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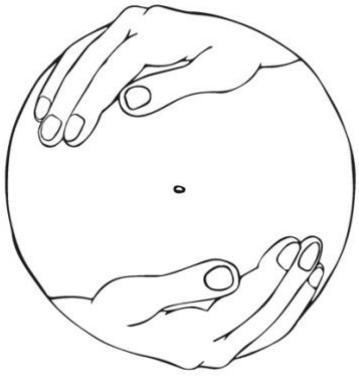
Clinical challenges of prolonged labour in Tanzania. A qualitative study



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Sammendrag

Tittel

Kliniske utfordringer knyttet til langsom fremgang i fødsel i Tanzania. En kvalitativ studie

Hensikt

Å oppnå en økt forståelse for kliniske utfordringer jordmødre og leger i Tanzania står overfor i forbindelse med langsom fremgang i fødsel.

Problemstilling

Hvordan beskrives kliniske utfordringer knyttet til langsom fremgang i fødsel av jordmødre og leger i Tanzania?

Metode

Dette er en kvalitativ studie basert på 9 gruppeintervjuer, hvorav 7 var med jordmødre og 2 med leger. Konteksten er to sykehus nord i Tanzania. Studien er en del av et større internasjonalt prosjekt. Prosjektets arbeidsgruppe planla, utførte, transkriberte og oversatte intervjuene før vi ble involvert. Dette materialet har vi organisert og gjort til gjenstand for en kvalitativ innholdsanalyse (Graneheim og Lundman).

Resultat

37 deltakere ble intervjuet, av dem 32 jordmødre og 5 leger. Gjennom den kvalitative analysen av materialet identifiserte vi fem kategorier. Vi fant at de kliniske utfordringene relatert til langsom fremgang i fødsel var forbundet med 1) *ulike måter å forstå langsom fremgang på,* 2) *å vurdere fremgang i fødsel,* 3) *å overvåke fosterlyd,* 4) *å intervenere hensiktsmessig til riktig tid og* 5) *å samarbeide i team.*

Konklusjon

Studien belyser og konkretiserer de kliniske utfordringene jordmødre og leger i Tanzania møter i arbeidet med langsom fremgang i fødsel. Funnene våre indikerer et inkonsekvent beslutningsgrunnlag.

Nøkkelord

Kvalitativ, fødsel, langsom fremgang, Tanzania, gruppeintervju

Abstract

Title

Clinical challenges of prolonged labour in Tanzania. A qualitative study

Objective

To improve understanding of the clinical challenges nurse-midwives and doctors in Tanzania encounter when managing prolonged labour.

Research question

How are clinical challenges related to prolonged labour described by nurse-midwives and doctors in Tanzania?

Methods

This is a qualitative study with 9 group interviews. 7 of the interviews involved nurse-midwives, 2 involved doctors. The study setting is two hospitals in Northern Tanzania. The interviews were planned, executed, transcribed and translated prior to our involvement. We organised the material and followed the procedure described by Graneheim and Lundman in conducting a qualitative content analysis. This study is part of an international project.

Results

A total of 37 participants, among them 32 nurse-midwives and 5 doctors were included. From our analysis, five categories emerged; clinical challenges were expressed in relation to 1) *various ways of understanding prolonged labour*, 2) *assessing progress in labour*, 3) *monitoring foetal heart rate*, 4) *appropriate intervention at appropriate time and* 5) *working as a team.*

Conclusion

The study offers a broader understanding of the clinical challenges facing nurse-midwives and doctors when managing prolonged labour in Tanzania. Our findings suggest that the basis on which decisions are made may be inconsequent.

Keywords

Qualitative research, parturition, prolonged labour, Tanzania, group discussions, interview

Preface

Our master's thesis comprises of an article manuscript and a complementary article thesis. The article presents our study on clinical challenges related to prolonged labour in Tanzania. The aim of the article thesis is to elaborate on the theoretical and methodological aspects of the study. We recommend the reader to begin with the article manuscript (attachment 1) before proceeding with this article thesis.

We present a preliminary study within the comprehensive project "Enhancing patient safety in high- and low-resource settings; how to improve the process of decision-making in case of prolonged labour?" (EPSHILS). The project has collaborating partners from Norway, Sweden, the Netherlands and Tanzania and is inspired by the Medical Research Councils' (MRC) guidelines (2006); "Developing and evaluating complex interventions: new guidance". To increase the value of the interventions, MRC recommends research in advance of an intervention study to enhance understanding of the context and the interactions of the multi-disciplinary team. The EPSHILS project group executed nine group interviews which we received after transcription and translation. Our work consisted of conducting a qualitative content analysis and presenting our findings as part of our master's thesis.

We would like to thank the project group of EPSHILS for allowing us to use their data material, and for supporting us with contextual information. We want to express our deepest gratitude to all the participants who contributed with their valuable insight and perspectives on prolonged labour. We would like to thank our supervisor for her positive and constructive guidance throughout our work with this master's thesis. Finally, we would like to thank our families for fruitful discussions and appreciated feedback.

A & J

23.10.19

Acronyms and abbreviations

ARM	Artificial rupture of membranes
CS	Caesarean section
EPSHILS	The project "Enhancing patient safety in high- and low-resource settings; how to improve the process of decision-making in case of prolonged labour?"
FHR	Foetal heart rate
MMR	Maternal Mortality Rate
MRC	Medical Research Council
NICE	The National Institute for Health and Care Excellence
NSD	The Norwegian Centre for Research Data
REC	Regional Committees for Medical and Health Research Ethics
TLTL	Too little, too late
TMTS	Too much, too soon
WHO	World Health Organization

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1.0 Introduction

Globally, some evidence suggests that up to one third of nulliparous women experience delay in the first stage of labour (World Health Organization [WHO], 2018). The project group of EPSHILS provided us with data material from group interviews on prolonged labour, for us to analyse. In this article thesis we will elaborate on theoretical and methodological aspects of the study. First, we will present research and background information relevant to the topic of prolonged labour in Tanzania, creating a research space (Swales & Feak, 2012, 331). Secondly, the aim of the study and our research question will be presented.

1.1 Background

Sub-Saharan Africa has the world's highest rates of maternal and perinatal mortality and several of these countries did not reach the Millennium Development Goal 5th aim of 75 % maternal mortality rate (MMR) reduction by the year of 2015 (Miltenburg, Kiritta, Meguid, & Sundby, 2018). In 2015, the MMR was 398 per 100.000 in Tanzania as opposed to 5 per 100.000 in Norway. The fertility rate (births per woman) in 2017 was 5,0 and 1,7 respectively. The neonatal mortality rate was 21,1 per 1000 live births in Tanzania compared to 1,5 per 1000 in Norway (FN-sambandet, 2017; The World Bank, 2019).

Prolonged labour is sometimes due to obstructed labour and sometimes due to poor or uncoordinated contractions (WHO, 2008). There is no global consensus on a definition of prolonged labour (Karaçam, Walsh, & Bugg, 2014; Neal et al., 2015; Nystedt & Hildingsson, 2014), nor agreement on what constitutes normal labour progression (WHO, 2018). These discussions will be further explored in chapter 2.1 (labour progress) and 2.4.2 (prolonged labour). Obstructed labour occurs when the presenting part of the foetus cannot descend further in the birth canal, in spite of good uterine contractions (Dolea & AbouZahr, 2003). A prolonged labour increases the risk of infection, postpartum haemorrhage and emergency CS (Rimmer, 2014, p. 428).

Miltenburg et al. (2018) conducted an observational study to identify the areas in need of improvement related to the quality of care during childbirth in Tanzania. The study included a range of examples of suboptimal maternal health care, such as insufficient monitoring

during labour. The authors noticed that the partograph seemed to be used more as a documentation tool than a decision-making tool. Sometimes documentation was done after the birth, with some assessments "guessed" rather than actually measured. Maternal vital signs, foetal heart rate (FHR) and contractions were seldom measured or discussed in relation to the progression of the birth or the well-being of the mother. The authors found that both underuse and overuse of interventions contributed to poor quality of care.

Mmbaga et al. (2012) investigated the causes of perinatal death at a zonal hospital in Tanzania. The authors studied a total of 1958 stillbirths and early neonatal deaths in a ten-year period. The major causes of perinatal mortality were unexplained asphyxia, obstetric complications, maternal disease and unexplained antepartum stillbirths. Obstructed labour was found to be the leading condition (251/303, 82.8 %) among the obstetric complications.

Maaløe, Sorensen, Onesmo, Secher and Bygbjerg (2012) conducted an audit of obstetric management preceding emergency caesarean sections (CS) for prolonged labour (144 cases) in Tanzania. In addition, they interviewed eight members of the staff. The authors found suboptimal management in most cases. Interventions to potentially avoid operative delivery was inadequately used and the research showed an excessive rate of emergency CSs. The results showed that in 26 % of the cases of CS, the labour was in fact not prolonged, and in 16 % of the cases the membranes were still intact. Of the women with truly prolonged labour, CS were conducted with a fully dilated cervix in 36 % of the cases. Vacuum extraction was not performed. The interviews revealed poor awareness of evidence-based guidelines among the staff. Management decisions were influenced by word of mouth, personal experience and fear, especially of HIV transmission. The authors recommend simple, uniform guidelines. They also suggest that training is needed for decision making related to prolonged labour - so that vacuum extraction, artificial rupture of membranes (ARM) and oxytocin augmentation can be provided safely and timely, to avoid unnecessary CS.

Mgaya et al. (2016) conducted a criterion-based audit (including 260 deliveries) at a hospital in Tanzania with the aim to improve standards of care related to obstructed labour. Their interventions included implementation of standard guidelines for diagnosis and management of obstructed labour, mandatory review by specialist for cases that were assigned CS and re-training and supervision on use and interpretation of partograph and strengthening teamwork between doctors, midwives and theatre staff. This showed improvement in the diagnosis and

management of obstructed labour. Perinatal outcomes, neonatal distress and fresh stillbirths, were reduced from 16 % to 8.8 %.

In Tanzania, neglected obstructed labour was reported among the leading causes of maternal and perinatal mortality and morbidity, strongly associated with substandard obstetric care (Dolea & AbouZahr, 2003; Mgaya et al., 2016). In order to avoid cases of neglected obstructed labour, appropriate management of prolonged labour is essential. More research on the management of prolonged labour in Tanzania is necessary to detect the areas in need of improvement.

1.2 Objective of the study and our research question

The aim of this study is to contribute to a better understanding of the clinical challenges encountered by health care personnel in Tanzania when managing prolonged labour. Our study is limited to clinical challenges, because these can be approached by intervention studies – in accordance with the intention of EPSHILS. To achieve our aim, we performed a systematic qualitative content analysis of group interviews with doctors and nurse-midwives.

Our research question was: *How are clinical challenges related to prolonged labour described by nurse-midwives and doctors in Tanzania?*

2.0 Theoretical framework

First, we will present theories on labour progress as well as relevant findings from two central articles. Thaddeus & Maine's article (1994) elaborates on the context and causes of severe obstetric outcomes in developing countries like Tanzania. Miller et al.'s article (2016) provides insight into global challenges of obstetrics with a focus on over- and under-medicalisation. Secondly, we will operationalise two central terms included in our research question, *clinical challenges* and *prolonged labour,* to specify our focus of analysis. We understand operationalisation of terms as turning words into concepts by concretising how we understand them (Johannessen, Rafoss, & Rasmussen, 2018, p. 31).

2.1 Labour progress

The mechanisms of labour progress are complex and multifactorial (Simkin, Hanson, & Ancheta, 2017, p. 15). Labour can be explained as a process requiring a balanced dynamic between "the three Ps" – passage (maternal bony pelvis), passenger (foetal presentation and position) and power (uterine contractions) (Karaçam et al., 2014; Rimmer, 2014, p. 427). Several authors argue that two additional "Ps" are essential in labour progress - pain and psyche (Simkin & Ancheta, 2017, p. 1). Friedman (1954) published "The graphic analysis of labour", introducing the concept of partograph by plotting cervical dilation against time (Dalal & Purandare, 2018). Eventually, the alert line and action line were added to the partograph. The standardised alert line has a slope of 1 cm/hour and the action line follows 4 hours later, parallel to the alert line. Since 2000, the start of active phase has been considered 4 cm cervical dilation (ibid). However, in the new WHO guidelines regarding intrapartum care (2018), the latent first stage of labour is defined by painful uterine contractions and some degree of effacement up to a cervical dilation of 5 cm. From then on, given a substantial degree of cervical effacement, it is known as the active first stage of labour until it reaches full cervical dilatation – the second stage (ibid.). Normal labour progression in active first stage of labour was viewed as a minimum cervical dilation progression of 1 cm/hour (hence the slope of the alert line). This is now considered unrealistically fast, and "slow - yet normal" is the new slogan. A progression slower than 1 cm/hour is no longer recommended as a sole indication for interventions (World Health Organization, 2018).

2.2 Too little too late, too much too soon

The article “Beyond too little, too late and too much, too soon: a pathway towards evidence-based, respectful maternity care worldwide” was published in *The Lancet series on Midwifery* by Miller et al. (2016). The authors shed light on two extremes on a continuum of maternal health care. On the one hand, some women are objected to inadequate resources, below evidence-based standards and ultimately, a lack of access to perinatal care. On the other hand, the authors describe an ongoing routine of over-medicalisation of normal pregnancy and birth with unnecessary use of non-evidence-based interventions. The authors discuss interventions like continuous foetal monitoring, episiotomies, induction, augmentation and CS - effective and life-saving when indicated, but potentially harmful when used inappropriately. Although “Too little, too late” (TLTL) is often associated with low-income countries and “too much, too soon” (TMTS) often occurs in high-income countries, the two opposing extremes may also coexist within the same country.

2.3 Three delays to treatment

Thaddeus & Maine (1994) published the review “Too far to walk: Maternal mortality in context”, addressing three different delays resulting in poor obstetric outcomes in some developing countries. The first delay concerns the decision to seek care. Reasons may be financial costs, lack of means of transport, poor infrastructure, distrust in health care providers and a requirement to be accompanied as a woman travelling (safety and/or cultural factors). The second delay is when the arrival at a health facility is delayed. The main factor here is the actual accessibility of adequate health facilities, i.e. distance and transportation. The third delay is related to the provision of adequate care when the patient finally has arrived at a health facility. This includes unqualified staff, shortage of staff, late or inaccurate diagnose, lack of equipment and inadequate management. The level of satisfaction with the outcome and the service received, impact on how they perceive the quality of care. The decision to seek care may again be affected by the experiences of others.

2.4 Operationalisation of central terms

2.4.1 Clinical challenges

Oxford University Press (2019) defines the word *clinical* as: "relating to the observation and treatment of actual patients rather than theoretical or laboratory studies". Challenge is defined by Cambridge Dictionary (2019) as: "(the situation of being faced with) something that needs great mental or physical effort in order to be done successfully and therefore tests a person's ability". When observing and treating patients with prolonged labour, what tasks and situations do the nurse-midwives and doctors describe that demand great effort and cooperation to be done successfully? And how do they describe their abilities being tested when managing prolonged labour? We perceive these areas as clinical challenges. Problems concerning lack of staff, lack of equipment or malfunctioning equipment are understood as structural or administrative challenges, not clinical challenges.

2.4.2 Prolonged labour

There is no global consensus on a definition of prolonged labour (Karaçam et al., 2014; Neal et al., 2015; Nystedt & Hildingsson, 2014; WHO, 2008) however it is associated with labour not following a predetermined line of progress – whether it is the rate of cervical dilation in cm /hour or according to the expected maximum duration in hours (Rimmer, 2014, p. 426). Alternative terminology related to prolonged labour include the following terms: inefficient uterine contractions, labour dystocia, failure to progress, protracted or arrested labour, dysfunctional labour, protracted or arrested descent, and cephalopelvic disproportion (Neal et al., 2015). The expected maximum duration of active first stage (when defined as from 5 cm) is 12 hours in nulliparous women and 10 hours in parous women. The second stage of labour is normally completed within a time frame of 3 hours for nulliparous and 2 hours for parous women (WHO, 2018).

3.0 Method

Our study has a qualitative approach with content analysis of group interviews. In this chapter, we will account for the study setting and our preunderstanding. Furthermore, we will explain the group interviews in detail; how the interview guide was developed, how the interviews were executed and who the participants were. Finally, we will describe how we conducted our analysis of the material.

3.1 Study setting

The number of Tanzanian women giving birth in a health facility increased from 44 % in 1999 to 63 % in 2015-2016. This coincides with an increased rate of skilled birth attendance from 51 % in 2010 to 64 % in 2015-2016 (Ministry of Health [Tanzania Mainland], Ministry of Health [Zanzibar], National Bureau of Statistics, Office of the Chief Government Statistician & ICF, 2016). The relevant study setting was one zonal consultant university hospital and one regional referral hospital in Northern Tanzania, from now on referred to as the zonal hospital and the regional hospital (Global Health Workforce Alliance, 2013).

The zonal hospital has approximately 4000 births annually. The workforce at the department of obstetrics and gynaecology consist of 85 nurse-midwives, doctors and medical attendants. The majority of patients come directly from home; however, some come as referrals from lower level health facilities. At this hospital, the partograph is started at 4 cm cervical dilation. The labour ward includes an operation theatre where CSs are performed, accounting for 35-40 % of the deliveries.

The regional hospital has approximately 3500-3800 births annually. The maternity ward has 51 nurse-midwives, doctors and medical attendants. They start plotting the partograph from 3 cm cervical dilation. CSs (15-20 % of the deliveries) are sometimes hindered by a lack of staff and inoperational facilities. Patients come directly from home or as referrals from district facilities. The regional hospital also transfers patients to the zonal hospital, especially for CSs.

Despite their differences, the two hospitals have similarities in how they organise their obstetric care. The women in labour are observed in the antenatal wards until transfer to

labour ward when they reach 7 cm of cervical dilation. A minimum of two nurse-midwives are present in the four-bedded delivery room 24/7, sharing the responsibility of the patients.

3.2 Preunderstanding

Our preunderstanding is our backpack of experiences, hypotheses, theoretical framework and our professional viewpoint which we bring into the project, consciously aware of it or not. In qualitative research the researcher is regarded as a tool that will necessarily affect the end results. In some ways, all parts of the research will be affected by the preunderstanding of the involved researchers. Given that the preunderstanding often reflects the motivation for looking into a specific topic, the search for specific answers may overlook other relevant viewpoints. The risk of missing out on important nuances is reduced by maintaining an active approach to one's own preunderstanding throughout the project. If all findings conform with hypotheses made in advance, this may indicate that the preunderstanding has been too dominating in interpreting the results (Malterud, 2017, pp. 19, 44-46).

As master's degree students we both have a genuine interest in global midwifery, having observed labour management in Nepal, Tanzania, India and Sri Lanka. One of the authors spent time at both the labour wards in question during her Bachelor of nursing. In a sense, we regard the field of obstetrics as having a universal and timeless component - one may argue that midwives have more in common than what separates them. Still, the context of this study is foreign to us in many ways. To explain our professional and theoretical preunderstanding, the idea of "Slow, yet normal" – as described by WHO (2018), is relevant. We understand "slow-yet-normal" as representing a paradigm-shift within obstetrics, one that we have been introduced to since the beginning of our studies. We acknowledge childbirth as a normal, physiological process. As Norwegian midwifery students we experience the challenges of "too-much-to-soon" in our own clinical practice. Throughout the study we have written a project record enabling us to observe the development of our own understanding throughout the study and the decisions made along the way.

3.3 Search for relevant literature

In order to explore the field of research prior to the analysis, we searched Medline, Pubmed, SveMed and Cochrane Library for relevant literature. We used PICO (Population, Intervention, Comparison, Outcome) – a tool for initiating search strategies, to identify

relevant keywords and Medical Subject Headings (MeSH) for our topic of interest (Helsebiblioteket, 2019). Examples of MeSH-terms used in various combinations are: dystocia, obstetric labour, obstetric labour complications, midwifery, Tanzania, decision making, interview and parturition. Examples of keywords used to search title/keywords/abstract are: partograph, prolonged, clinical challenges. In Search History, keywords were strategically combined with AND and OR to limit or expand further searches (ibid.). Google Scholar was used to execute citation searches. Following the analysis, we performed specific searches relevant to our findings and repeated the former searches, looking for newly published literature. We assembled the relevant articles (including key findings, methodology and our comments) in an informal overview in order to easily access them throughout our writing process. Inspired by standardised check lists, we continuously evaluated trustworthiness of the articles (Helsebiblioteket, 2019).

3.4 Group interviews

Our study has a qualitative approach, consisting of a content analysis of group interviews. A qualitative design allows for the detection of diversity, nuances and subjective experiences (Malterud, 2017, p. 30). The project leaders of EPSHILS intended to execute focus group discussions; however, we define them as *group interviews.* This is due to the low number of participants, the structured format of the interviews and the lack of observations of group dynamics and non-verbal communication (Halkier & Gjerpe, 2010, p. 38; Malterud, 2017, pp. 138-140). Group interviews are useful, as we are interested in participants' descriptions of a phenomenon that occurs in an environment where several individuals are cooperating (Malterud, 2017, p. 138). Through group interviews one strives to explore opinions and attitudes in a process analogous to the natural way of forming opinions with group dynamics affecting the dialogue and outcome (Holme & Solvang, 1996, p. 103). Knowledge or *episteme* is not just expressed in the interview, it comes into being through the dialogue (Kvale, Brinkmann, Anderssen, & Rygge, 2009, p. 303).

3.4.1 Interview guide

An interview guide is a tool used to moderate the interview to achieve the desired level of structure. It may be detailed, consisting of specific questions or function as a checklist with topics of interest (Kvale et al., 2009, p. 143). Our interview guide (attachment 4) was developed for use in semi-structured interviews, by the project group of EPSHILS. The guide

was inspired by informal interviews executed at a hospital in Norway. In advance of the interviews, a selected team of nurse-midwives and doctors in Tanzania evaluated the interview guide. It was perceived as relevant, and no changes were made. In view of the time available, the guide was characterised by many questions. The questions were rather specific, like for example; "Do you think pain perception may influence decisions on the management of prolonged labour? How"?

3.4.2 Location and execution

Nine group interviews were conducted in the two hospitals by a local research assistant (clinical officer) between August 27th and December 5th, 2018. The groups met undisturbed in a teaching room in one hospital and in a seminar room in the other, and a tape recorder was used. Each interview lasted between one hour and one hour and forty-five minutes. The interviews were intended to be semi-structured, but in reality, they were performed in a rather rigid manner bound to the interview guide. Often, the same question was asked to all the participants, one at a time. Occasionally, this approach hindered a dynamic flow and depth to the interviews. However, it made it possible to cover all the questions included in the interview guide.

The moderator who performed the interviews was familiar with the local culture and context, sharing nationality and language - Swahili - with the respondents. All interviews were executed in Swahili, facilitating a freer and more natural dialogue. The moderator had experience of conducting group interviews within the field of obstetrics. Still, prolonged labour was not a topic within his expertise. Few follow-up questions were asked to explore in depth the statements of the participants. However, he asked several affirmative questions to ensure a common understanding of terms and meanings.

In one interview at the zonal hospital, a previous respondent (a nurse-midwife), took part as an additional facilitator with a few contributions in the interview. This come across as a spontaneous decision, not according to the plan made by the EPSHILS project group. The sections where she contributed were not included in the analysis.

3.4.3 Recruitment and selection

37 participants were selected through a purposive random sampling, organised by the nurse in charge at each unit of the two hospitals. The purposive random sampling, borders on what Malterud (2017, pp. 58-59) describes as a convenience sampling. It is purposive and random due to its aim to include respondents that will provide different insights and a richness to the material. It is convenient also due to its pragmatic inclusion, because of a low number of available nurse-midwives and doctors. The inclusion criteria were to be either a nurse-midwife or a doctor presently practicing within the department of obstetrics and gynaecology. Experience from labour ward was a prerequisite. Homogenous groups were put together to facilitate freedom of expression within the group (ibid., p. 138). This resulted in two groups of doctors with two-to-three participants and seven groups with nurse-midwives consisting of four-to-five participants. Four groups were recruited from the regional hospital, whereas five groups represented the zonal hospital.

3.4.4 Participants

The participants presented themselves with their profession title and experience. Type of experience varied considerably; some nurse-midwives had recently rotated from a different unit, while others had practiced in labour wards most of their careers. The registered nurse-midwives included nursing officers, nurse-midwives and a volunteer nurse-midwife. The curriculum of their education is approved by Nursing and Midwife Council under The International Confederation of Midwives. Nursing officers have additional competence and some administrative responsibility. The volunteer nurse-midwife was newly educated and unemployed but functioned as an employed nurse-midwife within the labour ward. In the regional hospital, they often rotate staff between wards, resulting in wide, general competence. The majority of the nurse-midwives were presently working in the two labour wards. Among the doctors, level of competence ranged from resident to gynaecologist. They had working experience from different units and hospitals, including district hospitals.

3.5 The unit of analysis

3.5.1 Transcription and translation

The material was transcribed and translated from Swahili to English. The transcription was done by three Tanzanians with different backgrounds; a registered nurse, a retired engineer

and a woman with no formal higher education. The translation was done by the same retired engineer. The research assistant who functioned as moderator throughout the interviews, went through the material (in Swahili and English) to secure the quality of transcription and translation. The material was made anonymous by the project leader in Norway before it reached us.

3.5.2 Sorting the material

After receiving the material, we went through it all several times removing the text in Swahili, correcting minor spelling errors and detecting sentences of ambiguous meaning. We had a dialogue with the moderator in Tanzania, who reviewed the translation and the transcription where the content was unclear to us. An example is the sentence "There is something called four nakos, we measure pelvis from the inside, can it admit four nakos? If so, the mother can have safe delivery". The research assistant clarified that the meaning of "nakos" was "knuckles", but it was lost in transcription and translation. Clarifications were made and implemented in the data material.

3.6 The process of data analysis

The interview material was analysed through a hermeneutic process, understood as extracting relevant information from the written interviews in a process of interpretation and examination of text, working our way back and forth between the material as a whole and its separate parts (Malterud, 2017, p. 28). We explored the data in an inductive approach, with a gradual abstraction of the data (Creswell, 2013, p. 45).

We followed the procedure described by Graneheim & Lundman (2004) in conducting a qualitative content analysis of the manifest content. This model is frequently used in nursing research. Within qualitative research the interpreters' understanding is perceived as pivotal and the interpreter as a tool in deriving meaning from the material (Lundman & Graneheim, 2017, p. 220). Due to the specific content of our material and the challenge of analysing data from a foreign culture without participating in executing the interviews, we chose to solely analyse the manifest content.

All the transcribed text was read individually by both authors. First step involved several read-throughs of the unit of analysis to get a sense of the whole. Our initial understanding of

the material as a whole was written down. *Domains* gradually emerged, understood as parts of the text which relates to a specific topic that can be identified with a low degree of interpretation. Domains are often closely associated with the topics of the interview guide (Lundman & Graneheim, 2017, p. 224). Parallel to the process of identifying domains, we specified and narrowed down our research question.

We organized the material according to domains in HyperResearch - a software for organising qualitative research. By using such a software, it was easy to look back on the analysing process, amplifying the reliability of the study. The research question and domains were presented to the moderator of the interviews, to ensure a common understanding of the material at an early stage of the analysis. The chosen domains were: augmentation, cause of prolonged labour, decision making, definition of prolonged labour, diagnosing prolonged labour, foetal monitoring, pain and partograph.

Secondly, *meaning units* were detected - the constellation of words or statements that related to the same central meaning (Graneheim & Lundman, 2004). When including meaning units, we decided to be generous, to avoid exclusions due to our preunderstanding. The detection of meaning units was followed by *condensation*, in other words, an extraction of what was perceived as the essence (ibid.). This process was carried out in an Excel form in order to maintain a systematic overview over the material. The first condensates were put together by both authors and the rest of the meaning units we shared between us.

After detecting meaning units and condensating them, a procedure of abstraction and *creation of codes* followed. Abstraction involves an understanding of the content on a higher logical level (Lundman & Graneheim, 2017, p. 222). This was done both together and separately and resulted in 482 codes. We printed and cut out the codes, before scattering them over a big table for the categorizing process. This was a comprehensive procedure with many discussions and alterations in order to get categories that were mutually exclusive, exhaustive and saturated (Schreier, 2012). This analogue process gave us an important overview of the material as a whole and allowed for an inductive and iterative exercise. The codes were sorted into subcategories and categories (Graneheim & Lundman, 2004). This was finalised both in an analogue form and in Excel. When reviewing our categories, we looked back on the condensates and meaning units behind the codes to ensure a sense of coherence between established category and the original meaning unit (Malterud, 2017, p. 194).

Table 1: Example of condensation and coding of meaning units

Meaning unit	Condensate	Code
I mean, if you come across prolonged labour you can check what the first person who opened partograph was she careful enough? If you label her as not competent enough then it is better you do all process to satisfy yourself.	If prolonged labour - was the one who started the partograph competent enough? Double check	Distrust in first plot
Filling of partograph is still a bit difficult, not that people don't know but we don't fill it as supposed, because you know foetal heart rate, is measured after every half hour and filled up. You may be surprised, mother can come into labour ward and measurement is taken only once and thereafter she delivers, so it is not filled properly.	People know how to fill it, but it is still difficult. Foetal heart rate only measured once, not properly filled	Partograph is not filled properly even though we know how to do it
Partograph is not only PV alone, you even measure heartbeats of the child will indicate what situation you are in.	Partograph also indicates foetal heartbeats and what situation you are in	Partograph indicates danger signs

The whole analysis was characterised by thorough work involving many discussions among the two of us in order to grasp the meaning behind the respondents' words. This process was in accordance with Max Weber's theory of "verstehen" – to put ourselves in their shoes to be able to understand the meaning behind what is expressed (Johannessen et al., 2018, p. 45). This active approach to the material was important considering the fact that we represent a different culture from that of the participants. To validate our findings, the local project leader looked through our results draft. We discussed the local, clinical terminology, for example "poor progress", to ensure that our understanding was in coherence with their utilisation.

3.7 Ethical considerations

Local approval to conduct the group interviews was sought by the local research group and given from the leaders of both hospitals in Tanzania (attachment 6 & 7). The interviews were executed in the respondents' working hours. In itself, taking them out of the clinic requires an ethical consideration, due to the permanent lack of staff. The number of interviews were decided prior to the study, not in response to the informational strength – perhaps resulting in an unnecessarily large number of participants (Malterud, 2017, p. 63). All the respondents signed a consent form with information about the study. They were guaranteed anonymity and were free to withdraw from the study at any time. A notification form was submitted to the Norwegian Centre for Research Data (NSD). They considered an assessment unnecessary since no sensitive personal data was involved (attachment 9). Regional Committees for Medical and Health Research Ethics (REC) were informed about the study through a submission assessment. Their response was that no application was required since the aim of study was not acquiring new knowledge on health and diseases (attachment 10). The International Confederation of Midwives (2014) emphasise the responsibility of midwives to develop and share midwifery knowledge through research. We acknowledge our ethical responsibility in supporting other midwives' professional role and respectfully work with other health professionals, like doctors (Ibid.).

4.0 Presentation of the article

In the following chapter we will give a short presentation of the article. First, we will provide some information about the article manuscript. Thereafter, we will give a summary of the relevant results in light of the theoretical framework presented in chapter 2.0. The intention is to create a foundation for the discussion of results in chapter 5.2.

The article was entitled "Give time or take action? Clinical challenges of prolonged labour: perspectives from Tanzania". The aim was to find out how clinical challenges relating to prolonged labour was described by nurse-midwives and doctors in Tanzania. The background was the EPSHILS project, aiming to improve the process of decision-making in cases of prolonged labour in high- and low resource settings.

4.1 Preparation of the article manuscript

The article manuscript (attachment 1) was written and organised according to the journal *Midwifery*'s authors guide (attachment 3). They value a woman-centred and inclusive language. The article should measure approximately 5000 words and follow the IMRaD-structure; introduction, methods, results and discussion. Following this master's thesis, we intend to invite members of the local EPSHILS project group to further develop the article manuscript as co-authors. This is reasonable in view of their participation in the planning and execution of the study, and beneficial to decrease the risk of contextual factors creating misinterpretations.

4.2 Summary of the results

The five categories that emerged from the analysis were 1) *various ways of understanding prolonged labour*, 2) *assessing progress in labour*, 3) *monitoring foetal heart rate*, 4) *appropriate intervention at appropriate time* and 5) *working as a team*. The results considered most relevant in light of the theoretical framework relate to the understanding of terms, operative deliveries, referred patients, foetal monitoring and teamwork.

Differences in the understanding of terms related to prolonged labour especially, but also to descent. In their definition of prolonged labour, respondents referred to how much time that had passed and whether the partograph indicated prolonged labour. Distinctions were vague

and ambiguous between prolonged labour, obstructed labour and poor progress in labour. Likewise, descent, level and station caused confusion as indistinctive terms. The partograph seemed to impel interventions in spite of maternal and foetal wellbeing, due to its narrow normal. The respondents suggested that this led to early interventions like oxytocin augmentation and unnecessary CS. Vacuum extraction was barely mentioned and fear was mentioned as a potential cause of underutilisation.

Due to several delays in receiving adequate care, referred patients were considered at risk. They were associated with obstructed labour and poor outcomes, and rapid decisions were regarded as necessary. The respondents described a distrust in FHR assessments, apparently related to their recurrent experiences of fresh stillbirths and poor neonatal outcomes despite seemingly unaffected FHR. We also found differences between the professions in the evaluation of urgency. This, combined with a distrust between nurse-midwives and doctors, challenged the teamwork. The respondents called for clear guidelines on interventions such as ARM and oxytocin augmentation. In sum, these observations convey the impression that the ground on which relevant decisions are based, tends to be inconsequent.

5.0 Discussion

First, we will discuss our method by considering the reflexivity, relevance and validity of the study. By being transparent, we strive to increase the intersubjectivity of our study (Kvale et al., 2009, p. 92; Malterud, 2017, p. 18). This is followed by a discussion of our findings in light of the theoretical framework.

5.1 Discussion of the method

5.1.1 Reflexivity

We understand reflexivity to be the active and questioning approach to our method as well as our role as interpreters (Malterud, 2017, pp. 19-20). The reflexivity may be increased by an active approach to our own preunderstanding in advance of the analysis (Malterud, 2017, p. 46). We did not clarify our thoughts and findings systematically and in writing in advance of the analysis – a potential limitation of our study. However, as student colleagues we have had many discussions on the topic of prolonged labour related to clinical cases. We also discussed our own obstetrical experiences from developing countries.

Reflexivity might be challenged by proximity to the material (Malterud, 2017, p. 20). Our role as outsiders in relation to EPSHILS and Tanzania, may have enabled us to read less prejudice into the material. However, the preunderstanding of the project group of EPSHILS has played a part in their choice of method, the interview guide and the execution of the interviews. The moderator had limited knowledge of obstetrics but possessed cultural knowledge, decreasing the risk of misunderstanding the cultural norms and ways of communication – increasing validity (Kvale et al., 2009, p. 99). Possibly, an interviewer more familiar with obstetrics would have conducted a more in-depth exploration of the themes that concerned the participants and let the dialogue dwell longer on relevant topics.

5.1.2 Validity and relevance

Increased reflexivity can be obtained through systematic reflections regarding validity and relevance. The two are closely interrelated, and will therefore be discussed as a whole and systematically with a chronological approach (Malterud, 2017, p. 21). We understand validity as a measure of what our findings truly represent, based on how they were acquired (internal

validity) and under what conditions our findings are true (external validity) (Malterud, 2017, pp. 23-24). Relevance concerns what is added by our study and how it relates to existing knowledge (ibid., p. 22). The transferability of the study will be addressed by an exploration of the external validity and the relevance.

Our interest in the respondents' descriptions made *interviews* an appropriate method for acquiring valid answers. Our focus on teamwork and interaction substantiate why group interviews increases validity. Otherwise one might argue that individual interviews would give increased depth to the study. Participatory observation could have provided relevant data on collaboration, but would not have given access to the experiences of the health care personnel (Malterud, 2017, pp. 150-154). Observational studies are also time consuming and requires understanding and knowledge of culture and language.

The *interview guide* was not reassessed and revised after the initiation of the interviews, which may be considered a limitation. It was inspired by informal interviews at a hospital in Norway, but given the contextual differences, the internal validity may not have been increased by that. The local group of nurse-midwives and doctors who assessed the interview guide, ensured contextual relevance. As for the relevance of terms used, according to the moderator, "tools" was a word that was repeatedly misunderstood: "What kind of tools do you have to identify prolonged labour"? Despite the difficulties regarding this term, what we perceived as the intention of the question was answered throughout the interviews. The large number of questions and the limited time available, necessarily affected the depth of the discussions.

It is a weakness of the study that the *number of interviews* was decided in advance, instead of assessing informational strength consecutively (Malterud, 2017, p. 217). We did, however, view the material as sufficiently rich and saturated. To some extent, an increased number of interviews can make up for a superficial and repetitive material (Malterud, 2017, p. 70). The inclusion criteria were few, enabling a considerable variety of experiences and opening for hierarchy of seniority within each group. This can be seen as a limitation, opposing the recommendations of homogenous groups (ibid., p. 138). Dividing doctors and nurse-midwives in different groups was beneficial, due to same argument of homogeneity. Relevance was increased by including both nurse-midwives and doctors. We acknowledge that there was an imbalance in the number of respondents from each profession, however we

are uncertain as to how this impacts the relevance and validity of our findings. Given that there were only two and three participants in the doctor's groups, this necessarily affected the group dynamics allowing for longer monologues and less interaction.

Although the aim was to execute *semi-structured interviews*, the structure turned out quite rigid. The moderator's limited knowledge of the subject prolonged labour may have contributed to the rigid structure, reducing depth but ensuring width and discussion of all questions. The fact that they were moderated by someone familiar to the language, culture and context reduced the risk of misunderstanding the cultural norms and ways of communication (Kvale et al., 2009, p. 156). Validity may be increased by the affirmative questions asked by the moderator to ensure a common understanding. The additional facilitator present at one of the interviews, poses a limitation. Even though the directly affected sections were excluded from the analysis, we cannot know for certain how this affected the meaning units of this particular interview.

It is commonly regarded as a strength within qualitative research that the same person(-s) does the preparations, interviews, transcriptions and analysis (Malterud, 2017, p. 77). This represents a limitation of our study, because several individuals were involved in the different steps. *Transcription* and *translation* were delegated to a third party. Additionally, the structure and quality of transcription varied among the three individuals who performed them – decreasing the validity. The translation process always poses a risk of missing out on valuable aspects. The moderator went through the material as a whole to ensure a certain quality and a sense of coherence in the transcription and translation. We sought to increase validity by resolving unclear sections of text through dialogue with the moderator who searched for clarifications in the audio files, the transcriptions and the translated material.

Following the sorting of the material, we conducted a *qualitative content analysis*. This process included many sessions of individual work followed by comparisons and discussions. Validity is strengthened by a thorough analysis. Our findings answered the research question as well as the objective of EPSHILS, implying relevance.

We have achieved coherence between the research question, the theorical framework, the method and the unit of analysis. This indicates consistency and may be considered a strength of the study (Malterud, 2017, p. 25).

5.2 Discussion of the results

The respondents described clinical challenges related to understanding and diagnosing prolonged labour, assessing progress in labour, monitoring foetal heart rate, intervening appropriately at the right time and working as a team. The theoretical framework will pervade the rest of this thesis and was central in the choice of results relevant for the following discussion. These results, summarised in chapter 4.2, will be discussed in light of Thaddeus and Maine's "Too far to walk: maternal mortality in context" (1994) and Miller et. al.'s "Beyond too little, too late and too much, too soon: a pathway towards evidence-based, respectful maternity care worldwide" (2016).

Our study found inconsistent terminology among the respondents, most prominent was the apparent confusion of the three central diagnostic terms; prolonged labour, obstructed labour and poor progress. The meaning of these terms seemed overlapping and sometimes contradictory. Miller (2016) points out that usage of different terminology is a source of uncertainty for service providers. The local confusion seems intercorrelated with a global lack of consensus on prolonged labour as a diagnosis. There is no clear definition of prolonged labour and no consistent usage of the term (Karaçam et al., 2014; Neal et al., 2015). This is also associated with the many different theories about when to define start of active first stage of labour (Miltenburg et al., 2018; Simkin et al., 2017, p. 15), leading to several conflicting guidelines. The two hospitals included in our study are examples of this, defining the start of the active first stage differently. Inconsistent and conflicting recommendations and guidelines create confusion among the users (Miller et al., 2016). One may ask if the confusion of terms may lead to conflicting thresholds for initiating interventions. Our respondents also expressed confusion of terms related to assessing progress in labour. When measuring and documenting foetal descent, the respondents described having to juggle three different terms – level, descent and station – expressing confusion related to what distinguished one from the other.

We found indications of an overuse of CSs. In addition, vacuum extraction as a method for operative delivery was barely mentioned in our material. This gives an impression that both "too much too soon" (TMTS) and "too little too late" (TLTL) were represented in relation to operative deliveries (Miller et al., 2016). The respondents gave descriptions of CSs conducted unnecessarily and prolonged labour cases where emergency CS was scheduled although

membranes were intact. This is in line with the research of Maaløe, Bybgjerg et al. (2012) who found that 26% of prolonged labour cases that lead to CS were not actually prolonged and in 16% the membranes were intact when CS was performed. The limited use of vacuum extraction, may be explained with fear of HIV transmission among the health workers, as described in our study and found by Maaløe, Bybjerg et al. (2012). This coexistence of TMTS and TLTL in Tanzania, was also observed by Miltenburg et al. (2018) who found both underuse and overuse of obstetric interventions. We got the impression from our findings that crossing of the action line alone, was often interpreted as an indication for CS. This implies TMTS due to an insufficient evaluation of the situation. Although some respondents emphasised the presence of danger signs, it appeared inconsequent whether or not this was taken into consideration.

In our study, an apparent suboptimal foetal monitoring is another example of TLTL, which coexists with questionable oxytocin augmentation routines. We found that nurse-midwives repeatedly encountered fresh stillbirths and unexpectedly low Apgar scores. This may be associated with an inaccurate administration of oxytocin due to the practical challenge of manually adjusting the drip rate. The apparent inadequate foetal monitoring (TLTL) poses a risk of birth asphyxia due to oxytocin augmentation. One might question whether oxytocin augmentation within a context with limited resources is primarily beneficial or harmful. Miller et al. (2016) highlights the importance of locally specific, evidence-based guidelines and points to the lack of such in many low-income countries. This coincides with the interviewed nurse-midwives in our study, who expressed a need for clear guidelines regarding oxytocin augmentation and ARM.

Our respondents described that referred patients presented with severe cases of prolonged labour as a result of TLTL. The respondents related this to several delays in receiving care, complying with Thaddeus & Maine's descriptions of the three delays (1994). The respondents spoke of delays in recognising conditions requiring specialised attention and in organising and transporting the patient to an appropriate facility. Thaddeus & Maine (1994) found that the perceived quality of care takes precedence over both distance and cost when considering utilisation of a health facility. A reputation of being understaffed, underequipped and thus unable to provide quality care might lead to the situation being severe before seeking help (ibid.). Two Tanzanian studies found that the median time from the decision was made to perform an emergency CS until delivery, was nearly an hour (Hirani, Mchome,

Mazuguni, & Mahande, 2017; Maaløe, Sorensen, et al., 2012). This implies that from admittance to delivery, the patients suffer due to this final delay within the hospital. The severity of referral cases was illustrated through the respondents' findings of symptoms associated with obstructed labour – restless, febrile mothers with dry and warm vaginas. In our study, the referred patients came across as an especially vulnerable group, being victims of several delays and TLTL.

Structural challenges of staff shortage, lack of equipment and available operation theatre, were obvious in our material, but excluded from our study because it was not within our scope of analysis. In all probability, the structural challenges are interrelated with the clinical challenges described. The existence of TMTS in a setting affected by such structural challenges, implies an unfortunate use of interventions but also indicates room for improvement of management.

6.0 Conclusion

The aim of our study was to achieve an increased understanding of the clinical challenges encountered by doctors and nurse-midwives in two hospitals in Tanzania when managing prolonged labour. Through increased understanding, our aim was to prepare the ground for complex intervention studies by the project EPSHILS. We identified clinical challenges relating to different ways of defining prolonged labour, assessing progress in labour, the timing and choice of interventions, monitoring foetal heart rate and working in a team.

The coexistence of "too little, too late" and "too much, too soon" in this context, indicates that challenges goes beyond structural issues. Patients referred from other hospitals are recognised as being at risk, due to the numeral delays many suffer in advance of admittance in the regional hospital or zonal hospital. Inconsistent terminology and diagnoses among the nurse-midwives and doctors seem to produce conflicting thresholds for interventions. Inadequate foetal monitoring represents a risk of neglected foetal distress.

The study demonstrates the need to implement locally specific, evidence-based guidelines regarding intrapartum care, common understanding of prolonged labour and frequent training of practical skills relating to the assessment of labour progress and foetal monitoring. Future research should focus on establishing a safer ground on which decisions are made, aiming at reducing arbitrary and unfortunate decisions.

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Attachment 1: Article manuscript

Abstract

Title: Give time or take action? Clinical challenges of prolonged labour: perspectives from Tanzania. **Objective:** Improve understanding of how clinical challenges related to prolonged labour are perceived. **Design:** A qualitative study with group interviews, analysis according to Graneheim og Lundman. Groups of either doctors (2 interviews) or nurse-midwives (7 interviews). **Setting:** One zonal consultant university hospital and one regional referral hospital in Tanzania. **Participants:** 9 groups with a total of 37 participants, among them 32 registered nurse-midwives and 5 doctors, all with experience from labour ward. **Findings:** Five categories emerged - challenge is expressed in relation to 1) various ways of understanding prolonged labour, 2) assessing progress in labour, 3) monitoring foetal heart rate, 4) appropriate intervention at the appropriate time and 5) working as a team. **Key conclusions:** Contributes with a broader understanding of the clinical challenges nurse-midwives and doctors encounter when managing prolonged labour in Tanzania. The ground on which decisions are made, may be inconsequent. **Implications for practice:** They request clear guidelines and frequent training.

Keywords

Qualitative Research, Obstetric Labour, Parturition, Tanzania,

Abbreviations & Acronyms

ARM = Artificial Rupture of the Membranes
CPD = Cephalopelvic Disproportion
CS = Caesarean Section
FHR = Foetal Heart Rate
WHO = World Health Organization

Give time or take action?

Clinical challenges of prolonged labour: perspectives from Tanzania

Introduction

Globally, there is no consensus on a definition of prolonged labour (Karaçam et al., 2014; Neal et al., 2015; Nystedt and Hildingsson, 2014; World Health Organization [WHO], 2008). Prolonged labour was defined as a crossing of the 4-hour action line on the WHO partograph, understood as slow progress in cervical dilation (Rossen et al., 2016). WHO (2018) no longer recommend the use of alert line to assess satisfactory labour progress, due to its inaccuracy in identifying those at risk of adverse birth outcomes - "slow, yet normal" has become the new norm. Diagnosing prolonged labour is made complicated by uncertainty around defining the onset of labour and normal labour length (Karaçam et al., 2014). The latent phase of labour was defined as from the onset of labour until a cervical dilation of 4 cm. The active first stage of labour was considered from a cervical dilation of 4 cm, effacement of the cervix, combined with frequent uterine contractions (WHO, 2008). Now, the new WHO guidelines for intrapartum care (2018), define active first stage of labour by a cervical dilation of 5 cm instead of 4 cm. The expected maximum duration of the active first stage (when defined as from 5 cm) is 12 hours in nulliparous women and 10 hours in parous. The second stage is normally completed within a time frame of 3 hours for nulliparous and 2 hours for parous women (ibid.)

Several studies (Bremnes et al., 2018; Knight et al., 2013; Nyamtema et al., 2012; Shimoda et al., 2015) have shed light on the structural challenges evident in labour wards in Tanzania. Lack of staff, resources, equipment and facilities lead to difficulties and delays in providing adequate care (Miller et al., 2016; Ministry of Health et al., 2016; Thaddeus and Maine, 1994). In Tanzania 64 % of births are cared for by a skilled birth attendant (Ministry of Health et al., 2016). The overall caesarean section (CS) rate is 6 %, below the recommendations from WHO (ibid.; 2015).

Some evidence suggests that up to one third of nulliparous women experience delay in the first stage of labour at a global scale (WHO, 2018). The most common causes of prolonged labour are considered to be either mechanical obstruction, or poor or uncoordinated contractions (ibid.). Obstructed labour occurs when the presenting part of the foetus cannot descend further in the birth canal, in spite of good uterine contractions (Dolea and AbouZahr, 2003). In Tanzania, obstructed labour is reported as one of the leading indications for emergency CSs and a main cause of maternal and perinatal mortality (Mmbaga et al., 2012; Maaløe et al., 2012; Pembe et al., 2014; Shimoda et al., 2015). A prolonged labour increases the risk of infection, postpartum haemorrhage and emergency CS (Rimmer, 2014)

To the best of our knowledge, no studies are executed in Tanzania examining by group interviews, interdisciplinary management of prolonged labour. It is regarded as beneficial to strengthen the contextual knowledge prior to complex intervention studies (Medical Research Council, 2006). This is among the objectives of the larger project of which the present study is a part; "Enhancing patient safety in high- and low-resource settings; how to improve the process of decision-making in case of prolonged labour?" (EPSHILS). Our research question was: *How are clinical challenges related to prolonged labour described by nurse-midwives and doctors in Tanzania?*

Method

Study setting

Tanzania's health care system is decentralised and divided into national, zonal, regional and district levels (Global Health Workforce Alliance, 2013). The context of this study was one zonal consultant university hospital (ZCUH) and one regional referral hospital (RRH) in Northern Tanzania, from now on referred to as the zonal hospital and the regional hospital. Both hospitals receive referred women from district hospitals. Both use foetal scopes (steel/plastic), also called Pinard, and electronic dopplers for foetal monitoring. Oxytocin augmentation is administered by infusion bags where drip rate is manually adjusted by hand.

The zonal hospital is situated just outside a small city centre. Its catchment area represents 15 million people and approximately 4000 births annually. Women pay to give birth here and

equipment is included. To the best of our knowledge, the price is affordable to the majority of the population and payed at discharge. Social welfare is available for patients unable to pay the full price. Partograph is started at 4 cm cervical dilation in antenatal ward. Women are admitted at labour ward when they have reached a cervical dilation of 7 cm. The CS rate at this hospital is 35-40%.

The regional hospital is located near the same city centre and is free of charge. Its catchment area comprises about 1,6 million people and they have approximately 3500-3800 births annually. Necessary equipment is available. In antenatal ward, partograph is started from a cervical dilation of 3 cm and women are admitted to labour ward when they reach 7 cm. CSs account for 15-20 % of the births. Approximately 5 % of the labouring women are transferred to the zonal hospital.

Study design

The project group of EPSHILS used a qualitative method with group interviews. The interviews were semi-structured with the help of an interview guide developed by the EPSHILS project group, with participants from Norway and Tanzania. The guide consists of rather specific questions, like "Do you think pain perception may influence decisions on the management of prolonged labour? How?" All questions are closely related to clinical management of prolonged labour.

Recruitment and collection of data

Nine group interviews were conducted at the two hospitals between August 27th and December 5th, 2018. They were moderated by the local research assistant of the EPSHILS project (x) who is a clinical officer. Five interviews were conducted at the regional hospital and four at the zonal hospital.

A total of five doctors and thirty-two nurse-midwives were recruited through purposive sampling. The inclusion criteria were 1) being a registered nurse-midwife or doctor with experience from the labour ward, 2) currently working within the department of obstetrics and gynaecology and 3) being willing to participate in the study. In order to facilitate freedom of expression within the group (Malterud, 2017), the groups consisted of either doctors (two groups) or nurse-midwives (seven groups). Relevant experience among the

registered nurse-midwives ranged from recently educated to thirty years, and some had additional courses giving them superior titles. The interviews with nurse-midwives were administered in groups of four to five, with the doctors in groups of two to three. The doctors had three to eight years of experience, their level of competence ranging from resident doctor to gynaecologist.

Preparing the material

The material was transcribed and translated from Swahili to English. The transcribed material was made anonymous before it was passed on to x&x. We kept a dialogue with the research assistant who moderated the interviews, clarifying uncertainties in the material.

Data analysis

The procedure described by Graneheim & Lundman (2004) was followed when conducting a qualitative content analysis of the manifest content. Initially, we read through the material several times getting a sense of the whole. We detected meaning units relevant for our research question - the constellation of words or statements that relate to the same central meaning (Lundman and Graneheim, 2017). A software, HyperResearch, was used to organise the qualitative data. The meaning units were condensed and coded. An analogue, inductive and iterative process of categorizing was performed, resulting in mutually exclusive, exhaustive and saturated categories (Malterud, 2017; Schreier, 2012).

Ethical considerations

Local approval to conduct the group interviews was given by the leaders of both hospitals. All the participants signed a consent form which guaranteed anonymity and freedom to withdraw from the study at any time. Norwegian Centre for Research Data (NSD) and Regional Committees for Medical and Health Research Ethics (REC) were informed about the study, both considering a full assessment to be unnecessary.

Results

As the material was analysed, five categories emerged. Challenges were expressed in relation to 1) *various ways of understanding prolonged labour*, 2) *assessing progress in labour*, 3) *monitoring foetal heart rate*, 4) *appropriate intervention at the appropriate time* and 5) *working as a team*.

Various ways of understanding prolonged labour

The respondents displayed variations in expected duration of a birth. Prolonged labour was understood as "going beyond expected hours" by respondents at both hospitals. Respondents described the partograph as essential in diagnosing prolonged labour. In the regional hospital, many respondents operated with a timeframe of twelve hours. As one doctor put it;

> It is labour that goes beyond its usual time which is maximum allowed without having delivered. Let us say twelve hours, beyond that then it is prolonged labour. (RRH 05, Doctor 01)

At the zonal hospital the expected duration of the active phase for nullipara, ranged from eight to twenty-four hours. It did not seem to affect the «prescribed hours» whether the active stage of labour was regarded from 3 cm (regional hospital) or 4 cm (zonal hospital). Respondents in both hospitals differentiated between primiparous and multiparous women for both first and second stage of labour. Concerning the second phase of labour, nurse-midwives expected it to last no more than twenty minutes to one hour.

Identifying the cause of prolonged labour was expressed as essential by the respondents. They related the cause to four P's, as described by a nurse-midwife in the regional hospital:

> I will look for the causes of prolonged labour, first you look for four things, that are four P's. The first one is I will check for power, then passage, then passenger and finally psychology. After that I will start to manage her from any of the P's I found to be the cause. For example, it can be power, then I will rupture membranes artificially and augment it with oxytocin. If it is passenger and passage, it means the baby cannot come out; I will then decide, maybe I will call doctor to do CS. If it is psychology, I will do counselling only to the mother so that she can cope with labour pains. (RRH 02, Nurse-midwife 02)

Malposition, poor contractions, lack of energy, intact membranes and cervical dystocia were mentioned as causes of prolonged labour, and cephalopelvic disproportion (CPD) was

referred to as the most central cause among the respondents. This leads us to three terms described explicitly and implicitly throughout the material; prolonged labour, poor progress in labour and obstructed labour. Poor progress seemed to be viewed as an early stage of prolonged labour, but was also described as an indication for rapid CS, as expressed by this nurse-midwife:

> According to my opinion the management of poor progress and prolonged labour are similar, for example in case of prolonged labour I have to establish the causative factor and the management will get from that ground. But in poor progress in my management I will directly prepare her for CS, although I will check for causes but should go for caesarean. (ZCUH 02, Nurse-midwife 02)

Contrarily, prolonged labour was associated with severe findings of dry vagina and restless, febrile mothers by several nurse-midwives – implicating obstructed labour. Prolonged labour was also viewed as incompatible with vaginal birth, as stated by a doctor at the regional hospital;

> […] I will give her more time, but sometimes we succeed and after some time mother delivers, you can see it is not prolonged labour. (RRH 05, Doctor 03)

Assessing progress in labour

The respondents expressed great confidence in the partograph – as a guide, indicating time for intervention, avoiding prolonged labour and helping to prevent poor outcomes. A nurse-midwife in the zonal hospital said:

> Partograph is the first, this is important tool which I use to know prolonged labour, because it shows from the time mother enters active phase, it shows how contraction goes, it shows foetal heart rate, it shows everything. So partograph is the tool we depend on very much and we have confidence in it. (ZCUH 01, Nurse-midwife 02)

All groups emphasized the importance of filling the partograph properly. The nurse-midwives expressed a wish for training on the use of partograph. A nurse-midwife in the regional hospital said that it is not filled properly even though they know how to do it. Some doctors suspected that nurse-midwives sometimes filled the partograph, so it did not indicate prolonged labour. Starting the partograph at the correct time was considered a main challenge. Both doctors and nurse-midwives reflected on how an erroneous first plot in the partograph may wrongly indicate prolonged labour. Nurse-midwives expressed uncertainty in establishing the start of active labour. Referral cases provided challenges due to

undocumented anamnesis. Despite their confidence in the partograph, doctors at the zonal hospital reported that the partograph occasionally forced them to intervene. Not following the partograph, they explained, sometimes avoided CS and resulted in normal birth. Nurse-midwives also experienced the partograph as having a narrow normal, not fitting to all.

In assessing prolonged labour, nurse-midwives from both hospitals described vaginal examination and abdominal palpation as a challenge and advocated for training. Especially concerning the measurement and documentation of descent, there was mixture of terms. The respondents used the terms *level*, *descent* and *station* and were explicit about the lack of common understanding of their differences and similarities; as this nurse-midwife in the regional hospital said:

> In measuring spine level it is a problem […] even in interpreting, when you mix interpreting engagement and then comes station, you mix with level. You have to think twice, which one do you write down? It is zero in spine level but where it is in plus one or plus to and more? Where is plus two? Where is minus two? It is a problem altogether. (RRH 01, Nurse-midwife 04)

In addition to descent, measuring cervical dilation was described as challenging by nurse-midwives. They explained how different finger sizes would lead to considerable differences in measurements. In the zonal hospital nurse-midwives complained that inexperienced doctors lacked skills in cervical dilation measurement.

Seeing how malposition may cause prolonged labour, being able to identify the child's position and presentation during birth was regarded as important but challenging, by nurse-midwives in both hospitals. In detecting malposition, respondents also described pain as an indicator. Furthermore, severe pain, lack of pain and unexpected pain made the respondents alert to complications like uterine rupture. Detecting the cause of pain, was found to be challenging but essential, as expressed by a doctor in the regional hospital:

> "Why so much pain? […] I will go and find out why, why, why" (RRH 05, Doctor 01)

The respondents described how different expressions of pain influenced how they intervened, sometimes resulting in unnecessary interventions.

Appropriate intervention at the appropriate time

"We must take action" was a frequently used phrase among the nurse-midwives, often synonymous with CS. Respondents said that *action must be taken* when vaginal birth was not regarded as possible, there was a lack of progress for some time, the child was too big or if the "partograph said so". A nurse-midwife in the regional hospital described it this way:

> If you use partograph well you can know if the things are going well or not, so you can take action. If it is a big baby, definitely that cannot come out in normal way, so you must take action as early as possible. (RRH 04, Nurse-midwife 04)

Furthermore, nurse-midwives described how women ask for CS after being in labour for a long period. Allegedly, some women were told that if they cried and made a lot of noise, the doctor would take them for operation. However, doctors in both hospitals said that without danger signs, CS would not be performed solely on request from labouring women. The respondents mentioned referral cases where there was said to be prolonged labour and the partograph indicated CS, and still the membranes were not ruptured and when artificial rupture of the membranes (ARM) was performed the women gave birth. One doctor expressed frustration with guidelines that may indicate early interventions and CS when unnecessary:

> […] we discuss the difficulty at hand but at the end of the day if I follow my decisions, I find I have helped the mother she has her baby normally; I haven't followed guideline. […] If I have done early intervention, I will have to do another intervention for CS due to prolonged labour. (ZCUH 04, Doctor 02)

However, for referral cases with dry vagina of high temperature and with the child's head high – vaginal birth was unlikely to take place, according to respondents. Some doctors suggested that many are scared of vacuum extraction, and therefore it is not put into good use.

Regarding oxytocin, respondents agreed that it should not be administered too early, and that there should be good foetal heart rate (FHR) in advance. A nurse-midwife at the zonal hospital said that the FHR should be monitored "most of the time" when a labouring woman is augmented with oxytocin. The respondents were alert if the mother was silent when augmented with oxytocin. The nurse-midwives reported that labouring women themselves requested oxytocin to shorten labour. Unnecessary induction and inaccurate administration of

oxytocin were reported as causes of prolonged labour among the respondents at both hospitals. They expressed a challenge related to the practical administration of oxytocin – whether or not the valve was sufficiently opened. A doctor in the zonal hospital explained it like this:

> As service providers if we are not careful with the dose so that mother can deliver within prescribed time, you will find oxytocin dripping but there is no change in situation of the mother. It is you who have made decision of applying oxytocin while she was in mild contractions and you haven't opened enough the valve for oxytocin for mother to have strong contractions. [...] Maybe early application of oxytocin can cause prolonged labour. (ZCUH 04, Doctor 02)

The nurse-midwives expressed a need for guidelines regarding the use of oxytocin augmentation as well as when ARM should be performed. Some said that experience had taught them that performing ARM too early would result in prolonged labour, whereas delayed ARM may prevent it. When discussing ARM, nurse-midwives expressed fear of endangering the child by cord prolapse or increased risk of infection, especially transmission of HIV (human immunodeficiency virus).

Discussing the timing for interventions, nurse-midwives addressed the right time for admission to the labour ward. They said that too early admittance may result in misdiagnosed prolonged labour and the mother feeling poorly treated. Too late admittance, as for many referral cases due to repeated delays, made them anxious for both mother and child. A nurse-midwife in the zonal hospital said:

> If prolonged labour happens far away in the rural areas, it takes time to diagnose and also organizing and transporting the patient takes time as well. By the time she reaches here, she is tired and also the baby is tired. (ZCUH 01, Nurse-midwife 05)

Monitoring foetal heart rate

Respondents from both hospitals conveyed challenges related to finding and interpreting foetal heart rate (FHR). Differentiating foetal heart rate from the maternal was found to be difficult, as explained by a nurse-midwife in the regional hospital:

> It is possible you have listened but you listened to maternal heartbeat, you can say there is foetal heartbeat, but if you haven't incorporated your colleague or you haven't asked the mother if the baby is kicking inside and confirm with ultrasound at the end of the day you come up with such results [stillborn/macerated]. (RRH 01, Nurse-midwife 03)

Several nurse-midwives mentioned incidences where there was said to be FHR, but the child was stillborn. They understood FHR as either low, normal or high, and strong or weak. A nurse-midwife described continuous monitoring as listening to the FHR every half hour. Obese or non-cooperative mothers and cases of malpositioned children, represented additional challenges in finding FHR. Some respondents reported that there were no problems related to the interpretation of FHR, only difficulties in monitoring. Difficulties were closely related to distrust in all available foetal monitoring equipment, as explained by a nurse-midwife in the zonal hospital:

> […] there is no answer which I can precisely give if I can rely on either pinard, foetal scope, doppler or even ultrasound all has its challenges, because we have an experience of being told there is foetal heartbeat but on delivery you get fresh stillbirth, all these are challenges I don't know which can give accurate reading. (ZCUH 02, Nurse-midwife 03)

Nurse-midwives described how dopplers might give faulty readings and mislead them in their work, resulting in children with surprisingly low score at birth. Nurse-midwives also reported that poor knowledge on the utilisation of the equipment was a problem.

Working as a team

Within the team of respondents, the perception of urgency varied. Teamwork was perceived as challenging when the doctor gave the labouring women time but forgot to follow up or "gave time" repeatedly. Nurse-midwives in the regional hospital described how doctors gave time despite being informed that FHR was negatively affected, as this nurse-midwife explained:

> I am the one who know the patient, I stay with patient, maybe I have already taken one or two actions. Maybe FHR is 100 or 90 and I can see it is in distress and contractions has slowed down and child cannot come out, I have called the doctor who says we should give her another one hour. Personally I will tell the doctor […] it is not possible to give mother another one hour. (RRH 04, Nurse-midwife 04)

The doctors said that they only gave time if no danger signs were present for mother or child. Being available after giving time was described by the doctors as a necessity.

Teamwork seemed to be challenged by a mutual distrust between nurse-midwives and unexperienced doctors. In decision-making, doctors were sometimes bypassed if the nurse-midwife did not agree with the decisions made. Nurse-midwives described this bypassing as a way of advocating for the women and children when they felt their conditions were not taken

seriously. They argued that increased independence, especially when managing uncomplicated labours, would benefit the childbearing women. At the same time, they described a struggle with the fear of being accused of wrongdoing. When fearful of a poor outcome, they put effort into documenting the dialogue with the doctor to minimize the risk of blame.

Discussion

The purpose of this study was to explore how clinical challenges related to prolonged labour were described by nurse-midwives and doctors in Northern Tanzania. The findings will be discussed in light of previous research. Our findings indicate a mixture of different terms for the phenomenon of prolonged labour. The conception of urgency differed among the professions. Doubts regarding the accuracy of foetal heart rate findings were evident. The dialogue between doctors and nurse-midwives is challenged by distrust. All of the above contributes to complicate the ground on which decisions are made.

We found that the terms poor progress, prolonged labour and obstructed labour were discussed as three separate diagnoses, even though the usage was often overlapping and at other times, contradictory. An overview of indications for emergency CS in a hospital in Tanzania listed poor progress of labour, big baby, cervical dystocia, prolonged labour and CPD as different indications - poor progress being by far the leading cause for CS (Hirani et al., 2017). This seems to indicate that poor progress is used as a broader, less strict diagnosis, encompassing more than what obstructed or prolonged labour does. Poor progress remains an unclear diagnosis. According to our study, prolonged labour and obstructed labour tend to be used as equivalent terms. If a labouring woman gives birth vaginally, said one informant, the case cannot be labelled prolonged labour. This indicates an understanding of prolonged labour exclusively related to mechanical disproportion.

No consensus was found among the respondents regarding how many hours a normal labour was expected to last. Arriving at a definition of prolonged labour, presupposes an agreement about what constitutes normal labour onset and progress. However, there is no global consensus about the onset and duration of the different stages of “normal” labour - the concept of “normality” in labour is neither universal nor standardized (WHO, 2018).

Furthermore, there is no global consensus on a definition of prolonged labour. According to the respondents, the diagnosis of prolonged labour was given when the expected hours were passed, or the action line of the partograph was crossed.

Our study found that the respondents had great confidence in the partograph, but at the same time regarded it as presenting a narrow normal. The routinely use of the partograph has been widely promoted by the WHO (2018). However, the validity of the most important components, the alert and action lines, has been called into question during the last decade (ibid.). The new guidelines aim to facilitate "slow, yet normal" progression in labour (WHO, 2018). The respondents' thoughts were in line with the current waves of research. They often experienced disagreement with the partograph, and interventions were perceived as forced because "the partograph said so". Doctors stated that if they follow the guidelines many unnecessary CSs would be carried out, while disregarding the guidelines would sometimes lead to vaginal birth. Miltenburg et al. (2018) found that nurse-midwives were hesitant to start the partograph at early first stage of labour, concerned that too many would cross the action line. This manipulation of the partograph brings us back to our findings that nurse-midwives allegedly chose to make changes to the partograph so that it did not indicate prolonged labour, thus giving the labouring women more time to progress.

Crossing of the action line in the partograph prompted the respondents to "take action". The meaning of "taking action" was ambiguous. At times, the action line alone seemed to be interpreted as an indicator for CS – especially if other interventions had already been performed. High incidences of unnecessary CSs have been reported in Tanzania; one study found that 26% of prolonged labour cases that lead to CSs, were not actually prolonged (Maaløe et al., 2012). There seemed to be uncertainty around the appropriate time for oxytocin augmentation. Respondents described practical challenges related to adjusting the oxytocin infusion "rate" by hand – regulating the speed by opening and closing the valve. Maaløe et al. (2018) implemented locally tailored guidelines in Zanzibar, that recommended reserving intrapartum oxytocin augmentation until crossing of the action line. They found significant positive effects on neonatal outcomes. Our findings identified a request among nurse-midwives regarding guidelines on when to utilise oxytocin augmentation and ARM.

Evaluation of urgency seemed related to different danger signs; crossing of action line, exceeding "prescribed hours", foetal distress or maternal distress. The main assessment of maternal wellbeing seemed to be the focused on pain; that might imply urgency due to

uterine rupture or difficulties like malpositioned child. Our study also found a distrust in foetal monitoring equipment, similar to the findings of Mdoe et al. (2018). One may assume that our respondents' recurrent experiences of being surprised by poor neonatal outcomes, affected their confidence in the foetal monitoring equipment. Several of the nurse-midwives explained that interpretation of the FHR was not at all difficult, which may suggest a simplified understanding of a complex field. The nurse-midwives advocated for more education and training on the usage of the equipment. Lack of trust in FHR monitoring coexists with what we recognised as a questionable administration of oxytocin. Oxytocin augmentation can induce foetal distress (World Health Organization, 2017); however, our respondents mainly focused on the risk of uterine rupture. We question if this might imply an underestimation of the risks associated with oxytocin augmentation.

Our study found that the respondents often had different perceptions of urgency. According to the nurse-midwives, the doctors would give the labouring women "more time" despite the midwives' evaluation of urgency in the situation - this was a recurrent theme. The doctors explained that they always evaluated the larger picture before giving more time. According to the nurse-midwives, however, they might have to wait a long time for the doctor to arrive, although they had informed them about a poor FHR. Situations where foetal distress was not recognised by nurse-midwives or acknowledged by doctors, may be seen as examples of what Miller et al. (2016) described as "too little too late" in obstetric care. If the time interval from decision of emergency CS to birth is too long, this may have tragic consequences. Hirani et al. (2017) and Maaløe et at. (2012) found the decision-to-delivery interval to be close to one hour in Tanzania. The interviewed nurse-midwives were afraid of being blamed in cases of poor outcomes, in accordance with the findings by Miltenburg et al. (2018) and Bremnes et al.'s (2018). Both our study and Bremnes et al. (2018) found that nurse-midwives felt underestimated in their competence. Bremnes at al. (2018) found that this led to further delay in the diagnosing and treatment because the doctors did not trust the observations of the nurse-midwives. In this study, both nurse-midwives and doctors acknowledged the importance of trusting each other's competence and agreed that increased mutual trust would benefit the patients.

Strengths and limitations

The main strength of this study is that it conveys both nurse-midwives' and doctors' own perspectives on their management of prolonged labour and what they find clinically challenging. Our findings are intended to create a foundation for further research in interventions adapted to the local context. A limitation of the study may be that the analysis was conducted by two foreign authors (x & x) lacking a deeper insight into the local context. This may to some extent have influenced the interpretation of the material. Cross cultural research carries with it the risk of missing or distorting information. Attempts were made to limit misinterpretations through recurrent dialogue with the project group of EPSHILS in Tanzania.

Conclusion

Our results provide a broader understanding of what clinical challenges nurse-midwives and doctors in Tanzania face when managing prolonged labour. Our key findings suggest that the ground on which decisions are made, is somewhat inconsequent. This complicates teamwork due to different perceptions of urgency and distrust among doctors and nurse-midwives. They request guidelines to clarify the appropriate time to perform oxytocin augmentation, caesarean section and artificial rupture of membranes. Frequent training on vaginal examination, use of partograph and foetal monitoring is needed and requested.

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Attachment 2: Article manuscript attachments

The supplementary attachments requested by *Midwifery* in their guideline for authors are assembled here:

- Article title page
- Article highlights
- Conflict of Interest Checklist author 1
- Conflict of Interest Checklist author 2

Article title page

Give time or take action?

Clinical challenges of prolonged labour: perspectives from Tanzania

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(1) Conflict of Interest: None declared.

(2) Ethical Approval: Local approval to conduct the group discussions was given by the leaders of both hospitals in Tanzania. Norwegian Centre for Research Data (NSD) and Regional Committees for Medical and Health Research Ethics (REC) were informed about the study, both regarding it unnecessary with a full assessment.

(3) Funding Sources: None declared.

Article highlights

In managing prolonged labour, nurse-midwives and doctors perceive urgency differently.

Distrust among doctors and nurse-midwives complicates management of prolonged labour.

Nurse-midwives in Tanzania find available foetal monitoring equipment unreliable.

Conflict of Interest Checklist, author 1

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ICMJE Form for Disclosure of Potential Conflicts of Interest

Instructions

The purpose of this form is to provide readers of your manuscript with information about your other interests that could influence how they receive and understand your work. The form is designed to be completed electronically and stored electronically. It contains programming that allows appropriate data display. Each author should submit a separate form and is responsible for the accuracy and completeness of the submitted information. The form is in six parts.

1. Identifying information.

2. The work under consideration for publication.

This section asks for information about the work that you have submitted for publication. The time frame for this reporting is that of the work itself, from the initial conception and planning to the present. The requested information is about resources that you received, either directly or indirectly (via your institution), to enable you to complete the work. Checking "No" means that you did the work without receiving any financial support from any third party -- that is, the work was supported by funds from the same institution that pays your salary and that institution did not receive third-party funds with which to pay you. If you or your institution received funds from a third party to support the work, such as a government granting agency, charitable foundation or commercial sponsor, check "Yes".

3. Relevant financial activities outside the submitted work.

This section asks about your financial relationships with entities in the bio-medical arena that could be perceived to influence, or that give the appearance of potentially influencing, what you wrote in the submitted work. You should disclose interactions with ANY entity that could be considered broadly relevant to the work. For example, if your article is about testing an epidermal growth factor receptor (EGFR) antagonist in lung cancer, you should report all associations with entities pursuing diagnostic or therapeutic strategies in cancer in general, not just in the area of EGFR or lung cancer.

Report all sources of revenue paid (or promised to be paid) directly to you or your institution on your behalf over the 36 months prior to submission of the work. This should include all monies from sources with relevance to the submitted work, not just monies from the entity that sponsored the research. Please note that your interactions with the work's sponsor that are outside the submitted work should also be listed here. If there is any question, it is usually better to disclose a relationship than not to do so.

For grants you have received for work outside the submitted work, you should disclose support ONLY from entities that could be perceived to be affected financially by the published work, such as drug companies, or foundations supported by entities that could be perceived to have a financial stake in the outcome. Public funding sources, such as government agencies, charitable foundations or academic institutions, need not be disclosed. For example, if a government agency sponsored a study in which you have been involved and drugs were provided by a pharmaceutical company, you need only list the pharmaceutical company.

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This section asks about patents and copyrights, whether pending, issued, licensed and/or receiving royalties.

5. Relationships not covered above.

Use this section to report other relationships or activities that readers could perceive to have influenced, or that give the appearance of potentially influencing, what you wrote in the submitted work.

Definitions.

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Grant: A grant from an entity, generally [but not always] paid to your organization
Personal Fees: Monies paid to you for services rendered, generally honoraria, royalties, or fees for consulting , lectures, speakers bureaus, expert testimony, employment, or other affiliations
Non-Financial Support: Examples include drugs/equipment supplied by the entity, travel paid by the entity, writing assistance, administrative support, etc.
Other: Anything not covered under the previous three boxes
Pending: The patent has been filed but not issued
Issued: The patent has been issued by the agency
Licensed: The patent has been licensed to an entity, whether earning royalties or not
Royalties: Funds are coming in to you or your institution due to your patent

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ICMJE Form for Disclosure of Potential Conflicts of Interest

Section 1. Identifying Information

1. Given Name (First Name) [redacted]
2. Surname (Last Name) [redacted]
3. Date 18-October-2019

4. Are you the corresponding author? ☑ Yes ☐ No

5. Manuscript Title
Give time or take action? Clinical challenges of prolonged labour: perspectives from Tanzania

6. Manuscript Identifying Number (if you know it)

Section 2. The Work Under Consideration for Publication

Did you or your institution **at any time** receive payment or services from a third party (government, commercial, private foundation, etc.) for any aspect of the submitted work (including but not limited to grants, data monitoring board, study design, manuscript preparation, statistical analysis, etc.)?

Are there any relevant conflicts of interest? ☐ Yes ☑ No

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Place a check in the appropriate boxes in the table to indicate whether you have financial relationships (regardless of amount of compensation) with entities as described in the instructions. Use one line for each entity; add as many lines as you need by clicking the "Add +" box. You should report relationships that were **present during the 36 months prior to publication**.

Are there any relevant conflicts of interest? ☐ Yes ☑ No

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Section 4. Intellectual Property -- Patents & Copyrights

Do you have any patents, whether planned, pending or issued, broadly relevant to the work? ☐ Yes ☑ No

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Section 5. Relationships not covered above

Are there other relationships or activities that readers could perceive to have influenced, or that give the appearance of potentially influencing, what you wrote in the submitted work?

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☑ No other relationships/conditions/circumstances that present a potential conflict of interest

At the time of manuscript acceptance, journals will ask authors to confirm and, if necessary, update their disclosure statements. On occasion, journals may ask authors to disclose further information about reported relationships.

Section 6. Disclosure Statement

Based on the above disclosures, this form will automatically generate a disclosure statement, which will appear in the box below.

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[redacted] has nothing to disclose.

Evaluation and Feedback

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Conflict of Interest Checklist, author 2

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Non-Financial Support: Examples include drugs/equipment supplied by the entity, travel paid by the entity, writing assistance, administrative support, etc.
Other: Anything not covered under the previous three boxes
Pending: The patent has been filed but not issued
Issued: The patent has been issued by the agency
Licensed: The patent has been licensed to an entity, whether earning royalties or not
Royalties: Funds are coming in to you or your institution due to your patent

1

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ICMJE Form for Disclosure of Potential Conflicts of Interest

Section 1. Identifying Information

1. Given Name (First Name) [redacted]
2. Surname (Last Name) [redacted]
3. Date 21-October-2019

4. Are you the corresponding author? ☐ Yes ☑ No Corresponding Author's Name [redacted]

5. Manuscript Title
Give time or take action? Clinical challenges of prolonged labour: perspectives from Tanzania

6. Manuscript Identifying Number (if you know it)

Section 2. The Work Under Consideration for Publication

Did you or your institution **at any time** receive payment or services from a third party (government, commercial, private foundation, etc.) for any aspect of the submitted work (including but not limited to grants, data monitoring board, study design, manuscript preparation, statistical analysis, etc.)?

Are there any relevant conflicts of interest? ☐ Yes ☑ No

ADD

Section 3. Relevant financial activities outside the submitted work.

Place a check in the appropriate boxes in the table to indicate whether you have financial relationships (regardless of amount of compensation) with entities as described in the instructions. Use one line for each entity; add as many lines as you need by clicking the "Add +" box. You should report relationships that were **present during the 36 months prior to publication**.

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ADD

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☑ No other relationships/conditions/circumstances that present a potential conflict of interest

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Generate Disclosure Statement

[redacted] has nothing to disclose.

Evaluation and Feedback

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Attachment 3: Midwifery's Guide for Authors

MIDWIFERY

AUTHOR INFORMATION PACK

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ISSN: 0266-6138

DESCRIPTION

Midwifery publishes the latest peer reviewed international research to inform the safety, quality, outcomes and experiences of **pregnancy, birth and maternity care** for childbearing women, their babies and families. The journals publications support **midwives** and **maternity care** providers to explore and develop their knowledge, skills and attitudes informed by best available **evidence**.

Midwifery provides an **international, interdisciplinary** forum for the publication, dissemination and discussion of advances in evidence, controversies and current research, and promotes continuing education through publication of systematic and other scholarly reviews and updates. ***Midwifery*** articles cover the cultural, clinical, psycho-social, sociological, epidemiological, education, managerial, workforce, organizational and technological areas of practice in preconception, maternal and infant care, maternity services and other health systems.

The journal welcomes the highest quality scholarly research that employs rigorous methodology.*Midwifery* is a leading international journal in midwifery and maternal health with a current impact factor of 1.88 (2017 Journal Citation Reports, Clarivate Analytics 2018) and employs a double-blind peer review process.

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GUIDE FOR AUTHORS

INTRODUCTION

Dr Debra Bick, the Editor of *Midwifery*, welcomes manuscripts for consideration for publication in the journal.

Uniform Requirements

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You can use this list to carry out a final check of your submission before you send it to the journal for review. Please check the relevant section in this Guide for Authors for more details.

Ensure that the following items are present:

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Declaration of Interest

All authors are requested to disclose any actual or potential conflict of interest including any financial, personal or other relationships with other people or organizations within three years of beginning the submitted work that could inappropriately influence, or be perceived to influence, their work. More information.

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Contributors

Those who meet some but not all of the criteria for authors can be identified as 'contributors' with their contribution specified. All those individuals who provided help during the research (e.g., collecting data, providing language help, writing assistance or proofreading the article, etc.) that do not meet criteria for authorship should be acknowledged in the paper. Acknowledgments should be added to the title page if applicable.

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All authors should have made substantial contributions to all of the following: (1) the conception and design of the study, or acquisition of data, or analysis and interpretation of data, (2) drafting the article or revising it critically for important intellectual content, (3) final approval of the version to be submitted.

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Headings in the article should be appropriate to the nature of the paper. Research papers should follow the standard structure of: Introduction (including review of the literature), Methods, Findings and Discussion.

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State the objectives of the work and provide an adequate background, avoiding a detailed literature survey or a summary of the results.

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Provide sufficient detail to allow the work to be reproduced. Methods already published should be indicated by a reference: only relevant modifications should be described.

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Results should be clear and concise.

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This should explore the significance of the results of the work, not repeat them. A combined Results and Discussion section is often appropriate. Avoid extensive citations and discussion of published literature.

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Highlights are optional yet highly encouraged for this journal, as they increase the discoverability of your article via search engines. They consist of a short collection of bullet points that capture the novel results of your research as well as new methods that were used during the study (if any). Please have a look at the examples here: example Highlights.

Highlights should be submitted in a separate editable file in the online submission system. Please use 'Highlights' in the file name and include 3 to 5 bullet points (maximum 85 characters, including spaces, per bullet point).

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Acknowledgements

For original submissions Acknowledgements should be included in the title page file to facilitate blinded review. List here those individuals who provided help during the research (e.g., providing language help, writing assistance or proof reading the article, etc.).

Formatting of funding sources
List funding sources in this standard way to facilitate compliance to funder's requirements:

Funding: This work was supported by the National Institutes of Health [grant numbers xxxx, yyyy]; the Bill & Melinda Gates Foundation, Seattle, WA [grant number zzzz]; and the United States Institutes of Peace [grant number aaaa].

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Oguro, M., Imahiro, S., Saito, S., Nakashizuka, T., 2015. Mortality data for Japanese oak wilt disease and surrounding forest compositions. Mendeley Data, v1. http://dx.doi.org/10.17632/xwj98nb39r.1.

References to a book:

Field, P. A., Morse, J. M., 1985. Nursing research: the application of qualitative approaches. Croom Helm, London.

Reference to a chapter in an edited book:

Mettam, G.R., Adams, L.B., 1999. How to prepare an electronic version of your article. In: Jones, B.S., Smith , R.Z. (Eds.), Introduction to the Electronic Age. E-Publishing Inc., New York. pp. 281-304.

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Attachment 4: Interview guide

Modified semi-structured interview guide -Tanzania

Introduction – year of working as midwife/dr etc….. Experience, cadre?

1. Which stage of labour do you find most difficult to manage? Please explain (latent <4cm, or active phase of labour comprising first stage (4-10cm) or second stage (pushing phase))
2. What are your options to relief or solve the situation? (rupture of membranes, empty bladder, food/energy, different positions, rest/sleep, pain relief, presence of staff/comfort/support, oxytocin augmentation, vacuum, C-section etc)
3. How do you understand "prolonged labour"?
4. What are the risks related to prolonged labor? (neonatal asphyxia, uterine rupture, postpartum hemorrhage, fistula, fear of birth etc)
5. What kind of tools do you have to identify prolonged labor? (abdominal palpation/vaginal examination, contractions, membranes, caput succedaneum, partograph, expression of pain, exhaustion etc)
6. How do you perceive the usefulness of these tools?
7. What are the difficulties of carrying out these examinations and interpret the findings? (assessing the leading part? abdominal level?, spine level?, sutures/fontanelles, cervix, membranes etc)
8. Do you encounter difficulty in monitoring and describing contractions, and interpret fetal heart rate? How?
9. Do you think pain perception may influence decisions on the management of prolonged labour? How?
10. How important is the opinion of the mother (and relative) in the management of prolonged labour?
11. How is the teamwork in relation to prolonged labour?
12. How can the department ensure the best possible quality of the maternity care for mother and child in case of prolonged labor?

Attachment 5: Consent form for participation

Consent form for participation in Focus Group Discussions at the Maternity Dept, Mawenzi Hospital

The project "Enhancing patient safety in high- and low-resource settings (EPSHILS); how to improve the process of decision-making in case of prolonged labour?" will use Focus Group Discussions to learn about risk images related to prolonged labour among staff at the Maternity Department at Mawenzi Hospital. By gathering institutional specific information on the current management of prolonged labour, we can build a strong rationale on how to prepare and implement an intervention on multi-professional decision-making in case of prolonged labour for enhanced patient safety.

I volunteer to participate in this focus group discussion.
I understand that I am guaranteed anonymity, and that I am free to withdraw from the study at any time.

Attachment 6: Approval from Zonal Consultant University Hospital

K.C.M.C

KILIMANJARO CHRISTIAN MEDICAL CENTRE

An institution of the Good Samaritan Foundation

P. O. Box 3010, Moshi, Tanzania

Tel: 255-027-2754377/ 80 Fax: 255-027-2754381

Email: dirsec@kcmc.ac.tz Website: http: / / www.kcmc.ac.tz

Your Ref.

Our Ref. **KCMC/A.34** **Date: 18/10/2018**

Principal Investigator,
Stavanger University Hospital,
A011 STAVANGER NORWAY - Enhancing patient safety in high and low resource settings (EPSHILS) how to improve the process of decision making in case of prolonged labor STUDY

Dear Sir,

RE: APPROVAL TO CUNDUCT A FOCUSED GROUP DISCUSSION AMONG MATERNITY WARD STAFF AS A NEED ASSESSMENT INITIATIVE PRIOR TO COMMENCEMENT OF "EPSHILS" STUDY.

As the heading refers, I wish to formally inform you that your request put forward by the KCMC & Mawenzi prolonged labour team (Dated 23 June 2018) for conducting discussion among Maternity staff at KCMC regarding the challenges on diagnosis and management of prolonged labour has been approved.

As an institution we strongly believe gathering institutional specific information in management of prolonged labour is vital initial step in building a strong rationale for further investigating prolonged labour management challenges.

We hope that this study will highlight challenges in our institution and assist in devising measures to improve outcomes of obstetric cases with prolonged labour.

Thanks in advance.

Dr. Gileard Masenga
EXECUTIVE DIRECTOR

EXECUTIVE DIRECTOR
K. C. M. C. — MOSHI

All correspondences should be addressed to the Executive Director

Attachment 7: Approval from Regional Referral Hospital

THE UNITED REPUBLIC OF TANZANIA
MINISTRY OF HEALTH, COMMUNITY DEVELOPMENT, GENDER, ELDERLY AND CHILDREN

KILIMANJARO HEALTH
Tel: 027 52321 Direct Line
E-mail: mawenzirrh@afya.go.tz
(All letters should be addressed to
The Medical Officer In charge)

MAWENZI REGIONAL REFERRAL HOSPITAL,
P.O. Box 3054,
MOSHI.

Ref. No. M.1/11/Vol V/52

18th, October, 2018

PRINICIPAL INVESTIGATOR- EPSHILS STUDY,

NORWAY

Dear Sir,

REF; APPROVALTO CONDUCT A FOCUSED GROUP DISCUSSION IN THE MATERNITY WARD STAFF AS A NEED ASSESSMENT INITIATIVE PRIOR TO COMMENCEMENT OF "EPSHILS"STUDY.

As the heading refers, Enhancing patient safety in high- and low-resource settings (EPSHILS) on how to improve the process of decision-making in case of prolonged labor STUDY. I wish to formally inform you that your request put forward by the Mawenzi RRH & KCMC prolonged labour team (Dated 23 June 2018) for conducting discussion among Maternity staff at Mawenzi RRH regarding the challenges on diagnosis and management of prolonged labour has been approved.

As an institution we strongly believe gathering institutional specific challenges in management of prolonged labour is vital initial step in building a strong rationale for further investigating prolonged labour management challenges.

We hope that this study will highlight challenges in our institution and assist in devising measures to improve outcomes of obstetric cases with prolonged labour.

Thanks in advance.

Sincerely yours,

Dr. Japhet B. Boniface (MD_{RU}, MMED Ophthalmology$_{TZ}$)
Medical Officer In charge
Mawenzi Regional Referral Hospital

Attachment 8: Approval from EPSHILS

APPROVAL

This letter is a confirmation of access to transcribed data from KCMC and Mawenzi. The data consists of focus group interviews conducted as a part of the project "Enhancing patient safety in high- and low-resource settings (EPSHILS); how to improve the process of decision-making in case of prolonged labour?" in Moshi, Tanzania.

We approve that the midwifery students from Oslo Metropolitan University (OsloMet), [redacted] will get access to the data, analyse it and present it in as an article with cape as their masters thesis. In the case of publishing, the Vancouver recommendations will be met. This implies that [redacted] will be listed as the first-writers of the article, and their head supervisor, [redacted], will be included as the last writer. Other colleagues contributing to the article, will be listed in accordance with the Vancouver recommendations.

Local leader of the project:
Bariki Mchome, MD, Senior consultant, PhD-fellow, Department of Obstetrics and Gynecology, Kilimanjaro Christian Medical Centre (KCMC)

.....

External leader of the project:
Signe Egenberg, PhD, Research midwife, Department of Obstetrics and Gynecology, Stavanger University Hospital, University of Stavanger

Stavanger 01.05.19 .....

Attachment 9: Response from The Norwegian Centre for Research Data

NSD NORSK SENTER FOR FORSKNINGSDATA

NSD sin vurdering

Prosjekttittel

Practice and challenges related to prolonged labour - the reflections of nurse-midwives and doctors at two hospitals in Northern Tanzania. A qualitative approach.

Referansenummer

987925

Registrert

13.05.2019 av [redacted]

Behandlingsansvarlig institusjon

OsloMet - storbyuniversitetet / Fakultet for helsevitenskap / Institutt for sykepleie og helsefremmende arbeid

Prosjektansvarlig (vitenskapelig ansatt/veileder eller stipendiat)

[redacted]

Type prosjekt

Studentprosjekt, masterstudium

Kontaktinformasjon, student

[redacted]

Prosjektperiode

27.08.2018 - 24.10.2019

Status

07.06.2019 - Vurdert anonym

Vurdering (1)

07.06.2019 - Vurdert anonym

Det er vår vurdering at det ikke skal behandles direkte eller indirekte opplysninger som kan identifisere enkeltpersoner i dette prosjektet, så fremt den gjennomføres i tråd med det som er dokumentert i meldeskjemaet den 07.06.2019 med vedlegg, samt i meldingsdialogen mellom innmelder og NSD. Prosjektet trenger derfor ikke en vurdering fra NSD.

HVA MÅ DU GJØRE DERSOM DU LIKEVEL SKAL BEHANDLE PERSONOPPLYSNINGER?
Dersom prosjektopplegget endres og det likevel blir aktuelt å behandle personopplysninger må du melde dette til NSD ved å oppdatere meldeskjemaet. Vent på svar før du setter i gang med behandlingen av personopplysninger.

VI AVSLUTTER OPPFØLGING AV PROSJEKTET
Siden prosjektet ikke behandler personopplysninger avslutter vi all videre oppfølging.

Lykke til med prosjektet!

Kontaktperson hos NSD: Lise A. Haveraaen
Tlf. Personverntjenester: 55 58 21 17 (tast 1)

Attachment 10: Response from

Regional Committees for Medical and Health Research Ethics

Fra: post@helseforskning.etikkom.no
Emne: Sv: REK sør-øst 2019/976 Langsom fremgang i fødsel i Tanzania - jordmødre og legers tanker om egen praksis
Dato: 29. mai 2019 kl. 12:03
Til: [redacted]

Vi viser til innsendt skjema for fremleggingsvurdering for ovennevnte prosjekt *Langsom fremgang i fødsel i Tanzania - jordmødre og legers tanker om egen praksis, mottatt* 27.05.2019. Sekretariatet i REK sør-øst har på fullmakt vurdert henvendelsen, med tilhørende dokumentasjon.

Søker angir at formålet med prosjektet er å forsøke å bedre kvaliteten på pasientbehandlingen ved to lokalsykehus i Tanzania. Jordmødre og leger intervjues, og intervjuene har til hensikt å få innsikt i deres tanker og refleksjoner rundt egen praksis og utfordringer knyttet til langsom fremgang i fødsel. Spørsmål som stilles; Hva opplever de som utfordrende? Hvordan definerer de langsom fremgang? Hvilke verktøy bruker de for å diagnostisere, forebygge og behandle langsom fremgang?

Komiteen mener, basert på den dokumentasjonen som er fremlagt, at studien således ikke har til formål å skaffe til veie ny kunnskap om sykdom og helse, slik dette forstås i helseforskningslovens § 4.

Prosjektet er derfor ikke fremleggelsespliktig, jf. helseforskningslovens §§ 2 og 4. Studien kan gjennomføres uten REK-godkjenning.

REK antar for øvrig at prosjektet kommer inn under de interne regler for behandling av opplysninger som gjelder ved ansvarlig virksomhet. Søker bør derfor ta kontakt med enten forskerstøtteavdeling eller personvernombud for å avklare hvilke retningslinjer som er gjeldende.

Vi gjør oppmerksom på at avgjørelsen av spørsmålet om fremlegging er å anse som veiledende jfr. forvaltningsloven § 11.

Med vennlig hilsen

Claus H. Thorsen
seniorrådgiver
sekretariatet
REK sør-øst

-------Original melding--------

Emne: Langsom fremgang i fødsel i Tanzania - jordmødre og legers tanker om egen praksis
Fra:
Dato: 27.05.2019 12:19:07
Til: [redacted]
Kopi:

Prosjektplan 1.0.pdf
Interview guide.docx