Influencing Factors for Quality Care on Prevention of Postpartum Hemorrhage in the Northern Province of Rwanda: Beneficiary and Health Worker Perspectives.

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Abstract

Background: Reduction of maternal mortality and morbidity is a major global health priority. However, much remains unknown regarding factors associated with postpartum hemorrhage (PPH) among childbearing women in the Rwandan context. The aim of this study is to explore the influencing factors for quality care on prevention of PPH asperceived by beneficiaries and health workers in the Northern Province of Rwanda.

Methods: A qualitative descriptive exploratory study was drawn from a larger sequential exploratory-mixed methods study. Semi-structured interviews were conducted with 11 women who experienced PPH within the 6 months prior to interview. In addition, focus group discussions were conducted with: women's partners or close relatives (2 focus groups), community health workers (CHWs) in charge of maternal health (2 focus groups) and health care providers (3 focus groups). A socio ecological model was used to develop interview guides to describe factors influencing the prevention of PPH in consideration of individual attributes, interpersonal, family and peer influence, intermediary determinants of health and structural determinants. The research protocol was approved by the University of Rwanda, College of Medicine and Health Sciences Institutional Ethics Review Board.

Results: We generated four interrelated themes:(1) Meaning factors (beliefs, knowledge and understanding of PPH) among participants; (2) Organizational factors; (3) Caring factors and family involvement and (4) Perceived risk factors and barriers to PPH prevention. The findings from this study indicate that PPH was poorly understood by women and their partners. Family members and CHWs feel that their role for the prevention of PPH is to get the woman to the health facility on time. The main factors associated with PPH as described by participants were multiparity and retained placenta. Low socioeconomic status and delays to access health care were identified as the main barriers for the prevention of PPH.

Conclusions: Addressing the identified factors could enhance early prevention of PPH among childbearing women. Placing emphasis on developing strategies for early detection of women at higher risk of developing PPH, continuous professional development of health care providers, developing educational materials for CHWs and family members could improve the prevention of PPH. Involvement of all levels of the health system was recommended for better prevention of PPH. Further quantitative research, using case control design is warranted to develop a screening tool for early detection of PPH risk factors for proactive prevention.

Background

Maternal mortality remains a major global challenge to health systems. The World Health Organization(WHO) [1] states that about 295 000 women die per year as a result of pregnancy-related complications, of which most are preventable or treatable. The majority (94%) of these maternal deaths occur in low and lower middle-income countries [1]. According to Say *et al* [2], recent figures suggest that more than a quarter of these deaths are due to hemorrhage, with post-partum hemorrhage (PPH) accounting for almost 20% of all maternal deaths from direct causes. In Rwanda, Sayinzoga *et al* [3] report that 70% of maternal deaths result from direct causes and that PPH is the leading direct cause of maternal death with 22.7% of all reported cases.

PPH is commonly defined as a blood loss of 500 ml or more within 24 hours after birth [4, 5]. Although there have been concerted initiatives to reduce the levels of maternal mortality due to PPH, the issue remains a global challenge [6]. According to WHO [1], the latest available data suggest that fewer than half of all births in several low income and lower-middle-income countries are assisted by a trained midwife, doctor or nurse while in most high-income and upper-middle-income countries, more than 90% of all births benefit from the presence of a skilled birth attendant. A study on maternal death audit in Rwanda [3] notes that factors related to provision of substandard care were identified for 61.1% of the maternal death cases.

Evidence indicates that the majority of PPH-related morbidity and mortality is preventable through the effective implementation of evidence-based guidelines. WHO [7] provides recommendations which guide skilled health personnel and other stakeholders on how best to use uterotonics to prevent PPH in women giving birth in hospital or community settings in high-income, middle-income or low-income countries. However, it is recognized that high service coverage with evidence-based guidelines alone is not enough to guarantee high-quality care or a reduction in maternal and newborn morbidity and mortality [8, 9]. WHO [7] is urging international agencies and donors, as well as professional associations, clinicians and national health system stakeholders to reassess their national health policies and protocols on PPH prevention. In addition, Prata *et al* [10] highlight that each country should develop its own context-specific policies and programs incorporating a variety of approaches to address PPH challenges, and PPH prevention interventions need to be prioritized. WHO [9] considers that quality of care for women and newborns involves the degree to which maternal and newborn health services increase the likelihood of timely, appropriate care to achieve desired outcomes that are both consistent with current professional knowledge and take into account the preferences and aspirations of individual women and their families.

There is cause to consider that the investigation of factors influencing PPH prevention from different perspectives is crucial to enhance quality of care during childbearing. Salient factors at different levels of service delivery have been found to be critical in shaping participants' experience for the implementation of obstetric hemorrhage initiative in Florida [11]. Furthermore, the study of Semasaka *et al* [12] on self-reported pregnancy-related health problems and self-rated health status in postpartum Rwandan women observed poor sexual and reproductive health care and recommended that particular attention be given to

the determinants of poor quality care and to the prevention of related complications. WHO [1] reports categories of main factors that prevent women from accessing or receiving care during pregnancy and childbirth to be related to poverty, distance to facilities, lack of information, inadequate and poor quality services, and cultural beliefs and practices.

Woiski *et al* [13] demonstrated that the main obstacle for high quality PPH-care identified by patients was the lack of information given by the professionals to the patient and partner before, during and after the PPH event, while health care providers expressed hindering factors such as lack of clarity of the guidelines, lack of knowledge and poor communication within teams. Therefore to improve the quality of care provided to women for the prevention of PPH, an in-depth analysis from different perspectives identifying influencing factors for the delivery of high quality PPH-care will provide necessary information for implementing a strategy to improve care [14]. Currently in Rwanda, little is known about key factors that could influence the prevention of PPH from the perspectives of patient and family members, the community and health care professionals. This study aims to explore influencing factors for quality care on prevention of PPH as perceived by beneficiaries and health workers in the Northern Province of Rwanda. The knowledge of these factors will contribute to the development of a risk assessment tool for the prediction and prevention of PPH in Rwanda.

Method

Design

As part of a larger exploratory sequential mixed-methods study, we undertook the phase one of the study with a qualitative descriptive design to develop a rich description of the phenomenon under study [15, 16]. This design was used to uncover everyday experiences of participants by remaining close to their reported or observed events [17]. To explore influencing factors for delivering PPH preventive care from different perspectives, a social determinants approach to maternal deaths [18] and Social Ecological Model (SEM) [19] were used.

Setting

The healthcare system in Rwanda reaches from the community to the national referral hospitals [20]. Community Health Workers (CHWs) provide a vital link between community members and the health centers and hospitals. There are three levels of healthcare: 1) community health centers and health posts which constitute the primary level of healthcare, 2) district hospitals operating at the secondary level of healthcare, and 3) provincial referral hospitals, national referral hospitals and University Teaching Hospitals, serving as the tertiary and highest level of healthcare [20]. Recently, the Rwandan Ministry of Health established a new level of health facility which is in between the district hospital and the health center, to relieve the challenge of delays in referral of obstetric cases and overcrowding at district hospitals. These facilities are called medicalized health centers [21].

The present study was conducted at primary and secondary levels of the health system in Rwanda. We reached out to the community by involving community members and CHWs in charge of maternal health. This study was conducted in three health facilities of Gicumbi district in Northern Province of Rwanda. We included one health center, one medicalized health center and one district hospital. The majority of women with uncomplicated pregnancies deliver at a health center, while complicated cases are referred to the district hospital level or to the referral hospitals according to the severity of the complication [12]. With medicalized health centers, the referral system in Rwanda has been strengthened by deploying capable staff (medical doctors, paramedics, anesthesia, etc.) and ensure that essential equipment, conducive environment in terms of infrastructure are available to allow staff to attend to patients with acute life threatening conditions especially obstetric emergencies [21]. The selection criteria we considered while selecting facilities to be visited included their level of performance in maternal and newborn health, location (urban versus rural), and the geographical accessibility of the health facilities to the clients. The study sites were selected by the principal investigator and validated by the research committee. Byumba district hospital serves a population of 444 387 in its catchment area, which also includes 24 health centers [22]. For this study, the sites included are Byumba district hospital, Rutare medicalized Health Center and Rwesero Health Center. The Northern Province of Rwanda was purposively chosen for being in a rural area where some health centers are hard to access, and for its low uptake of antenatal and postnatal services among childbearing women [22].

Participants and recruitment

Fifteen women were purposively selected for having experienced PPH within the six months immediately before data collection, for being willing to participate, and for being aged above eighteen. The research team, in collaboration with the head of maternity at the facility, identified PPH cases from the birth register and the CHWs in charge of maternal health assisted by connecting the research team with women from the villages who had been discharged from the health facility. Women who were still in hospital were given a verbal invitation to participate. Women and their partners or close relatives who agreed to participate were given an appointment for an interview at the nearest health facility. The inclusion criteria for relatives, were to be her husband or a close relative who was with her when the PPH occurred. The final sample size reached eleven women when it was determined no new themes were emerging from the interviews and therefore that sufficient data had been collected to address the study's purpose [15]. Ten close relatives to the women from two health facilities responded to our invitation and were willing to participate (eight husbands and two close female relatives).

The CHWs in charge of maternal health living in the same village as the woman who experienced PPH were also invited to participate in this study because they are in charge not only of maternal health but also neonatal health. In fact, they are in every Rwandan village and are tasked to identify and register women of reproductive age, promote family planning service utilization, identify pregnant women in the community and encourage them to use maternal care services. They are also involved in the follow up of postnatal women and newborn babies, referring them to health centers in case of danger signs. They also accompany women in labor to health facility so they can get delivery assistance by qualified personnel

[23]. The CHWs who participated in the present study were identified through the CHW coordinator who is a full time employee at the health facility. Then the researcher made a phone call to fourteen CHWs, inviting them to participate in the study, then sent to them a text message specifying the venue and time for the focus group interview. Eleven female CHWs from the two health facilities responded to the invitation.

A total of twenty-five qualified health care providers working in the maternity units of the selected health facilities were also invited to participate, of whom fourteen (10 nurses, 3 midwives, 1 medical doctor) were available to participate in a focus group discussion (FGD). All correspondence to potential participants was in Kinyarwanda language. Participants were recruited using email or telephone messages. Inclusion criteria included: being a full-time and qualified health care provider with at least one year's experience of working in maternity, and ability to speak and read in either English or Kinyarwanda.

In this study women and their relatives are considered as beneficiaries while qualified health care professionals and CHWs in charge of maternal health are all considered as health workers.

Data collection

The research team developed semi-structured interview guides in both English and Kinyarwanda, including one for each category of individual interview and FGD. The interview guides were translated back and forth by an independent professional translator, to confirm that the meaning and content of the questions of the original copy had not changed during the translation process. Verification of the translated instrument was also done by the research team to ensure its validity. The interview guide questions focused on the five interrelated levels of SEM to facilitate identification and description of potential PPH influencing factors: individual, interpersonal, community, organizational, and policy/enabling environment [19]. Demographic data of participants was obtained using a demographic form during individual interviews. All participants chose to be interviewed in Kinyarwanda. The researcher, who was educated with research methodology courses including qualitative research, conducted the interviews. Prior to voluntarily participating in the study, participants were provided with a study letter of information and a study participation consent form for their signature. Anonymity and confidentiality were observed throughout the conduct of the study. After getting participants' informed consent, all interviews were digitally audio-recorded with participants' permission and transcribed verbatim. Data collection took place over a period of three months from December 2018 to February 2019 in meeting rooms of the three selected health facilities.

First, we conducted one-to-one in-depth interviews with eleven women who experienced PPH. Then, FGDs took place with the three groups of participants: 1) two FGDs with the partners and close relatives of the women, 2) two FGDs with CHWs and 3) three FGDs with health care providers. The duration of individual interviews ranged between 45 to 60 minutes, while the FGDs lasted 45 to 90 minutes.

The combination of individual interviews and FGDs was used to seek data completeness in this study [24]. Each method (individual interviews and FGDs) revealed different information about the prevention of

PPH and contributed to a more comprehensive understanding. Integration of data involved moving back and forth between the data sets to discover data convergence and complementarity.

After the number of individual interviews and FGDs described above, the participants' responses had become repetitive, therefore it was assumed that data saturation had been reached. The figure bellow illustrates number of participants in individual interviews and in focus groups discussions.

Data analysis

Data analysis was concurrently undertaken with data collection and was initiated after the completion of the first interview. NVivo Pro Version 12 was used to organize the data for further analysis. To analyze findings from the present study, we used the six steps of inductive thematic analysis [25, 26]. As described by Braun and Clarke [25] we focused on interpreting and explaining what the study participants shared. Throughout this process the researcher considers whether the themes work in the context of the entire data set and refined the developed themes to make sure that they are coherent and are distinct from each other. The transcripts were read while listening to the audio recording to ensure accuracy and completeness.

First, we read and re read the transcripts to become familiar with what was stated and to be immersed in the data, noting initial analytic observations. Second, we engaged in open line by line coding and assigned preliminary codes to the data in order to describe the content with interesting features across the entire data set. A coding guide was developed, consisting of all the codes or labels from the transcripts. Third, we proceeded to group familiar codes into preliminary themes which depicted the same ideas or concepts. The themes were discussed and agreed by the research team members through consensus. Ongoing analysis helped to refine the specifics of the themes and clear definitions and names for each theme were created. Finally we produced a report [26] on influencing factors for PPH prevention care from different perspectives.The researcher collaborated with the supervisors throughout the data analysis process to discuss the codes and preliminary themes, and come to a consensus of the final emergent themes. Verbatim quotes were selected to illustrate main themes in the report writing.

Data quality

To ensure rigor of the present qualitative study [27], trustworthiness was established by observing the criteria suggested by Lincoln and Guba [28]: credibility, transferability, dependability and confirmability.

To prepare for data collection, the interview guides were developed by the principal investigator after a literature search and critical discussion with the research committee members. The interview guide was initially pilot tested with three participants who are not included in the present study. For the credibility of data, we used investigator triangulation. For data quality checkup, two transcripts from individual interviews and one transcript from a focus group discussion were randomly selected by the principal investigator and shared with research team members for ensuring that findings are based on participants' responses rather than the researcher's own preconceptions. The resulting comments were discussed and

final decisions on codes and themes were made in consensus. We also involved an independent researcher to analyze a set of data while the principal investigator who conducted the interviews verified the consistency and fit of the analyzed data with the original transcripts and audio records. Credibility of data was also ensured by data triangulation by using different methods and different sources to collect data to develop a comprehensive understanding of factors affecting PPH prevention in selected health facilities. Individual interviews and FGDs were conducted with different groups of people believed to have information about the topic under study. Data were gathered from three health facilities from the Northern Province of Rwanda offering different packages of health services to ensure greater representation of participants from various contexts and experience. One medical doctor in charge of maternity unit was recruited to ensure that a wide range of insights were gained about the phenomenon.

During data collection and analysis, to account for personal bias and maintain objectivity, the researcher used field notes to capture important information, especially the non-verbal communication and journal writing to highlight the researcher's reflections on the research in progress. A verbal check was also made by the researcher during and at the end of each interview, asking the participant to confirm whether the researcher’s understanding of the information provided aligned with what the participant had meant to say. After data analysis, some participants were contacted with a phone call to obtain feedback on the generated themes and categories.

An audit trail, including field notes, was also used to ensure dependability by providing the details of data analysis and some of the decisions that led to the findings and recording decisions throughout the research process.

This study was presented and assessed by the Institution Review Board at the College of Medicine and Health Sciences, University of Rwanda, and approval (No 313/CMHS IRB/2018) to carry out the study was granted in accordance with the applicable rules concerning the review of research ethics committee and informed consent.

Results

A total number of 46 informants participated in individual in-depth interviews (11 women) and FGDs (7 groups involving a total of 35 participants). To ensure confidentiality of study participants, they are identified as follows: W1, 2, 3, ….. (women); HCP1, 2, 3, ….. (health care professionals), CHW1, 2, 3, ….. (community health workers), R1, 2, 3 (relatives).

Characteristics of participants in the individual in-depth interviews
Of the 11 women interviewed, 6 were aged between 20–34, and 5 were aged between 35–43. The majority of the women (n = 7) were in the range between parity 1–4 while 4 were parity 5 or above. Eight lived in an area where they experience difficulties to access the nearest health facility and six recalled having received Oxytocin after delivery (the other five did not know).
Characteristics of participants in the FGDs

The minimum number of participants in an FGD was 4 and the maximum 6. Of the 14 participants in the health care provider FGDs, 9 were male and 5 female; 10 were nurses, 3 were midwives and 1 was a medical doctor. They had between 2 and 35 years of experience working in reproductive health care. Of the 10 participants in the relatives FGDs, 8 were husbands and 2 were relatives. Eleven CHW's in charge of maternal health participated in the two FGDs. All CHWs who participated in this study were female, reflecting the reality in Rwanda that CHWs responsible for maternal health care are all female.

Influencing factors to quality care in PPH prevention

Four interrelated themes that described the factors influencing PPH prevention care were identified: 1) Meaning factors: personal beliefs, knowledge and understanding of PPH 2) Organizational factors 3) Caring factors and family involvement and 4) Perceived risk factors and barriers to PPH prevention. These themes included several sub-themes, which will be described in the following sections.

Meaning factors: Personal Beliefs, knowledge and understanding of PPH

This theme incorporates the way in which women, their partners or close relatives, CHWs in charge of maternal health and health care providers think about PPH, and what it means in this context. It highlights a variety of beliefs, and clinical understanding relating to the nature and prevention of PPH. It also describes what beneficiaries and health care providers say about their need for information about PPH, in terms of level of knowledge from a beneficiary's perspective and additional training needs from a healthcare provider perspective.

The health care providers working in health facilities defined PPH as blood loss more than 500 ml within the first hour after birth and the quantity of blood loss was described as visually estimated. Most CHWs described recognizing PPH in a woman when she "*changes the sanitary pad two times or more within the first hour"* after childbirth. But the majority of the women participants described bleeding after childbirth as "*not well known"* but an unusual blood loss after birth is a condition that needs to be resolved in a hospital setting.

*"...I really don't know what is it but what I know from myself, I delivered my child after a while I felt like I was sleeping in a basin of water, was full of blood all over, was feeling dizzy and told the nurse that I was uncomfortable the whole body, after that I did not know what was the next, and I woke up after being transferred in another referral hospital" (*W1).

PPH was also described by relatives as coming *"unexpectedly"* and it was believed that every woman is *"candidate"* to PPH, i.e. at risk of experiencing it: *"When I try to look through it I assume that this problem happens unexpectedly and my conclusion is that every mother is a candidate, that is why all women must be prepared whether they are rich or poor"* (R12).

Many health care providers mentioned that PPH has been associated with common causes like uterine tonicity, retained tissues after birth, tearing and trauma of genital organs during birth, and coagulopathy problems. It has been also echoed among many participants that the condition was also associated to some beliefs like hard manual labor performed by the woman, to poison in the village, and the beliefs may lead to delay to seek appropriate care: *"Now in the village they like to say that the problem is*

associated to poisons and a woman may go to the traditional doctor which can be the reason to be late to reach the health facility and may lead to those problems of bleeding" (HCP22).

Participants revealed that there is a culture of *"hiding"* a complication that might happen during childbearing. Close relatives indicated that such hiding might be associated with lack of awareness about PPH in the community as the condition is believed to be associated to poison: *"what I saw in many Rwandans is that they try to hide that they have had a complication afterbirth. I think this might be associated to lack of awareness of the causes as some might link it to poison"* (R17). Participants mentioned that family members have a great influence in forcing women to follow what they believe in such as the use of traditional medicines. These beliefs might be contradictory to the woman's own knowledge on PPH. "*..for example a woman can be aware of the signs that can lead to PPH but her mother-in-law oblige her to take traditional medicines telling her that if her grandchild faces a problem because she did not take those traditional medicines she will be accountable and will explain it"* (HCP29).

Participants shared their desire for information to improve their knowledge on PPH prevention. The women and their relatives revealed that CHWs in charge of maternal health in their village educate families about abnormal signs (in this case, participants talked about severe headaches, fever and bleeding) in pregnant woman and in postpartum period. It was also indicated that CHWs encourage the pregnant women to go to the health facility for antenatal consultation and for delivery. They suggested to have local leaders, like administrative leaders of the local village to be educated about PPH as they are close to the population in the village. "*……I can suggest that all leaders at the villages' level can take this as their duty and I think this can contribute a lot to prevent some maternal health problems*." **(R21).**

The health care providers and CHWs expressed the need for continuous training. In this case, participants noted that health care providers and CHWs may change workplace, looking for a new job. It was mentioned that the new staff might not be aware of new updates in protocols in PPH prevention. The health care providers working in antenatal clinics stated that when they are well informed about PPH and its risk factors, they are able to teach and help women gain knowledge about the signs and symptoms of PPH and what actions to take. They remarked when a woman notices one of the symptoms she will know to immediately come to the hospital which, in turn reduces the risk of PPH. CHWs in particular said they wanted to be adequately trained on some procedures like assisting home deliveries so they are able to provide care in case a woman delivers in the community before reaching the health facility. One CHW explained: "*…as a community health worker who meet women with PPH before reaching the health center, and as you know it is most of the times difficult for them to get transport, my suggestion is that they can train us on basic practices, like home deliveries, and delivery of the placenta so that the woman reaches the health center after being basically treated*".

Organizational factors influencing PPH prevention

This theme highlights some of the organizational factors that influence the prevention of PPH. In this regard, healthcare providers identified factors associated with some policies in use for PPH prevention and the majority of participants felt that adequate resources were a necessary factor, as was the influence of collaboration across the health system structure for PPH prevention.

Participants mentioned some policies around PPH prevention. Health care providers described that teaching women about PPH and prevention strategies is among their expectations.

"……. Our Ministry of Health always encourage the health providers at the hospitals and health centers to teach pregnant women to go for the pregnancy checkup and to give birth in a hospital setting and I think this contributes to the prevention of PPH….." (HCP13).

CHWs expressed that their role is to educate woman about risk factors and "*get her to the health facility"* when she is approaching the expected date of delivery so that she can been assisted by a skilled birth attendant. In case the woman gives birth at home or on the way to the health facility the policy of task shifting allows CHWs to provide Misoprostol to the woman after delivery to prevent PPH. *"when a woman gives birth at home or before reaching the hospital we give her the misoprostol which reduces the hemorrhage, then we take her to the health providers who orders her to take enough rest, for us we use the advice and trainings given to help women* (CHW36).

In addition to some policies, participants affirmed that limited human and material resources and the lack of continuity of care across the health system are other factors affecting the prevention of PPH. The shortage of qualified health professional in maternity was highlighted as a challenge by all participants. Participants stated that having "*specialized health professionals"* in health care settings would contribute to the reduction of PPH cases. Health care providers stated that having only a small number of knowledgeable staff on a shift creates problems "*to follow up properly*" women every fifteen minutes after birth, and they do not have time to effectively teach mothers about factors that may lead to PPH. Relatives of the women recognized that health care providers' heavy work load may hamper recognizing a client who is bleeding after birth:

"*… all levels may influence our women to bleed. The health care provider may be overwhelmed because of many patients when she is one or two on a shift, it is hard for her, for example my wife gave birth without any complication but by accident she was damaged which caused her to bleed, I could not say that it is the understandings instead it was the problem of health personnel*" (**R16**)

Though health care providers were aware of the recommendation to administer injectable oxytocin for the management of third stage of labor to prevent PPH, they were not confident about its effectiveness because of the heat sensitivity of the medicine. The lack of refrigerators in maternity units was highlighted as their main challenge for quality prevention of PPH.

"*… the injectable oxytocin we use is the one to be kept in the fridge but all maternities in the health centers or the hospital do not have a fridge to keep the oxytocin, it is kept in the general pharmacy which will prevent us to give the oxytocin on time and with appropriate temperature…"* (HCP35).

Furthermore, the majority of participants mentioned the importance of information sharing for the continuity of care and a proper follow up of clients across the health system from the community to the district hospital. When there is a client in labor or with another obstetrical problem in the community, the

CHWs, through a system of "*rapid SMS"*, use their cell phones to call health providers at the health facility to send the ambulance. Women and their relatives affirmed that this is a good collaboration between the health facility and the CHWs, although sometimes there is delay in sending the ambulance. However, women identified the need for getting accurate information about PPH during pregnancy, delivery and the postpartum period so that they can make informed decisions regarding when to seek follow up care. The health care providers mentioned that the client's health information related to her pregnancy is not well shared from the antenatal clinic of the health center to the maternity setting where the woman gives birth, which can further impede the recognition of clients at risk of PPH.

"Most of the signs and symptoms discovered during antenatal consultation remain in the clinic, a woman does not have that information, what is only written on her file is to come early and give birth at the health center" (HCP29).

Participants mentioned that for a proper prevention of PPH the awareness should be enhanced in the health system so as to ease the identification of risk factors as early as possible by means of regular checkups of well-informed women before and after delivery.

Caring factors and family involvement

This theme reveals personal qualities, role expectations and clinical skills valued by women and their relatives, CHWs in charge of maternal health and the health care providers during their interactions contributing to PPH preventions. It also highlights some disrespectful practices that women experienced while seeking care.

Participants discussed family involvement in their decision-making to prevent PPH. The women mentioned feeling dependent upon family members for assistance. *"The family help me in not doing heavy activities and not being stressed… I first inform the person I live with, here I mean my husband, then we take a decision to go to the hospital because they are the right people to help me prevent against PPH."* **(W2)**.

The partners to women expressed the feeling of "*being less helpful*" to women in terms of PPH prevention due to their lack of knowledge to be able to take informed decision on the health conditions of their wives. They feel that their main role is to "*get the woman to the health facility*" to be assisted by qualified health professionals. However, CHWs feel that the prevention of PPH should start in the nuclear family, with parents teaching their young daughters about prevention.

"A family has to be the first one to teach their young daughters to prevent early pregnancies which may lead to PPH, and to have that discussion in their home." (CHW43).

The women and their relatives view the role of CHWs in charge of maternal health as their *"parent"* as they live together in the community, closely following up pregnant women and reporting to the health facility. But they also pointed out that CHWs have insufficient knowledge about PPH and PPH prevention to be able to provide enough information to community members. *"Community health workers are*

available but we do not discuss about that issue of bleeding. They accomplish well their tasks but I think they do not know much about PPH so that they can teach us too about it" (W10).

Regarding the care provided by health care providers, women's relatives recognize the busy work of health professionals. They have appreciated the recommendation from the government of Rwanda to health care professionals to stop using cell phones during working hours.

"There are things that the government has changed according to the way we were used to be given medical services like that thing of stopping cell phones at hospitals changed a lot things and we are so thankful. Before when we needed assistance from them, we used to find them busy on phone." (R20).

Women and their relatives expressed feelings of frustration and anxiety when they have to enter into relationships with angry and irritable health care providers which may be a barrier to the good communication for the prevention of PPH.

…there are some problems we face at hospitals where we find doctors or other medical professions who are always angry or with bad services and you will realize that some patients are not comfortable and are fearing to tell everything to the health care provider. There are people who can look at you and you have fear to express yourself…. (R19).

Perceived risk factors to PPH prevention

This theme elaborates on risk factors associated with PPH and participants describe them as antepartum and intrapartum risk factors. They also stated that the socioeconomic status of the family and the delays to receiving health care are factors that affect access to quality care for PPH prevention. Participants highlighted that knowledge and consideration of these risk factors can contribute greatly to timely prevention of PPH.

Health care providers mentioned that the "*knowing of pregnant women with predisposing risk to PPH*" would contribute to PPH prevention. As presented in the previous themes, participants feel that the lack of knowledge and insufficient information sharing across all levels of care is a barrier to the recognition of the clients at risk of PPH and hinders effective and timely PPH prevention. The risk factors are described to be non-use of family planning methods leading to frequent birthing, history of PPH, retained placenta, tearing/trauma of genital organs. In case of trauma of genital organs during birth, women and their relatives sometimes feel that birth attendant "*damage the woman's internal tissues"*. Some of the risk factors are thought by women and relatives to be associated with some religions where people consider "*use of family planning as sinful"* and such people are the ones who give birth frequently without birth spacing. Women and their relatives commented that giving birth at home heightens the risk of complications such as retained placenta or tears of genital organs which lead to PPH.

"...my last born was born at home but the placenta remained inside and I bled and bled a lot so they took me to the health center, I recovered my consciousness when I realized that I was lying on the bed of the health center…" (W 11).

Relatives of women as well as health care providers also expressed the view that poor nutritiondiet exposes the woman to developing PPH. "*what I can add is that the challenge the society meet is the poverty because if a pregnant woman does not eat a balanced diet when she is pregnant, she may have post-partum hemorrhage after giving birth*". (R13*)*

Participants also highlighted barriers related to delays to seeking care which prevent women from getting quality services for the prevention of PPH. The socioeconomic status of the family echoed among the majority of all categories of participants to adversely impact PPH prevention, was poverty. CHWs highlighted that poor families experience the challenge of not being able to afford to buy basic food, or to seek care at the health facility, which is believed to increase the risk for PPH.

"there is a problem of poverty like people in the first category are our big challenge because they are the ones who live with malnutrition problems and give birth frequently, they tell you their problems at a later stage when the woman cannot even sit on a motorcycle and we pay for their transport (CHW38).

Family conflict was also expressed as a challenge associated with socioeconomic conditions. Health care providers in this study revealed that families living with conflict may be less likely to take good decisions to pay for medical insurance hence don't access medical services on time leading to childbearing complications.

"*Families can miss the insurance and you may find a husband in a family who is a drinker or cheating on his wife and when it comes to go to hospital the wife miss someone to accompany her and then she chooses to stay home instead of paying a motorcycle for transportation, a community health worker can recognize this situation late when a woman is in a bad situation, that is how poverty is still a barrier in our zone" (*HCP29*).*

Participants stated that the shortage of staff leads to the delay to proper follow up of childbearing women especially those at risk to develop PPH. This has been expressed as "delay to attend a case" which might mean that signals of an emergency are missed as expressed by a CHW: *"A health provider might be working alone in maternity and she has assisted a woman to give birth thereafter, she might be called by other women in labor to look after them, and meanwhile the lady who just gave birth is left alone, no one is there to provide follow up. In this case the woman may be at risk of bleeding, then bleed and the health care provider will delay to attend the case, no one will know…"* **(CHW39**)

Most of the women participants expressed the delay associated to "*the location of some health facilities is also mattering because we live in high hilled lands* "and people resort to taking motorcycles in case the ambulance takes a long time to reach them. The delay to transfer the woman from a health center to a district hospital has been also expressed as a risk to a woman to have her health status complicated:

"… there is a problem of a delaying decision making when a woman is at the health center or hospital, they may delay to take decision to refer her at night while she has been there for a day bleeding and when she reaches the hospital they may try to intervene while it is no longer possible…" (HCP34)

To address the factors influencing PPH as presented in this section, participants recommended placing an emphasis on prevention measures. They suggested to start prevention strategies pre-conception, and antenatally.

Discussion

This study explored influencing factors for quality care on prevention of PPH as perceived by beneficiaries (childbearing women and their close relatives) and health workers (CHWs in charge of maternal health and health care providers) in the Northern Province of Rwanda.

Beneficiary perspectives

The results from the present study suggest that beneficiaries consider PPH as unusual blood loss followed by alteration of general health condition of the client. Participants believe that every pregnant woman has the potential to experience PPH as it happens “unexpectedly”. Among the causes of PPH commonly known as the ‘4Ts’ mnemonic: tone, tissue, trauma, and thrombin [5, 30] beneficiaries noted that PPH is associated with trauma of genital organs that might be caused by poor delivery care or by lack of birth spacing. Beneficiaries variously mentioned lack of balanced diet and poverty as antenatal risk factors and this is supported by Halle-Ekane *et al* [31] reporting that poverty, lifestyle and malnutrition are some of the broad issues that have been accepted as inevitable and unchangeable but which influence the outcome of a patient with PPH. It has been reported that the knowledge of the risk factors would inform public health interventions for PPH control [32].

Women and their relatives in this study are aware of the severe consequences of PPH. They affirmed that the health system in place is in best position to address the issue of PPH and its prevention. These results point to the likelihood of indication of knowledge and consequences of apparently “*unusual*” blood loss after birth in some women who later become very ill. This finding echoes that of Finlayson *et al* [6], who conducted a qualitative systematic review appraising available evidence about the views and experiences of women and healthcare providers on interventions to prevent PPH. They found that women were generally aware of the consequences of a severe PPH, but in some contexts relied on traditional healers to manage potential childbirth complications. Although our findings demonstrate that participants were generally aware of the consequences of PPH, some beneficiaries believed that PPH might be associated with poison, and in addition some family members (e.g. mothers-in-law) are discouraging women from accessing care at a health facility by recommending traditional medicine instead. This is supported by the literature where some of the more supernatural beliefs and understandings of PPH and remain a challenge in some low- and-middle income countries [6, 33]. In addition Semasaka *et al* [12] report high prevalence of poor sexual and reproductive health among Rwandan women in the early postpartum period. Education programs designed to increase awareness of the potential dangers of PPH may improve understanding in these contexts [6, 34].

Apart from understanding about PPH, other factors that matter to beneficiaries in connection with prevention of PPH include avoidance of “heavy activities”, and the prevention of psychological distress

associated with unsupportive partners. The emotional impact of a PPH is sometimes not given much consideration in the literature but research suggests that, for some women, the repercussions can be severe and associated with long-term mental health problems including posttraumatic stress disorder [35]. Beneficiaries reported a barrier of living with low socioeconomic conditions which sometimes lead to delay in accessing health facilities. Previous literature suggests funding agencies can help underwrite initiatives aimed at reducing PPH through the use of cost-effective, resource appropriate interventions to facilitate all communities especially from low- and-middle income countries, to access quality services in a timely manner [7, 10, 36].

Our findings demonstrate that sometimes there is poor interaction between beneficiaries and health care providers, which can make women reluctant to express freely their health needs during childbearing. Beneficiaries expressed feelings of frustration and anxiety when they have to enter into relationships with angry and irritable health care providers which may be a barrier to the good communication needed for the prevention of PPH This might be associated with the heavy workload of health care providers as also acknowledged by beneficiaries. Our findings concur with Bohren *et al* [37] confirming that overcrowded and understaffed maternity wards fostered a high-stress work environment. To increase facility-based childbirth outcomes, improving quality of care, including women's experiences of care, has been highlighted in recent studies [38, 39] as a key component of strategies to further reduce preventable maternal mortality and morbidity. It is stressed that women must be given a platform to voice their experiences of care [37]. Even though PPH can emerge suddenly, Woiski *et al* [13] suggest that care providers can nevertheless anticipate risk factors, especially if a high risk for PPH is present, by providing the patient with information during pregnancy, about the risks. Particular attention can be paid to patients and family seeking information about PPH and hence be a partner in their own care. This is in accord with van der Pol *et al* [40] stressing that that of maternity services users' views and preferences should be taken into account in the provision of healthcare.

The findings of this study demonstrate the importance and trust the beneficiaries have in the CHWs in charge of maternal health whereby they view his role as being their "*parent*" in the community. This might be associated to close follow up of CHWs in charge of maternal health towards women of reproductive age. Our findings are supported by previous studies [4, 41] which found that an enabling factor to task shifting misoprostol administration to community based auxiliary midwives in every village in Myanmar, was the recognition amongst community members, healthcare providers and policy makers of the critical role played by those auxiliary midwives in providing care during childbirth, particularly in hard-to-reach areas.

Results demonstrate that women and their relatives stressed the limited knowledge of CHWs in charge of maternal health with regards to PPH prevention, though they do have trust in them. This is in agreement with findings from a recent systematic review [42] highlighting the risk associated with inconsistent community knowledge regarding dosage and timings of misoprostol use for PPH prevention, and inconsistency of CHWs' knowledge to differentiate between PPH caused by atony or due to other causes such as uterine rupture, vaginal lacerations and placental abnormalities [42]. Educational sessions for all

people involved in the prevention of PPH has been proposed as a way to contribute to early detection of PPH risk factors.

Health worker perspectives

Our findings suggest that health care providers generally recognize PPH based on a visual estimation of blood loss among health care providers which is defined as blood loss of more than 500 ml within the first hour after birth. This is in accordance with the recommended definition of the WHO [5, 7] and implemented by Rwanda Ministry of Health [43]. In contrast to this common definition of PPH, the Royal College of Obstetricians and Gynecologists (RCOG) in the UK amended its own definition. Considering that the formal measurement of postnatal blood loss suggests that this volume of blood loss is very common, occurring in up to 50% of deliveries, the RCOG approved that the postpartum blood loss of 500 ml is used as a point of 'alert', whereas treatment is only given once the women has lost 1000 ml of blood [30]. For the CHWs in charge of maternal health included in this study, they recognize a woman with PPH when she changes the sanitary pad two or more times within the first hour following birth. Our study provides support to the guidelines developed by Rwanda Ministry of Health indicating how CHWs have to provide close follow up of pregnant women in the community during the antenatal and postpartum periods [29]. In a situation where there are still debates on the importance of estimation or measurement of blood loss, which require extra attention, the consideration of women at risk of developing PPH may improve outcome by early identification and timely action.

Regarding PPH prevention at the community level, CHWs in this study reported adherence to the task shifting policy with administration of Misoprostol in case of home delivery. This is in agreement with a host of literature [29–34] demonstrating the effectiveness of the use of Misoprostol in reducing PPH in a variety of community-based settings. This is regarded as a solution to address staff shortages in some low- and-middle income countries [6, 7]. However, careful attention must be paid in interpreting the finding about the use of Misoprostol in home births, especially in Rwandan settings. CHWs in charge of maternal health and some partners to the pregnant woman reported that their role is just to get the woman to the hospital for delivery which is similar to the findings of a study conducted in Mozambique [41]. This is in line with the guideline of Rwanda Ministry of Health stating that CHWs in charge of maternal health during their home visits, are to assist the mother with birth preparedness and to identify danger signs (with appropriate referral) [23, 29, 44]. When delivery happens at home or in transit to the health facility, CHWs are authorized to administer Misoprostol for PPH prevention, then to continue to take the woman to the nearest health facility for further assessment and follow up. This is contrary to some other settings of low- and-middle income countries where home deliveries are happening in the community with assistance of traditional birth attendants or auxiliary midwives [45–48].

From an organizational perspective our findings indicate that healthcare providers practice active management of the third stage of labor with injectable Oxytocin to prevent PPH, but its effectiveness is questionable as most health facilities lack refrigerator storage in the maternity units to keep oxytocin which requires transport and storage at 2 °C–8 °C regardless of the label [7]. Smith *et al* [49] point out that oxytocin as an essential medicine for preventing PPH, requires proper storage with regular supply of the medicine. This suggests a need for better supply chain management of maternal health medicines

and supplies, as well as greater coordination between clinical/service provision [7, 49] and regular training to improve active management of the third stage of labor, optimizing the timing of uterotonic administration [50].

A common obstacle to the early prevention of PPH is the limited knowledge regarding actions for being “proactive” in the prevention of PPH and team communication and collaboration. Similar results were reported in a qualitative study conducted in the Netherlands [13] on influencing factors for high quality care on postpartum hemorrhage. Health care providers often lack knowledge and skills about proactive actions to prevent exacerbation of PPH, but also about risk factors for PPH. Health workers from the present study visually estimate blood loss to predict PPH. However as reported by Andrikopoulou and D'Alton [51] both estimated and quantitative blood loss can be inaccurate and cannot predict or reduce the risk of PPH. The identification of risk factors for PPH can lead to both awareness and preparedness for PPH. Risk assessments should be undertaken during prenatal visits, antepartum care, admission to labor and delivery, during the labor and postpartum course, as risk factors can change or evolve during the course of labor [31, 51, 52]. Furthermore, insufficient team communication and collaboration, for clear patient information from antenatal clinic to maternity unit were described in the health care provider FGDs as obstacles. These obstacles could lead to inadequate team performance and a lack of appropriate care with regard to being proactive in early identification of PPH risk factors. More exploration with research on early assessment of PPH risk factors during antenatal, delivery and postnatal periods are needed to bring a contribution on being proactive in prevention of PPH.

Strengths and limitations to the study

A strength of our study is its approach of triangulation [53] used to obtain credible information on influencing factors to the provision of quality care for PPH prevention. We used different methods and different sources to collect data to develop a comprehensive understanding of the phenomenon under study from health facilities of different levels of the health system of Rwanda. Another strength is use of the multidisciplinary approach, including all professionals involved in PPH prevention care (Medical doctors, Nurses and midwives), CHWs in charge of maternal health, women who experienced PPH and their close relatives including their partners. We organized one to one interviews with women and FGDs with other participants to identify influencing factors for quality care on PPH prevention from both beneficiary and health worker perspectives. This aligns with Kumar's [54] recommendation to address the need at individual, community and political levels to promote maternal health and to reduce the burden of maternal deaths due to PPH.

Some study limitations bear mentioning. The general applicability of our findings may be questionable as the selected health facilities were from a rural area and thus may not be applicable to the health facilities from the urban area. Nevertheless, our results apply to international guidelines for PPH prevention [5, 7] and to the social determinants approach to maternal deaths [18] because we referred to these guidelines to develop our interview guides. The limited response to the survey is another limitation; a further case control study using quantitative methods is warranted, however. Therefore, our study contributes to early detection and prevention of PPH.

Conclusion

In conclusion, influencing factors for delivery of quality PPH prevention care were described, from both beneficiary and health worker perspectives. For beneficiaries, factors hampering PPH prevention were described to be primarily poor understanding of PPH, while from the health worker perspective there was a focus on organizational factors associated with shortage of staff, poor team communication and collaboration and lack of refrigeration storage in maternity settings to keep injectable oxytocin nearby delivery rooms. Limited knowledge on identification of PPH risk factors among health care workers during the antenatal and intrapartum periods were obstacles for being proactive in early detection and prevention of PPH. Our findings show that placing emphasis on developing strategies for early detection of women at risk of developing PPH, continuous professional development of health care providers, developing educational material for CHWs and family members could improve the prevention of PPH. Results also indicate a need to further enhance communication systems among the various levels of health care and a recommendation to involve all levels of the health system for a better prevention of PPH. Further quantitative research, using case control design is warranted to develop a screening tool for early detection of PPH risk factors for a proactive prevention.

Abbreviations

PPH
Postpartum hemorrhage; CHW:Community Health worker; W:Woman; R:Relative; HCP:Health Care Provider; FGDs:Focus Group Discussions

Declarations

Competing interests

The authors declare that they have no competing interests.

Availability of data and materials

The datasets used and analyzed during the current study are available from the corresponding author on reasonable request.

Ethics approval and consent to participate

The present study was approved by Institution Review Board at the College of Medicine and Health Sciences, University of Rwanda (approval No 313/CMHS IRB/2018).

Consent for publication

Not applicable.

Competing interests

The authors declare that they have no competing interests.

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Authors’ contributions

OB (University of Rwanda) conducted the research, drafted and revised the manuscript. MN, AU (University of Rwanda) and EM (Western University) provided supervision and guidance throughout the process of the research project and completion and revision of the manuscript. MCU (University of Rwanda) reviewed the manuscript. All authors read and approved the final manuscript.

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Figures

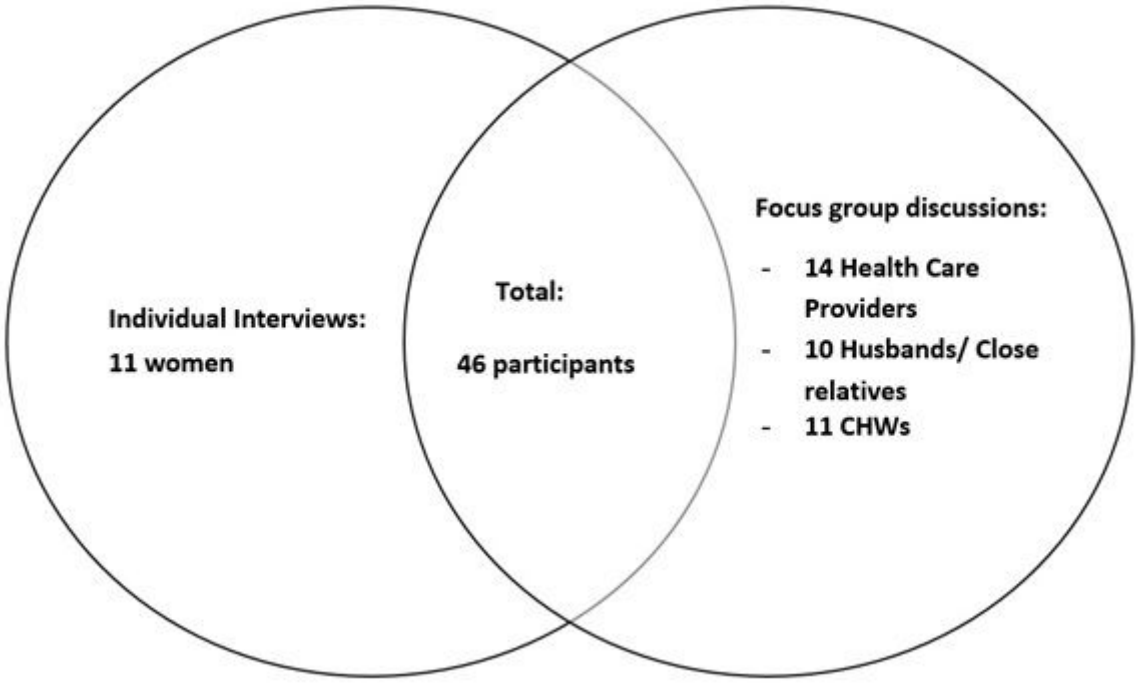

Figure 1

Participants in the qualitative study