BMC Pregnancy and Childbirth

RESEARCH

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Perspectives of midwives on the use of Kaligutim (local oxytocin) for induction of labour among pregnant women in the government hospitals in Tamale

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Abstract

Background The use of herbal medicine and/or its products is common throughout the world. In Tamale Metropolis, pregnant women frequently use local oxytocin to induce labour, as shown by the fact that 90% of midwives reported managing patients who used kaligutim (local oxytocin) to speed up labour. Early career midwives are also aware of this and have personally observed it being used by their clients. The purpose of the study was to assess midwives' opinions on pregnant women's use of the well-known kaligutim (local oxytocin) for labour induction in the Tamale Metropolis.

Methods A facility-based, quantitative, cross-sectional research design was used for the study. A total of 214 working midwives from Tamale's three main public hospitals participated. Data for the study were gathered through a standardized questionnaire. For the analysis and presentation of the data, descriptive and analytical statistics, such as basic frequencies, percentages, Fisher's exact test, chi square test and multivariate analysis, were employed.

Results According to the findings of this study, the safety, dosages, and contraindications of kaligutim during pregnancy and labour are unknown. The cessation of contractions was reported by 44 (22.4%) of the respondents whose clients used local oxytocin. The study also revealed that women in Tamale metropolis use "walgu", a spiritual form of oxytocin, to induce and augment labour. Respondents who responded, "yes" to baby admission to the new-born care unit were 25% more likely to use kaligutim (local oxytocin) than were those who responded, "no" to baby admission to the new-born care unit (AOR = 0.25 95% CI (0.01, 0.53), $P = 0.021$).

Conclusions It can be concluded that using kaligutim to start labour has negative effects on both the mother and the foetus. Additional research is required to evaluate the efficacy, effectiveness, biochemical makeup, and safety of these herbal medicines, particularly during pregnancy and delivery, as well as the spiritual significance of kaligutim (Walgu) and its forms.

Keywords Local oxytocin, Kaligutim, Pregnancy, Herbal medicine, Traditional medicine

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Introduction

Herbal medicines, traditional treatments, and traditional practitioners are the main source of health care for many millions of people, and sometimes the only source of care [1]. Herbal medicines include herbs, herbal materials, herbal preparations and finished herbal products, that contain as active ingredients parts of plants, or other plant materials, or combinations [1, 2]. Women in both developed and developing countries use herbal medicine before pregnancy and during pregnancy and delivery, which has several consequences [3]. The use of herbal medicine has a long history, tracing its roots back to ancient and biblical days when there was no Orthodox medicine. Currently, both developed and developing countries use herbal medicine due to the presence of many traditional medicine practitioners [4].

Many cultures worldwide use herbal medicine to induce or accelerate labour, and the incidence of labour induction to shorten the duration of labour is on the rise. Most herbal medicine users are pregnant women who have no formal education, who have a low level of income and who mostly stay far from health facilities [5]. The majority of pregnant women use herbal medicine through the oral route and have confidence in its efficacy, safety and effectiveness [6]. Herbal medicine is used by women for maternal health-related issues, such as to induce abortion and labour, to correct infertility, for the treatment of pregnancy-related issues, for breast milk secretion and for general wellbeing during pregnancy [5].

Women who use herbal medicine during pregnancy and/or labour usually have a high risk of postpartum complications [7]. The use of herbal uterotonics can lead to hyperstimulation of the uterus, foetal asphyxia and several other adverse effects of labour [8]. Moreover, traditional medicine used by pregnant women is associated with several complications, including a ruptured uterus, a fresh still birth, a macerated still birth, a caesarean section and even death [9]. These herbal medicines have both uterotonic and nonuterotonic effects on labour and delivery and are mostly used to induce or augment labour in prolonged labour or postdate or to relax or widen the pelvis for delivery [8].

Maternal and neonatal deaths are still major challenges for most developing countries, with obstetric complications, especially postpartum haemorrhage (P.P.H.) being the major cause of maternal mortality [10]. The delivery of healthcare services is still poor quality in developing nations [11]. Maternal and foetal mortality and morbidity have remained high due to inadequate health services and inadequate emergency obstetric treatment. Childbirth is accompanied by numerous customs that are subject to ethnological research and are often rooted in traditional medicine or religion. Cultural influences and sociodemographic characteristics play an important role in a woman's decision to seek maternal and child health services.

The induction of labour is the process of artificially starting labour by stimulating the uterus with oxytocin or manually through the rupture of amniotic membranes. This process is usually not risk free, and most women find it to be uncomfortable [12]. The induction of labour is an obstetric procedure recommended when the benefits to the baby and mother outweigh the benefits of continuing the pregnancy. The procedure usually involves complications and failures and must be performed under close monitoring, proper selection of clients and good preparation [13].

Labour induction also changes the normal physiological processes that accompany childbirth and increases the risk of adverse pregnancy outcomes such as postpartum haemorrhage, neonatal mortality, foetal distress, uterine rapture and premature birth [14]. Oxytocin is a natural hormone produced by the hypothalamus and is responsible for the activation of sensory nerves during labour and breastfeeding [15]. Clinically, commercially manufactured synthetic oxytocin is administered to commence or increase uterine activity to reduce the duration of labour [16].

The induction of labour is not free from risk and must be performed with caution because the procedure involves hyperstimulation of the uterus and foetal distress. Herbal medicine used by pregnant women has long-term effects on both mothers and babies [17]. Many pregnant women in the Tamale Metropolis use prepackaged herbal medicine before and during pregnancy [18]. Health-related factors such as cost, distance, access and unavailability of medications influence the utilization of herbal medicine by pregnant women [17].

All women should be given a prophylactic dose of oxytocin as soon as they give birth. If they start to haemorrhage, they should also be given a treatment dose of oxytocin, which is greater than the prophylactic dose [19]. There is also a traditional manufactured form of oxytocin (kaligutim) that pregnant women use to start labour. Kaligutim is the local name for the mixture of some special plant parts or a combination of plants prepared and given to pregnant women to start or accelerate the process of labour in the northern part of Ghana [17].

Ideally, women should take medical drugs during pregnancy (folic acid and fersolate) to help prevent birth defects and congenital malformations such as neural tube defects of the foetus and spinal bifida during pregnancy [20]. However, in recent decades, women worldwide have used herbal medications during pregnancy and labour, with some taking both herbal medicine and orthodox medicine at the same time [21]. However, little is known about the use and safety of these medicines, especially

during pregnancy, and their dosages, indications and contraindications are not known [22].

There are studies on herbal medicine use by women during pregnancy and labour, but there is currently no literature on the use of Kaligutim (local oxytocin) for labour induction among pregnant women in Ghana, but similar studies have been conducted in Uganda, Malawi, Tanzania, and Nigeria. Despite the efforts of the government and other nongovernmental organizations to ensure maximum coverage of skilled delivery to help reduce maternal and neonatal mortalities, women still use locally prepared oxytocin to induce labour. Although herbal medicine is commonly used by pregnant women, healthcare providers, especially midwives, are often unprepared to communicate effectively with patients or make proper decisions concerning complementary and alternative medicine use, especially during pregnancy and labour [23].

It is well known that herbs have played a vital role since the precolonial era during pregnancy, delivery and postpartum care in many parts of the country, but there are still few data on the use of herbs among pregnant women in Ghana [24]. Towards the end of pregnancy, many women are tired and eager to welcome their babies into the world. Moreover, as the expected date of delivery approaches, these women are given local oxytocin by their mothers' in-laws, grandmothers, mothers, or TBAs or even by the women themselves to start labour at home before going to the health facility [25].

Medicinal plants that are used to hasten or speed up labour are mostly taken towards the end of pregnancy or the beginning of labour [26]. Even after delivery, these herbs may be found in small amounts in the mother's breast, and some may cross the placental barrier and have harmful effects on the baby. The use of herbal medication by pregnant women is inevitable given that up to 80% of people who live in developing nations rely on traditional medicine for their healthcare needs [18].

The situation in Ghana, especially Northern Ghana, is not different, as pregnant women continue to use herbs despite the availability of health facilities [24]. The use of herbal medicine (kaligutim) among the Ghanaian population is alarming. Pregnant women in Tamale use herbal products at a rate of 42.5% prior to pregnancy and 52.7% during pregnancy [27]. Residents of Tamales who seek healthcare services in hospitals or herbal clinics are therefore at a greater risk of experiencing adverse consequences from drug-herb interactions [28].

Herbal product manufacturers should clearly state that pregnancy is a contraindication, and vendors should use caution when selling these items to pregnant women [27]. The use of Kaligutim (local oxytocin) by pregnant women is a maternal and child health problem. Herbal medicine used by pregnant women has long-term effects on both mothers and babies [17]. Unfortunately, maternal, and neonatal deaths may occur, and hence, there is a need to examine midwives' perspectives on local oxytocin use during labour, its effects on the progress and outcome of labour, and the relationship between kaligutim use and birth outcomes among pregnant women in the three major government hospitals in Tamale Metropolis.

Theoretical foundation

This study adopted and adapted Andersen's (1968) behavioural model of healthcare service utilization (use and nonuse of health services [29]. Andersen's healthcare utilization model is a conceptual model aimed at demonstrating the factors that lead to the use/nonuse of health services [29]. This study was guided by Andersen's behavioural model of health service use as a theoretical framework to identify the effects of Kaligutim on the progress and outcome of labour and to establish the relationship between the use of Kaligutim and nonuse of kaligutim and birth outcomes. The behavioural model is a multilevel model that incorporates both individual and contextual determinants of health service use.

Conceptual framework

Many people rely on products made from medicinal plants to maintain their health or treat illness, and current general development trends in developing and developed countries suggest that the consumption of medicinal plants is unlikely to decline in the short to medium term because of the benefits to consumers, producers, and society as a whole [29]. Therefore, there is a need to increase our understanding of what motivates the consumption of medicinal plants, despite the barriers to the establishment of solid evidence on the safety and efficacy of herbal medicines and related products [29].

This unified conceptual framework offers a step towards establishing a comprehensive approach to understanding the experiences midwives encounter when their clients use herbal medicine to induce their labour. The exposure variable in this study refers to kaligutim (local oxytocin) used by pregnant women in the three major government hospitals to induce labour through several routes, including oral, rectal, and vaginal routes, among others. When oxytocin is used by pregnant women, it can produce several results that can be immediate or late.

The results elicited on labour are termed the outcome variables, which can be immediate outcomes (the progress of labour) or outcomes after delivery (the outcome of labour). The progression of labour includes three stages: progressive dilatation of the cervix from 1 cm to 10 cm, delivery of the baby and expulsion of the placenta. Several factors can be used to determine the progress of labour (obstructed labour, prolonged labour, nature of

uterine contractions, precipitated labour, foetal distress, and poor progress of labour).

The outcome of labour on the hand refers to what happens during the delivery of the baby, how the baby was delivered, foetal conditions and maternal conditions. The following factors were used for the purpose of this study to determine the outcome of labour (mode of delivery, postpartum haemorrhage, ruptured uterus, cervical tear, birth asphyxia, uterine atony, maternal mortality, and neonatal mortality). This study focused on the immediate effects of Kaligutim (on labour progress) and the effects of Kaligutim after delivery (on labour outcomes) and the relationship between the use of Kaligutim and birth outcomes.

Methods

Study area

The study was carried out in Tamale, which is the capital city of the northern region of Ghana. According to the 2021 World Urbanization Review, Tamales has an estimated population of 671,812 people. Tamale still has a blend of typical rural and urban communities, although it has attained the status of a metropolitan area. There are three major government hospitals in Tamale: Tamale Central Hospital, Tamale West Hospital and Tamale Teaching Hospital. The Tamale Teaching Hospital is the only tertiary facility in the northern region and serves as the main reference centre for the five regions of the north.

Study population

The main study population was midwives working in Tamale Metropolis. The sampling frame was all midwives practicing in the three major hospitals in Tamale Metropolis who were willing to participate in the study.

Study design

A facility-based cross-sectional research design was used for this study. A cross-sectional study is a type of observational study design carried out at one point in time or over a short period of time to estimate the prevalence of the outcome of interest for a given population for the purpose of public health planning [30]. This study adopted a quantitative research approach to obtain information.

Sampling technique

A purposive sampling technique was used for this study. Purposive sampling is a nonprobability sampling method in which participants are selected for inclusion in the sample based on their characteristics, knowledge, or experiences. This is because of the midwives' knowledge, experiences, and objective of the study.

Sample size calculation

Total number of midwives = 458

Yamane formula (1967) was used with a confidence interval of 95% and a margin of error of 5%.

N = population size (458).

n = the sample size (?)

e = margin of error (5%).

$n = \frac{N}{1 + N(e)2}$

$n = \frac{458}{1 + 458(0.05)2}$

$n = 214.01 = 214$.

Sample size = 214 midwives.

Inclusion criteria

All midwives practicing in the three major government hospitals in Tamale Metropolis who were willing to participate in the study were included.

All midwives in the three-government hospital with experience with kaligutim use during labour were also included in the study.

Exclusion criteria

All midwives who were not practising at the three major government hospitals in Tamale Metropolis were excluded from the study.

Midwives who were practicing at the three major government hospitals in Tamale and who were not willing to participate in the study were also excluded from the study.

All midwives who did not have experience with kaligutim use for the induction of labour were excluded from the study.

Data collection instrument

The data collection tool that was used for the study was a standardized questionnaire. The questionnaire was constructed by reviewing various documents, including existing questionnaires that have been used in previous research. Close-ended questions with few open-ended questions were used as the question format. It was designed in line with the objectives of the study to help obtain the necessary information needed for the study. The questionnaire was pretested with midwives before the actual data collection took place.

Data management and analysis

Data collected from the field were coded, cleaned, and entered into the Statistical Package for Social Services (SPSS) version 21.0. Descriptive and analytical statistics, including simple frequencies and percentages, were used for the analysis and presentation of the data. The relationships between predictor and outcome variables were assessed by means of bivariate (chi-square test) analysis to determine potential predictors of kaligutim (local

oxytocin) at p values less than 0.05. Adjusted odds ratios were reported, and p values less than 0.05 were deemed to indicate statistical significance at the 95% confidence level after multivariate analysis.

Ethical consideration

The following ethical principles guided this study: respect for persons, beneficence, and justice for all. These principles are based on the human rights that must be protected during any research project, including the right to self-determination, privacy, anonymity, confidentiality, fair treatment and protection from discomfort and harm. First, an introductory letter was obtained from the University for Development Studies authorities. This letter was then presented to the authorities of the three major government hospitals in Tamale, namely, Tamale West Hospital (T.W.H.), Tamale Central Hospital (T.C.H.) and Tamale Teaching Hospital (TTH.), to seek permission to undertake the study. Ethical clearance was also obtained from the Kwame Nkrumah University of Science and Technology (KNUST) (CHRPE/AP/332/22).

Permission was once sought through a consent form to which participants were asked to consent if they were willing to participate in the study. The participants were assured of the confidentiality of all the information they were going to provide. They were also encouraged to participate in the study as much as they could but were also made aware that the study was voluntary and that they could withdraw at any point in time during the process if needed. There was no compensation for the study participants.

Results

Biodata

The study revealed that 45% of the respondents were between the ages of 20 and 30. Most of the respondents were in their twenties or thirties. Those who were in the first half of their work life constituted 73% of the respondents, while 17% were in the second half of their working life. The majority of the respondents were diploma midwives, representing 48% of the respondents; post basic midwives, constituting 32%; and degree and master's holders, representing 19% and 1%, respectively. Staff midwives composed the largest group of respondents, while Principal Midwifery officers composed the group with the lowest participation in the study. The lowest rank in midwifery practice in the study was staff midwives, and the highest was principal midwifery officers. This is presented in Table 1.

The experience of using local oxytocin to induce labour

Approximately 90% of the respondents have prior knowledge or heard that some of their clients take local oxytocin at home to start labour, and only 10% of respondents have no prior knowledge of that. Approximately 63.4% of the respondents encountered local oxytocin cases more than three times every week. This is presented in Fig. 1.

Table 1 Bio data

Variables	Frequency	Percentage (%)
Age		
20–30	96	45
31–40	81	38
41–50	33	15
50–60	4	2
Years of Work		
1–5 years	133	62
6–10 years	53	25
11–15 years	15	7
16–20 years	9	4
above 20 years	4	2
Qualification		
Diploma	102	48
Degree	41	19
Masters	3	1
Post-basic	68	32
Rank		
Midwifery Officer	58	27
Principal Midwifery Officer	7	3
Senior Midwifery Officer	19	9
Senior Staff Midwife	33	15
Staff Midwife	97	45

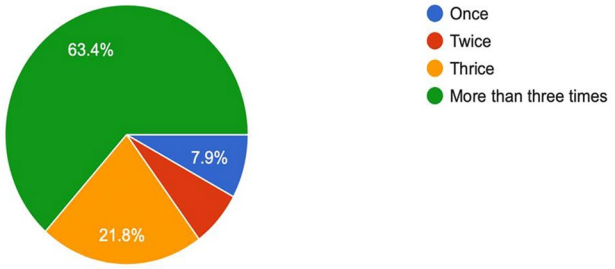

Fig. 1 Average number of local oxytocin cases per week

Approximately 72.9% of the respondents said that their clients had ever induced labour during the previous C/S, and 59.6% of the respondents said that they met clients who also induced their labour during twin pregnancy. Another 64.5% of the respondents said that they also met clients with large babies who also induced labour using local oxytocin, while 86.2% of the respondents said that they also met clients who induced labour with local oxytocin even when they had grand multiparity. Another 11.3% of the respondents said that they met clients who used local oxytocin to induce labour during transverse lies, and 15.3% of the respondents said that they had experienced when clients with mal presentations used local oxytocin to induce labour. This is presented in Fig. 2.

The study additionally asked midwives to report on how pregnant women who had taken local oxytocin to induce labour coped during their care. Midwives were expected to respond whether the women they cared for experienced good, difficult, bad, painful, life-threatening, terrible, or normal labour. As shown in Fig. 3, generally, the experience that pregnant women experience when they use local oxytocin to induce labour is not good. A total of 93.5% of the respondents said that the women who used local oxytocin had very bad experiences.

The study further revealed that 15.2% of the respondents had experienced situations where some pregnant women died because of the use of local oxytocin.

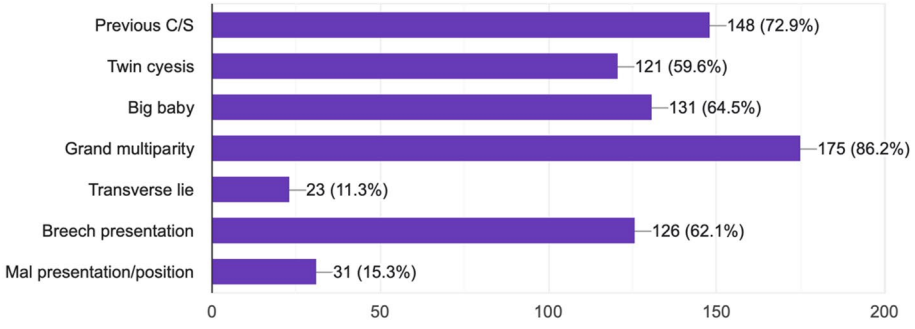

Fig. 2 Induction of labour by clients through local oxytocin under certain conditions

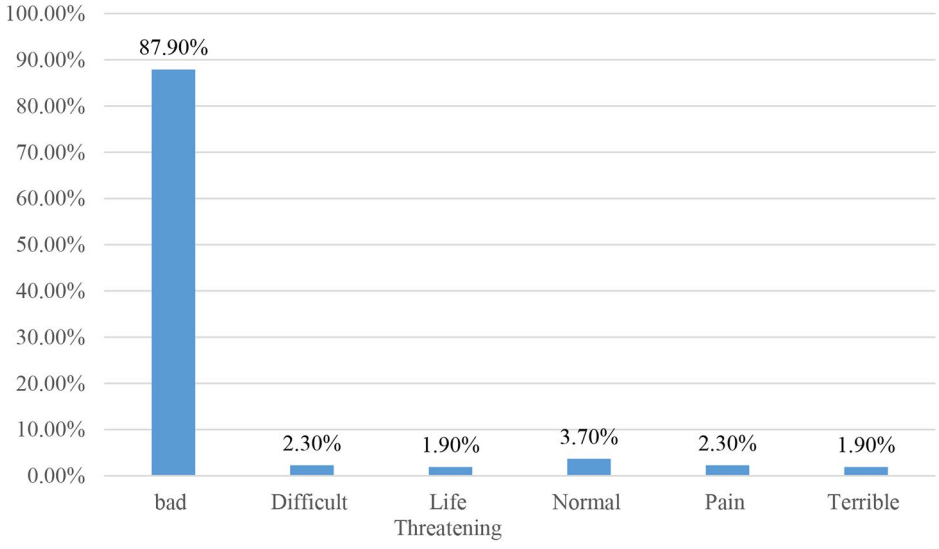

Fig. 3 Experience of using local oxytocin to induce labour

Effects of local oxytocin on the progress of labour

The effects of local oxytocin (Kaligutim) on the progress of labour were diverse. The study revealed that the effects of Kaligutim on the progress of labour are negative, as it causes prolonged labour for some, obstructed labour for others, precipitated labour, and poor progress of labour for others. With obstructed labour being the leading effect of kaligutim on the progress of labour, most of the respondents chose caesarean section as the preferred delivery for most clients who used kaligutim at birth. The use of local oxytocin also has some effect on the amniotic fluid of pregnant women, as 99% of the midwives who responded to the study said that there were some levels of stain of the amniotic fluid, and only 1% said it was clear. It is evident from the study that for most pregnant women who use local oxytocin, there is hyperstimulation of the uterus, as most of the midwives confirmed this for the study. Most pregnant women who use kaligutim suffer excessive contractions, which could have an effect on both mothers and babies. Again, more than half (53.75) of the respondents also said that their foetal heart rate was above 160 bpm. The majority (77.65) of the respondents said that there was no cessation of the contractions for those who took the local oxytocin. The results are presented in Table 2.

Impact of local oxytocin on the outcome of labour

To understand how local oxytocin impacts labour, the study went further to ask participants what the mode of delivery was for those who used Kaligutim. According to the data, caesarean section is the mode of delivery for most women (56.5%) who use local oxytocin, and most are unable to achieve spontaneous delivery. This has contributed to the increasing number of caesarean sections recorded daily. Most of the babies had an Apgar score of 4/10 to 6/10. Many babies born to mothers who used herbal oxytocin were born with moderate birth asphyxia (69.6%) and severe birth asphyxia (24%). The study also reported that 20.8% of midwives reported that hysterectomy was carried out on their clients who had used herbal preparations to induce or hasten labour. This is alarming because many women have their uterus removed as a result of herbal oxytocin (kaligutm) usage. Most clients who used Kaligutim experienced postpartum haemorrhage after delivery. It was also evident that some pregnant women (34.5%) had uterine atony, although it cannot be said that Kaligutim was the cause of uterine atony. Several pregnant women (65.3 years old) who used Kaligutim also developed a ruptured uterus. See Table 3.

Table 2 Effects of local oxytocin on the progress of labour

Variables	Frequency	Percentage
Progress of the labour		
Precipitate labour	38	18.4
Prolonged labour	38	18.4
Obstracted labour	52	25.2
Poor progress	44	21.4
All the above	135	65.5
State of the amniotic fluid		
Clear	2	1
meconium stained +	12	6
meconium stained ++	32	15
meconium stained +++	161	78
Hyper stimulation of the uterus		
Yes	131	64
No	75	36
Excessive contractions		
Yes	134	65.2
No	72	34.8
Fetal heart rate of the babies		
less than 100 bpm	47	22
100–160 bpm	48	22
above 160 bpm	110	51
Cessation of contractions		
Yes	152	77.6
No	44	22.4

Table 3 Impact of local oxytocin on the outcome of labour

Variables	Frequency	Percentage
Mode of delivery (*n* = 214)		
assisted delivery	59	27.6
caesarean section	121	56.5
spontaneous vaginal delivery	34	15.9
Apgar score of babies (*n* = 204)		
4/10 to 6/10	142	69.6
7/10 to 10/10	13	6.4
less than 4/10	49	24
Hysterectomy performed on clients (*n* = 202)		
Yes	42	20.8
No	160	79.2
Postpartum hemorrhage after delivery (*n* = 204)		
Yes	187	91.7
No	17	8.3
Uterine atony (*n* = 197)		
Yes	68	34.5
No	129	65.5
Raptured uterus (*n* = 197)		
Yes	128	65.3
No	68	34.7

Table 4 Relationship between kaligutim (local oxytocin) use and birth outcome

Variable	Response category	Kaligutim (Local oxytocin) status		Test Statistics
		No	Yes	
Do women who go through the normal process of labour and those who use kaligutim to induce their labour have same birth outcome?	No	14(7.3)	179(92.7)	Fisher Exact test = 31.6, $p = 0.021$*
	Yes	8(38.1)	13(61.9)	
What was the foetal wellbeing?	Live birth	8(6.9)	108(93.1)	Chi square test = 22.7, $p = 0.041$*
	Birth asphyxia.	7(0)	63(100)	
	Still birth	7(91.1)	21(8.9)	
When do most neonate whose mothers have taken kaligutim dies?	Intrauterine	5(18.2)	31(81.8)	Fisher Exact test = 54.9, $p = 0.038$
	Within 30 min after delivery	7(10)	81(90)	
	Within the first week of life	6(8)	69(92)	
	Within the first 28 days of life	0(0)	11(100)	
Was baby admitted at the New-born Care Unit?	No	8(29.6)	19(70.4)	Chi square test = 24.9, $p = 0.001$*
	Yes	14(7.5)	173(92.5)	
Did you get cases of birth asphyxia as a result of kaligutim use during labour?	No	7(46.7)	8(53.3)	Chi square test = 21.3, $p = 0.001$
	Yes	15(7.5)	184(92.5)	
Have you ever recorded a maternal death as a result of the use of Kaligutim?	No	15(9.5)	143(90.5)	Chi square test = 45.1, $p = 0.02$*
	Yes	7(12.5)	49(87.5)	
Apart from herbal oxytocin, do you know any other of local oxytocin that pregnant women use to induce labour?	No	15(8.6)	159(91.4)	Chi square test = 38.2, $p = 0.21$
	Yes	7(17.5)	33(82.5)	

Relationship between kaligutim (local oxytocin) use and birth outcome

Table 4 shows the associations between kaligutim (local oxytocin) use and birth outcomes among the respondents. Fisher's exact test and the chi-square test showed that several birth outcome variables were significantly associated with kaligutim (local oxytocin). Do women who go through the normal process of labour and those who use kaligutim to induce their labour have the same birth outcome? (P value = 0.021), what was the foetal wellbeing? (P value = 0.041), When do most neonates whose mothers have taken Kaligutim die? (P value = 0.038), was baby admitted at the Newborn Care Unit? (P value = 0.001), were significantly associated with kaligutim. Additionally, having recorded a maternal death because of the use of Kaligutim (p value = 0.002) was also significantly associated with kaligutim, as presented in Table 4.

Multivariate analysis of birth outcome predictors of Kaligutim (local oxytocin) among pregnant women in three major government hospitals in Tamale metropolis

In Table 5, three birth outcome variables strongly depicted kaligutim use among the respondents: foetal wellbeing, admission to the new-born care unit, and death of most neonates because of the use of Kaligutim by their mothers. Respondents who responded, "yes" to baby admission to the Newborn Care Unit were 25% more likely to use kaligutim (local oxytocin) than were those who responded "no" to baby admission to the Newborn Care Unit [(AOR=0.25 95% CI (0.01, 0.53), P=0.021)].

Discussions

Although the respondents cut across with regard to the number of years of experience, most of the respondents were early career midwives. The fact that these early career midwives are familiar with and have experienced the use of local oxytocin by their clients shows that it is widely used by pregnant women in the Tamale metropolis. Approximately 90% of respondents were aware of the usage of kaligutim (local oxytocin) for inducing labour at home before going to the hospital for delivery. However, a study conducted in the Ashanti region of Ghana revealed that midwives and other healthcare professionals lack proper knowledge about herbal medicine usage among pregnant women, even though this information is urgently needed so that appropriate action may be taken to address the issue [31]. The study findings also demonstrated that pregnant women frequently utilize local oxytocin and that many of them are unaware of the potential negative effects that these herbs may have on them in certain circumstances. Figure 2 shows that the use of local oxytocin was not limited to only one condition. These findings further show that the use of local oxytocin by pregnant women is widespread and that pregnant women do not know the effect that local oxytocin can have on them when they have certain conditions. Additionally, pregnant women are ignorant of the fact that local oxytocin can be contraindicated under certain conditions and must be avoided. Hence, it may put the life of the pregnant mother and her baby in danger.

Although herbal medicines are natural, not all herbs are safe to use while pregnant. Thus, expectant mothers should consult their midwives for guidance before taking herbal remedies. The experience that pregnant women have when they use local oxytocin to induce labour is not a positive one. A total of 188 respondents, or 93.5% of the respondents, stated that the women who used local oxytocin had a very unpleasant experience. This is supported by additional research results showing that between 50 and 80% of pregnant women use traditional plant remedies, which could have adverse perinatal effects [32]. The statistics indicate that local oxytocin is frequently used by pregnant women in the Tamale Metropolis. Most of the midwives reported seeing these cases virtually daily. This finding supports a study conducted in Ghana's Ashanti region (Kumasi), which revealed that knowledge of herbal medicine is widely shared and that there is evidence of an increase in the usage of herbs [33].

The study revealed that local oxytocin (Kaligutim) has a diverse range of effects on the progress of labour, including precipitating labour, prolonging labour, obstructing labour, and slowing labour. The partograph is a great tool for keeping track of labour progress and serving as a warning system for abnormalities in normal labour, which helps to prevent obstructed labour and improves maternal and foetal outcomes [34]. This is supported by the study's findings, which indicate that using a partograph to monitor labour progress and identify any deviations is essential [34].

According to this study, most midwives, who make up 65.2% of the respondents, also claimed that pregnant

Table 5 Multivariate analysis of birth outcome predictors of Kaligutim (local oxytocin) among pregnant women (midwives) in the three major government hospitals in Tamale Metropolis

Variable	Response Category	AOR	(95% CI)	*P* Value
Do women who go through the normal process of labour and those who use kaligutim to induce their labour have same birth outcome?	No Yes	Ref 0.48	0.073–5.15	0.39
What was the fetal wellbeing?	Live birth Birth asphyxia. Still birth	Ref 0.16 1.9	0.08–3.08 0.01–1.21	0.045
When do most neonate whose mothers have taken kaligutim dies?	Intrauterine Within 30 min after delivery Within the first week of life Within the first 28 days of life	Ref 3.4 2.23 2.80	0.74–1.5 0.00-0.02 0.26–3.3	0.047
Was baby admitted at the Newborn Care Unit?	No Yes	Ref 0.25	0.01–0.53	0.021
Have you ever recorded a maternal death because of the use of Kaligutim?	No Yes	Ref 3.18	0.27–3.7	0.125

women who use local oxytocin (Kaligutim) have excessive contractions, while only 71 of them, or 34.8% of the respondents, claimed that they do not notice excessive contractions in their clients. This is supported by research performed in Zambia, which revealed that these herbal medicines also elicit greater than normal uterine contractions [26].

Most pregnant women who use kaligutim experience excessive contractions, which may have an impact on both the mother and the unborn child. Similarly, other authors have also claimed that using herbal remedies during labour causes stronger and more frequent uterine contractions, which do not necessarily result in cervical dilatation [35]. This was confirmed in the study's findings, which also noted that herbal oxytocin not only produces excessive uterine contractions but also may cause contractions to cease, as 44 (22.4%) of the respondents reported that those who took local oxytocin had a halt in contractions. Intravenous fluids such as normal saline and Ringer's lactate are used to flush out the local oxytocin in the system and CS in the case of an emergency. Nifedipine is also given in certain circumstances to prevent contractions.

According to the study, 121 midwives, or 59.6% of the respondents, stated that caesarean sections were the preferred method of delivery for women who used kaligutim to induce labour. Both [36] in South Africa and [34] in Western Uganda reported these findings. Moderate birth asphyxia (69.6%) and severe birth asphyxia (23%) are common in newborns whose mothers utilize herbal oxytocin. According to the survey, 20.8% of midwives said they had performed hysterectomy procedures on clients who had utilized herbal induction or hastening methods to induce labour.

One of the main causes of maternal deaths worldwide, including in Ghana, is postpartum haemorrhage [10]. 91% of midwives said that when their patients use herbal oxytocin during labour, more of them suffer from postpartum haemorrhage. This is corroborated by research by Frank (2018), who found a connection between postpartum haemorrhage and the use of herbal medications during labour [37]. In contrast, other studies [38] have shown that using herbal medication during childbirth is linked to a lower risk of postpartum haemorrhage. Individuals who experienced postpartum haemorrhage were managed with uterine massage, intravenous fluids, Cytotec, repairs to tears, expulsion of retained products, blood transfusions, cervical repairs, and catheter use.

This report supports the findings of a study conducted in the Ugandan village of Kiganda, where the researcher [37] reported that the use of herbal medicines has been linked to labour induction, which can cause significant birth canal tearing, postpartum haemorrhage, uterine atony, a raptured uterus, and, if untreated, maternal mortality. Medical experts who are aware of the dangers of herbal remedies and who are obliged to advise patients against using them do so themselves. The majority of women who use herbal preparations during pregnancy have a high school education or higher, according to evidence showing that more than 57.5% of pregnant women who use herbs have a high school diploma or higher, which is consistent with findings from Saudi Arabia by [39] that show that formal education cannot even prevent women from taking herbs during pregnancy and labour.

Kaligutim also causes excessive uterine contractions, foetal discomfort, excessive uterine stimulation, uterine atony, PPH, birth hypoxia, and premature bearing down, claims this study. This is supported by the results of a study carried out in Europe, where researchers [40] found that the majority of herbal drugs taken by pregnant women have undesirable side effects. An Iranian study, however, revealed that utilizing herbal treatments during labour can lessen discomfort, speed up the process, and enhance both the quality of a woman's delivery experience and her odds of having a healthy baby [41].

According to the study's findings, three birth outcome variables strongly affected kaligutim (local oxytocin) use among the respondents: foetal wellbeing, admission to the newborn care unit, and death of most neonates as a result of the use of Kaligutim by their mothers. Respondents who responded, "yes to baby" and were admitted to the new-born care unit were 25% more likely to use kaligutim (local oxytocin) than were those who responded, "no to baby" and were admitted to the new-born care unit (AOR=0.25 95% CI (0.01, 0.53), P=0.021). This is probably one of the effects of taking local oxytocin. These infants were hospitalized for a variety of reasons, including asphyxia, respiratory distress, and low Apgar scores.

Additionally, the study results indicated that respondents who responded that a still birth outcome affected foetal wellbeing were 1.9 times more likely to use kaligutim (local oxytocin) than those who responded no to having live births were (AOR=1.9 95% CI (0.01, 1.21), P=0.047)]. This finding is consistent with findings from a sub-Saharan African study that showed that herbal medications used to speed up and induce labour have uterotonic effects and increase the risk of neonatal asphyxia attributable to uterine hyperstimulation [42]. This could be ascribed to the fact that the respondents wanted fast and easy delivery, which subsequently caused this effect.

Another interesting finding was that respondents who responded that having a birth asphyxia outcome to foetal wellbeing were 0.16 times more likely to use kaligutim (local oxytocin) than were those who responded no to having live births (AOR=0.16, 95% CI (0.08, 3.08), P=0.047). This result is similar to that of [42], who conducted their study in sub-Saharan Africa. This could be

a result of the effects of kaligutim on foetal well-being, which results in birth asphyxia.

Furthermore, newborns whose mothers used kaligutim during labour and who died within the first hour of birth were 3.4 times more likely to use kaligutim (local oxytocin) than those whose mothers used kaligutim during labour [AOR=3.4 95% CI (0.74, 1.5), P=0.045]. In support of the findings from this study, a study on the consumption of herbal drugs among pregnant women in rural Malawi revealed that consumption was linked to pregnancy-related issues and that users had a greater risk of neonatal mortality/morbidity within the first hour of life than nonusers [14]. This could be attributed to the dangers this herb poses to the foetus during delivery.

Newborns whose mothers used kaligutim during labor and who died within the first week of life were 2.23 times more likely to use kaligutim (local oxytocin) than those whose mothers used intrauterine kaligutim [(AOR=2.23 95% CI (0.00, 0.02), P=0.045)]. This is supported by findings from a Malawian study that revealed that the use of labour-inducing plants during pregnancy has negative effects on obstetric and labour outcomes, such as uterine rapture, which can cause neonatal mortality and morbidity [35]. This could be attributed to the fact that PPH, uterine rapture, cervical tear, DIC, and hypoxia were the main causes of death.

Conclusion

Every life matter, which is why mothers' lives and that of their newborn babies must be safeguarded at all costs. A sufficient level of knowledge is always vital since it exacerbates doubt. Therefore, it is crucial that people are informed of their rights, their health, and the services they can utilize to maintain and improve health to have a healthy increasing population. Although herbal medicine could be effective in treating certain ailments associated with pregnancy and delivery and is easily accessible to pregnant women, especially in rural communities, the possibility of overdose, drug-herb interactions, contraindications, and the unhygienic conditions under which they are prepared may influence both maternal and neonatal conditions.

The results showed that the use of kaligutim by pregnant women in Tamale Metropolis is on the rise. This means that much needs to be done to do away with the use of kaligutim, and this must start with midwives. Pregnancies and births can be improved with a healthy and qualified midwifery care model in improving and protecting women's and newborn health in Tamale.

It can be concluded that the use of this herbal medicine (Kaligutim) poses a greater long-term health challenge for mothers and their babies. Midwives and other healthcare workers in the Tamale Metropolis must therefore intensify their public health campaigns against the use of Kaligutim for labour induction.

Recommendations

The findings of the study have important implications for maternal and child health. The nonuse of kaligutim (local oxytocin) for the induction of labour is the best option for pregnant women. Pregnant women should visit the hospital for all their health needs during the entire pregnancy. This will help prevent adverse pregnancy and labour outcomes as well as maternal and neonatal mortalities and morbidities.

Future researchers should perform further studies on the spiritual aspects of kaligutim (Walgu) and its types. Like synthetic oxytocin, an Islamic form of oxytocin is prepared by Mallams and causes uterine contractions and dilates the cervix.

However, studies should also be conducted on the efficiency, effectiveness and biochemical composition of these herbal preparations and their safety, especially during pregnancy and delivery. Samples of these herbal preparations should be taken for laboratory investigations.

Acknowledgements

We thank the Management and Healthcare Staff of the Tamale West Hospital (T.W.H), Tamale Central Hospital (T.C.H) and Tamale Teaching Hospital (TTH) for their support throughout the data collection process. We acknowledge the contributions of all the midwives who shared their knowledge and experiences with us, your efforts are well appreciated.

Author contributions

ASA and SD conceptualised and drafted the research proposal. ASA, SD, and JL performed the statistical analysis, assisted with interpretation of the results, and co-drafted the manuscript. All authors contributed to the discussion of the paper, read, and approved the final manuscript.

Funding

No funding was available for the study.

Data availability

All data generated or analysed during this study are included in this article and its supplementary information files are available from the corresponding author on reasonable request.

Declarations

Ethics approval and consent to participate

An introductory letter from the University for Development Studies was presented to the three government hospitals, Tamale West Hospital (T.W.H), Tamale Central Hospital (T.C.H) and Tamale Teaching Hospital (TTH) to seek for permission to undertake the study. Ethical clearance was also obtained from the Kwame Nkrumah University of Science and Technology (KNUST) with reference number (CHRPE/AP/332/22). Permission was also sought through a consent form of which participants were asked to consent to if they were willing to participate in the study. They were assured of confidentiality of every information they were going to provide. All other methods were performed in accordance with relevant guidelines and regulations on subject selection and participation.

Consent for publication

Not applicable.

Competing interests

The authors declare no competing interests.

Received: 15 April 2024 / Accepted: 8 August 2024
Published online: 28 August 2024

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