



## Low use of vacuum extraction: Health care Professionals' Perspective in a University Hospital, Dar es Salaam



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### ABSTRACT

**Background:** Use of vacuum extraction (VE) has been declining in low and middle income countries. At the highest referral hospital Tanzania, 54% of deliveries are performed by caesarean section (CS) and only 0.8% by VE. Use of VE has the potential to reduce CS rates and improve maternal and neonatal outcomes but causes for its low use is not fully explored.

**Method:** During November and December of 2017 participatory observations, semi-structured in-depth interviews (n = 29) and focus group discussions (n = 2) were held with midwives, residents and specialists working at the highest referral hospital in Tanzania. Thematic analysis was used to identify rationales for low VE use.

**Findings:** Unstructured and inconsistent clinical teaching structure, interdependent on a fear and blame culture, as well as financial incentives and a lack of structured, adhered to and updated guidelines were identified as rationales for CS instead of VE use. Although all informants showed positivity towards clinical teaching of VE, a subpar communication between clinics and academia was stated as resulting in absent clinical teachers and unaccountable students.

**Conclusion:** This study draws connections between the low use of VE and the inconsistent and unstructured clinical training of VE expressed through the health care providers' points of view. However, clinical teaching in VE was highly welcomed by the informers which may serve as a good starting point for future interventions.

### Background

Prolonged and obstructed labour is one of the five major causes of maternal mortality in most low income countries [1] and is a risk factor for postpartum haemorrhage, chorioamnionitis, uterine rupture, obstetric fistula, perineal injury, birth asphyxia and overall neonatal morbidity [2–4]. In Tanzania, prolonged labour is present in a majority of perinatal deaths [2,5,6] and 9% of all maternal deaths are caused by complications of prolonged and obstructed labour [7], which can be prevented by timely diagnosis and relief by either caesarean section (CS) or assisted vaginal delivery including vacuum extraction (VE). Foetal distress, dystocia and maternal factors such as exhaustion, ill-health or medical conditions that call for measures to prevent of

cardiorespiratory hyper function such as heart failure, respiratory distress or severe anaemia are included among the major indications for the use of VE [8–11].

VE, also referred to as “ventouse”, is an evidence-based technique of assisted vaginal delivery aimed at shortening the length of the second stage of labour [8]. At Muhimbili National Hospital (MNH) in Dar es Salaam, the Malmström design is the most common method of VE. This consists of a metal cup connected to a vacuum pump which adheres the cup to the foetal head such that when traction is applied, the head is flexed and delivery is assisted by traction during the second stage of labour. However, the Malmström design is not the recommended design by the World Health Organization standards.

High rates of CS at MNH [12] have been strongly associated with

**Abbreviations:** CS, caesarean section; EmOC, emergency obstetric care; FGD, focus group discussion; IDI, in-depth interview; HCP, health care practitioner; MNH, Muhimbili National Hospital; MoU, memorandum of understanding; MUHAS, Muhimbili University of Health and Allied Science; VE, vacuum extraction

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the development of life-threatening maternal conditions [13–19], and show inverse proportionality to the use of vacuum extraction [12]. Studies performed at MNH have found that the delay of emergency obstetric care (EmOC), which includes vacuum extraction, is one of the major determinants of severe maternal morbidity [20–22]. In the same setting, up to one fifth of the women sent to the operation theatre for a caesarean section due to prolonged, obstructed labour and/or foetal distress, delivered vaginally while waiting for the operation [23]; and thus unnecessarily been exposed to the increased risk of complications associated with second stage CS.

Basic EmOC includes intravenous/intramuscular antibiotics, oxytocin and anticonvulsants, the removal of the placenta, the removal of retained products of conception, basic neonatal resuscitation, and assisted vaginal delivery, including VE. Comprehensive EmOC encompasses blood transfusion and CS, in addition to the basic EmOC actions. Although VE is one of seven critical interventions of basic EmOC [24–26], 40% of health care facilities in sub-Saharan Africa never use or teach VE [27]. When safely performed by professionals, and based on proper indications, VE has been proven to reduce maternal and neonatal morbidity and mortality [28,29]. Recent intervention studies in similar settings have shown improvements in maternal and perinatal outcomes following increases in VE use [30,31]. Few previous studies have used a qualitative methodology to examine the reasons for the low use of VE in sub-Saharan Africa, although lack of equipment, trained staff and perceived trauma to the baby with risk of HIV-transmission are noted as reasons for low usage [29,30,32,33]. While the high CS-rates at MNH have been studied extensively, no research has looked into the low VE rates at the facility. Hence, the aim of this study was to identify any structural, personal or cultural factors hindering or aiding the use of VE. The findings from this study may contribute to quality improvement interventions to increase knowledge and improve skills on VE. The maximum impact of implementation of EmOC is achieved when provided as a package of basic and comprehensive EmOC components, complementing health facility level efforts to prevent avoidable maternal and perinatal severe morbidity.

## Method

### Setting

MNH is a teaching hospital of Muhimbili University of Health and Allied Science (MUHAS) and the highest referral health facility in Tanzania. It is situated in the main commercial city of Dar es Salaam, with a population of about 5 million. Approximately 9000 deliveries per year are performed at the facility in the public (60%) and private (40%) domains combined. During 2017, approximately 54% of all deliveries at MNH were performed through CS and less than 1% through VE. Unlike lower referral health facilities, MNH provides all nine basic and comprehensive EmOC interventions and can offer obstetric and neonatal intervention care within the maternity buildings. The lower referral facilities ought to provide all nine interventions in basic and comprehensive EmOC, but due to inadequate storage of blood for transfusion, and a frequent lack of neonatal units, their comprehensive EmOC is limited. These issues have also resulted in otherwise avoidable referrals to MNH.

The MNH accreditation process recently established over 25 key performance indicators of clinical teaching, research and supportive services. These indicators include obstetric data (see Table 1), directors reports and nursing reports routinely collected weekly and monthly.

Several staff-led quality improvement maternal death reviews at MNH have revealed rates of maternal death ranging from 4 to 6 deaths per month for both referred and non-referred admissions. The still birth rate is 80 per 1000 births, of which 45% are fresh stillbirths. All maternal deaths are reviewed by a committee of multidisciplinary professionals, including six obstetricians and gynaecologists, one anaesthesiologist, a nurse in charge of obstetric wards and the obstetric

**Table 1**  
Obstetric data.

Obstetric data included in key performance indicators at MNH
Maternal mortality rate
Fresh still birth rate
Proportion of death within 30 days after surgery
Death during surgery
Proportion of specialist reviews within 12 h of admission
Caesarean section rates
Length of hospital stay
Review of clinical guidelines every 2 years
Rate of wound infection after elective surgery
Wound dehiscence after surgery
Customer satisfaction

theatre, a pharmacist, a laboratory technologist and one hospital administrator. The hospital policy requires weekly maternal mortality case reviews based on a modified audit form. Maternal near-miss cases are presented and discussed in daily clinical meetings upon request.

MNH has a bed capacity of 370 divided across nine obstetric wards, of which two are labour wards (one private and one public). There are four operating rooms, but only three (two during on-call hours) are available simultaneously due to staff capacity. All deliveries are monitored using WHO's partogram model and, when necessary, foetal monitoring is performed with either the Moyo foetal monitor or the Pinard fetoscope.

Although many of the patients at MNH are complicated referred cases, there is a growing number of private deliveries, which are generally anticipated to be normal or uncomplicated. Approximately two thirds of all deliveries at the labour ward are private and self-referred, and could theoretically could have been managed at a lower level [32]. These patients choose to deliver at MNH for various reasons: more comfortable accommodations, service by a particular doctor of their preference, or perceived adequacy of emergency care. The mode of payment is either out-of-pocket or through insurance companies. The health care providers (HCPs) caring for these private patients get a percentage of the total hospital costs. For the private patients, the care is provided by a single specialist (often chosen by the patient) throughout the pregnancy. Unless a planned caesarean section has been scheduled with a particular specialist, the patient, once in labour, will be cared for in the private section of the labour ward by whomever is on call that day.

The obstetrics and gynaecology residents and midwifery students have access to the university's clinical skills laboratory, where some practical materials (mannequins and plastic VE-devices) are available for students to practice vacuum extraction use. Four operational classic Malmström-design metal cup sets, with assistant-dependent hand pumps, are available in the clinical setting at the teaching hospital. Supervision of students' practical training is a primary responsibility of the university staff and a secondary duty of the hospital staff. The university staff are also required to "...offer clinical services at MNH..." according to the memorandum of understanding (MoU) signed in 2013. The same MoU also states that clinicians at the teaching hospital are required to "...provide clinical teaching/bed side teaching for junior staff and students..." [34].

### Study procedure

Data collection was performed in November and December of 2017. The main researcher performed semi-structured in-depth interviews (IDIs), focus group discussions (FGDs) and participatory observations during ward rounds, meetings and daily work at the labour ward. All IDIs were performed either during or off working hours, in private, secluded settings around at the hospital or on the university campus. The FGDs were conducted with groups of peers with a shared profession, after working hours in closed-door sessions. The main researcher

was a passive member of the medical team, who would neither suggest nor make decisions regarding care of patients. Daily detailed observations and reflections throughout the two months of data collection were documented on the day of observance in reports that were shared with the research team. These reports also served as a confirmation and consolidation of what was stated in the IDIs and FGDs and as a platform for reflexivity, both at an individual level and as a collective activity within the research group [35].

All IDIs and FGDs performed were audio recorded and later, usually on the same day, transcribed verbatim by the main researcher. The transcriptions were documented in English, translated from Swahili by the main researcher when necessary. English was the language most often used during the IDIs and FGDs, but some informers, primarily the midwives, preferred Swahili. The main researcher, who performed all IDIs and FGDs, is a medical doctor from Sweden, proficient in Swahili, with considerable exposure to East African contexts at both a personal and a professional level. Hence, when requested by the informers or when difficulties in the use of English were obvious, the main researcher could switch to Swahili for the benefit of the informers' free expression in either English or Swahili. These are the languages normally at the hospital.

The questions posed during the IDIs and FGDs were open-ended and focused on experiences of VE, perceptions and attitudes concerning the VE rate, and associated factors hindering or promoting the use of VE. When necessary, follow-up questions were posed, mainly focused on interactions between staff and the teaching environment of practical medical skills. Half way through data collection, all transcripts were read by the main researcher and areas in need of further clarification and exploration were identified. These partially partly steered the discussions during the latter half of the data collection. Data collection was stopped when saturation was reached and no new information was gathered during the IDIs.

#### Study participants

In total, 29 IDIs were performed, encompassing three administrators, five residents, 10 midwives and 11 specialists (medical doctors with at least a master of medicine degree in obstetrics and gynaecology). Out of the 11 specialists, three identified themselves as academicians, employed and working mainly at the university. Another three identified as administrators, holding positions at MNH with practical and logistical duties. Age ranged from 27 to 56 years and the number of years working ranged from 1 to 30 years. The participants were purposefully selected to provide a range of gender, age and clinical experience.

#### Analysis

During data collection, the main researcher transcribed and analysed data continuously with repeated read-throughs of collected material, alongside with discussions with the research team, which helped in the wording of additional probing questions and identification of areas in need of clarification. The research group consisted of senior researchers with a local (Tanzanian) and foreign (Swedish) base, as well as PhD graduates, all with working, living or research experiences in the setting of Tanzania. The main researcher is a resident of obstetrics and gynaecology in Sweden where the average VE rate is around 6% [36]. In the Swedish context, delivery by VE is considered a relatively safe [29,37–39] alternative to CS. The diversity of the research group contributed to heterogeneous input, which strengthened the critical analysis. Through discussions with the local members of the research group, the data was peer-reviewed checked for context relation. Data were also shared, verified and consolidated with all participants and other local members of the clinical staff at clinical meetings and later disseminated through the research forum at MNH.

Thematic analysis [40] was applied to collected data, starting with

multiple read-throughs of the transcripts where codes and representative quotes were identified. Conflicting statements, patterns and parallels were then identified and formed into themes. Further revision of themes in collaboration with the research group produced a coherent structure of the themes allowing for theorization of their interdependence.

#### Ethics

Ethical approval was gained from both the Muhimbili National Hospital's Ethics Review Board and the National Research Ethics Committee. Approval from the Commission for Science and Technology was also obtained since the main researcher is not a Tanzanian national. Written and verbal consent was obtained from all participants in English or Swahili depending on their preference. All recordings and transcripts were made anonymous before being discussed with the research group.

#### Results

Fear and blame culture among colleagues and management and a lack of structured, updated guidelines defining task division and practical management of patients with VE indications, were found as rationales for using CS instead of VE. Furthermore, poor communication between the separated MNH and MUHAS was stated as resulting in both clinical teachers and students being absent or not fulfilling their duties, thus affecting the practical VE skillsets.

#### Management of referred cases

The management of referred cases was prominent among the rationales that the informers gave regarding why VE was not used more often. During the IDIs, HCPs expressed concern that, as a tertiary referral hospital, the teaching hospital received high numbers of referred patients who were considered to have medical complications limiting the possibility of VE usage. These patients are often already in labour and considered more complicated than the self-referred and private patients, and hence less suitable for VE: "You find that most of the referred patients, about maybe 50 or 40 percent of the deliveries here are referrals. And most of them will come here for caesarean section. And sometimes we don't really try something else." (Specialist 26) Informers stated that once the patients reached MNH through a functional or structural referral system, few patients could be considered to have an indication or lack a contraindication for VE. Similarly, as pointed out by an administrator, even in cases where indications existed and no contraindications were identified, the HCPs might still refrain from using VE: "I think most of the time doctors think when they see them [referred patients] that there is no time for vacuum [extraction] but rather just caesarean section." (Administrator 4) It was generally indicated, by the informers and through observations, that there was a lack of reviewing and individual decision-making with regard to the referred patients. In a sense, this sidesteps the standard operating procedures (SOPs). An almost automated train of thought was seen: Referred patient means complicated patient means CS.

#### Fear and blame

A complicated culture of fear and blame was described by the informers. Central to the fear, and driving the blame, was the risk of a poor outcome or a low scoring baby and the disciplinary actions that would follow. The junior doctors and junior midwives stated that such an occurrence could jeopardise their entire career: "... it [performing VE] becomes a challenge because if anything goes wrong it can really affect my studies. So you get worried like let me instead of doing vacuum [extraction] let me take the lady for C-section." (Resident 5); "Me I can say, maybe they [junior midwives] are afraid of the outcome. As you see this is a

tertiary hospital so they are afraid if a bad outcome and then someone come and try to find where the gap was. So someone may be afraid to do that. Maybe a resident or specialist perform that then end up with bad outcome, no one will argue. But someone, maybe the mistakes occur and you find a midwife did that ... so then finger pointing.” (Midwife 26)

Senior doctors and midwives also confirmed the culture of blame and its relation to VE use: “Another thing that we are not saying loudly is the fear of being blamed. Sometimes you might try vacuum [extraction] and it might fail and then you go to do a C-section and lose the baby. So there is a lot of blaming here. [...] They send for caesarean just to get rid of the blames. Too much blaming.” (Specialist 27)

Some other senior professionals acknowledged that juniors were easy targets and explained how they did their best to protect them by informing them about the risks of being blamed for something they were not responsible for. “I think they [the residents] are avoiding it [VE] to avoid being asked or tasked on that because once there is a complication or they make a wrong decision on vacuum [extraction] use that will be a problem for them because they are students. Sometimes that could be the end of their studies.” (Specialist 22); “... there is also a tendency to blame the residents. [...] Because they [the management] have this tendency where they want something to happen. Some way to blame it on the resident. Because the easy way out is for the student to be punished or discontinued. So I told residents several time, be careful. People are looking to pin things on your neck and throw it on you.” (Specialist 26)

The junior doctors and midwives often described themselves as being on the receiving end of the blame, but the phenomenon reached higher positions as well. Similar to how the political structure in Tanzania now is swift in its replacements of key figures, and so is the hierarchy in Muhimbili; this perspective shone through in a statement made by a senior specialist: “Of recently it has also been a concern because there is too much pressure coming from above. And no one would like to be noted as if he was responsible or the one causing it. So you would rather just wash your hands off so you have clean hands. Because if anything happens they are coming for you.” (Specialist 1)

When discussing blame with the informers, it became evident that at least some of it might stem from or be aggravated by a lack of clear work division defining work duties: “There’s role conflict. Something like of that type. I don’t know how the midwifery say but I think there is a problem as to who is to do what.” (Specialist 25) Guidelines and SOPs clarifying distribution of work, duties and responsibility were stated as being absent or not observed, further perpetuating a situation of disorganised patient care in which fear and blame would thrive.

### Skills and knowledge

Junior and senior professionals alike admitted to lacking skills and knowledge on use of VE. This was stated as affecting their decisions regarding VE or CS: “I believe most people who take their patients for caesarean, if they knew how to do vacuum extraction they would do that.” (Specialist 28) Apart from directly affecting the decisions made in the clinics, this might also affect the cognitions and perceptions of VE. Many informers recognised their own limitations in performing VE, leading them to limit their exposure to the procedure. Others told stories of how they were initially overconfident in performing VE, using the method when contraindications were present or when no indication for use was fulfilled, resulting in severe adverse outcomes. This occurred in conjunction with a poor perception of the method in general. Only after proper and structured training, during which both theoretical and practical skills were obtained, did the understanding of the method’s role become clear and the informers’ perception and subsequent use of VE change (indirect quote Specialist 21).

Organised and structured training was stated as absent at the hospital and the university. Initiatives for and guidance during VE sessions at the skills lab were placed solely on the students, whose practical skills would only be assessed by university staff during practical examinations on mannequins at the university. Actual skills in the labour

ward, with the devices available there, were stated as never being assessed in a structured manner: “You see, actually it’s a bit difficult to say what kind of skills they [the residents] have because we have not done a proper observation of the skills if there is a vacuum extraction apart from during the exams. [...] But in real life, because you are not observing vacuum extraction we really can’t say about the skills. But of course, for use, if someone is performing good on simulation maybe we think they can also perform good in real life. But these two things are a bit different.” (Specialist 28) The residents also reported a discrepancy between the teaching instruments and the instruments that were actually used in practice: “... the teaching and discussion was based on the bigger one [Malmström] but during the training I was trained on the small Kiwi. [...] [after training] I will not be that much eager using the one we have here [in the hospital].” (Resident 17) Clinical hands-on training was described as being circumstantial and occurring when a junior and senior professional found themselves in the labour ward with a patient who had indications for VE and the circumstances were suitable for teaching the method. Furthermore, the juniors found it difficult to obtain sufficient guidance in the labour ward: “It’s hard to find a nurse with experience to assist you.” (Resident FGD)

Past equipment problems (such as leaking pumps and broken handles) and the assumption of ongoing problems with equipment, were stated as reasons for low use, even though investments had recently been made by the department to replace faulty devices. Some reasoned that this assumption of faulty equipment might affect the expectations of VE results. This was particularly apparent if a HCP had personal experience of failure in VE due to faulty equipment prior to the recent investment in new devices. “... for a long time we didn’t have proper functioning vacuum extractors. You want to do a vacuum [extraction], the set would come and the pump is not working. A set would come, the cup is broken. A set would come ... and then people lost interest in doing because every time there is no proper equipment.” (Specialist 24)

### Training structure

Although the MoU states that clinicians at MNH are required to “... provide clinical teaching/bed side teaching for junior staff and students ...” [34], the clinicians felt frustration over not being able to hold the students accountable: “... they [the students] are taking advantage that they are only accountable by the university faculty doctors. They are only responsible by the university faculty doctors. You see. That’s the problem.” (Specialist 1); “... back in 2000, the university and hospital separated. I think that is when the problem started. And those who are on this side [hospital] they don’t feel responsible for the students.” (Specialist 24) The clinicians, not being official faculty staff for the students and residents, expressed a feeling of lacking direct authority over them. This responsibility was placed on the academicians employed at the university, who were seldom present at the clinics, even though the MoU stipulates that the academicians are “... required to offer clinical services at MNH ...” [34]. Thus, many informers claimed they lacked the necessary skills to perform the procedure due to the absence of structured training at the facility, as a direct result of poor implementation of the MoU: “We as residents don’t receive any training on vacuum extraction and we are supposed to work on call and manage everything.” (Resident FGD); “... we have never organised a training of vacuum [extraction] as a hospital. We rely on others when they come with their training and we just capture some of the residents or nurses.” (Specialist 4); “They [the midwifery students] have time [to practice at the skills lab] once, then they can go there on their own. But I don’t think if that will be enough and make them competent to practice in a clinical setting. [...] They need more practice. I don’t know if they become competent after graduation if they don’t practice some and get more addition.” (Midwife 23)

In line with the informers’ depictions of a lack of training, a unanimous positivity towards a hypothetical training session on VE could be noted: “It [structured training sessions] would be good because some people want to practice but they don’t have that knowledge. If they had the



knowledge maybe they would practice and the rate would increase. And maybe even lower the caesarean section rate.” (Midwife 9); “Training can help because for those who are still ... you know you can learn and understand something but getting there you become and understand ... you get confidence. I think training can help a lot and more practice. You learn and you practice it can help.” (Midwife 11) Not only was more and better training seen as increasing the potential for better use of VE, but also possibly reducing the CS rate and building confidence, thereby addressing the previously mentioned fear and blame culture.

#### Guidelines and professional conduct

While a doctor could decide to use a method with or without guidelines, based on his or her knowledge and experience, many informers requested clearer and more easily accessible guidelines on VE use: “You see, normally we post on the ward the guidelines. But I have not seen one specifically talking about vacuum [extraction]. We have the guidelines we can just read it, the indications and so on. But I don’t think it is all over the places so that we are aware of the guidelines.” (Resident 8); “[Researcher asks:] What do you think about the current guidelines and standard operating procedures about vacuum [extraction]? There is no standard procedure in the labour ward. You have been there ...” (Specialist 7) This request was particularly underlined in relation to the fear and blame culture which could lead to health care providers being unfairly scrutinised in the case of a poor outcome. According to the informers, relying or referring to guidelines and SOPs could serve almost as a lifeline for those who might risk damage to their career following a poor outcome.

Although updated and clear guidelines were requested, the adherence to the available guidelines was described as being low. Several of the senior and very influential clinicians were described as being reluctant to change their practices, often trusting their experience more than research. This meant that when quality improvements were attempted, in the form of guidelines or otherwise, they were often met with resistance and poor adherence. The lack of clear guidelines was evident in the management of other conditions as well, as one academician described it when relating an experience with an attempted quality improvement: “... there was a study on urinary tract infections in pregnancy. Most of the drugs that are being used here were not working. But people are still using them. And some of this research informs the guidelines and the policy of the country. But how many of them are reading? Very few of them are reading. Because if they were reading then some of those drugs would have been changed.” (Specialist 28)

This phenomenon of reluctance in adapting practices was the cause of major frustration, mainly among the academicians and junior clinicians, who had given up on trying to change outdated or suboptimal practices. One specialist academician expressed their frustration as follows: “These senior specialists have their own belief in a lot of things and they believe in that and changing them is so difficult. So you find even just doing a Pfannenstiel incision they are against that. [...] I think you need to think about these old people in the department ... the senior specialists. And it’s not just vacuum extraction it’s a lot of things. And I’ve given up at some points. I just go to the meetings and just keep quiet because I can’t change anything.” (Specialist 26)

Conflicting practices between senior and junior professionals were described as affecting the communication and collaboration between the institutions. Others stated that the separation of institutions also caused frustration. A specialist academician explained this as follows: “... the way they separated us, that was ... especially our department [...] those with good grades went to MUHAS, to the university. And those of us with poor grades came to do clinicals. I think that is where the problem started. So I think it is a tug of war.” (Specialist 27)

#### Private patients and preferences

Some informers described MNH as embodying higher moral

standards, where CS was not performed for the sake of financial gain: “[Researcher asks:] Do you think the staff can be pushing for caesarean section in the private patients? No! Not at Muhimbili! At other hospitals but not at Muhimbili. [Researcher asks:] Why not at Muhimbili? [In Swahili] Our behaviour is not like that. We can talk to the mother more about not having caesarean. But other hospitals like [Private Hospital in Dar es Salaam] you can go for caesarean section. [Researcher asks:] So it’s just the way people are here? Yes. More professional than [Private Hospital in Dar es Salaam] and the other hospitals.” (Midwife 15) Meanwhile, others claimed that there was a practice of pushing for certain practices for financial gain: “Let me tell you one secret. Science is science and pay is pay.” (Specialist 24) “If you perform a procedure that is more expensive your percentage will be more. I’m not saying every doctor is doing that but it happens. In fact we are seeing a lot of that.” (Administrator 13) “We [midwives] are here for saving lives. Mama and babies. [...] I know most of them [doctors] decide caesarean section, then she [the patient] come and you see this is no indication for caesarean section. Then I see that they [the doctors] are not here for the same reason as me.” (Midwife 26) However, others stated that the system of payment made the process “... too complicated to bother” (Specialist 26) or that other factors, such as professional reputation among the private patients, were stronger drivers in decisions on the use of CS: “People don’t do a caesarean section for money. [...] But for private patients it is very easy to decide for caesarean if you have a patient who you know, we know our patients. We know them from when they are pregnant. We know their attitudes, what they can do and what they cannot do. So some of these people will maybe go and say something which is not ... if something bad happens they might start complaining and sharing it in the news and media. Once you know this is a patient that is complicated and complains a lot and then you start picking things which are not very straightforward during labour it is very easy to decide for caesarean. Because you know if we are going to lose the baby it is going to be chaos.” (Specialist 24) The contradictory statements suggest that the extent to which financial compensation affects decisions is highly individual and may be large for some HCPs, but not all.

Unlike CS, VE was not considered by most of the informers to be common knowledge among their patients: “When it comes to vacuum extraction, very few women are aware of that. It’s not something that is that much familiar in society compared to C-section.” (Specialist 17) However, it was stated that some patients, and even some HCPs, considered VE to be a scary and intimidating method when presented with it as an option “Even if you tell the woman the baby is almost there but it is not descending, we are going to do vacuum [extraction], the baby will benefit by doing vacuum [extraction]. They say: ‘no, don’t pull my baby’. Better go for caesarean section.” (Specialist 27) Although both statements may be true for individual patients, it is also important to consider the context in which VE would be used and how it was presented to the woman. As one midwife explained: “... if one in their family has had vacuum [extraction] and complications of that they will fear it. Unless you have time to counsel her.” (Midwife FGD) The informer stressed that counselling after a negative VE experience was important. Similarly, a resident explained how they had never received a no from a patient when presenting VE, simply due to the fact that they took the time to counsel and provide information: “Once you take consent and they agree to it you have to educate them because most of them they don’t know about it. Most of them will accept it. Because all this time whenever you try to tell them they agree. It has never happened that somebody says no.” (Resident 16)

#### Discussion

While there was a general positivity towards training sessions on VE, we found a lack of structured training to be one of the main causes of low VE use. Moreover, the informers’ perceptions of risks associated with VE were not proportional to the risks of VE described in the literature [33,37–39]. Training on VE should preferably take place in a clinical setting and in an environment where open and honest discussions about the HCPs’ skills and limitations could be held. Even though

the method of VE itself may not require a lot in terms of material or practical training, there are structural and communicational requirements on a setting in which sustainable teaching can occur. The current capacities of the hospital and university were stated by the informers to be lacking several of the aspects necessary for effective clinical teaching.

As previously described in qualitative publications from the same facilities, we found that a culture of fear and blame seemed to be present at the hospital and university, which affected decision-making in relation to CS [32]. Although it has been stated that putting blame and responsibility on lower level clinical staff is easier than holding managerial level staff accountable [41], even seniors and managerial level staff members spoke of fear and blame affecting their decision-making. The intricate relations fear and blame works operate at this facility are seemingly based on structural hierarchy rather than on titles or positions. In a structure where even the decisionmakers are fearful, the introduction of any type of change will meet with resistance, as any initiative opens the door for critique and the possibility of replacement. Staying silent, following familiar pathways and not making updates is the safest option in such a situation [42].

As was stated by some informers and observed by the main researcher, some senior doctors and midwives had the skills necessary to perform VE safely. However, physician leadership, which is essential for optimisation of health system performance [43–45], was not evident in the case of VE. The skilled seniors had not been organised at the hospital or the university to advocate correct practical use of VE to among their own residents and midwifery students. This had created a recurring problem of unskilled residents graduating as specialists and staffing most of the lower referral institutes in the country, further reducing the nation-wide use of VE. This despite the MoU's explicit declaration of shared responsibility in the teaching of students and managing the clinical wards.

The MoU included a clear description of the responsibilities of clinical and academic staff in teaching and clinical work. However, actual practice, as stated and observed in our study, did not yet correspond with the MoU's stipulations. The evident fragmentation of efforts between academicians and clinicians was in line with arguments put forth by scholars who also stated that it might be best to separate research and clinical practice at tertiary hospitals [46]. The "bundling" of research and clinical practice as an organisational method of managing teaching hospitals was suggested to be unsuitable. However, the crucial element of clinical teaching (highlighted in this study of VE) is noted by Mintzberg as falling between the cracks in a distinct separation of research and clinical practice [46]. Some refer to this intermediate space between the clinics and the university as a "third space" [47], where loss of guidance can lead to poor outcomes in teaching [48]. To allow for efficient clinical teaching, strong partnerships between hospitals and universities are essential and such initiatives are most often successful when initiated by university-based advocates [49].

Apart from being described in the MoU, the responsibilities of teachers, students and clinicians [50] were observed to be disregarded in some instances. This may result in lacking integration of the learning processes into clinical care teams through role modelling [51], in turn resulting in disorganised training programmes, non-evidence-based practices and failure in the provision of adequate learning of clinical procedures, including VE, as seen in the reports.

It has been argued in the literature that the attitudes towards and perceptions of VE among HCPs may be inaccurate and not up-to-date. Old guidelines referring to a risk of mother-to-child transmission of HIV are often stated as a reason for low use of VE in sub-Saharan Africa [52–54]. However, in our study, only one informer claimed that HIV played a role in the current VE practices and no other information gathered supported that claim. This indicates that, at least for the population studied, fear of or actual risk of transmission of HIV was not a major determinant of VE use.

In the global study of CS rates, financial incentives have been an important topic of discussion. Although not directly focused on it, this study explored the phenomenon in relation to VE, in a setting where VE use would yield less pay to the HCPs than if they were to perform CS. This raises the question whether perverse financial incentives could be affecting decisions on VE usage. Definitive answers to this question could not be extracted from this study. Similarly, the finding of impeded collaborations between the hospital and the university could not be differentiated as being either created by or resulting in a poor adherence to guidelines in general. Further studies, stepping away from VE and focusing more closely on these specific topics, could yield greater insight into the causations and relations of the institutions and their financial policies. Such studies, like this one and most qualitative studies, offer low generalisability of results outside of their particular context [35]. However, this setting is not unique. Other settings, whether at low, medium, or high income, with a challenged institutional structure may be able to draw pertinent conclusions from this study.

### Strengths and limitations

One practical challenge encountered during data collection was organising and performing the FGDs. Due to participant work-load and collaborative disincentives among the informants, only two FGDs were performed, contributing to the overall data volume to a much smaller extent than the IDIs. However, the challenges encountered were part of the observational data and, as such, served an important role in exemplifying the organisational challenges facing the two institutions. The two FGDs performed also captured the two professional groups – residents and midwives – that spent the most time at the labour ward and were generally most exposed to the use of VE. Still, it would have been optimal to also perform FGDs with specialists and FGDs with mixed professions.

All data was collected by one main researcher, which benefitted the analysis process. Less room for interpersonal interpretation was achieved using the same researcher for all data collection and analysis. However, during analysis and through the use of a daily diary, continuous discussions were held with members of the research team with varying backgrounds and foreign and local experiences of research. This diversity was used to improve the objectivity of the interpretations. In communications with the research team, a large degree of personal and collective reflexivity was achieved [35].

The main researcher, being a foreigner and outsider to the study site, may have improved the objectivity of observations, as well as allowing for freer expression among the informers. Because the main researcher was not a member of the collegial structure, the informers may have felt able to speak more freely. The main researcher's knowledge of Swahili allowed the informers to switch freely between English and Swahili, furthering the informers' comfort.

### Conclusion

This study indicates a connection between the low use of VE and the inconsistent and unstructured clinical training on VE as expressed from the HCPs' points of view. Although the problematic culture of fear and blame and the poor adherence to guidelines were also factors hindering the use of VE, a generally positive attitude towards training in the method was evident. Clinical training sessions with the potential of bridging the gaps in skills among the HCPs may not only provide the necessary components of basic EmOC, but also bring the academicians and clinicians together in their efforts to provide the nation with skilled obstetricians and gynaecologists.

The factors associated with the low use of VE identified in this study may be multifactorial, dependent on several different aspects of the health care system and not possible to address or solve by any one key intervention. However, the outlook for future implementation efforts at this facility is positive, given the findings in this study. Preferably,

future quality improvement efforts should focus on the clinical aspects of practical teaching, with a more integrated and structured guidance for VE use, as well as updating guidelines and materials used to WHO standards. To build acceptance amongst the clinicians, one might provide regular feedback as a part of the implementation, in order improve the transparency of VE usage and results, thereby indirectly addressing the fear and blame culture.

### Availability of data and materials

The datasets generated and/or analysed during the current study are not publicly available due to them containing information that could compromise research participant privacy but are available from the corresponding author on reasonable request.

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### Authors' contributions

HMS partook in the design of the study, including ethical applications and official approvals. All data collection was performed by HMS including transcriptions and translations. Analysis and interpretation was done by HMS with support from other members of the research team. HMS wrote the majority of the manuscript.

AM was a key element in the design of the study as well as an important facilitator during data collection. Being a vital part in the research team AM also contributed extensively in the analysis and interpretation process. AM also contributed with writing the manuscript and approval of its final version.

JB assisted in data collection on site and partook in the analysis and interpretation process as well as approval of the manuscript.

HL was crucial in the design of the data collection and supported the team continuously during data collection. HL also assisted in the analysis process and the approval of the manuscript.

HK assisted in the design of the study and facilitated official approvals on site.

BE guided the team and laid the foundation for the theoretical grounds of which the study operated on in the early planning stages up to the final version of the manuscript. BE was also responsible for the design of the study and offered direct guidance in data collection, qualitative analysis and interpretations.

### Declaration of Competing Interest

The authors declare that they have no competing interests.

### Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.srhc.2020.100533>.

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