

Acceptability of Phone-Based Communication Intervention by Healthcare Workers as an Adjunct to Routine Referral Form: A Qualitative Study in South Western Uganda

Hamson Kanyesigye^{1*}, Joseph Ngonzi¹, Edgar Mulogo², Yarine Fajardo¹, Noni E. MacDonald³, Jerome Kabakyenga²

¹Department of Obstetrics and Gynecology, Faculty of Medicine, Mbarara University of Science and Technology, Mbarara, Uganda

²Department of Community Health, Mbarara University of Science and Technology, Mbarara, Uganda

³Faculty of Medicine & MicroResearch International, Dalhousie University, Halifax, Canada

Email: *hkanyesigye@must.ac.ug

How to cite this paper: Kanyesigye, H., Ngonzi, J., Mulogo, E., Fajardo, Y., MacDonald, N.E. and Kabakyenga, J. (2023) Acceptability of Phone-Based Communication Intervention by Healthcare Workers as an Adjunct to Routine Referral Form: A Qualitative Study in South Western Uganda. *Open Journal of Preventive Medicine*, 13, 23-40.

<https://doi.org/10.4236/ojpm.2023.132003>

Received: December 31, 2022

Accepted: February 24, 2023

Published: February 27, 2023

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Abstract

Introduction: A functional maternal referral system should encompass a feasible communication system between health facilities. In Uganda, the current paper-based patient referral form is associated with inadequate patient-information and low feedback rates. A recent quasi-experimental study demonstrated that a phone-based communication intervention is feasible for iterative communication between health facilities, and there were improved maternal-fetal outcomes and high rates of feedback. However, the acceptability of the intervention was not assessed. **Objective:** The study assessed the acceptability of a phone-based communication intervention by the health care workers (HCWs) for iterative communication between the referring and receiving health facilities. **Methods:** This was a qualitative study conducted in South Western Uganda, in April 2021. The study employed a theoretical framework of acceptability of medical interventions. We conducted in-depth interviews with HCWs and used deductive-inductive analysis. **Results:** We enrolled a total of 23 HCWs, of whom 69.6% (n = 16) were females while 30.4% (n = 7) were males. Majority (65.2%, n = 15), were midwives and the rest were: doctors (30.4%, n = 7) and a nurse (4.3%). The HCWs were positive towards the intervention: they believed that the intervention reduced delays, promoted professional escort, encouraged sharing of supplies, enabled exchange of relatively more patient details, feedback and improved case management. They believed it was culturally acceptable and had enough skills

and experience of operating phones. All participants recommended scale out of the intervention, but advised on the need for dedicated human-resource to coordinate phone calls, ensure availability of airtime and charged battery.

Conclusion: This study demonstrates that the phone-based communication intervention was highly accepted by the healthcare workers, and that hospitals can successfully give feedback to lower health centres through iterative phone calls. This provides a possible solution to the long-standing challenge of poor feedback rates and a vicious cycle of poor maternal-fetal outcomes in resource limited settings.

Keywords

Acceptability, Phone-Based Communication Intervention, Referral Form, Healthcare Workers

1. Introduction

Communication prior referral and feedback remain key components of appropriate management of maternal referrals from lower level health centres to tertiary referral hospitals [1]. Communication helps the lower health centres identify and address gaps in the referral process with consequent improvement of maternal-fetal outcomes [2].

In Western Uganda and similar low resource settings, feedback between referral hospitals and lower level health centres remains a challenge [3]. Real time information sharing hardly happens [4]. The lack of adequate communication between referring and receiving health facilities has negative impact including poor patient care, compromise of patient safety and underutilization of available health facility resources [5].

Currently, in Uganda, a health care worker uses a medical referral form (HMIS FORM 32) to refer a mother in labour from lower health centre to a regional referral hospital. This referral form is used to communicate health information of that particular patient to a referral hospital. The referral hospital then uses the same form to give feedback to the lower health facilities concerning maternal-fetal outcomes and the related gaps for improvement after the patient has been discharged [6]. The use of the referral form for giving feedback has not been successful [7], and elsewhere, the feedback rates have been registered to be very low [8].

A recent quasi-experimental study demonstrated that an intervention of using a phone-based communication prior to maternal referral and feedback to lower health facilities after discharge from hospital improved maternal-fetal outcomes. The study was conducted in western Uganda at Mbarara regional referral hospital (MRRH) and Rwekubo health centre IV (HCIV). This experimental study investigated the effect of a phone call communication prior to referral of mothers in labour as an intervention to reduce preparation delays and improve maternal-fetal outcome at a referral hospital (MRRH). The phone-based interven-

tion was also used to give feedback from MRRH to Rwekubo HCIV [9]. However, acceptability of this intervention had not been assessed.

Assessment of acceptability of such a medical intervention is paramount before considering its scale out [10]. Although the concept of acceptability is widely applied in implementation science, there is no single-globally agreed definition and measurement of acceptability of interventions [11]. Many studies have applied different definitions, and scales of measurement and there are no unified standardized tools to assess acceptability of medical interventions [12]. Studies have applied varying approaches that include both qualitative with think aloud questions and quantitative approaches with Likert scale [13].

Most definitions have considered acceptability as the way people feel and think about the interventions, therefore applying closely related words including usability, actual usage, intentions to engage in the intervention and satisfaction following the intervention [11].

Sekhon *et al.* 2017 provided a definition of acceptability of health interventions as a multi-faceted construct that reflects the extent to which people delivering or receiving a healthcare intervention consider it to be appropriate, based on anticipated or experienced cognitive and emotional responses to the intervention [14]. They also have formulated a theoretical framework of acceptability (TFA) for assessment of acceptability of medical interventions. The TFA has seven constructs: Affective attitude, Burden, ethicality, intervention coherence, intervention effectiveness, self-efficacy and opportunity cost. The seven constructs have been defined as follows:

Affective attitude: How the individual feels about the intervention, if they like or dislike the intervention. Individuals will accept an intervention if they have a positive attitude and enjoy the whole experience of engaging in the intervention.

Burden: The amount of effort required to participate in the intervention. If a lot of effort is required to participate in the intervention process then it is less likely that the intervention will be accepted compared to the one that is easy and less tasking.

Ethicality: The extent to which the intervention has good fit with the individuals value system or morals or culture.

Intervention coherence: The extent to which the participant understands how the intervention works to achieve the purpose. The people delivering and the ones receiving the intervention need to understand how the intervention works in order to increase its chances of acceptability.

Intervention effectiveness: The extent to which the individual thinks that the intervention will achieve the intended purpose. If the participants know that a certain intervention is likely to be effective in achieving positive results, then the acceptability of the intervention is highly likely.

Self-efficacy: The participant's confidence that they can perform behaviors required to participate in the intervention. The participants have to possess the skills, knowledge and confidence to be able to operate or implement the intervention.

Opportunity cost: The benefits or opportunities that are given up to engage in the intervention. If a lot have to be sacrificed in order to participate in the intervention, then its acceptability will be low.

The TFA has an advantage of assessing both the cognitive and affective capabilities of the individual to accept an intervention not only the behavior of the individual. Also, it can be used for assessment of acceptability at different stages of the intervention development and implementation [13]. These can be at designing, pre-implementation, during implementation and post-implementation stages.

This study, therefore, used the TFA to assess the acceptability of the phone-based communication intervention as an adjunct to a medical referral form. The intervention was piloted for purposes of the lower health facilities to communicate to the regional referral hospital prior to maternal referral, and for the referral hospital to give feedback to the lower health centres through iterative phone calls.

2. Methods

2.1. Study Design

This was a qualitative study design.

2.2. Study Site

The study was conducted at Mbarara Regional Referral Hospital (MRRH) in Mbarara district, and Rwekubo HCIV in Isingiro district. The two health facilities participated in the phone-based communication intervention. Both health facilities are located in South Western Uganda but around 50 km apart. Mbarara Regional Referral hospital is located in Mbarara city and also serves as a teaching hospital for Mbarara University of Science and Technology (MUST). It has a bed capacity of approximately 350 beds and the department of Obstetrics and Gynecology registers about 10,000 deliveries per year. The hospital offers specialized obstetric and pediatric care. Most maternal referrals come to MRRH from Rwekubo HCIV seeking for specialized care.

Isingiro district is located in South-Western Uganda, with sixty (60) lower level health centres which refer significant number of patients to Rwekubo HCIV, which then refers the patients with complicated conditions to MRRH. Upon referral, a mother is given a referral form to take to the health workers at MRRH and the same form is supposed to be used by the hospital management to give feedback to Rwekubo HCIV. Rwekubo HCIV is headed by a general doctor. The HCIV offers maternity services, and the human resource includes general doctors, midwives, nurses and Clinical officers, all supervised by the doctor. The HCIV registers an average of 2160 deliveries per year.

2.3. The Context of the Intervention

This was a quasi-experimental study with non-equivalent control group con-

ducted at MRRH in South Western Uganda from September 2020 to March 2021. It investigated the effect of a phone call communication prior to referral of mothers in labour as an intervention to reduce preparation delays and improve maternal-fetal outcome at MRRH.

A real-time pre-referral phone call would be placed from Health Care Workers (HCWs) at Rwekubo HCIV to alert a contact person at MRRH, and the contact person alerts the responsible team at MRRH maternity ward to prepare for management of the emergency obstetric referral. This was in addition to the standard-of-care (referral forms).

Rwekubo HCIV would also be called by the team at MRRH for feedback concerning the patient care and outcome so that the referral process was complete. Upon receiving feedback, a health care worker at Rwekubo HCIV would use the feedback information to complete the copy of the referral form by filling its feedback section.

The control group was composed of emergency maternal referrals from a similar health centre IV (Kabuyanda HCIV) in the same district (Isingiro district) utilizing only the referral forms, which is the standard-of-care. No phone call was made for the referrals from the control group [9].

2.4. Study Population

The study participants were health care workers at maternity ward of Rwekubo HCIV and those at MRRH who participated in the intervention. They included doctors, clinical officers, midwives, and nurses. We also interviewed the head of the department of Obstetrics and Gynecology, head of outreach services at MRRH, and the district health officer (head of health services in Isingiro district).

2.5. Selection Criteria and Study Period

All the doctors, clinical officers, midwives and nurses at Rwekubo HCIV who had participated in the implementation of the intervention and the district health officer (DHO) of Isingiro district were eligible for recruitment in the study. At MRRH we included: the health care workers who participated in receiving phone calls from, and giving feedback to Rwekubo HCIV, the head of department of obstetrics and gynecology, and the head of outreach services. The data collection was conducted in April 2021 immediately after the interventional study.

2.6. Sample Size Determination

We purposively included all the health care workers at maternity wards of Rwekubo HCIV, the health care workers at MRRH who participated in the intervention, the head of department of obstetrics and gynecology at MRRH, and head of outreach services at MRRH. We interviewed all the health workers at maternity ward because we wanted to maximize the number of study participants since the health workers in the health centre were not many (30 healthcare workers). The

sample size was enough since the participants had rich information and professional experience on the topic of maternal referral process and therefore minimal participants were required to reach code saturation [15].

2.7. Recruitment and Study Procedure

The research assistants and first author approached the eligible participants for consent after explaining the study. We then identified participants basing on the record of staff on maternity ward for those who had participated in intervention study or if the health worker was a leader (head of department of obstetrics and gynecology and of outreaches at MRRH, and the DHO Isingiro district). The interviews were conducted in a quiet room to avoid distraction and offer privacy. All the interviews were conducted in English and were audio recorded. We had a moderator and a notetaker to supplement the audio recordings. Each interview lasted between 30 - 90 minutes. Participants were encouraged to talk freely and we used probing questions for more explanations in addition to the interview guide.

2.8. Data Collection Tools and Study Variables

We used a semi-structured interview guide with open-ended questions. The tool was formed and pretested by the first author based on the TFA under the seven constructs. The questions included:

1) Affective Attitude: Was there anything, in particular, you liked or disliked about calling MRRH before referring mothers in labour?

2) Burden: In your opinion, how easy or difficult was it to make phone call before referral?

3) Ethicality: How appropriate do you think it is to use a phone call to communicate to colleagues to MRRH?

4) Intervention Coherence: How do you think this intervention can help in the process of referring mothers in labour?

Probe, Ease of passing on the message and feeling of being understood, reducing delays

5) Perceived Effectiveness: To what extent do you think the intervention will work to reduce maternal and neonatal outcomes?

6) Self-Efficacy: How easy is it for you to operate phone?

Probe, Skill of operating a phone.

7) Opportunity Cost: In your opinion are there some more important things you missed doing while making a phone call prior referral?

The biodata was captured (health centre, sex, age, cadre/qualification, years of employment in the district, years of practice at the current health centre, date of interview). Other general questions related to scale up and recommendations included:

a) Would you recommend the intervention?

b) How do you maintain the phone financially now that the study is finished?

c) What do you think needs to be improved for this innovation to work to your best expectation?

2.9. Data Management and Analysis

All the interviews were transcribed verbatim. The PI cross checked the transcribed interview and audio recordings to ensure accuracy. We used deductive-inductive analysis to generate codes, subthemes and themes. Deductive method was used for the prior-generated themes according to the TFA, but for codes and subthemes we used an inductive approach and followed the six steps of thematic analysis [16]. KH and JK coded the transcripts independently, compared them and there was agreement.

Rigor consideration for the study

We followed four-dimension criteria for assessing rigor in qualitative research of Credibility, dependability, confirmability and transferability [17]. Credibility was ensured by engaging the health care workers for enough time during the interviews, testing the interview guide, using experienced research assistants who work with Mbarara University of Science and Technology (MUST) in the same area of conducting qualitative research. These were also trained on the data collection tools so that accurate information was captured. We also had regular debriefing with the co-authors. For dependability, we developed a detailed study protocol, described our study participants in detail, KH and JK did the coding process independently and the data were repeatable. We ensured confirmability by triangulating the information collected through: use of probing techniques, targeting health workers from both the initiating and receiving health facilities, and involving cadres at different levels including in-charges, midwives and doctors who were interviewed separately through in-depth interviews. Reflexivity was by using interviewers who were not health workers and had no personal experience in maternal referral process. The PI used a “sit back” approach during the interview process in order to avoid bias which could arise from his professional experience of dealing with obstetric referrals. Transferability was ensured by purposively choosing study participants and making sure that we reached saturation of data codes.

3. Results

A total of 23 health care workers participated in the study, of whom 69.6% (n = 16) were females while 30.4% (n = 7) were males (Table 1). The age of participants ranged between 25 - 45 years. Majority (65.2%, n = 15) were midwives and the rest were: doctors (30.4%, n = 7) and a nurse (4.3%). Of the seven doctors, three were holding managerial positions: the head of health services in Isingiro district (district health officer), the head of department of obstetrics and gynecology at MRRH, and the head of outreach services at MRRH. These were targeted due to their leadership positions, knowledge and experience of handling maternal referral challenges. The doctors at Rwekubo HCIV work on maternity

Table 1. Participants' characteristics.

Characteristic		Total, N = 23	
		Number	Percentage (%)
Sex	Female	16	69.6
	Male	07	30.4
Age (years)	25 - 40	19	82.6
	>40	04	17.4
Qualification	Midwife	15	65.2
	Doctors	07	30.4
	Nurse	01	04.3

and other departments which include male ward, general ward and out-patient clinics. At the time of conducting the interviews, all the participants had been serving in their respective healthcare positions for at least one year.

The results of the interviews are presented according to priori themes. The priori themes were informed by the seven constructs of the TFA, which is comprised of: 1) **Affective attitude**, 2) **Burden**, 3) **Ethicality**, 4) **Intervention coherence**, 5) **Intervention effectiveness**, 6) **Self-efficacy**, and 7) **Opportunity cost**.

1) Affective attitude

Under this theme, five (5) subthemes emerged. These are; a) Reduction of 3rd delay at RRH, b) Receiving feedback, and complete information, c) Improvement in case management, d) Mobilizing human resource and supplies, and e) Motivation.

a) Reduction of 3rd delay at RRH

Health workers expressed themselves of how they liked the intervention because the regional referral hospital would prepare in advance to receive and manage the maternal referrals *“during that time, it helped us greatly because we used to first make a phone call before referring a mother and whenever the mother would reach the referral hospital, she would be given first and immediate attention because the staff of the referral hospital were expecting her based on the phone call they received”* a midwife reported. (RWE-HCW-RMW-11)

b) Receiving feedback, and complete information

The participants from Rwekubo HCIV narrated that they enjoyed the intervention because they started to receive feedback from the regional referral hospital. They added that the feedback was immediately after receiving the referral but also after patient management. The doctors at regional referral hospital would ask for more information through phone call communication to get more patient details that were not documented in the referral note.

“If you refer a mother and they work on her, they give you feedback im-

mediately” reported by a nurse. (RWE-HCW-EN-1)

“Whatever feedback we needed to know from Mbarara regional Referral hospital was given to us” a doctor added. (RWE-HCW-DR)

“Phone calls also helped on the part of giving information regarding the patients, you would find that they already have the patient’s information that you gave them verbally through the phone just before referral, and in case you find you skipped it in documentation of referral form, then you would mention it over the phone call” a midwife explained. (RWE-HCW-RMW-3)

c) Improvement in case management

All the health workers reported that through feedback, they were able to know the gaps in management of mothers in labour and which improved their knowledge and skills. The healthcare workers at Rwekubo HCIV, at times would have consultative phone calls with the doctors at MRRH and manage the patients without having to refer them.

“The feedback has helped us to improve because they would tell us where we have messed up and where we did well, so we would also try to make things better” from a midwife. (RWE-HCW-EMW-10)

“... in turn we acquired more knowledge from the feedback we received” a midwife added. (RWE-HCW-MW-1)

“Sometimes we would call to the referral hospital and they tell us how to carry out a certain procedure, so you find that the case we wanted to refer was handled from our facility” reported by a midwife. (RWE-HCW-MW-4)

d) Mobilizing human resource and supplies

At the health centre, the phone was used to mobilize health workers by calling them to report to their work stations in case of emergencies especially at night time. They would call and alert the team to come to theatre and other places to quickly attend to the emergencies. The health workers at MRRH would inform the colleagues at Rwekubo HCIV to refer mothers with certain sundries from the HCIV that would be missing at MRRH in order to quickly work on the emergency.

“The phone call intervention also helped us here at the facility because it’s not easy to find the whole team here gathered at the same time, so in presence of the phone, you are able to mobilize other staffs to support you in case you have an emergency either in the theatre or in the maternity ward. The intervention was so good” a midwife narrated. (RWE-HCW-RMW-4)

“Sometimes when they had a shortage of supplies, they would request us to send the mother with some supplies. It also helped in relieving stress on the mother’s side because they knew that the moment they reach Mbarara Referral hospital, someone is going to handle them, instead of waiting in line with non-emergencies” a midwife reported. (RWE-HCW-EMW-14)

“They would also communicate back and tell us, ‘we don’t have this at MRRH, when you are referring mothers, refer them with this and this’. So, it really made work a bit easier” from a midwife. (RWE-HCW-RMW-6)

e) Motivation

The intervention motivated the health workers to escort the emergency maternal referrals because the communication improved the relationships between the health workers at the referring health facility and the receiving hospital.

“It also creates a good relationship between the health workers at our health facility and the health workers at the referral hospital” reported by a doctor. (RWE-HCW-DR-1)

“It is also quick, timely and you escort the mother with confidence knowing that there is someone expecting you at the referral hospital”. (RWE-HCW-EMW-2)

2) Burden

Under this theme, the participants revealed that they had no problem making a phone call since it was an easy task and benefiting them and their patients.

“It was very easy for us to make a phone call and they would give us very good reception”. (RWE-HCW-MW-2)

“For me it’s really easy, I don’t think there is any challenge” a doctor said. (RWE-HCW-DR-2)

“It is very easy, anyone can place a call as long as the phone is charged” a midwife reported. (RWE-HCW-MW-5)

3) Ethicality

All the participants feel that it is a normal practice to communicate to each other using a phone.

“I find a phone very easy for me to operate because I use one in my daily life”. (RWE-HCW-MW-1)

“This is dot.com era, everyone is at least operating a phone. From a doctor”. (RWE-HCW-DR-1)

4) Intervention coherence

The participants knew how the intervention works. They explained that because emergency maternal referrals are worked on quickly, this would avert delays with consequent improvement in the process of maternal referral. They also knew how the intervention could work to give feedback and complete the referral form at the referring health facility.

“It will help in the way that it reduces on the delays that are usually involved during referral of mothers to access health care” a midwife reported. (RWE-HCW-RMW-6)

“A person would receive the feedback here at Rwekubo HCIV, fill the forms and then she would share with us the feedback, so it was easy for that information to come through and we complete the referral forms” said by a midwife. (RWE-HCW-RMW-3)

“Making phone calls before referring also gave enough time to the referral hospital to prepare for the coming client and plan for the mode of delivery. Sometimes when they had a shortage of supplies, they would request us to send the mother with some supplies. It also helped in relieving stress on the mother’s side because they knew that the moment they reach Mbarara Re-

referral hospital, someone is going to handle them, instead of waiting in line with non-emergencies". A mid wife explained the different ways the intervention would work. (RWE-HCW-RMW-14)

5) Perceived effectiveness

All the participants believed that the intervention would achieve its purpose by reducing the delays in the referral process with consequent improvement in both maternal and fetal outcomes. The health workers also reported that with feedback and consultations, their knowledge and skills of managing the mothers in labour would improve.

"... that patient is given attention very fast and helps in saving lives of the mother and the baby." Midwife reported. (RWE-HCW-EMW-1)

"This intervention will work to achieve at least 90% effectiveness, we shall be able to save the lives of mothers who die during labour, we are also going to reduce on the perinatal deaths which occur in transit from the point of referral to the point of destination" a midwife explained. (RWE-HCW-RMW-14)

6) Self-efficacy

All the participants explained that they were comfortable to engage in the intervention because they had confidence in operating a phone and all had personal phones which they had been operating with ease.

"It is very easy; anyone can place a call as long as the phone is charged" a midwife stated. (RWE-HCW-MW-5)

7) Opportunity cost

The participants appreciated that it costed them nothing to make a phone call prior referral of obstetric emergencies but most added that the phone should have charged battery all the time and have air-time. Some added that at times it would be hard to engage in the intervention especially when called to receive feedback if the patients to attend to on the maternity ward were many. The health workers at the referral hospital reported that sometimes the midwives at Rwekubo HCIV would prefer an appointment to receive feedback in order to complete documentation in the referral forms. With this, the participants suggested that it would require more staffing levels and reduction in work load or a dedicated person to receive feedback and complete the documentation for the intervention to be more successful.

"... as you prepare the patient and make sure they are ready for referral, you then call the referral hospital. It does not cost me anything" a doctor stated. (RWE-HCW-DR-1)

"So, in the process of making a phone call, you may end up forgetting some of the things, but that is brought by shortage of staff, if we were enough, we would distribute roles amongst us during emergency cases" a midwife reported. (RWE-HCW-MW-14)

Scalability

All the participants said that they would recommend the intervention be extended to other health facilities in the region. Others suggested that the interven-

tion should be rolled out immediately to all other health departments that refer patients and not only maternal referrals. Such referrals would include medical, surgical and paediatric referrals. We were also informed by the participants at Rwekubo HCIV that after the end of the study, the health centre management maintained the phone and load air-time to keep communicating to and mobilizing staff for different activities including alerting the team for help in case of emergencies.

“This intervention is actually very important not only for mothers but it cuts across all referral systems because even if you are referring someone with another condition, when you make a phone call and communicate in time, that person is given attention very fast and helps in saving lives of our patients” a midwife stated. (RWE-HCW-EMW-1)

“I wish this intervention would improve to other departments as well not only the maternity department, that would be better. If this intervention continues, we will be very grateful” a midwife stated. (RWE-HCW-RMW-4)

“The phone call intervention also helped us here at the facility because it's not easy to find the whole team here gathered at the same time, so in presence of the phone, you are able to mobilize other staffs to support you in case you have an emergency” a midwife narrated. (RWE-HCW-RMW-4)

4. Discussion

This study has demonstrated that the phone call intervention in the process of emergency maternal referral was highly accepted by the healthcare workers at both the referring and the receiving health facilities. The healthcare workers believed that the intervention reduced delays in the referral process with improvement of maternal and fetal outcomes. They also stated that it promoted professional escort of maternal referrals, enabled feedback from the regional hospital to the lower health centre and subsequently improved case management.

Through iterative phone call communication, the healthcare workers were able to exchange more patient details compared to what is routinely documented in the referral forms and the intervention encouraged sharing of supplies between the health facilities.

Scale out of the intervention was highly recommended by the participants. However, they advised that for the intervention to be more successful, a dedicated human resource should be availed to always receive the feedback from the regional referral hospital and make sure that the phone has airtime and charged battery.

Our findings that the phone call intervention was highly acceptable by the participants agrees with other studies done in the field of: HIV care [18] [19] [20], oncology [21], hypertension [22], physical exercise [23] and maternal health [24] [25]. We think that this is because the phone call technology and the behaviors that are required to engage in the intervention are not new to the study populations.

In this study, all the participants reported having owned and operated phones before the intervention. Also, most of them believed that the intervention had many benefits in the process of emergency maternal referrals and knew that it could achieve its purpose of reducing adverse maternal-fetal outcomes.

The participants anticipated that the intervention would reduce delays in the process of maternal referrals. This was true as evidenced by the experimental study findings. The intervention reduced patient waiting time on the admission bench and we observed that there was less adverse maternal-fetal outcomes in the intervention group compared to the control group [9].

Following a phone call prior to referral of maternal emergency, there would be a better relationship between the health workers at the regional referral hospital and those at the lower health centre. The healthcare workers also got more confidence in the system knowing that the colleagues at the referral hospital were waiting for them. This was motivating and encouraged the midwives to escort the emergency maternal referrals.

This is an important finding because previously it has been reported that the health workers at the regional hospital would harass the health workers who would come from lower health centres escorting maternal referrals in labour [7]. Since professional escort of maternal referrals is still a problem in our setting and similar resource limited settings [26], we need to capitalize on this intervention as it seems to be an incentive that motivates health workers to escort maternal referrals.

This study has demonstrated that it is possible and satisfying for the lower health facilities to get feedback through phone call communication. Currently it is not feasible to get feedback by use of referral forms (the standard of care). In many similar settings, the feedback rate is unacceptably low [8], and possibly this is due to lack of a system in place for health workers to communicate [27].

However, with this intervention the regional referral hospital was able to give feedback to the HCIV for all the referrals (100%) during the study period. Moreover, the phone call does not replace the standard of care but is an adjunct. Sometimes, the documentation on the referral form is inadequate and missing important patient details, but with the phone call intervention, a doctor at the referral hospital is able to probe for more details which help in patient care.

By receiving feedback, the health workers were able to identify gaps in management of emergency maternal referrals and addressed them. Also, the phone call was used for consultations and additively, the HCWs believed that there was improvement in case management. In a systematic review, phone call consultations were reported to be beneficial [28]. Another systematic review of a study about improving maternal outcomes and quality of care in Sub Saharan Africa, they revealed that audit and feedback improve patient care [2].

With this intervention, the number of maternal referrals from lower health units to regional referral hospital is likely to reduce because the participants reported that following phone call-consultations, some mothers who would otherwise be referred were managed at the health centre IV. Similarly, studies in-

volving physician-to-physician phone call consultations in Canada have the same findings that the number of patients visiting the consultants decreased [28].

In low-income countries, it is common to have shortage of sundries in certain referral hospitals. Such sundries could be available at the lower health unit which is referring in search of specialized human resource but after reaching the referral hospital, there could be delays and financial losses to the poor patients while trying to mobilize the same sundries [29].

With this intervention, the maternal referral could come from the lower health centre with the missing sundries at the regional referral hospital after getting real-time phone call communication and the status update of supplies at the referral hospital. This encourages the re-distribution of such resources and averts some causes of 3rd delay which eventually improves maternal and fetal outcomes.

In implementation science, it is important to learn from the piloted evidence-based interventions before considering its scale out [10]. Our study findings suggest that the chances of successfully extending the intervention to the whole of Uganda and similar settings of low-income countries are easier and highly likely. This is because the intervention was very highly received by the healthcare workers at both the referring and the receiving health facilities, and they all recommended the scale-out.

The health centre that participated in the intervention has since maintained the phone and the concept of calling before referral, and some neighboring health centre IV has tried to copy and is implementing the practice. However, the findings emphasize that in order to maximize the effectiveness of the intervention, there is a need to have dedicated human resource to manage the phone and receive the feedback at any time from the referral hospital. This is because the phone call may be placed when the healthcare workers are busy with other patients. This agrees with findings from another study in Spain which reported that work load interfered with the physicians to implement e-health intervention [30].

Limitations and Strengths of the study

There could have been a social desirability bias but this was reduced by using interviewers who were new to the participants and not part of the participants' supervisors from the referral hospital.

The results from this study have limited generalizability beyond the health facilities that participated in the study but we made effort to explore all aspects of assessing acceptability until we reached saturation.

Additionally, we involved different cadres from both the HCIV and the regional referral hospital including in charges of the health facilities and the head of district health services. All the respondents had participated in the interventional study and their views were realistic. This helped to generate the views of both the HCWs in operational activities of maternal referrals and their leaders who plan for the activities and strategies to manage the resources.

We therefore consider that the findings are a good representation that indeed the acceptability of the phone-based intervention by the HCWs was high.

5. Conclusions

A phone call communication prior to maternal referral was a highly acceptable intervention by the healthcare workers both at the referring and the receiving health facilities. The experience of the intervention motivated healthcare workers to escort mothers in labour. The consultative phone calls and feedback are believed to have improved the confidence and knowledge of health care workers at the health centre with possible improvement in case management of maternal referrals.

The study also suggests that regional referral hospitals can successfully give feedback to lower health centres through iterative phone calls. This could be the solution for the long-standing challenge of a vicious cycle of poor feedback rates and adverse maternal-fetal outcomes from dysfunctional maternal referral systems in resource limited settings.

We recommend a multicenter study as the commencement of the scale-up and scale-out of this intervention to further evaluate its benefits. However, there should be a dedicated human resource to manage the phone and phone calls to maximize the effectiveness of the intervention.

Acknowledgements

We are grateful for the technical support received from MicroResearch International, MUST through Health Child Uganda, Obstetrics and Gynecology Department of Mbarara University of Science and Technology, Office of DHO-Isingiro district, Rwekubo HCIV and Mbarara Regional Referral Hospital management. We also thank all the healthcare workers who fully accepted to participate in this study.

Ethical Considerations

This study was approved by the Institutional Review Committee of MUST (Ref: MUREC 1/7, No 08/08-19) and we registered the study with Uganda National Council for Science and Technology (UNCST-HS543ES) while the trial was registered with Pan African Clinical Trial Registry (PACTR). **Trial registration:** Pan African Clinical Trial Registry PACTR20200686885039.

Administrative clearance was obtained from the Director MRRH and District Health Office Isingiro district. A written informed consent to participate in the study and for publication of anonymized responses was obtained from all study participants in the language that they understand.

Study participants were identified by numbers and not names. Interviews were conducted with privacy and we maintained confidentiality. Data collected are accessed by only authorized personnel. We complied with the Helsinki declaration while conducting this study.

Conflicts of Interest

The authors declare that they have no competing interests with regard to publication of this work.

Authors' Contributions

All authors (HK, JK, JN, YF, NM and EM) made substantial contributions to: conception and design of the study, acquisition, analysis and interpretation of the data. All the authors took part in drafting and revising the article critically for important intellectual content; agreed to submit it to the current journal; gave final approval of the version to be published; and agree to be accountable for all aspects of the work.

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Abbreviations

HCIV: Health Centre IV; **HMIS:** Health Management Information System; **HCWs:** Health Care Workers; **VHT:** Village Health Team; **DHO:** District Health Officer; **ICU:** Intensive Care Unit; **MRRH:** Mbarara Regional Referral Hospital; **MUST:** Mbarara University of Science and Technology; **MUST REC:** Mbarara University of Science and Technology Research Ethical Committee; **UNCST:** Uganda National council for Science and Technology.