Reaching Women and Newborns with Multidisciplinary Specialized Care Via Whatsapp Interaction. A One-Year Experience from Tanzania

Naibu Mkongwa

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Abstract

Introduction: EmONC is one of the interventions that reduce maternal and newborn morbidity and mortality by treatment of complications that may arise during pregnancy and childbirth. To support provision of EmONC service to critically ill patients, in 2018, Maternity WhatsApp Groups (MWGs) were established to render technical assistance to frontline skilled health care providers.Materials and methods: A total of 9 MWGs were formed with members from Regional and District Health Management Teams, hospitals (referral and district), health centres and HFs (both public and private). Clinicians, paramedics and policy makers constituted membership of groups. Interactive messages generated from groups were exported in notebook and then word. Generated were manually coded into themes and subthemes using the structural functionalism and grounded theories. An inductive approach was used to analyze data.

Index terms—

Reaching Women and Newborns with Multidisciplinary Specialized Care Via Whatsapp Interaction. A One-Year Experience from Tanzania Abstract-Introduction: EmONC is one of the interventions that reduce maternal and newborn morbidity and mortality by treatment of complications that may arise during pregnancy and childbirth. To support provision of EmONC service to critically ill patients, in 2018, Maternity WhatsApp Groups (MWGs) were established to render technical assistance to frontline skilled health care providers.

Materials and methods: A total of 9 MWGs were formed with members from Regional and District Health Management Teams, hospitals (referral and district), health centres and HFs (both public and private). Clinicians, paramedics and policy makers constituted membership of groups. Interactive messages generated from groups were exported in notebook and then word. Generated were manually coded into themes and subthemes using the structural functionalism and grounded theories. An inductive approach was used to analyze data.

Results: A total of 431,845 texts were generated the 9 MWGs and were coded in themes; (i) Management of Referral, (ii) Occurrence of unique events, (iii) Availability of medicines, (iv) Process of care, (v) Addressing Management Challenges, (vi) Commodities and Supplies, and (vii) Feedback and Compliment. In 12 months period, 584 critically ill cases were discussed and CFR was 4.6% (n=27).

Discussion: While, there is paucity of data on telemedicine use in provision of service to patients. Use of MWGs presented here ushers some light on its usefulness. Findings have demonstrated that the successful telemedicine requires a motivated leadership so as a guideline. Further, the effectiveness of ICU telemedicine program was influenced by various factors within the domain leadership and organization structure. The MWGs have supported management of supplies when one geographical area face scarcity of life saving commodities. In this program women and newborn from remote areas received multidisciplinary specialized care at the time when they needed most through MWGs.

1 Background

he WHO estimates show that about 295,000 women died due to mostly pregnancy related complications in 2017. Over94% of these deaths occurred in low-resource settings, and most could have been prevented by applying

simple medical interventions (1). Emergency Obstetric and Newborn Care (EmONC) are interventions that can reduce maternal and newborn morbidity and mortality from complications that may arise during pregnancy and childbirth (2). Bhandari, et al in 2014 showed that timely referral from basic to comprehensive EmONC services is key to reducing maternal death and disability (3). Ansari, et al (2015) demonstrated that improving maternal and newborn health (MNH) indicators remains the biggest challenge in low resource countries (4). This challenge emanates from inadequate numbers and training of Skilled Birth Attendants (SBAs), a bottleneck that impacts provision of EmONC services, especially in low resource countries (5,6,7).

Electronic social media provides an opportunity for health experts to improve care through the exchange of knowledge and skills and mentoring, maximizing the impact of the few available health specialists by increasing the magnitude of contact. Amani, et al (2017) reported that in Cameroon WhatsApp managed to address challenges to knowledge, referral, equipment and expertise in emergencies related to neonates (8). This tallies with experience in Oman, where the WhatsApp platform provided a more rapid response in referral leading to optimal utilization of specialized care and reducing inappropriate patient transfers (9). Koparal, et al (2019) showed that the WhatsApp platform supported dental care and in most cases consultation was conclusive (10). Bakshi et al (2017) and Clavier et al (2019) showed that use of the WhatsApp platform facilitated interaction and discussion of health specialists with other staff, thus improving T knowledge, confidence and documentation in clinical notes (11,12).

Tanzania is in accord with the Global Strategy for Women and Children (2016-2030), The Health Sector Strategic Plan IV and One Plan II **??**2008) **??**2009) **??**2010) **??**2011) **??**2012) **??**2013) **??**2014) **??**2015) that aim to improve MNH by ensuring access to SBAs and EmONC services (13,14,15). It is also important to note that in Tanzania the availability of Nurse Midwives stands at 52% (16). Ueno, et al (2015), Harvey, et al (2007) and the Tanzanian EmONC Assessment (2015), have shown that provision of EmONC services was limited by inadequate knowledge and skills in the performance of basic MNH interventions (17,18,19).

To bridge the gap in knowledge and skills in provision of EmONC services, in 2018, Maternity WhatsApp Groups (MWGs) were established to support health service providers from lower health facilities (HFs) with technical assistance from medical specialists who are locally available in Tanzania and those residing outside the Country. This case study aimed to explore how health care providers and their remote mentors communicated in finding solutions to the acute problems discussed, which challenges were described and how they were addressed, with the ultimate goal of sharing these unique experiences with stakeholders in a condensed and structured way.

2 a) Methodology

We used a case study approach to explore routine data derived from the MWGs.

3 b) Theoretical framework

Our approach was guided by structural functionalism theory of how systems function, and grounded theory. (20,21).

4 c) Study area

Tanzanian Mainland, from June 2018 to July 2019.

5 d) Maternal WhatsApp Groups to support Emergency

Obstetric and Newborn Care in Tanzania MWGs were formed by the Reproductive and Child Health Section (RCHS), in the Ministry of Health in 2018 to improve decision making and service provision for maternal and newborn emergency cases at primary and secondary levels of care. Mentors in each group were available day and night and provided advice free of charge. Any participant could post a case or a question at any time. Administrators were selected by the groups, usually the zonal reproductive and child health coordinator, who monitored conversations with regards to confidentiality and appropriateness and facilitated individual follow up or referral. Each group had a representative from RCHS to assist with systemrelated issues that could not be solved at the district or regional level, e.g. distribution of drugs or medical equipment. They were also tasked with collecting experience with ethical aspects of the use of social media in health care with the aim of informing the development of a legal framework for Tanzania.

Anonymous clinical data on patients were shared in the group by clinicians or nurses in need of specialist opinion. The specialists could ask for more information in order to arrive at a conclusion, and at times individual calls were made to discuss a case with the frontline workers. Providers in HFs sometimes WhatsApp video or voice calls at night, to ask for support.

On Mainland Tanzania there are eight health zones, each led by a Zonal Reproductive and Child Health coordinator (RCHco). Each zone consists of 2-3 regions (Table 1). The regions and districts also have Regional RCHco and District RCHco. Zonal RCHco provide a link between the regions and the Ministry, while Regional RCHco and District RCHco are responsible for overseeing the RMNCAH implementation at the regionalor district levels, respectively.

A total of 9 MWGs were formed (Table 1). The Lake Region was later divided into three zones and Dar Es Salaam City was a stand-alone zone. Members of MWGs were drawn from Regional and District Health

Management Teams, hospitals (referral and district), health centres, from both public and private HFs. General practitioners, obstetricians, midwives, anaesthesia experts, pharmacists and laboratory staff, blood services and others, formed the core of expert mentors. Individual consent from health care providers and managers participating in the groups was not sought, but through group assent. The Ministry issued an official statement, that data from these groups would be stored as routine, analyzed and may be published with the aim of improving the use of digital communication to enhance quality care. Prior to starting the groups, guidance was sought about data security. Previously no legal framework had existed in Tanzania with regards to the use of digital techniques. The groups were therefore advised to use medical ethical standards in their communication to ensure confidentiality. The administrators of MWGs were instructed to remind members of the confidentiality of the information shared and anonymity of cases while seeking medical consultation at the various levels, from the primary to the tertiary level.

In a certain sense, this article describes how policy makers to can share their experience in implementation of various policies, strategies, and guidelines, without which such data would be lost forever.

6 f) Data collection methods

Data from these groups was considered routine data related to service provision. Data generated from these groups through consultation via WhatsApp were exported by notebook, transcribed verbatim to word and stored in 9 files, one for each per zone and on a password protected computer at the Ministry of Health. Each transcript contained the whole communication of each group over one year (June 2019 -May 2019) and was translated into English where primary communication was in Kiswahili, by experienced translators. Any remaining names or locations that could reveal patient or provider identities were removed. To ensure meaning was not lost during the translation, all translated transcripts had both the original text (Kiswahili and English version) and the English translation. These documents were then reviewed by the principal researcher and the RCHS team to ensure no translation errors were embedded before the transcript was moved to next level of analysis.

7 g) Data Analysis

To ensure integrity of findings, each transcript was assigned to two research assistants working independently and results were compared with an intercoder reliability threshold of at least 60%.

An inductive approach was used to analyze the data. This helped to condense the extensive and varied raw text into themes and provided insights into current processes of care for mothers and newborns in Tanzania. To enhance the plausibility of conclusions, manual coding of MWGs discussion data into themes and sub-themes was conducted.

To aid coding, a list of codes was developed. As a control measure to ensure new codes were only created when necessary, the data analysis team was asked to develop a code-book with code definitions and examples of when to use the codes and when not to use them. These codes and definitions were shared with the broader team for validation before they were adopted for final analysis. The transcripts were clustered by inductively forming categories based on the raw text, and then sorting quotations into the categories.

8 II.

9 Results

A total of 642,484 words were extracted from the nine groups and seven themes emerged during coding; (i) Management of Referral, (ii) Occurrence of unique events, (iii) Availability of medicines, (iv) Process of care, (v) Addressing management challenges (vi) Commodities and supplies, and (vii) Feedback and Compliment.

During the 12 month period, the nine groups contributed to the management of 584 cases of critically ill patients, with a case fatality rate of 4.6% (n=27). The number of cases reported showed variation from 319 in the Central Zone to as low as 1 in the Northern Zone. This may be attributed to the level of acceptability and stewardship of the use of innovative methods. All groups contributed valuable data by seeking help, responding and following up with care of critical cases. However, the Southern, Lake, and Eastern zones were especially effective in strong stewardship and coordination of the MWGs (Table 2).

10 Box 1 a) Communication on accountability for maternal and newborn's health

MWGs included decision makers from the national, regional, district and health facility levels (Health Facility person in-charge, matron, laboratory technician in-charge, etc). This broad inclusion enabled the improvement of decision making for critically ill patients as shown below. LZ. 111018. A patient in Lake Zone who developed disseminated intravascular coagulation (DIC) provides a good example of accountability. The patient needed 4-5 FFP before transfusing RBCs units, which were not readily available. Mobilization of safe blood was made along leadership hierarchy and these supplies were shipped at night for a distance of 200 kilometres. The Regional and District Medical Officers organized teams of laboratory technicians and drivers to prepare requested units at

12 SZ231218 THROUGH THE GROUP, THE TEAM FURTHER EXPERIENCED A COORDINATED REFERRAL BETWEEN RHTM, CHMT, FAITH BASED HFS, HCPS AND WITH TECHNICAL INPUT FROM NATIONAL HOSPITAL FOR A PATIENT WITH PERIPARTUM CARDIOMYOPATHY, ENABLING SAFE REFERRAL TO NATIONAL MEDICAL CENTRE. THE HOSPITAL OFFERED HUMAN RESOURCE AND AMBULANCE WHILE THE CHMT SUPPORTED WITH FUEL FOR THE AMBULANCE AND DAILY SUBSISTENCE ALLOWANCES FOR ESCORTING MEDICAL STAFF AND DRIVER. B) MENTORING OF SKILLED HCPS IN REAL CASES

11 DZ 090718 One morning an obstetrician in hospital shouted for support to have an adequate blood supply for a patient who had ruptured uterus. The request via WhatsApp group provided a good response with members offering technical support and supply of highly needed blood from neighbour health facilities to save life of the patient.

The MWGs have observed improvement in the quality of referrals with multidisciplinary participation and joint decision making at various levels.

12 SZ231218 Through the group, the team further experienced a coordinated referral between RHTM, CHMT, Faith Based HFs, HCPs and with technical input from National Hospital for a patient with peripartum cardiomyopathy, enabling safe referral to National Medical Centre. The hospital offered human resource and ambulance while the CHMT supported with fuel for the ambulance and daily subsistence allowances for escorting medical staff and driver. b) Mentoring of skilled HCPs in real cases

In the developing world there is a huge challenge in mentoring and couching of HCPs after graduating from pre-or in-service training resulting in suboptimal performance. The MWGs were observed to fill this gap through continuous non-structured mentoring, while managing complicated obstetric and newborn cases. This mentoring process contributed to change of practice and behaviour of HCPs through support from various experts (MPZ 170718). MPZ 170718: A patient was prescribed for an emergency Caesarean section due to eclampsia. Surgeon and other staff were ready for the procedure but the anaesthetist felt that the condition of patient required more expertise hence a need for referral to a regional referral hospital. Therefore, an Anaesthesiologist from Muhimbili National Hospital was consulted via MWG and then a conference call was set between the two. Through the call, the anaesthetist was supported in providing general anaesthesia under supervision of the anaesthesiologist from remote location. This CS ended uneventful with good outcome for both mother and newborn.

MWGs demonstrated successful mentorship and couching in management of complicated PPH with DIC, abruptio placentae, shock, suspected venous thromboembolism, anaesthesia and other complications, (SZ 280618). SZ. DH. 280618: Primi para delivered by CS with general anaesthesia due to eclampsia on the fourth day when she became unconscious. Post operative the patient had good recovery with regaining consciousness but a day later she deteriorated again, losing consciousness. She was on eclampsia management protocol with anticonvusant injection magnesium sulphate, antihypertensives and antibiotics. She was started on intramuscular dexamethasone 4mg 8 times hourly. Initial report showed; PR 78 beats per minute, BP 150/104 mmHg, respiratory rate was 21 breaths per minute and oxygen saturation, 95%. Chest was clear and urine output was approximately 60 mls per hour. Brain function showed that pupils were reacting to light but there was diminished knee jerk reflexes. The team in health facility decided to seek help from MWG. MWG responses: Experts advised a HF to designate an "ICU like bed" to provide conservative management aimed at reducing suspected raised intracranial pressure. The group deferred sending the patient to Muhimbili National Hospital due to the distance and to conditions surrounding the referring ambulance. After three days of management the patient regained consciousness and was later discharged. In turn, the HF benefited from learning basic elements of ICU.

In a previous presentation of SZ. 230718, MWGs specialists and other members equivocally agreed to the diagnosis of ruptured uterus. This was a near miss, the management of which changed from severe anaemia to ruptured uterus, whereby the team conducted the appropriate procedure using crystalloid fluids, preparation of safe blood for transfusion and finally, a subtotal hysterectomy was performed. This process revealed that the diagnosis by the MWG was correct and the patient survived.

The case described below shows the value of the MWG in a situation where obstetric findings contradicted normal labour. This patient finally required CS as mode of delivery (SHZ. 150818). SHZ. 150818. A primigravida mother 18 years old at term who was reported to be in labour, fully dilated for more than one-hour with viable foetus, membranes were ruptured and she had moderate contractions. Initially, the team thought the patient was truly at second stage of labour pain and thought to augment labour and possibly assisted delivery with a vacuum extractor. However, after a thorough consultation in MWG benefit of doubt was given and she was referred to a neighbour regional referral hospital. The feedback showed the woman had cephalopelvic disproportion with presented part having both caput and moulding. The caesarean section and the outcome of both mother and newborn was good.

13 c) Logistic support through the platform

In August 2018, the health facilities experienced a shortage of antin-convusant injection magnesium sulphate to treat eclampsia. The MWGs mitigated this challenge by mobilizing the Zonal Medical Stores Department (MSD) warehouse and from other HFs such as dispensaries and health centers and arranging a quick redistribution to meet the demand on time.

MWGs also identified and mediated a demand for low molecular weight heparin in management of suspected venous thromboembolism patients. For a short time, the demand for the medicine at HFs increased sharply. This medication is now considered by HCP as a lifesaving commodity for maternal care. The increased demand for LMW heparin led the MSD to increase the supply to meet the needs of the HFs.

14 d) Improvement in the quality of referral

Referral of critically ill patients is a major challenge for health care systems in most developing countries. Ideally, the referring team needs to fulfil a number of lifesaving tasks to ensure that the referred patient reaches point B safely. Experts in MWG have often refrained from transporting patients because of lack of ideal ambulance services, frequently deciding instead to support local teams with knowledge and skills to manage such patients locally. When referral becomes necessary, these experts ensure that the patient is stabilized, referred and transported. The above narrative case of SZ. 230718, a patient treated after setting up an ICU bed, illustrates this challenge.

15 e) Collaboration and teamwork in management of complicated patients through the MWG platform

Using MWGs, health care providers have managed to bring together administrators, obstetricians, midwives, anaesthesiologists and other experts to manage a single given patient who is critically ill, hence cultivating a sense of team work as shown in the previous presentation.

16 III.

17 Discussion

In Tanzania, MWGs have enabled us to unify the various sectors of the health system as one, the various actors brought together to manage a single woman and her newborn. Acknowledging the paucity of data on the use of telemedicine to provide services directly to patients, this case study sheds some light on its usefulness. The findings of Wilcox and Adhikari (2012), and Vranas, et al (2018) tally with ours, demonstrating that the use of telemedicine was associated with a reduction of mortality hence providing promise for support for future use in critical care (22,23).

This study also observed that a lack of guidelines had implications for the effectiveness of telemedicine in the management of patients, as providers felt they were not protected and that they might be "required" to use telemedicine. Kahn and Rak's (2019) findings have demonstrated that successful telemedicine requires motivated leadership, sound organization, structural influence and the availability of clear guidelines (24). The observations above tally with our experience that where the local leadership was supportive of MWGs, the performance was good -and vice-verse.

In review, it is our observation that the majority of studies focused more on the use of the platform in training and leadership (25,26,27). This finding calls for the need for more documentation of experience with the use of electronic platforms for real-time management of patients.

Finally, we would like to share our experience with the limitations in making electronic platform use for patient management more successful:-Limitations Use of MWGs were limited by 6 major issues; i. Lack of guidelines

vi. The importance of this unconventional way of consultation may not be considered as equally important by policy makers.

IV.

18 Conclusions

We have seen in these MWGs that leadership and stewardship has an important role in management of critically ill patients. Strong teamwork in the groups was a key to sharing information and to making critical decisions for the management of individual patients. The MWGs expanded their function to include management of supplies when one geographical area faced scarcity of life saving commodities. In a certain way the intervention galvanized the whole concept of accountability along the lines of the "Every Woman, Every Child Initiative".

It is fair to mention that women in rural settings in developing countries seldom enjoy the fruits of their taxes when it comes to access to health services from qualified personnel. In this program women and newborns from remote areas received multidisciplinary specialized care at the time when they needed it most, through these MWGs.

1

Health zones	Regions for each zone	WhatsApp Consultation No. of words
North	Kilimanjaro, Arusha and Tanga	14,952
Southern	Mtwara and Lindi	127,635
Western	Kigoma and Tabora	14,650
Eastern	Pwani and Morogoro	70,165
Central	Dodoma, Manyara, Singida	91,522
Southern Highland	Iringa, Njombe and Ruvuma	23,039

Figure 1: Table 1 :

2

	Zone	Reasons to call for help								Total
		Obstetric haemorrhage	Eclampsia	Prolonged labour	Sepsis	Anaesthesia complication	Severe anaemia	Venous thromboembolism	Others	Total No. of cas
	Northern	0	0	0	0	0	0	1	1	
	Southern	18	5	1	2	2	0	2	11	41
	Eastern	10	11	2	3	1	2	0	9	38
	Western	0	1	0	0	2	0	0	3	6
	Central	29	43	181	1	1	9	0	55	319
Year	Lake Southern Highland South West	33 0 3	33 1 4	7 0 1	8 0 3	2 0 0	15 0 3	5 0 0	31 4 14	134 5 28
2021	Dar Es Salaam	3	0	5	0	0	2	0	2	12
28	Total	96	98	197	17	8	31	7	130	584

[Note: K © 2021 Global Journals Reaching Women and Newborns with Multidisciplinary Specialized Care Via Whatsapp Interaction. A One-Year Experience from Tanzania Box 1 SZ. 230718: HF A: We have a Gravida 4 P 3 woman admitted a day ago with 2 living children, with history of previous Caesarean section. Current pregnancy the GA 35 weeks. Admitted with labour pain, painless vaginal bleeding, which has stopped. No foetal kicks. On examination patient is severely pale, dry mouth, oedema ++ with cold extremities, tachypnoea, weak pulse 50 b/min and BP 120/52 mm-Hg. Working diagnosis was Severe Anaemia in failure, IUFD and 3 Previous scars. Investigation done FBP 7 g/dl. Platelets 202 and the patient was transfused 2 unit of blood and injected frusemide 80mg. Today still dyspnoic, BP 117/75 mmHg, PR 112 b/minute, pale and control Hb 8.4 g/dl. platelets 117 and we are preparing 2 more units of blood. Obstetrician 1: Can you do ultrasound? Please look for free fluid in the abdomen and assess placenta. She may have a silent partial rupture. You may also be able to see the lower part of pleura and heart. GP 1: What is the situation with urine output? GP 2: Auscultate chest and check Oxygen saturation. HFM: Since yesterday urine output is 1000mls, oxygen saturation range 93-97% in room air. Obstetrician 2: Anaemia in failure with HB of 7-8 does not tally. Obstetrician 2: Do a quick USS as asked. She may have ruptured uterus! Obstetrician 1: I completely agree, there is something else going on. Obstetrician 2: Venous thromboembolism is unlikely with O2 saturation profile. Obstetrician 2: She may have abruptio placenta or ruptured uterus. Obstetrician 2: All these condition leads to foetal demise. Obstetrician 1: The thrombocytes are going down, you should also prepare for replacement. and DIC. Can you do a bedside clothing test or anything more sophisticated? GP 1: Can we try to do serum and full blood picture so as to see if there is active bleeding somewhere? Obstetrician 2: Whatever condition, OP is mandatory. Check bedside 1. clotting time, x match, the OP under GA intubation is needed. Technologist: As you leave tell us to get prepared to receive the patient. Obstetrician 3: we received the mother with ruptured uterus. Haemoglobin level at admission was 10g/dl. Patient was transfused 2 units of FFP and 1 unit of blood. Then, emergency laparatomy done, macerated still birth female baby extracted with weight 2900Kg. Today mother is fine and continuing with antibiotics. Vitals signs BP 115/90 mmHg pulse rate 101b/min and Body temperature is 37.1. Generally patient is fine.]

Figure 2: Table 2 :

.1 Acknowledgements

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