with a relationship either with the TBAs or with other providers or with the health facility?*
13. *Would you say that, in some sense, there is an informal "network of care" for such cases? Are there ways in which there are some coordination or communication concerning such cases?*
14. *To what extent would you say that current arrangements are (or are not) reasonably functional? What could be done to improve coordination and communication, to achieve better patient outcomes?*

Appendix IV Informed Verbal Consent Form

Title of Study: Informal networks of health care during and after delivery in rural Bangladesh: perspectives from the TBAs

Contact Information

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Hello, my name is Mridul Kanti Ghosh. I am a graduate student at the University of Alberta, Canada in the School of Public Health. I am undertaking this research that will be used in the accomplishment of my MSc in Global Health thesis.

I am trying to know about the coordination among different health care workers providing services to the women during pregnancy, childbirth or after delivery in rural areas of Bangladesh. Given your important role as a health care provider engaged in serving the pregnant women during pregnancy, childbirth and after delivery for a long period of time, I am very much interested in knowing your experiences and opinions about managing complications during and after delivery and coordination among different health care workers in your area regarding referrals of these cases to health care facility.

The insights from these interviews will enable me to understand the informal network regarding childbirth and the role of different health care workers for this in rural Bangladesh. This will help

the policy makers and program managers in planning for better support to strengthen this informal network for the improvement of maternal health in Bangladesh.

You will be taking part in one in-person interview to share your experience and opinions about managing complications during and after delivery and coordination among different health care workers in your area regarding referrals of these cases to health care facility. This interview will take about 40-45 minutes of your time.

I would like to make a tape recording of our discussion, so that I can have an accurate record of the information that you provide to me. I will transcribe that recording by hand and will keep the transcripts confidential and securely in my possession. This recording will be retained for 5 years as a requisite of University of Alberta once I transcribe it.

You are unlikely to experience risks or discomforts by taking part in this research. There are no other expected risks of participation.

Though there is no direct benefit for you from being in this study, the information will help program the policy makers and program managers in planning for better support to strengthen this informal network for the improvement of maternal health in Bangladesh.

Participation is voluntary. There is no obligation for you to participate in this study. If you decide not to participate, there will be no penalty or loss of benefits to which you are otherwise entitled. You can, of course, decline to answer any question as well as to stop participating at any time, without any penalty or loss of benefits to which you are otherwise entitled. Even if you agree to be in this study, you can change your mind and withdraw and stop being in the study (the last date for withdrawal from this study is October 10, 2022). After this time, you cannot be removed from the study as the data analysis will be done and draft thesis will be prepared. To withdraw from the study please contact Mridul Kanti Ghosh at mridulka@ualberta.ca or Dr Stephen Hodgins at shodgins@ualberta.ca or +1 (780) 492-6814 (voicemail only).

Please be informed that the information provided by you will be used for the accomplishment of my thesis work, relevant research articles and presentations only. There is no risk of a breach of confidentiality. I will not link your name to anything you say, either in the transcript of this interview or in the text of my thesis or any other publications.
Your de-identified information will not be used or shared with other researchers.

After the study is done, we will store this information (Audio Recordings) for a minimum of 5 years. The information will be stored in a password protected secured Google Drive with only access to me and my supervisor.

If you have any additional questions concerning this research or your participation in it, please feel free to contact me, Mridul Kanti Ghosh at mridulka@ualberta.ca or my thesis supervisor, Dr Stephen Hodgins at shodgins@ualberta.ca or +1 (780) 492-6814 (voicemail only) at any time.

If you have any questions regarding your rights as a research participant, you may contact the University of Alberta Research Ethics Office at reoffice@ualberta.ca and quote Ethics ID Pro00102186. This office is independent of the study investigators.

Please keep this letter for your records.

Do you have any questions about this research? Do you agree to participate, and may I record our discussion?

If so, let's begin ….