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Research article

Evidence-based intrapartum care during vaginal births: Direct observations in a tertiary care hospital in Central Sri Lanka

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ABSTRACT

Background: Evidence-based practice (EBP) is an effective approach to improve maternal and newborn outcomes at birth.
Objective: This study aimed to assess the current intrapartum practices of a tertiary care hospital in Central Province, Sri Lanka, during vaginal births. The benchmark for this assessment was the World Health Organisation's (WHO) recommendations on intrapartum care for a positive childbirth experience.
Methods: An observational study was conducted at the delivery room of Teaching Hospital, Peradeniya with the participation of 196 labouring women who were selected using systematic random sampling. A non-participant observation checklist covering labour room admission procedures, management of the first, second, and third stages of labour, and immediate care of the newborn and postpartum mother was used for the data collection. The care interventions implemented throughout labour and childbirth were observed and recorded. The data analysis was done using SPSS version 22.
Results: WHO-recommended practices such as providing privacy (33.2%), offering oral fluids (39.3%), and opioids for pain relief (48.5%) were found to be infrequent. Encouraging correct pushing techniques (77.6%), early breastfeeding (83.2%), regular assessment of vaginal bleeding (91.3%), skin-to-skin contact (93.4%), and using prophylactic uterotonics (100.0%) were found to be frequent. However, labour companionship, use of upright positions during labour, women's choice of birth position, and use of manual or relaxation techniques for pain relief were not observed in hospital intrapartum care.
Conclusion: The findings of the study indicate that additional attention and monitoring are required to align the current intrapartum care practices with the WHO recommendations. Moreover, the adoption of evidence-based intrapartum care should be encouraged by conveying the standard evidence-based intrapartum care guidelines to the grassroots level healthcare workers to avoid intrapartum interventions.

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1. Introduction

Improving maternal and neonatal health remains a global challenge. One of the main concerns in achieving this is to ensure a high quality of intrapartum care by optimising a spontaneous vaginal birth with a minimum of medico-technical interventions [1]. The intrapartum period and the immediate postnatal periods are times of great risk for both the mother and her baby [2–4], as most pregnancy-related deaths and morbidities occur at the time of childbirth [5]. The global estimates indicate 289,000 maternal deaths [6,7], 2.65 million stillbirths, and, 2.8 million neonatal deaths annually [7]. The vast majority of these deaths (94%) occurred in low-resource settings, and most could have been averted [8]. However, in high-income countries, most of the perinatal deaths have been prevented with advances in the quality of intrapartum care [9].

Sri Lanka is reportedly shown to have better maternal health statistics when compared to the other countries in the region. The maternal mortality ratio (MMR) for Sri Lanka is 29.2 per 100,000 live births in 2021 [10]. However, the MMR in the country has remained static from 2010 to 2018, fluctuating between 31 and 39 deaths per 100,000 live births. Sustainable Developmental Goals (SDGs) for Sri Lanka are to reduce the MMR to 25 per 100,000 live births by 2020, 15 per 100,000 live births by 2025, and to less than 10 per 100,000 live births by 2030 [11]. And, Sri Lanka strived to achieve a reduction of the neonatal mortality rate (NNMR) to 4.2 per 1000 live births and the stillbirth rate to 4.5 per 1000 total births by 2020 [12]. However, the NNMR in Sri Lanka for the year 2021 was 7 per 1000 live births, showing an increasing trend compared to the previous years [10].

Approximately, 70% of the Sri Lankan maternal deaths in 2017 were categorised as preventable. Substandard care, either at the field or hospital levels, contributed to 38% of maternal deaths in 2017. Gaps in field services, deficits in basic clinical services, and non-adherence to protocols and standard practice were identified as the pitfalls [11]. Hence, the quality of care during the intrapartum period has massive importance in attaining significant improvement in both maternal and newborn health outcomes. However, addressing these challenges necessitates a comprehensive approach, and evidence-based practice (EBP) emerges as a crucial tool in optimising the quality of intrapartum care and thereby reducing maternal and neonatal morbidity and mortality.

Evidence-based practice (EBP) is an important tool for improving the quality of maternity care [13]. EBPs are derived from the use of the best available research results to guide healthcare practices [14]. Therefore, integrating up-to-date evidence into childbirth practice can improve the health outcomes of pregnant women [13]. Appropriate adherence of health care professionals to the EBP is very important as it directly affects the quality of care the patients receive [15,16]. The application of evidence-based practice to maternity care has been recommended by the Pan-American Health Organisation (PAHO) and World Health Organisation (WHO) since 1985 and 1996, respectively, and reinforced by the guidelines in 2018. Adequate and timely use of EBP during labour and childbirth can optimise maternal, foetal, and newborn outcomes, promote effective and respectful care, and assist providers' and women's decisions [14].

The World Health Organisation is currently promoting the systematic adoption of evidence-based obstetric practices and the replacement of ineffective or harmful practices with those based on the best available evidence [17]. The up-to-date, comprehensive, and consolidated guidelines by the WHO on essential intrapartum care bring together new and existing WHO recommendations that ensure good-quality and evidence-based care irrespective of the setting or level of health care. This guideline emphasises the importance of woman-centred care to optimise the experience of labour and childbirth for women and their babies through a holistic, human rights-based approach [18].

According to the WHO quality of care framework for maternal and newborn health, EBP is a key quality of care component [3]. Two entities that strengthen the implementation of evidence-based care are the provision of "recommended practices" and the avoidance of "not-recommended practices." Recommended practices are practices that have evidence of effectiveness and generally facilitate the physiological process of birth. Not-recommended practices are those that are often invasive medical interventions and have proved ineffective or harmful if provided in a routine manner [19]. However, unsafe intrapartum care practices continue to occur despite the availability of best practice initiatives. Such interventions are more likely to cause harm to women during childbirth [20].

In the Sri Lankan context, the literature on evidence-based intrapartum care is scant. To the best of our knowledge, this study is the first to investigate the current childbirth care in a local healthcare setting against the WHO recommendations for a positive childbirth experience. Therefore, the findings of this study will help cover the knowledge gaps in the area of childbirth care in Sri Lanka and thereby inform hospital authorities and policymakers about where improvement may be needed. Thereby, it will shed light on designing better policies related to childbirth care in local healthcare settings. Therefore, this study aimed to assess the degree to which intrapartum care follows the evidence-based clinical guidelines on an individual level during labour and childbirth at the delivery room of Teaching Hospital, Peradeniya, Sri Lanka.

This is part of a mixed-methods study conducted to assess the quality of intrapartum care in a tertiary care hospital in Central Sri Lanka. The study used Donabedian's model of quality assessment as the theoretical framework, as it describes all vital components of the healthcare delivery system that are essential to quality care. The Donabedian model is one of the models recommended to assess the quality of care by WHO [21]. It is a multidimensional framework that defines three distinct aspects of quality, namely; structure, process, and outcome [22]. 'Structure' outlines the attributes of the settings in which care is offered; staff, equipment, supplies, and guidelines. 'Process' describes the actual giving and receiving of the care. 'Outcome' indicates the effects of care on the health status of individuals and populations, such as improvements in clinical outcomes (reduction of maternal, and neonatal deaths, disability, and complications) and positive client experiences [23]. In this study, 'process' was evaluated by observing the application of evidence-based guidelines in intrapartum care, and this paper presents those quantitative findings.

2. Materials and methods

2.1. Study design and setting

This observational study was conducted in the delivery room of the Teaching Hospital, Peradeniya, which is a tertiary care hospital in Central Sri Lanka. In Teaching Hospital Peradeniya, the delivery room is a consultant-led unit in which the care decisions for both low- and high-risk mothers are made by the consultant and the physicians, whereas the deliveries, the immediate newborn care, and the postpartum care of women are mainly performed by the midwives and the nurse-midwives.

2.2. Study participants

One hundred and ninety-six labouring women were selected using systematic random sampling, where every second eligible woman in labour was recruited to the sample. Full-term pregnant women (37–42 weeks) in labour within 4–8 cm cervical dilatation with a single foetus and vertex presentation were included in the study. Labouring women who were diagnosed by a physician as high-risk mothers (GDM, PIH, bad obstetric history, etc.) were excluded from the study.

2.3. Study instrument

A non-participant observation checklist including socio-demographic data of the women, maternity admission procedures, management of first, second, and third stages of labour, and, immediate care of the newborn and the mother was used for the data collection. This tool had "yes" and "no" options implying the presence or absence of a variable, respectively. The delivery room maternity care routines were observed and recorded without participating in the situation or interfering with the care being provided. The WHO recommendations on intrapartum care for a positive childbirth experience [18] were used as the benchmark for this evaluation.

The data collection tool consisted of WHO-recommended and not-recommended practices. Recommended practices include labour companionship, information sharing, providing privacy, offering oral fluids, encouraging mobility and upright positions, opioid analgesics for pain relief, relaxation and manual techniques for pain relief, encouraging women to follow their own urge to push, allowing maternal preferred position for delivery, prophylactic use of oxytocin, delayed cord clamping, controlled cord traction, skin-to-skin contact, breastfeeding within the first hour, prophylactic use of vitamin K, babies wrapped with warm cloths, regular assessment of vaginal bleeding, assessment of uterine contractions, measurement of fundal height and, measurement of maternal temperature and pulse rate starting from the first hour after birth. Not-recommended practices include routine amniotomy, continuous CTG in spontaneous labour, routine episiotomy, application of fundal pressure, and routine nasal or oral suction. WHO "recommended" and "not-recommended" practices were closely observed and recorded.

2.4. Data collection

Data collection was conducted between June 2019 and April 2021. On admission, it was assumed that women are usually anxious about their well-being and that of their unborn baby. Thus, obtaining written consent at this moment was thought to be unethical. Therefore, verbal consent was obtained first, after explaining the purpose, procedures, voluntary participation, and right to withdraw from the study at any time. Then informed written consent was obtained before they were discharged from the labour room. A total of 581.55 h of direct observation of 196 labouring women was carried out within 66 productive days. Sometimes, the investigator had to stay in the labour ward for 13.5 h to complete observations, on average, 2–3 women were observed daily.

2.5. Data analysis

After checking for accuracy and completeness, all the collected data were entered according to a pre-set data entry format. After entering, the data cleaning was done to remove duplicates and incorrect entries. The data analysis was performed using the Statistical Package for Social Sciences (SPSS), version 22. The frequencies and percentages were used to describe the current intrapartum practices in the setting.

2.6. Ethical considerations

Ethical approval for this study was obtained from the Ethics Review Committee of the Faculty of Medicine, University of Peradeniya (2018/EC/34). Permission to collect data from the hospital setup was obtained from the Director of Teaching Hospital, Peradeniya.

3. Results

3.1. Socio-demographic characteristics

A total of 219 labouring women were enrolled in the study. Of all 219 women invited to participate, none declined, giving a 100% participation rate. However, the observation of 23 women who presented with no complications during admission and fit the inclusion

criteria for the study was discontinued along the process of labour due to being delivered by caesarean section (14 women), and the other 09 women the observer could not wait to witness their completion due to the time factor. Only 196 patients were included in the final analysis.

One hundred and forty-five primiparous and 51 multiparous women were enrolled, and their ages ranged from 19 to 42 years with a mean age of 29.4 (SD ± 5.3). All the participants were married. The number of children ranged from 0 to 5, with a mean of one birth. The majority of the women, 88 (44.9%), had formal education up to Advanced Level. Of the 196 women, 143 (73.0%) were engaged in household work, whereas only a few participants (24.5%) were private or government sector employees (Table 1).

3.2. Practices observed during labour and delivery

WHO-recommended and not-recommended practices were observed during the admission to the labour room, the first stage of labour, the second stage of labour, the third stage of labour, the immediate care of the newborn, and the immediate care of women after birth (Table 2).

3.2.1. The labour room admission procedures

None of the labouring women were allowed to have a labour companion during labour and childbirth. The pain was assessed only in 67 (34.2%) of the women. On admission, the foetal heart rate was measured by cardiotocography (CTG) in 172 (87.8%) women, whereas the Pinard stethoscope was used only in 24 (12.2%) women. The vaginal examination was performed for all women on admission, and the majority (93.4%) of these vaginal examinations were performed by a physician. Only 7 (3.6%) vaginal examinations were performed by midwives, 4 (2.0%) examinations by medical students, and 2 (1.0%) examinations by nurse-midwives. Findings from all those examinations were recorded on the patient's record and partograph. Only 88 (44.9%) women were informed about the vaginal examination to be performed. Vaginal examination findings and findings on foetal wellbeing were communicated only to 2 (1.0%) and 3 (1.5%) women, respectively. Providing privacy during vaginal examinations was observed only in 65 (33.2%) women.

3.2.2. The practices observed during the first stage of labour

Only 5 (2.6%) women were informed of the estimated duration of the first stage. Of the women who received oral fluids, 47 (61.0%) were given oral fluids on request. Of the 113 women whose labour was augmented with syntocinon, 90 (79.6%) were primiparous, and 23 (20.4%) were multiparous. The dosage administered was indicated in 110 (97.3%) of the 113 women. All the women who had augmented labour with syntocinon were ordered by a doctor. Artificial rupture of membrane (ARM) was performed on 85.2% of labouring women in the unit. However, routine amniotomies alone for the prevention of delay in labour were performed in only 1.5% of women. Sixty-five women (33.1%) were subjected to frequent vaginal examinations in less than 4-h intervals. On assessing how

Table 1
Socio-demographic characteristics of the participants (n = 196).

Variable	Frequency	Percentage (%)
Mean age (years)		29.4 (SD ± 5.3)
Age of woman (years)		
19–24	35	17.9
25–30	84	42.9
31–36	54	27.6
37–42	23	11.7
Marital status		
Married	196	100
Parity		
Primiparous	145	74
Multiparous	51	26
Number of children		
None	78	39.8
1–2	102	52.0
3–4	15	7.7
5 or more	01	0.5
Highest level of education		
Primary	03	1.5
Up to O/L	77	39.3
Up to A/L	88	44.9
Diploma	06	3.1
Degree or above	22	11.2
Occupation		
Housewife	143	73.0
Self-employed	03	1.5
Private sector	15	7.7
Government sector	33	16.8
Others	02	1.0

Table 2
Practices observed during labour and delivery (n = 196).

Practices	Frequency	Percentage (%)
On admission		
Allowed a labour companion[a]	0	0
Performed the vaginal examination (VE)	196	100
Informed women about the VE to be performed[a]	88	44.9
Informed women the findings of the VE[a]	02	01
Providing privacy during VE[a]	65	33.2
First stage		
Offered oral fluids[a]	77	39.3
Routine amniotomy[b]	167	85.2
Encouraged mobility and upright positions[a]	0	0
Continuous CTG in spontaneous labour[b]	14	93.3
Opioid analgesia for pain relief[a]	95	48.5
Relaxation and manual techniques for pain management[a]	0	0
Second stage		
Encouraged women to follow their own urge to push[a]	152	77.6
Allowed the preferred position for delivery[a]	0	0
Performed routine episiotomy[b]	141	71.9
Application of fundal pressure[b]	39	19.9
Third stage		
Prophylactic use of oxytocin[a]	196	100.0
Delayed cord clamping[a]	163	83.2
Controlled cord traction (CCT)[a]	187	95.4
Sustained uterine massage[b]	0	0
Immediate care of newborn		
Routine nasal or oral suction[b]	11	5.6
Skin-to-skin contact[a]	183	93.4
Breastfeeding within the first hour[a]	163	83.2
Hemorrhagic disease prophylaxis using vitamin K[a]	196	100
Babies wrapped with 'warm' towels and clothes[a]	190	97.0
Immediate care of the women after birth		
Regular assessment of vaginal bleeding[a]	179	91.3
Assessment of uterine contractions[a]	0	0
Measurement of fundal height[a]	0	0
Measurement of blood pressure shortly after birth[a]	118	60.2
Measurement of temperature starting from the first hour after birth[a]	0	0
Measurement of pulse rate starting from the first hour after birth[a]	93	47.4

[a] WHO-recommended practices.
[b] WHO not-recommended practices.

many health workers performed a vaginal examination on each woman before delivery, the minimum was one examination, and the maximum was 10 examinations, with a mean of 2.28 (SD ± 1.26) examinations. By one person, 62 (31.6%) women were examined, 64 (32.7%) women were examined by two persons, 37 (18.9%) women were examined by three persons, 28 (14.3%) women were examined by four persons, 04 (2.1%) women were examined by five persons, and only one woman (0.5%) was examined by seven persons before delivery.

Even though upright positions were not encouraged in the delivery room, non-supine positions such as side-lying positions were encouraged in 100 (51.0%) women. The majority of women (99.0%) experienced continuous CTG monitoring during the first stage of labour. However, continuous CTG monitoring was done throughout the first stage on 9 (4.6%) women who presented in spontaneous labour. Only 106 (54.1%) women received any kind of pain management method. Among them, 88 (83.0%) received opioids (pethidine IM injection) only, 11 (10.4%) received Entonox only, and 7 (6.6%) women received both opioids and Entonox for pain management. Not a single woman used or was encouraged to use relaxation and manual techniques for pain management.

3.2.3. The practices observed during the second stage of labour

The second stage of labour was informed to 176 (89.8%) labouring women. All the deliveries (100%) were performed by skilled birth attendants. The majority of the deliveries (91.8%) were attended by a midwife, whereas 10 (5.1%) deliveries were performed by a doctor, and the other 6 (3.1%) were attended by a nurse-midwife. There were 5 (2.5%) assisted vaginal deliveries (AVD) out of 196, including 4 (2.0%) ventouse deliveries and 1 (0.5%) delivery using both vacuum extraction and forceps. In all the deliveries (100%), the delivery trays used were complete and sterile.

The majority (96.9%) were instructed to adopt the dorsal position during delivery, while the rest of the mothers (3.1%) were kept in the lithotomy position. The fundal pressure was applied in 19.9% of the cases during delivery. Out of the 141 episiotomies performed, 116 (82.3%) were done under local anaesthesia. Hundred and twenty-six (89.4%) of the episiotomies were performed on primiparous women, and only 15 (10.6%) were performed on multiparous women. Perineal tears occurred in 72 (36.7%) women with, 50 (69.4%) in primiparous women and 22 (30.6 %) in multiparous women. Out of 176 women who had an episiotomy, perineal tears, or both, only 167 (95.0%) were repaired under local anaesthesia. Among those 176 women, 92 (46.9%) women were sutured within 15 min after

birth, 34 (17.3%) women within 30 min after birth, 32 (16.3%) women between 30 min and 1 h after birth, and 16 (8.2%) women 1–2 h after birth. All the episiotomy incisions were mediolateral, and episiotomy scissors were used in all of the episiotomies.

3.2.4. The practices observed during the third stage of labour

During the third stage, all the women were given intravenous prophylactic uterotonics before delivering the placenta. Early cord clamping (earlier than 1 min after birth) was observed in 33 (16.8%) women. The sustained uterine massage was not performed on any of the women.

3.2.5. The practices observed during the immediate care of the newborn

In the immediate care for newborns, all the babies were dried well with sterile clothes before wrapping. Only 6 (3%) of the 196 babies were wrapped in clothes that were not pre-warmed. The average time taken to initiate breastfeeding in newborns was 45.1 (SD $\pm$ 20.7) minutes. All the newborns (100%) were given vitamin K, and skin-to-skin contact was performed on 94.3% of newborns. Eleven newborns (5.6%) that were born through clear amniotic fluid had oral/nasal suctioning using a sterile suction tube.

The Apgar score at the first minute after birth was assessed and recorded for all the newborns. The Apgar score at 1 min was 8 or 9 in 190 (97%) neonates, whereas a score of 6 or 7 was recorded in 6 (3.0%) neonates. The Apgar score at 5 min was recorded as 10 in 185 (94.4%) neonates, whereas a score of 9 and 8 was recorded in 9 (4.6%) and 2 (1.0%) neonates, respectively. Eight newborns were resuscitated, of which three were performed by doctors and five by midwifery-trained nurses.

3.2.6. The practices observed during the immediate care of the women after birth

Assessment of uterine contractions, measurement of fundal height, and measurement of temperature starting from the first hour after birth were not observed among postpartum women in this labour room. Measuring maternal blood pressure (60.2%) and pulse rate (47.4%) following childbirth was not adequate.

4. Discussion

This study evaluated the intrapartum practices during vaginal births against the WHO recommendations on intrapartum care for a positive childbirth experience. The study findings indicated that maternity care providers efficiently use some of the recommended practices, whereas certain practices that are entirely relevant in facilitating women's positive experience of childbirth are often underused.

4.1. WHO-recommended practices for a positive childbirth experience

Deliveries attended by skilled professionals are known to contribute to better maternal and neonatal outcomes at birth [24]. All women in our study were assisted by a skilled professional birth attendant, which is a positive result as per the WHO recommendations [18]. However, none of the labouring women were allowed to have a labour companion during labour and childbirth, although a companion of choice is recommended by the WHO [18] and the Ministry of Health, Sri Lanka [25] throughout labour and childbirth. However, few studies in India (69.9%) [26] and Ethiopia (64.0%) [13] reported allowing labour companionship during childbirth. A Cochrane review has found that continuous support from someone other than a health professional may improve outcomes for both women and infants, including increased spontaneous vaginal births, reduced length of labour, reduced use of any type of pain relief, fewer babies with a low 5-min Apgar score, decreased risk of negative feelings about childbirth experiences [1,18,27] and decreased rates of caesarean birth, instrumental vaginal birth, use of any analgesia, and use of regional analgesia [27].

Providing adequate information during labour and childbirth may be helpful to women in labour. Women want to be informed of their labour progression and the baby's well-being [22]. Effective communication and information sharing positively affect women's birth outcomes and satisfaction with the birthing experience. Studies have found that client satisfaction is positively affected by the amount of information received and increased participation in the decision-making process [28]. Therefore, a lack of information sharing during childbirth can lead to women's frustration, dissatisfaction with received care, and negative childbirth experiences.

Baldisserotto et al. [29] found that the information and explanations given to women during labour are essential for enhancing women's sense of autonomy during labour. In the present study, only 5 (2.6%) women were informed of the estimated duration of the first stage, whereas only 2 (1.0%) women were informed of the estimated duration of the second stage. The vaginal examination findings and findings on foetal well-being were communicated only to 2 (1.0%) and 3 (1.5%) women, respectively. However, an Egyptian study reported infrequent information sharing among women (17.0%) on vaginal examination findings, which is a little higher value than our study finding yet not sufficient [30].

Lack of privacy in healthcare settings will reduce the quality of care, and cause irreversible harm to the patient [31]. Privacy preservation is one of the key aspects of respectful maternity care which is recommended by the WHO [32], and it is one of the most important reasons for childbirth satisfaction among mothers, which leads to positive childbirth experiences [31]. However, a lack of privacy during labour and childbirth keeps women from using maternal health services [32,33], diminishes their satisfaction and confidence in the healthcare system, and results in unfavourable pregnancy outcomes [32,34]. Therefore, respecting women's needs as well as maintaining privacy and confidentiality is considered foundational to high-quality intrapartum care [35]. This atmosphere provides the women with a sense of respect and security [36]. In the current study, providing privacy during vaginal examinations was observed only in 65 (33.2%) women. Several studies in Tanzania [37] and Iran [38] also reported a lack of privacy during examinations. However, Altaweli et al. [39] reported in a quantitative study that 78% of labouring women in Saudi Arabia were allowed

privacy during labour.

The WHO-recommended practices such as offering oral fluids, opioid analgesia for pain relief, encouraging mobility and upright positions and the use of relaxation and manual techniques for pain management were infrequently observed during the first stage. Restricting food and fluids during labour is a common practice across many birth settings, with some women only being allowed sips of water or ice chips. Restriction of oral intake may be unpleasant for some women, and may adversely affect their experience of labour [40]. In the current study, only 39.3% of women were offered oral fluids during the first stage of labour. Parallel to our finding, a Turkish study also reported a higher rate of restricting food and liquid intake (80.3%) during labour [41]. However, contradicting our findings, three Ethiopian studies reported higher rates (71.6%, 70.6%, and 78.5%) of offering oral fluids to labouring women [13,42,43].

The use of pain relief methods was also low in our study. Only 48.5% of the women received opioid analgesics, and none of them received non-pharmacological pain relief. Few studies in Ethiopia also reported low rates (12.8% and 41.5%) [13,42] for using opioid analgesics for pain relief. However, inadequate pain management may lead to adverse physical outcomes in the postnatal period, including venous thromboembolism resulting from reduced mobility, pneumonia secondary to inadequate ventilation, anxiety, and depression, which may affect mother-infant bonding and breastfeeding [44]. Several studies have investigated the factors associated with inadequate pain management in low-income countries. One major explanation reported in a study from Bangladesh is that both caregivers and the women themselves think that a woman should bear the natural pain. Women's lack of knowledge and lack of availability are the other reasons for the underutilisation of pain-relieving methods [1]. A study in Ghana found that midwives do not administer adequate analgesics due to the fear of adverse effects and increased workload. Moreover, some midwives encouraged women to tolerate pain, thinking that the pain was normal, which eventually contributed to poor labour pain management [45].

Non-pharmacological pain management methods are commonly considered safe, with minimal side effects compared to pharmacological interventions, and have demonstrated positive outcomes in diminishing labour pain intensity and enhancing satisfaction among parturient women [46]. In the present study, non-pharmacological methods were not used in the unit for relieving pain. Comparatively, a Jordanian study reported the use of non-pharmacological methods such as breathing exercises by verbal command (31%), distraction methods (7%), position change (3%), back massage (2%), and therapeutic touch (1%) to relieve labour pain in addition to the usage of narcotic analgesics (pethidine) [47]. An Ethiopian study also reported the use of relaxation techniques for pain management (35.5%) [42]. Furthermore, a Canadian study also reported the use of medication-free pain management during labour (40.0%), contradicting our study findings [48]. Effective use of non-pharmacological methods to relieve labour pain is believed to reduce anxiety, stress, and fear among women during labour and increase satisfaction, which otherwise may aggravate labour pain and lead to prolonged labour because of stress hormone release [49].

Previous experimental studies have demonstrated that the upright position in labour results in less maternal pain, increased uterine contractions, low caesarean birth rates, decreased perineal tears and episiotomy rates, and decreased use of analgesics. Further, the upright labour position slightly affects the rates of spontaneous vaginal deliveries and instrumental deliveries [50]. Encouraging women to move and assume upright positions during labour was not found at all in the labour room. Even though upright positions were not encouraged in the delivery room, non-supine positions, such as side-lying positions were encouraged in 51.0% of women. In line with these findings, a few studies in Turkey (35.0%) [41], Ethiopia (38.5%) [13], Ethiopia (48.8%) [42], Ethiopia (30.8%) [43], Jordan (94.0%) [47], and, Egypt (38%) [30] reported restrictions on movements during labour.

Physical position during birth can influence the outcome [1,24]. Upright and lateral birthing positions may have more potential benefits in enhancing maternal and neonatal outcomes during childbirth and addressing certain obstetric complications more effectively. These positions can greatly improve women's sense of control, may shorten the duration of the second stage of labour, and enable them to have a positive birth experience. Certain upright positions, such as sitting and squatting, may be associated with perineal trauma and greater blood loss. Supine and lithotomy positions should be avoided for the possible increased risk of greater pain, severe perineal trauma, relatively longer labour, and more foetal heart rate patterns [51]. A meta-analysis has shown higher rates of episiotomies and instrumental deliveries among women giving birth in a supine position [1].

The majority (96.9%) of the current study sample were instructed to adopt the dorsal position during delivery, while the rest of the mothers (3.1%) were kept in the lithotomy position. None of them was encouraged to adopt an upright position. Similarly, another study also reported the use of only supine (1.8%) and semi-Fowler's (98.2%) birth positions, emphasising the low use of upright birthing positions in Philippine maternity care settings [19]. However, all Jordanian women in a study used the lithotomy position for birth [47] contradicting our findings. Moreover, the use of alternative birthing positions was reported only among 13.3% in an India study [26].

Pushing in the second stage of labour from an upright position has shown numerous benefits, such as gravity assisting the foetal descent, and the uterus contracting more strongly and efficiently. Moreover, with upright positions such as squatting and kneeling/hands-knee positions, the dimensions of the pelvic outlet are increased, reducing the risk of compressing the mother's aorta and thus giving a better oxygen supply to the baby. Therefore, women should be offered the choice to move and deliver in the most comfortable position [36]. Encouraging correct pushing techniques in the second stage was found to be frequent in the current study (77.6%). Similar findings were also reported from several other studies in Ethiopia (72.4%) [13], the Philippines (74.1%) [19], and Turkey (74.6%) [41].

In the current study, WHO-recommended practices such as prophylactic uterotonics, delayed umbilical cord clamping (not earlier than 1 min after birth), and controlled cord traction (CCT) were found to be satisfactorily frequent during the third stage of labour. In line with our findings, a study by the SEA-ORCHID Study Group [52] to assess current practices in perinatal health care in four Southeast Asian countries also revealed that controlled umbilical cord traction to deliver the placenta was routinely performed in Indonesian, Malaysian, and Philippine hospitals. However, in Thailand, the rates were below 50% in the regional and tertiary hospitals

but 96% in the provincial hospitals. An Indian study showed a higher rate of using prophylactic uterotonics (90.8%) and a low rate of delayed cord clamping (44.2%) during the third stage of labour [26]. Another study in the Philippines reported satisfactory use of prophylactic oxytocin in the third stage (100%), control cord traction (99%), and low rates of delayed cord clamping (50%) [19]. Moreover, a Turkish study by Çalik et al. [41] also reported 44.7% for delayed cord clamping and 60.1% for controlled cord traction, which are very low rates when compared to our study findings. Similarly, an Ethiopian study also showed delayed cord clamping only among 22.0% [42]. Another study in Ethiopia reported low rates of using prophylactic oxytocin (78.5%) and applying controlled cord traction (77%), opposing our study findings [13].

Practices such as skin-to-skin contact, prophylactic vitamin K, wrapping the baby with warm clothes, and early initiation of breastfeeding were commonly seen during the immediate newborn care following the WHO recommendations. Parallel to our findings, an Ethiopian study also reported satisfactory rates of administration of prophylactic vitamin K (76.4%) and early initiation of breastfeeding (75.3%) [13]. Contradicting our findings, a Turkish study by Çalik et al. [41] reported that only 14.0% of women were encouraged for skin-to-skin contact following birth. A similar study in Brazil also reported that only 34.1% of women were encouraged for skin-to-skin contact following birth [29]. An Indian study also reported very low rates for wrapping the baby immediately (48.3%), skin-to-skin contact (34.2%), and early initiation of breastfeeding (15.0%), opposing our findings [26]. A study in Zambia reported that a total of 50 (75.8%) women who birthed at Mumbwa General Hospital were not advised to initiate breastfeeding after birth [53].

Complications such as postpartum haemorrhage and sepsis pose significant risks to women during the immediate postpartum period. Approximately, 60% of maternal deaths happen during the postpartum period, with 45% of these occurring within the initial 24 h following delivery. Therefore, it is crucial to conduct postpartum monitoring, including monitoring blood loss and assessing vital signs, to promptly detect and address any complications [54]. Practices related to the immediate care of women after birth were not satisfactorily frequent in the present study. Some practices, such as measuring fundal height, assessing uterine contractions, and measuring temperature starting from the first hour after birth, were not seen at all. However, the Modified Early Obstetric Warning Score (MEOWS) was initiated in every parturient woman. Regular assessment of vaginal bleeding and monitoring maternal vital signs are important practices for the prevention, early detection, and management of postpartum haemorrhage (PPH), a leading cause of maternal death. A study in Burkina Faso and Côte d'Ivoire revealed that adherence to these life-saving and low-cost practices was very low [55].

Findings from maternal mortality reviews reveal inadequate monitoring and delays in initiating treatment as significant contributors to maternal mortality. For instance, in a review conducted in Kenya, inadequate monitoring was identified as a contributing factor in 27% of the examined mortality cases, while prolonged abnormal observation without intervention was found to have played a role in 24%. Multiple studies across maternity care and various clinical fields have demonstrated the importance of vital sign measurements in predicting adverse clinical outcomes and making better and timelier care decisions, which contributes to improved patient outcomes [54].

Vital signs monitoring is a critical component of high-quality maternity care, which is the first step to identifying maternal complications. Deviations in vital signs frequently manifest in common postpartum complications such as haemorrhage and sepsis. For example, haemorrhagic shock can be identified by lowered blood pressure, an elevated heart rate, and low urine output. In such situations, prompt treatment can avert more dangerous outcomes and, eventually, death. Increasingly adopted early warning systems aim to enhance the timely recognition and management of obstetric complications by relying on vital signs assessment to score and triage patients [56].

The WHO's latest postpartum care guidelines underscore the critical need for promptly identifying and managing complications during the immediate postpartum period. These guidelines encourage continuous monitoring in the crucial first 24 h after childbirth, ensuring a positive postnatal experience for both women and their newborns. With the release of these guidelines, there's an opportune time to address deficits in the quality of immediate postpartum care in low- and middle-income countries (LMICs) [54,57].

4.2. Practices not recommended by the WHO for a positive childbirth experience

Several practices that are not recommended by the WHO were frequently observed in the current study setting during labour and delivery. Hundred and twenty-six (89.4%) of the episiotomies were performed on primiparous women, and only 15 (10.6%) were performed on multiparous women. Giving episiotomies to all primigravida mothers was highly practiced during intrapartum care. Higher episiotomy rates in primipara [15,19,30] were reported in similar studies. Perineal tears occurred in 72 (36.7%) women with 50 (69.4%) in primiparous women, and 22 (30.6%) in multiparous women in our study. Parallel to this finding, a Jordanian study also reported that more than half of the women in that study had perineal and external genitalia trauma (58%), with 37% having an episiotomy.

The routine use of episiotomy was the current practice for most of the 20th century, which is harmful and unnecessary [47]. The short-term consequences associated with episiotomy are perineal lacerations, haemorrhage and increased blood loss, pain, hematoma formation, wound site oedema, infection, anal sphincter damage [58,59] urethral injury, bladder injury, and episiotomy dehiscence [59]. The long-term consequences associated with episiotomy are pain, chronic infections, anorectal dysfunction, pelvic organ prolapse, urinary incontinence, sexual dysfunction [59], psychological trauma, and dyspareunia [58]. Therefore, the current evidence promotes restrictive episiotomy policy over routine episiotomy, as it is associated with less posterior perineal trauma, less suturing, and fewer complications associated with healing [58].

It was seen in the present study that fundal pressure was applied to a significant percentage (19.9%) of women. However, this rate is lower than previously reported in several studies conducted in India (50.8%) [26], Turkey (43.3%) [41], Turkey (72.6%) [60], Egypt (36.0%) [30], Ethiopia (39.6%) [42] and the Philippines (31.2%) [19]. In many countries, care providers commonly practice fundal

pressure during the second stage of labour to help expedite the delivery process and shorten the second stage of labour [30,61]. However, there is very limited data on the subject of its safety and efficacy [30,62]. A Cochrane review in 2017 revealed that there was insufficient evidence of the benefits and harms of this practice [61,63]. A recent trial in South Africa involved 1158 nulliparous women and utilised gentle assisted manual pushing during the second stage of labour. However, the findings reported no evidence of benefit, but more women reported discomfort instead [61,63].

Furthermore, some studies have reported the potential adverse events associated with the application of fundal pressure, such as laceration of the birth canal, maternal rib fracture, amniotic fluid embolism [62] perineal tears, shoulder dystocia, and neonatal birth injuries. Moreover, the use of fundal pressure may lead to reduced maternal satisfaction with the labour and childbirth experience, which will possibly reduce the likelihood of the women seeking assistance from skilled health personnel in future births [61]. Therefore, WHO and other obstetric care bodies specifically recommend against the use of fundal pressure as it is not beneficial and is possibly harmful to women [18,61].

Some practices that are not recommended by the WHO such as routine amniotomy in the first stage, are commonly seen (85.2%) among women. Similarly, a high early amniotomy rate (70%) was reported in an Egyptian study [30]. However, several studies in Ethiopia showed low amniotomy rates (38.1%) [42], (45.0%) [13], and (58.8%) [43] compared to our findings. Another study in Turkey also reported that 31.9% of women had early amniotomies during labour [41]. In the current study, a majority (99.0%) of women experienced continuous CTG monitoring during the first stage of labour. Similarly, continuous CTG in spontaneous labour (93.3%) was also commonly seen in the current practice. Parallel to our findings, a Jordanian study reported a high rate (77%) of using continuous external foetal monitoring in low-risk labouring women [47]. Similarly, a Turkish study also reported a higher rate of continuous electronic foetal monitoring (95.4%) in women undergoing vaginal delivery [41].

Continuous CTG during labour is associated with a decrease in neonatal seizures but no significant difference in infant mortality, cerebral palsy, or other standard measures of neonatal wellbeing [64–68]. In addition, continuous CTG monitoring restricts a woman's movements during labour and may limit her choice of birthing position [67,69]. Restricting a woman's mobility also leads to a lack of control over both her body and her environment [69]. Furthermore, a Cochrane review showed that continuous CTG was associated with an increase in caesarean sections and instrumental vaginal births, both of which carry a high risk for women as well as newborns [65–69].

Sustained uterine massage to prevent PPH in women who have received prophylactic oxytocin was not seen during the current practice. However, several studies conducted in Turkey (27.6%) [41] and Ethiopia (69.9%) [13] reported that women received uterine massage to prevent postpartum blood loss. A Cochrane review in 2013 reported the use of staff time, discomfort caused to women, and increased blood loss by pressing pooled blood out from the uterine cavity as disadvantages of uterine massage [63]. However, a randomised controlled trial conducted in Turkey recognised uterine massage as a beneficial and life-saving measure that effectively reduces the amount of blood loss. Moreover, the study suggests uterine massage as a simple and cheap intervention for low- and middle-income countries with limited and inadequate resources and where the availability of uterotonics is limited or nonexistent [70]. However, according to WHO and FIGO (International Federation of Gynaecology and Obstetrics) guidelines, sustained uterine massage is not recommended in women who have received prophylactic oxytocin, as it may have no benefit for the prevention of PPH [18,71]. In our study, routine nasal or oral suction was performed only in 5.6% of the newborns. However, the rates are higher in several studies conducted in India (34.2%) [26] and Ethiopia (63.9%) [13].

4.3. Strengths and limitations

This study was the first to evaluate the intrapartum care practices during vaginal births at a tertiary care hospital in Sri Lanka, against the WHO recommendations on intrapartum care for a positive childbirth experience. Therefore, the novelty of the current study is considered a major strength. The direct observations of the deliveries aided in developing baseline data on general intrapartum practices as well as women's obstetric characteristics. Moreover, the study used a well-structured observation checklist that covered all aspects of intrapartum care during vaginal births.

There were several limitations in this study. The findings of this study are limited to a single tertiary care hospital in Central Sri Lanka and therefore cannot be generalised to all hospitals in Sri Lanka. Another limitation is that the data collection was interrupted from time to time during the peak of the COVID-19 pandemic, as access for the researcher to the study setting was not allowed. Therefore, the stipulated period for the data collection had to be extended. The small sample size of this study may also affect the generalizability of the findings.

5. Conclusion

The evidence-based recommendations on intrapartum care were not implemented satisfactorily in the study setting. Practices that insufficiently follow current WHO recommendations include allowing companionship during labour and childbirth, effective communication and information sharing, privacy protection during examinations, routine episiotomy for primiparous women, allowing mobility and upright positions during the first stage of labour, offering oral fluids, allowing preferred birthing positions, use of pharmacological, and non-pharmacological pain-relieving methods. Hence, it is noteworthy to examine the current intrapartum care in both private and government maternity facilities in Sri Lanka in comparison to evidence-based practices aiming to identify gaps and formulate strategies to ensure a positive childbirth experience for every expectant mother. Furthermore, the empowerment of maternity care providers through continuing professional development and formal training to develop knowledge, skills, and professional attitudes will facilitate the implementation of person-centred maternity care where the individual women's preferences,

needs, and values are appreciated and respected.

6. Recommendations

The study findings suggest that the adoption of evidence-based intrapartum care should be encouraged by conveying the evidence-based intrapartum care guidelines to the grassroots level health care workers to optimise the existing intrapartum interventions and to avoid unnecessary intrapartum interventions that can cause harm to both women and newborns. A collaborative effort from the highest authorities in maternity settings is needed to eliminate the use of inappropriate practices. They should take the leading role in improving other co-workers' knowledge and practices regarding the EBP and maintain transparent communication with them about the latest local and international updates and policies in the field of intrapartum care. Moreover, all care providers should contribute to creating a culture of awareness in the work environment that favours women's participation in care. Reformulating the national guidelines, and institutional protocols regarding intrapartum care in accordance with WHO recommendations and evidence-based practices may also contribute to uplifting the quality of intrapartum care. This should be done by the Ministry of Health, Sri Lanka, incorporating a multidisciplinary team including policymakers, stakeholders, and, most importantly, nurses and midwives, as they are the most in contact with labouring women.

It is recommended that the stakeholders pay attention to developing a plan for the establishment of an active labour ward or low-risk labour unit. The presence of a separate unit for low-risk women will enhance the provision of intrapartum care with fewer medical interventions. Accordingly, it will facilitate the future implementation of a midwife-led unit. Furthermore, it is recommended that the relevant authorities take the initiative in implementing the policy of labour companionship, and the hospital administration should facilitate the implementation of labour companionship in the labour room, ensuring a positive childbirth experience for women. Moreover, the highest authorities in the maternity care settings should ensure close supervision and proper guidance to the co-workers, which enables the delivery of respectful maternity care to the labouring women. Providing formal training for continuous professional development, and providing updated intrapartum care guidelines in evidence-based intrapartum care are imperative to improving current practice. Finally, the present study forms a baseline for further research studies related to evidence-based childbirth care and practices in Sri Lanka. It is essential to replicate this study on a larger scale, including government and private maternity units, to develop robust findings that would generate a broader picture of intrapartum care in Sri Lanka.

Ethics statement

This study was reviewed and approved by the Ethics Review Committee of the Faculty of Medicine, University of Peradeniya (2018/EC/34).

All participants provided informed consent to participate in the study.

No author declares any conflict of interest.

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Data availability statement

We did not deposit the study data into a publicly available repository for quantitative data. Data are stored on a password-protected external disk.

Data will be made available on request.

CRediT authorship contribution statement

Thilini Kumari Weerasingha: Writing – review & editing, Writing – original draft, Visualization, Validation, Supervision, Resources, Project administration, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Chathura Ratnayake:** Writing – review & editing, Validation, Supervision, Resources, Project administration, Methodology, Formal analysis, Conceptualization. **R.M. Abeyrathne:** Writing – review & editing, Validation, Supervision, Resources, Project administration, Methodology, Formal analysis. **Sampath U.B. Tennakoon:** Writing – review & editing, Validation, Supervision, Resources, Project administration, Methodology, Formal analysis.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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