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Exploring potential opportunities and strategies of using the Labour Care Guide to improve labour monitoring and health outcomes among health care providers in Uganda: a qualitative study

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Abstract

Background Labour monitoring tracks cervical dilation, contractions, and foetal heart rate to ensure safe childbirth. Prolonged labour is identified when progress exceeds expected timelines, shown on the partograph or Labour Care Guide (LCG). The LCG helps health care providers detect abnormal labour patterns early. This study explored how the LCG could enhance labour monitoring in Uganda, identifying strategies to improve maternal and foetal outcomes through timely assessments and interventions.

Methods Between June and September 2023, qualitative interviews were held with Health Care Providers and Ministry of Health officials familiar with the Labour Care Guide. Conducted privately and digitally recorded, the interviews were transcribed and coded. Through iterative analysis, researchers identified multilevel factors influencing sustained engagement in labour monitoring and the uptake and implementation of the LCG.

Results The median age of the interviewed HCPs was 36 years(IQR,27-54). All participants demonstrated great enthusiasm, describing the LCG as a simple, easy-to-use and comprehensive tool that could quickly aid detection of prolonged labour for timely management, if modified appropriately. HCPs identified LCG's potential to facilitate sustained use through perceived ability to correctly define active labour at 5 cm of cervical dilatation, with major labour parameters recorded on one-A4-paper for easy comparison and reference. LCG facilitated HCP-patient-labour companion interaction for social support and would undergo customization to address user needs, enhance accountability and reduce over-documentation since the same single-page format could capture all the necessary details needed to make a one-stop quick and effective clinical decision. HCPs underscored the role and sustained benefits of off-site training, team building, guidelines accessibility, real-time feedback, peer mentorships and championships. LCG pitfalls included small fonts, observation ordering, missing record of social-demographic and key outcome data, plus fields/parameters deemed redundant/inappropriate.

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Conclusion Our data demonstrates a responsive, enthusiastic and supportive environment that has potential to facilitate LCG customization, uptake and scale up. The high LCG expectations are important considerations in developing sustainable and acceptable implementation strategies that meet user needs. More work is needed to refine and evaluate the tool's effectiveness in improving labour monitoring in Uganda.

Keywords Labour Care Guide, Childbirth, Labour monitoring

Introduction

Labour monitoring is essential for ensuring maternal and foetal well-being during childbirth that involves tracking maternal vital signs, uterine contractions, foetal heart rate and other labour assessments to detect complications [1] for timely interventions. Prolonged labour occurs when duration of labour exceeds expected time, with plots crossing the action line on the partograph or surpassing cervical dilation time thresholds in the WHO Labour Care Guide [2]. Globally, obstructed labour defined as failure of labour progress due to mechanical reasons [3] remains a significant contributor to the burden of maternal and perinatal deaths, being highest in low- and middle-income countries and almost non-existent in high income countries [4, 5]. In a Ministry of Health (MOH) report in Uganda, 8% of all maternal deaths were due to obstructed labour and 90% of perinatal deaths were due to birth asphyxia and were directly attributed to obstructed labour, which is largely preventable with good intrapartum foetal surveillance [6]. In fact, the same report asserted that prolonged labour remains a major pathway to obstructed labour and other common labour complications such as post-partum haemorrhage, ruptured uterus, puerperal sepsis and obstetric fistula among others [6]. Improved quality of care, monitoring during and after delivery with early identification and treatment of complications are therefore at the forefront towards averting unnecessary C-sections, augmentation of labour, unfavorable delivery outcomes and deaths [7].

Friedman's partograph of 1954, also referred to as the partogram, has been a gold standard for monitoring progress of labour to enable timeous intervention in case of slow progress, prolonged or obstructed labour. [8]. During this period, it's utilisation and completion rates remain sub-optimal with high incidence of obstructed labour and other labour complications. HCPs perceived the partograph as a complex tool which led to its low acceptability and sub optimal utilization [9–13] The partogram offers subjective variations by assuming that all women progress at the same rate, which may affect intervention rate [14]. Other studies have pointed out health system factors such as lack of knowledge, unavailability of printed partographs, absence of functional support supervision, negligence and shortage of staff at facilities as major obstacles to effective partograph use [13, 14]. Despite improvements in skilled birth attendance, medical supplies, partograph availability, and improved referral systems, Uganda still reports some of the highest global rates of prolonged and obstructed labour, maternal mortality (MMR 336/100,000), and perinatal mortality (41/1,000 births) [10–12]. To avert these persistent deaths and desire to overcome partograph challenges, the WHO, in 2018 called for research into partograph modification to fit emerging user and global needs while incorporating positive pregnancy and child birth experiences and respectful maternity care [15]. By 2020, the LCG (Fig. 1) was recommended to facilitate HCPs in quickly identifying deviations from normal labour progress [2]. It has alerts that stimulate HCPs to review each parameter and take action if abnormal. This LCG encourages HCP interaction, stimulating shared decision making between skilled birth attendant, women in labour and their labour companion ultimately promoting women centered care, while emphasizing safety and avoiding unnecessary practices [16]. According to Joshua Vogel et al., the LCG is regarded as the "next-generation" partograph basing on recent intrapartum care guidelines [17]. Currently, Uganda's Ministry of Health (MOH) is in the process of adopting the new recommended LCG to replace the long-used partograph across all health facilities. This aims to improve care and experience during labour and childbirth, ultimately optimizing birth outcomes by preventing maternal–fetal morbidity and deaths, through early detection and management of labour complications [18–22]. In this study, we utilized a well-established Consolidated Framework for Implementation Research (CFIR) [23] to explore potential opportunities and strategies of using the LCG to improve labour monitoring among HCP and MOH officials in Uganda.

Materials and methods

Study design and setting

We conducted in-depth qualitative interviews with 30 purposively selected HCPs actively engaged in labour monitoring, and 6 MOH officials. We utilized the Consolidated Framework for Implementation Research [23] to identify challenges, facilitators and patterns of potential and sustained uptake of the new intervention (LCG) in Mbarara city. Uganda's public health system is organized into seven tiers with national and regional referral hospitals, general district hospitals and four levels of community health centres including Health centre four, three, two and one. Staffing and available services vary across these levels: HCIII offer basic emergency obstetric

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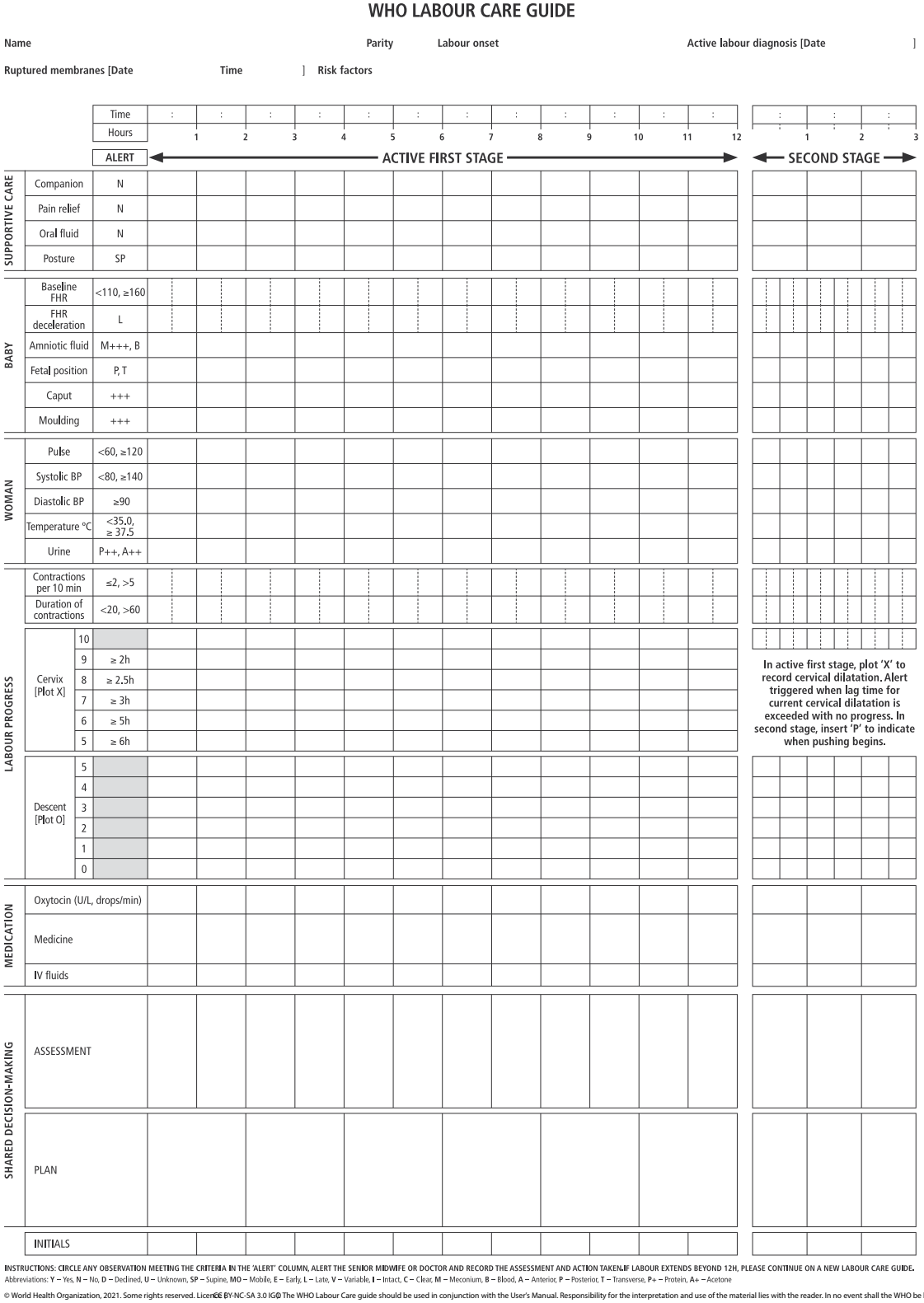


Fig. 1 The new WHO labour care guide

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care which includes provision of antenatal care and conduct vaginal delivery services, whereas HCI and HCII serve as low resource primary health care units. HCIVs, general, regional and national hospitals conduct normal and caesarean deliveries through comprehensive emergency obstetric care package, and have ambulances and blood transfusion services [24]. Private providers operate in parallel to the public health system.

Study population, participant sampling and recruitment

A purposive qualitative sampling strategy was used to construct a sample of HCPs, health facility managers and MOH officials with varied knowledge and experiences of labour monitoring and childbirth. We included HCPs with at least one year of maternity care experience using the partograph (before LCG introduction), who were trained and exposed to the LCG. We also included health facility managers, officials from the reproductive health division of the Ministry of Health and WHO country office as well as individuals with self-reported willingness to use LCG in monitoring of labour. A trained research assistant who was a male PhD holder with diverse qualitative research skills received a list of prospective participants from the principal investigator and initiated contact to all HCPs and MOH officials. The research assistant introduced himself to each participant before seeking consent for participation in the in-depth interviews. The research assistant explained the goals of the study and obtained consent from all eligible participants. Additional consent to audio-record the interviews was sought from each participant. All HCPs and MoH who were contacted participated and completed data collection. We identified 30 HCPs actively involved in conducting deliveries from the different public health facility levels with varying qualifications and experiences of maternity care, labour monitoring and childbirth. We purposively selected 6 MOH officials and stakeholders to provide a wide range of experiences, circumstances and decision-making processes across potential LCG users and implementers.

Data collection

Demographic information (e.g., age, experience, educational background) of individuals participating in in-depth face to face interviews was collected using a brief pretested questionnaire at the outset of each interview followed by a key informant interview guide structured interaction. All interviews took place in a private location mutually agreed upon by the participant and the interviewer. For all these in-depth interviews (HCPs and MOH facility managers), we explored the five major domains including intervention characteristics, outer setting, inner setting, characteristics of individuals and implementation process. HCPs were recruited from all the 14 publicly-funded facilities across Mbarara district/city and ministry of health headquarters. The interviews were open-ended and organized to cover pre-designated core domains of the intervention acceptance and CFIR implementation research frameworks. This open-ended approach ensured systematic coverage of specific areas of interest while allowing for unanticipated content to emerge, until a point of data saturation (when no more new content emerged) was achieved. To maximize data quality, interviewees were asked to describe actual experiences and events wherever possible. Interviews explored potential facilitators and barriers of LCG use using detailed CFIR domains including; 1) LCG Intervention characteristics, 2) Individual HCP characteristics and experiences monitoring labour; 3) the inner setting; 4) the outer setting and 5) the implementation process: All qualitative interview sessions lasted 60–90 min and were audio taped/recorded and were transcribed verbatim. Field notes were used to put context to each interview.

Data analysis and interpretation

The aim of this qualitative data analysis was to inductively construct categories describing multilevel implementation factors that influenced LCG implementation, effectiveness and health outcomes. Qualitative analysis was inductive in nature, a codebook was developed through conventional content analysis [25]. To ensure accuracy, transcripts and field notes were done in English by the principal investigator and the research assistants. The category construction process began with repeated review of transcripts to identify relevant content. Identified content served as the basis for developing a coding scheme. Coded data was iteratively reviewed and sorted to suggest categories under the general headings guided by CFIR framework. The categories developed from coded data consisted of descriptive labels, elaborating text to define and specify each category's meaning, and illustrative quotes taken from the transcripts. Upon finalization of the codebook, the rest of the transcripts were coded to calculate an intercoder reliability Kappa using the NVIVO software Version 12 (Melbourne, Australia). Kappa values from 0.61 to 1.0 were taken to as perfect agreement. Demographic data was used to describe the sample.

Results

The median age of the HCPs and MOH officials interviewed was 36 (IQR;27–54) years with mean durations of clinical practice of 11.3 (SD = 7.7) years. Other details on education level, position, experience, training and self-rated competence of LCG use are presented in Table 1.

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Table 1 Social demographic characteristics of interviewed HCPs and MOH official

Characteristic	Total(*n* = 36)
Median Age (years), (IQR)	36(27–54)
Mean years of clinical practice (SD)	11.3 (7.7)
Highest level of Education, n (%)	
Certificate Midwife	5(13.9)
Diploma Midwife/Nurse	10(27.8)
Graduate level Nurse/Midwife/Doctor	16(36.1)
Post graduate	5(13.9)
Current position, n (%)	
Enrolled Midwife	8(22.2)
Ward in-charge	4(11.1)
Obstetrician/Gynaecologist Residents	9(25.0)
Midwife resident	2(5.6)
Assistant Nursing Officer	3(8.3)
Nursing Officer	3(8.3)
Specialist/consultant Obstetrician/Gynaecologist	3(8.3)
District Health Officer	2(5.6)
MoH Technical consultant/officer	1(2.8)
WHO Technical consultant/officer	1(2.8)
Period spent on labour monitoring using LCG (Weeks)	
< 5	6(16.7)
5–10	2(5.6)
11–15	3(8.3)
> 15	25(69.4)
Form/Source of LCG training	
Webinars/Continuous Medical Education	24(66.7)
On Job training/Mentorship/Couching session	8(22.2)
Formal MOH trainings/workshop	0(0.0)
In School training	0(0.0)
None	4(11.11%)
Self-rated competence/knowledge of LCG use in labour monitoring	
Excellent	16(44.4)
Good	11(30.6)
Average	4(11.1)
Poor	5(13.9)

Summary of the qualitative findings

All HCPs interviewed demonstrated great enthusiasm and willingness to use the LCG if appropriately modified. The following themes were generated;

1. Looks and works better than the partograph
2. Everything is recorded on one *consolidated form* for easy comparison
3. Enhance responsibility, follow-up and accountability
4. Gives a clear picture of what is happening in all stages of labour
5. Role of appropriate training strategy

Looks and works better than the partograph

All HCPs interviewed highlighted that the LCG looked and worked better than the partograph in terms of being simple, detailed, easy-to-use and comprehensive, which they argued would foster and motivate users to capture all the key labour monitoring information. This detail and comprehensiveness further facilitated quicker/early detection of risks or danger signs that may arise during labour.

> *"The labour care guide is easy to fill and is also more detailed. It is much easier to interpret, and it is more objective and reproducible meaning that two different people working with it are more likely to give you the same plot"*
> *A 44-year-old senior midwife with over 20 years of practice*

Everything is recorded on a single- paper format for easy comparison

The HCPs noted the potential of the LCG to reduce over-documentation and filing alternative labour monitoring tools in the patient file. They further said that the single-page format would capture all the necessary details needed to make a one-stop quick and effective clinical decision that could reduce unnecessary stationery. The LCG gives a clear picture of what is happening to the patient in all stages of labour, therefore aid HCPs to timely identify an impending problem or complication, and facilitate making a reasonably accurate decision since everything is recorded on a single-paper format for easy comparison.

> *"If you look at how it is made, I do not think anyone should be burdened with writing a lot of notes in the patient's file anymore. With its improved design, it has potential to capture all labour events without duplication, they can all be recorded on the LCG and can be used for future reference. This avoids extra workload"*
> *A 45-year-old ward in-charge with over 20 years of clinical practice*
> *"We have suffered with the partograph for so many years. It's not working for us. This LCG better gets here faster because I think it can allow us to record all important labour information on one paper. All information you need as a midwife to interpret labour progress is on one paper and I think this can save us some time, energy and stationery that we usually don't have. Currently we record on partograph, patient notes, fluid balance charts etc. This consumes a lot of time and yet we have many mothers to attend to"*
> *A 54-year-old enrolled midwife with over 30 years of clinical practice*

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Enhance social support, responsibility, follow-up and accountability

HCP perceived ability of the LCG to stimulate/encourage HCP-patient-labour companion interaction for needed social support, and a perceived ability of the tool to enhance responsibility, follow-up and accountability with their initials captured at all stages. According to a 46-year-old senior midwife,

> *"That part of supportive care is very important because when you deliver a woman in presence of her preferred companion, it becomes easy for her. Culturally, women here do not feel comfortable being seen by their mother-in-law or by sister-in law, while giving birth. They will feel uncomfortable and feel bad if you allow them to enter their delivery room. We need to be careful and ask them on who they prefer".*
> *"This tool is good and makes everyone to be accountable at least. For example, there's a part where everyone puts down their initials at the end of each assessment and so you get to know and follow up with who is responsible for what and at what time since a patient can be seen by different cadres, you can easily tell who has done what. This way, everyone owns their mistakes in case of anything and so you have to be careful and do your part well which is good"*
> *Added a 32-year-old midwife working in a fast-paced maternity center.*

Gives a clear picture of what is happening in all stages of labour

There were other LCG intervention characteristics identified by HCPs that were thought to facilitate sustained use, that included a perceived ability to help correctly define active labour at a more acceptable 5 cm of cervical dilatation.

> *"Many women stay in latent labour for a long time, yet the partograph assumes cervical dilatation rate of 1 cm per hour for all women and every time the plot crosses the action line, we are compelled to act. The LCG diagnoses active labour at 5 cm which is ideal and realistic in our setting. I know that actually labour does not always progress very well until the mother is about 5 to 6 cm. I also think 5 cm is a good thing compared to 4 cm because if I look at what we were doing with the partograph, actually those we would start monitoring labour at 4 cm are the mothers who would be tagged or misdiagnosed as prolonged labour because at 4 cm the contractions are still few, the cervix may not be well effaced and therefore you may not expect this mother to progress very well. When you start monitoring at 4 cm chances are that you with find the mother still 4 cm after 4 hours and you start thinking of intervening early with C-sections and augmentation yet everything is still okay and they don't need anything".*
> *A 38-year-old senior House Officer with over 10 years of clinical practice added.*

Role of appropriate training strategy

All HCPs further underscored the role and sustained benefits of training in the form of Continuous Medical Education (CMEs), off-the-hospital workshops for psychological and environmental readjustment and readiness to learn as a key implementation factor in this introduction, engagement and utilization of the LCG is concerned. Monitoring, real-time feedback, technical supervision, alongside mentorships, LCG champions and one-on-one coaching were suggested as vital incentives, motivations, cues to action, supporting and empowering LCG uptake, sustained engagement, long term. According to interviewed HCPs, the LCG's new features and opportunities were bound not only to make labour monitoring experience more satisfying and exciting to both HCPs and patients, but would also inevitably convert resistant attitudes to champions long term.

> *"Training all midwives and other users outside their work stations to make sure that all midwives get first hand information at a more relaxed venue would encourage attendance, attention and concentration"*
> *A 33-year-old LCG trained senior midwife at HCIII*

The Consolidated Framework for Implementation Research (CFIR) was utilized to explore potential opportunities and strategies of using the LCG to improve labour monitoring among health care providers and MOH officials in Uganda.

Labour care guide (Intervention) characteristics

HCPs observed that the LCG contains specific alerts at every stage of labour, for all observations. This is an important cue that could prompt the labour monitoring team to objectively evaluate labour progress, and prompt them to take action on each abnormal observation as soon as it happens, rather than waiting for plots to cross the action line (partograph). This could reduce unnecessary labour interventions such as C-section and augmentation with oxytocin, and instead early detection would encourage timely intervention for women in need of these interventions. All interviewed HCPs said that labour monitoring is not just about the fetal heart rate, contractions and cervical dilatation as provided by

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the partograph, but also other parameters like presence or absence of molding, caput formation, fetal position, labour posture, supportive care during labour, fetal heart rate decelerations (if one has a cardiotocography—CTG) and other vital maternal-foetal parameters or observations as provided by the LCG. HCPs therefore noted that LCG if enhanced, could be more comprehensive especially with improved provision to appropriately define active labour, and record events in the second stage of labour, plus the immediate postpartum period. The HCPs also observed that all this information can be captured on the single-page LCG format without necessarily and concurrently writing or duplicating labour monitoring information in the patients file to avoid extra workload. LCG was therefore seen to bear potential to reduce over-documentation and filing since the same single-page format could capture all the necessary details needed to make a one-stop quick reference to make effective clinical decisions.

HCPs also suggested vital considerations that they believed may improve the LCG design and facilitate the utilization and full-scale implementation including;

1. Small text fonts and boxes which might be challenging for those with sight problems or might fade with time, which affects the readability, thus proposing the use of bigger fonts to retain clarity.
2. Absence of key social-demographic data, such as name of facility, in patient number, HIV/Syphilis/Hepatitis status (Triple elimination strategy) needed to be captured to enable easy longitudinal follow up and appropriate interventions throughout admission, labour monitoring and discharge of women using the same LCG, especially in facilities which struggle with stationery and funding.
3. Addition of a record for the key outcome of labour on the LGC flip side to enable HCP capture all vital and comprehensive peripartum parameters on one consolidated form for easy reference, monitoring, follow-up, and reduction of stationery cost in busy facilities. Parameters suggested included; date and time of delivery, duration of active and second phase of labour, mode of delivery, gender of the baby, birth weight, Apgar score at 1 and five minutes, gross congenital abnormalities, volume of blood loss, status of baby-alive or dead, post-delivery maternal blood pressure, pulse and temperature, placenta assessment, uterotonics administered, perineal tears and repairs done, immediate medications to baby such as vit K, tetracycline eye ointment, nevirapine for HIV exposed newborns, initiation of breastfeeding within 1 h of birth, cadre and initials of person conducting delivery and assistant, new born temperature before discharge and immunization given at birth like BCG, polio 0 and Hepatitis B vaccinations. These parameters were noted to have been part of the partograph for Uganda.
4. Some fields that were deemed redundant and not applicable by some facilities, such as foetal heart decelerations often picked up by CTG machines that are unavailable, and not mandatory in most Ugandan basic and comprehensive emergency obstetric care facilities, except for some regional referral and private hospitals. A 49-year-old midwife said,

"I think some of the words are a bit small but can really be read by those with good eye sight. Other information like name of facility, in patient number, HIV/Syphilis/Hepatitis status can be added to help save paper as these inform us during admission, management and discharge. other things may be the routine but very important maternal and baby outcomes that we record during and after delivery. These can be recorded on the flip side but still on the same paper for easy reference without having to go through the whole file. That way, our tool becomes a comprehensive one-stop reference and makes work easier".

Another 36-year-old midwife added,

"Of course, there is an issue on the part of recording the fetal heart rate baseline and decelerations, I understand that this tool is to be used for all levels of health care facilities. That section would need CTG machines for monitoring and recording these decelerations. These CTG machines are not available in lower facilities like HC III and IV where labour monitoring occurs, even in general hospitals and regional referral hospitals I do not think every mother is monitored using CTG. I think HCPs need to be told that the tool is designed for every mother in all health facility levels including those with CTG so for facilities without CTG, and that this section can be left blank. We actually do not have to remove this parameter because it will apply to that mother where you actually need to do CTG".

Individual HCP characteristics and experiences monitoring labour

Interviewed HCPs and MOH officials expressed great enthusiasm in participating in tool refinement, taking up and using the LCG to monitor labour in this setting, while pointing out its unique and clearly defined identifiers of prolonged/obstructed labour such as presence/absence of molding, caput formation, foetal heart rate decelerations. The LCG was described as potentially comprehensive, easy-to-fill, and satisfying and could give better experience to HCPs and mothers in labour, with reduced number of unnecessary interventions and

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resources as a result of wrongfully or mis diagnosis of prolonged labour. The inclusion of the social support component was also thought to have great potential to stimulate and encourage HCPs to engage women and interact with their labour companions, making them not only adequately aware of their progress, but also facilitate close interaction with their carers to provide the needed social support, adding that this timely information to women and their companions could also be re-assuring, could reduce anxiety, and improve labour and childbirth experience for all involved. A senior midwife and ward in-charge with over 10 years of experience said,

> *"The added sections where midwives engage and interact with patients and labour companion is very good. Everyone is involved which is a mandatory requirement for respectful maternity care. Mothers and caretakers are not anxious, they are aware about what is going on, compared to the partograph where the midwife or doctor would examine mothers without prompts to discuss their findings. This way, we can make labour monitoring experience easier, lighter and exciting. Everyone gets satisfied with the outcome I think"*

Most HCPs appreciated the new tool and looked forward to its introduction. According to them, the LCG would bring good, desired change and a sense of ownership especially that they will have participated in refining and customizing it to suit their needs locally. Most HCPs interviewed further reported that the LCG could also enhance team work through its perceived ability to timely transfer information from one duty team to another (hand over), and encourage responsibility, accountability and follow up since the LCG provides for labour monitoring personnel to initialize their names at the end of each recording session. A 29-year-old Nursing officer argued,

> *"This change will be good after using the partogram for all these years with its challenges. For example, if I monitor labour, I will be able to correctly present how this mother has been progressing to the next person coming in and if you have not monitored well, then you cannot look well in a team you are handing over to, which is bad. It even makes things better now that you are asking us to suggest changes, we need from the beginning because we found this partograph here and we do not know how it came about. It has been here for very many years and I think it's time for us to change and use tools that represent our needs".*
> *"The LCG is good and makes everyone to be accountable at least. For example, there's a part where everyone puts down their initials at the end of each assessment and so you get to know and follow up with who is responsible for what and at what time since a patient can be seen by different cadres, you can easily tell who has done what. This way, everyone owns their mistakes in case of anything and so you have to be careful and do your part well which is good"*
> *Added a 32-year-old midwife working in a fast-paced maternity center.*

Generally, the HCPs interviewed indicated that they had not attended formal trainings facilitated by the Ministry of Health regarding the LCG. HCPs indicated that they had obtained self-training, facilitated by a few colleagues that had learnt about it while in school before. HCPs reported that the labour parameters used on the LCG were similar to those used in the old partograph and that this would make it easy to learn and fill. HCPs therefore reported that they were willing to try and use the LCG with minimal support following initial training and introduction to its use, especially since all HCPs were familiar with the required measurements of all the labour parameters needed to be recorded, monitored, presented and interpreted on the LCG, and that they required no additional training to assess similar parameters as done routinely during current practice, aside from filling the guide. Whereas most HCPs asserted that LCG training manuals and tutorials in text and video were easily available online and that the tool was easy for them to learn and execute with minimum support, a few noted that these manuals were bulky and needed to be summarized and customized for local use. Most HCPs asserted that they found no challenges using the LCG after single day training and exposure or few days observation from colleagues, and 100% of HCPs would recommend it to other midwives and obstetricians in Uganda and beyond. According to a 45-year-old senior midwife,

> *"At the end of the day, everyone needs good re-training and training in schools on using this LCG and to make sure we are all confident to use it properly without any excuses before its finally introduced… Me I trained myself and it took me a few days while observing how a fellow colleague filled it for me to learn it and be comfortable using it…I found it easy to learn and I would recommend it to everyone since it needs the same things we have been assessing for all women all along like cervical dilatation, foetal heart rate, assessment of pain, contractions, time in labour and others".*
> *"I have found it easy to learn to use this tool as I learnt from a colleague and it took me like one hour to learn what to fill where on the form. I have also*

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found the available videos and information available on the WHO websites are too long to follow, and other short videos shared by colleagues very useful to guide any HCP and good enough, it's not like I was re-learning how to assess these things needed to fill out the form so I found it a good tool to guide everyone on the team to monitor a mother. Others may take more time to learn but I believe these are skills and decisions we learn more so on-job, in workshops and with some good hands-on teaching and help, it's easy to fill", added another 38-year-old midwife.

However, all HCPs made emphasis that additional or initial CMEs, off-the-hospital workshops and training would be key to empower users with adequate initial skills as one is able to devote time to attain the necessary training before the LCG is fully introduced or rolled out. HCPs also suggested group champions as a way of empowering new users, but also improving consistency and accountability among different users. A senior 64-year-old OBGYN consultant argued,

"For this LCG to work well, there should be a champion on the ground in every maternity unit to oversee the process of using it properly. I think the doctors can pick a champion, the interns, in-charges and midwives can also each pick theirs, and so they get to transfer information consistently and everyone becomes accountable to each other for each mother in their care and these must be properly trained so that they can also easily train others".

Outer setting: external influences on LCG implementation

To prevent avoidable maternal and perinatal deaths, WHO and MOH have always discouraged use of ineffective practices in labour and childbirth. HCPs, Health care managers at all levels asserted their readiness to transition to using the LCG once local contextualized data showed that the new tool works better than the partograph in detecting prolonged and obstructed labour. MOH and WHO officials particularly believe in the potential of this LCG to tremendously improve peripartum maternal and newborn indicators for Uganda. They affirmed their willingness and readiness to support the implementation of the LCG and demonstrated commitment to mobilize partners and resources needed to improve health facility environment and training to meet HCP demands and ensure a smooth transition in Uganda. A senior MOH consultant said,

"We are ready. We will mobilize resources necessary to make sure this transition happens because we believe this tool has great potential reduce persistent and not-so-good maternal and perinatal mortality and morbidity statistics.... In fact, we may not need extra resources, it may not be very problematic to pool resources. We plan to actively involve everyone right from the beginning to identify resources and training needs in order to avoid the challenges that we have seen in other roll-out programs".
"This is probably going to be exciting as this change will be a new dawn in the history of labour monitoring. We were not around when the partograph came but being around when this LCG has come makes us own it, I feel that the roll out will be properly smooth, including proper",
Added another Senior Health Officer working in a fast-paced maternity center.

Interviewed MoH stakeholders further highlighted that there would be concerted effort to pool resources for initial intensive trainings, mentorships, coaching and generally technical assistance to the Health Teams and HCPs as a boost or an incentive to improve performance, empower users and sustain utilization. According to an assistant district health officer,

"Previously we used Result Based Financing (RBF) schemes for similar programs. Such approaches worked wonders for us when specific services and results were expected from individual facilities...The ministry of health and implementing partners would pool resources and engage to not only to actively train, coach, support and finance the new labour care guide but should also plan to regularly reward consistent LCG champions as a way to encourage, motivate and improve performance of the LCG as they launch it"
"Of course, it will always require additional resources. We are also not void of resources as long as there is commitment from all of us as stakeholders and some reallocations in the mother ministry of Health. Our partners are always willing to help us and we need to prove something works here and it must be country-owned to be used both in public and private health facilities, and of course show that as a country we are willing and ready to empower the teams that matter"
Added a WHO technical officer.

Inner setting: the setting in which the LCG is set to be implemented

All interviewed HCPs and MOH officials noted that the LCG is welcome and reportedly long overdue in terms of stimulating the needed change and motivation in management of labour among users. HCPs asserted that the LCG is a necessary upgrade of the partograph and that

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if appropriate modifications are made, it would present an appropriate and cost-effective way of organising teams and information during labour monitoring, with minimal or new changes in capacity to assess the required parameters. According to HCPs, critical and comprehensive information would be logically presented and interpreted to detect timely and accurate deviations from normal before life threatening complications occurred to the mother and/or the foetus/newborn baby such as foetal distress or even obstructed labour. They further asserted that the HCP's potential to record all parameters on one single-page format LCG to make a stand-alone decision would potentially negate/mute staffing issues in busy facilities. This could save time and effort used to duplicate clinical notes in patients' files. Data showed that recognizing and praising HCPs and health facilities using the LCG very well could motivate and encourage other people and facilities to do the same.

> *"We have used the partograph for so many years and it's not working for us. This LCG better get here faster because I think it can allow us to record important labour information on one paper. Currently, we record on partograph, record in the book, and write clinical notes in the patient file. This consumes time yet we have many women to attend to",*
> *Said 54-year-old enrolled midwife with over 30 years of clinical practice.*

A 38-year-old obstetrician also said,

> *"As an obstetrician, I welcome anything that can help to improve the wellbeing of mothers and their babies, I would be happy if it was rolled out soon with proper with training, reaching all HCPs. Personally, I have not got any challenge learning how to use the LCG and I know once you have the right training and you know what you should fill at each section, you do not meet any challenges".*
> *"You find there are HCPs who plot labour observations well whenever they are on duty and there are those who just don't, so I think using this as a performance measure and praising or rewarding those that do it properly would be good to encourage everyone as individuals or even as a facility"*
> *Added a 46-year-old maternity ward in charge.*

MoH officials indicated readiness to facilitate research, transition and availability of required labour monitoring tools, upgrade infrastructure, facilitate training and supervision of the LCG use. The resources and logistics are fairly within reach since the facilities are already equipped and staffed fairly for this potential upgrade. The interviewed HCPs and MOH officials further noted that the new structure, availability of interfacility referral network and the recent regional LMN systems would facilitate this LCG adoption, uptake and scale up. According to a 42-year-old District Health Officer,

> *"I think we are ready as a ministry because most of what we need is like stationery, and a few things that need extra logistics to train, motivate and empower the users and facilities, which can be mobilized along the way. Almost all these health centers are fairly equipped to monitor labour. We can make a clear assessment of our needs and prioritize our national safe motherhood goals within the coming budgets".*

The LCG could be tailored to address the patient and HCP-centered needs to appropriately and accurately monitor labour. According to interviewed HCPs, the ordering of the tool will need to accommodate medications and or dosages locally available, plus include measures or observations that provide safety margins workable in different levels of health facilities under the current human and facility capacity challenges. A 44-year-old senior midwife noted,

> *"The LCG has to take considerations of things that work for us midwives in low Uganda community setting because we encounter a lot of transfers since for example, we cannot do C-Sections here, so the levels of action line need to allow warning levels and also include things that we have here like 500 ml not 1 liter of Normal saline for administration of oxytocin. This LCG comes with an alert and action on abnormality of every observation, which is great and if everyone responded timely would save mothers. Events in second stage of labour accurately tell the time a mother has been pushing so you can easily make the diagnosis of prolonged second stage of labour. These attributes never existed on the partograph and we can easily embrace them. The partograph had the alert line and action lines but largely on the cervical dilatation, yet anything can go bad including the blood pressure, urine protein etc., meaning that if the HCP doesn't critically measure, record and interpret each parameter, then they would leave a mother with a danger sign that is un recognized".*

Implementation process

According to HCPs, MOH officials and implementation partners interviewed, there was need to explain to the health workers where the LCG is coming from for them to welcome it and accept it. All individuals interviewed highlighted targeted LCG modifications to suit

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the local needs and proper training of all users before roll-out. Formal workshops, phased-in trainings for all health workers, followed by phased-in on-site peer-to-peer mentorships, and coaching were suggested for quick uptake and sustained use. Additionally, incentives such as recognizing, praising and rewarding labour monitoring champions was thought to keep the enthusiasm high and encourage resistant attitudes to come on board and use the new tools. According to a senior midwife,

> *"Training all midwives and other users outside their work stations to make sure that all midwives get first-hand information at a more relaxed venue would encourage attendance, attention and concentration. It can be phased-in in nature, but it can work. You see in most cases, these ministry people pick one midwife, usually the in-charge who will then return and train others. Generally, midwives who didn't train often feel like this one who went, got the training, plus the allowances, and so she should do the work alone, and even if she tries to train them, they won't be attentive or committed. If possible, the ministry should consider phased-in trainings or mentorships for all HCPs".*
> *"The LCG is an exciting tool especially, after suggested modifications. It fits all the user needs in Uganda and must be country owned. There is need to design a standardized training manual to explain the tool elements. The instructions and protocols must be very clear, accessible and attractive to everyone to empower labour monitoring teams to avoid past mistakes with the partograph",*
> *Added a WHO official.*

Other HCPs suggested that the MOH could emphasize having visible onsite standard protocols and guidelines to reinforce and guide usage at all times. They suggested that these standard protocols need to be easily available and accessible by everyone at any time. HCPs added that their active involvement in customization and refining the tool and development of training protocols would improve LCG ownership and loyalty. A resident midwife working in a very busy maternity center said,

> *"There may not be much additional resources we need since the LCG is available on a consolidated form just like the partograph and apart from training on usage, all HCPs may already be familiar with assessments needed to monitor labour. It is a matter of re-orientation and support and pooling necessary resources to ensure protocols are available and accessible by everyone in the facility".*

However, there were a few challenges that needed to be addressed to improve uptake. These included complex family relationships between the mother and her labour companions. HCPs interviewed asserted that many women don't prefer their mother-in-law in the labour ward as they give birth. Mothers should take care while selecting the most suitable labour companion in order not to jeopardize the anticipated social support. According to a 46-year-old senior midwife,

> *"That part of supportive care is very important in our labour wards because when you deliver a woman in presence of her preferred companion, it becomes easy for her. If you insist on inviting anyone, for example many women do not culturally feel comfortable being seen by their mother-in-law while giving birth. They will feel uncomfortable if you allow them to enter their delivery room so we need to be careful and ask them on who they prefer".*

The HCPs expressed an ongoing challenge where doctors and higher cadres leave filling of labour monitoring tools to midwives after labour assessment. This affects completion rates and facilitates late decision making, occasionally resulting in poor delivery outcomes. This presents a potentially significant barrier to effective LCG implementation, roll-out and sustained use. According to some HCPs, the day-to-day top-down supervisory culture could be replaced with peer-to-peer mentorships and coaching. Roles among different cadres should be well streamlined to avoid feeling overwhelmed while monitoring labour. HCPs expressed a firm need for the implementers to engage and plan an awareness campaign on team building to remind everyone that a woman's well-being is everyone's responsibility and monitoring should not only be left to the lower cadre if we are continue providing *women-centred maternity care for improved outcomes. For example, one 35-year-old obstetrician said,*

> *"At my level I don't get to do the plotting but people working under me like the midwives and more junior doctors do that kind of stuff, and I only get to see what they have plotted and make the decisions. I hope you interview them because they might have a better description of the experience and suggestions than some of us"*

However, the WHO official interviewed affirmed,

> *"The transition will take some time but if all stakeholders agree and begin to move together, then it's possible. We have a good environment and we just need to commit ourselves, because maternal health is everyone's responsibility. I don't think there is any-*

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body who is doubtful about the new tool enhancing respectful maternity care through communication and engagement with the patient and their companion"

Discussion

The main findings from this study indicate that the LCG is *simple, easy-to-use and comprehensive.* With appropriate modifications, the LCG would enhance quick and accurate detection of prolonged labour and foster attending HCPs to timely carry out necessary interventions to avert impending risk and complications among women in labour. The LCG was perceived to have the ability to correctly define active labour at a more acceptable 5 cm of cervical dilatation, a landmark that provided a clear picture of when labour becomes established. The LCG has potential to record all labour parameters on one paper for easy comparison and reference, while reducing unnecessary interventions like labour augmentation and C-sections. Noteworthy, the LCG was perceived to not only stimulate or encourage HCP-patient-labour companion interaction for the needed social support, but also enhance responsibility, follow-up and accountability on the side of the HCPs with their initials captured at all stages. These attributes/characteristics identified by HCPs were seen to have potential to facilitate introduction and sustained use and benefits of the LCG long term, when coupled with well-structured off-site and continuous training, mentorships, supervision and feedback to incentivise, encourage and motivate LCG use.

To prevent avoidable maternal and perinatal deaths, WHO has persistently discouraged the use of ineffective practices in labour and childbirth, and has instead recommended evaluation and adoption of context specific solutions, innovations and modifications to improve labour monitoring and promote better health outcomes [15]. Noteworthy, the LCG's ability to stimulate and encourage shared decision making could facilitate the needed respectful maternal care with potential to improve the desired culturally appropriate communication, dignity, support and outcomes during labour and childbirth [26]. Other studies have underscored a need to train HCPs on the role of documentation, labour companionship, access to pain relief, provision of oral fluid, techniques to improve the comfort/re-assurance of women during labour as a way of enhancing women centered care that the LCG strives to provide [26, 27]. Our data has shown that the LCG has great potential to improve birth outcomes in low resource settings compared to the partograph which had no provision for stimulating HCP-labour companion interaction during labour. The LCG emphasizes birth companionship which largely supported women emotionally, and attended to their physical needs [28], including exploration of culturally sensitive issues (related to the choice of companion) for urgent attention, an attribute that the partograph lacked. The LCG's many perceived benefits, enthusiasm and high expectations among the interviewed HCPs and MOH/WHO officials could revolutionize labour monitoring and reduce both maternal and infant mortality rates.

Many studies have observed that the recurrence risks for mortality and death increase exponentially among women who survive death unless preventive measures for early detection and monitoring throughout the perinatal period are adopted [7, 29–31]. Indeed the WHO has called for urgent evaluation and adoption of context-specific health solutions to improve risk detection, monitoring, maternity services provision and utilization as major drivers of maternal and early childhood mortality and morbidity [32]. The approach to develop familiar and context specific tools and interventions appropriate within peoples' communities encourages enthusiasm, retention and adoption [33]. These participatory maternal health risk reduction efforts implemented at the individual, family and community levels were observed to also be quickly appreciated by target communities [34]. Therefore, like most new interventions, implementers of the LCG will need to accommodate, modify or refine HCP-user identified challenges, and further involve them to help further customize, tailor and characterize this promising LCG. Using this participatory approach to fit the local needs and context could potentially improve uptake and utilization long term. Noteworthy, research findings have documented a need to evaluate priority scale-able approaches or intervention's practicability, useability, acceptability, feasibility and cost-effectiveness before full scale up in targeted settings [35].

Training was identified as key in facilitating the correct and sustained utilization and implementation of the LCG. Data revealed that continuous medical education (CME) sessions and off-site workshops were key for psychological adjustment, readiness to learn, and effective introduction of the LCG. Additionally, monitoring, real-time feedback, capacity building and team building activities, were also suggested as vital incentives to facilitate LCG uptake and sustained utilization. Studies have previously observed that lack of training among healthcare worker limits the usability of effective interventions, and may contribute to resistance to change or to use and thus hinder evidence based intrapartum care [36]. Therefore, initial and refresher training sessions and continuous support aimed at practically imparting skills among HCPs and this could indeed allow sufficient time for familiarization, awareness and quick and sustained adoption and utilization of this highly potential intervention. Researchers have encouraged that such training should be peer led rather than lecture based to enhance performance, retention and quality of learning [37], and further discourage the use of ineffective or

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unnecessary interventions [38]. HCPs observed that these training opportunities outside the facility environments could enhance better attendance, and these plus supervision, champions and feedback and rewards could eventually make labour monitoring experience more satisfying and exciting to both HCPs and patients, and would also inevitably convert resistance attitude to champions, long term. However, the supervisory culture and roles among different cadres were proposed to be well streamlined for specific cadres not to feel overwhelmed or biased while managing labour as a team. Some studies have indeed observed that a training environment plays a key role in enhancing training effectiveness by encouraging active interaction, faster learning and comprehension [39]. Additionally, trainers need to ensure that training environments have high-quality indoor facilities to positively influence performance of given tasks and the attention spans of the trainees [39].

Continuous mentorship, team building and supervision are also key factors to successful intervention implementation. According to scholars, mentorship and supervision can be strengthened by identifying local champions within hospital facilities [26]. However according to other scholars, this requires the establishment of mechanisms aimed at motivating these local champions to ensure sustained usability, because its absence was reported in Ethiopia, as one of the reasons for non-utilization of the partograph [40] among midwives and other obstetric care givers.

This study was one of the first attempts to explore and understand potential opportunities and strategies of using the Labour Care Guide to improve labour monitoring and health outcomes among health care providers in Uganda. This study therefore documents HCP and other MOH/WHO perspectives, experiences and suggested potential implementation strategies of the LCG with great potential to improve enthusiasm in labour monitoring and health outcomes in Uganda. This data will inform the development, modifications, refinement, customization and tailoring of a user-centered LCG that can be easily useable in a Ugandan setting to improve labour monitoring and labour experience, through early risk detection and timely management, ultimately reducing maternal and neonate mortality and morbidity. This data can also inform implementation strategies aimed at helping implementers plan and overcome potential barriers and improve sustained uptake and utilization of the LCG over time. We have noted some limitations in this study. This study utilized only qualitative methods and purposively selected participants who had previous LCG exposure, limiting generalizability of the study findings. However, just like most qualitative studies, we aimed at exploring and providing a deeper contextualized understanding of existing and potential opportunities and strategies of using the Labour Care Guide to improve labour monitoring and health outcomes among health care providers in Uganda, and not necessarily generalization of findings. Social desirability and reflexivity could affect interpretation of results.

Conclusion

HCPs in Uganda generally perceive the LCG to be simpler, easy-to-use and comprehensive, and that with appropriate modifications it would enhance quick and accurate detection/identification of prolonged labour. The LCG was generally perceived to have great potential to improve labour monitoring landscape and respectful maternity care in Uganda. Our data demonstrated a responsive, enthusiastic and supportive environment that has potential to facilitate LCG customization, uptake and scale up. The high LCG expectations are important considerations in developing sustainable and acceptable implementation strategies and incentives that are user-friendly to sustain its use. Training, team building, peer-peer mentorships, champions and feedback, as well as cadre roles should be well streamlined and well distributed to avoid overwhelming situations and bias while managing labour as a team at facilities.

The customization, modification and tailoring of the LCG should be done by involving relevant stakeholders to best suit the user needs and improve uptake and utilization. This is aimed at the development of a locally acceptable labour care monitoring intervention that can be adopted across all facilities for better implementation outcomes. Stakeholder meetings in form of workshops or focus group discussions and expert panels may help capture additional and key parameters that could have been missed during the design of the generic WHO Labour care guide, and beyond these 36 HCP/MOH/WHO representative interviews. We recommend further large-scale evaluation of the LCG to understand its effectiveness in improving labour monitoring in Uganda and similar settings as a basis for integration into national maternal health policies.

Abbreviations

CFIR	Consolidated Framework for Implementation Research
CME	Continuous Medical education
CTG	Cardiotocography
HCP	Health Care Provider
LCG	LABOUR Care Guide
MOH	Ministry of Health
WHO	World Health Organization

Supplementary Information

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Supplementary Material 1.

Supplementary Material 2.

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Authors' contributions
MRG is a PhD candidate who developed the research concept, supervised data collection, analyzed data and wrote the first draft of this manuscript under the supervision and mentorship of JB, FYT, ECA and WT. WT conducted all the interviews. All authors reviewed and approved the manuscript.

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Data availability
Not applicable. The datasets generated and/or analysed during the current study are not publicly available because we did not collect consent to publish any raw data (such as interviews and transcripts) from participants, yet difficult to de-identify them but are available from the corresponding author on reasonable request.

Declarations

Ethics approval and consent to participate
Ethical clearance was obtained from Mbarara University of Science and Technology Research Ethics Committee (MUST-2023–808) and National Council for Science and Technology in Uganda (UNCST) – HS2864ES. We obtained written informed consent from all study participants before enrolment into in the study. A written consent for digital audio recording was obtained in English from each participant.

Consent for publication
Not applicable.

Competing interests
The authors declare no competing interests.

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