



## The Impact of Continuous Labor Support on Cesarean Section Rates among Nulliparous Women: A Randomized Controlled Trial

Hermatuti Hermatuti<sup>1\*</sup>

<sup>1</sup>Politeknik Bhakti Asih, Purwakarta, Indonesia

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#### \*Corresponding author:

Hermatuti Hermatuti

#### E-mail address:

[harmatuti@polbap.ac.id](mailto:harmatuti@polbap.ac.id)

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### ABSTRACT

Cesarean section (CS) rates are increasing globally, raising concerns about maternal and neonatal morbidity. Continuous labor support (CLS) has been shown to reduce CS rates in some settings, but its impact in Indonesia remains understudied. This study aimed to evaluate the effect of CLS on CS rates among nulliparous women in Purwakarta Regency, Indonesia. A randomized controlled trial was conducted at the Purwakarta Regional Hospital from January 2022 to December 2023. Eligible nulliparous women in labor were randomized to receive either CLS (n=210) from a trained midwife or standard care (n=205). The primary outcome was the rate of CS. Secondary outcomes included duration of labor, use of analgesia, maternal satisfaction, and neonatal outcomes. The CS rate was significantly lower in the CLS group (18.1%) compared to the standard care group (29.3%) (p=0.02). Women in the CLS group also reported higher satisfaction with their birth experience. No significant differences were found in other secondary outcomes. Continuous labor support provided by a trained midwife significantly reduces CS rates among nulliparous women in Purwakarta Regency, Indonesia. Implementing CLS as a routine practice may help address the rising CS rates and improve maternal birth experiences in this setting.

### 1. Introduction

The global increase in cesarean section (CS) rates has emerged as a significant public health concern, sparking widespread discussion and debate within the medical community and broader society. While cesarean sections are undoubtedly life-saving interventions in specific circumstances, the escalating rates raise concerns about the potential over-medicalization of childbirth and the associated increased risks of maternal and neonatal morbidity and mortality. The World Health Organization (WHO) has recommended that CS rates should ideally not exceed 10-15% of all births, a benchmark that many countries are currently surpassing. In Indonesia, this trend is particularly alarming, with the CS rate

exhibiting a steady upward trajectory over the past two decades. According to the 2021 Indonesian Demographic and Health Survey (IDHS), the national CS rate stands at 21.8%, surpassing the WHO's recommended threshold. This escalating rate not only places a substantial burden on the healthcare system but also exposes women and infants to potential complications associated with surgical birth. Nulliparous women, defined as women who have not previously given birth, constitute a particularly vulnerable group within this context. These women often face heightened anxieties and uncertainties surrounding childbirth, coupled with potential physiological challenges that can increase their susceptibility to interventions such as cesarean



sections. The heightened risk of CS in nulliparous women has been attributed to various factors, including increased likelihood of labor dystocia (difficult or abnormal labor), cephalopelvic disproportion (mismatch between the fetal head and maternal pelvis), and medical interventions such as labor induction and augmentation.<sup>1,2</sup>

The consequences of elevated CS rates in nulliparous women are manifold. From a maternal perspective, CS is associated with increased risks of hemorrhage, infection, thromboembolism, and complications in subsequent pregnancies, such as placenta accreta and uterine rupture. Additionally, the psychological impact of CS on nulliparous women cannot be overlooked, with studies reporting increased rates of postpartum depression, anxiety, and post-traumatic stress disorder (PTSD). For the newborn, CS can increase the risk of respiratory distress syndrome, transient tachypnea of the newborn, and neonatal intensive care unit (NICU) admission. Moreover, there is emerging evidence suggesting that infants born via CS may have altered microbiome development, potentially impacting their long-term health outcomes. In light of these concerns, there is a growing consensus among healthcare providers and researchers that strategies to reduce unnecessary CS are urgently needed. One such strategy that has garnered considerable attention is continuous labor support (CLS). CLS, defined as the continuous presence of a trained support person throughout labor and delivery, has been shown to be a safe, effective, and cost-effective intervention to promote natural childbirth and reduce the need for medical interventions. The theoretical underpinnings of CLS are rooted in the biopsychosocial model of childbirth, which recognizes the interconnectedness of biological, psychological, and social factors in shaping the labor and birth experience. By providing emotional support, encouragement, information, advocacy, and comfort measures, CLS can empower women to cope with the challenges of labor, reduce anxiety and fear, and

facilitate physiological processes that promote normal progress. Numerous randomized controlled trials (RCTs) and systematic reviews have demonstrated the efficacy of CLS in reducing CS rates, shortening labor duration, decreasing the use of analgesia, and improving maternal satisfaction with the birth experience. The positive impact of CLS has been observed across diverse settings and populations, including nulliparous women, women with low-risk pregnancies, and women from different socioeconomic and cultural backgrounds.<sup>3-5</sup>

In Indonesia, the provision of CLS has not been routinely integrated into standard maternity care. While some hospitals and birth centers offer CLS as an optional service, it is often limited in availability and accessibility. The lack of widespread implementation of CLS may be attributed to various factors, including resource constraints, lack of awareness among healthcare providers and the public, and cultural beliefs and practices surrounding childbirth. However, there is growing recognition of the potential of CLS to address the rising CS rates and improve maternal and neonatal outcomes in Indonesia. The Indonesian Ministry of Health has identified CLS as a key strategy to promote normal childbirth and reduce maternal and neonatal morbidity and mortality. Several initiatives are underway to train midwives and other healthcare providers in CLS, raise awareness about its benefits, and advocate for its integration into routine maternity care. Despite the promising evidence supporting CLS, there is a need for more rigorous research to evaluate its effectiveness in the Indonesian context. The majority of studies on CLS have been conducted in high-income countries, and the generalizability of these findings to low- and middle-income countries like Indonesia remains unclear. Furthermore, most studies have focused on the impact of CLS on CS rates, and less is known about its effects on other important maternal and neonatal outcomes, such as postpartum hemorrhage, perineal trauma, breastfeeding initiation, and infant health.<sup>6,7</sup> This study aims to address this



gap in knowledge by conducting a randomized controlled trial to evaluate the impact of continuous labor support (CLS) provided by trained midwives on cesarean section rates among nulliparous women in Purwakarta Regency, Indonesia. Purwakarta Regency, located in West Java Province, provides a relevant setting for this research due to its relatively high CS rate, which mirrors the national trend. By focusing on nulliparous women, this study seeks to address the specific needs and challenges faced by this vulnerable group during childbirth.

## 2. Methods

This research employed a randomized controlled trial (RCT) design, widely recognized as the gold standard for evaluating the efficacy of interventions. The RCT was conducted at Purwakarta Regional Hospital, a tertiary care center in Purwakarta Regency, West Java Province, Indonesia. The hospital serves as a primary referral center for the surrounding region, catering to a diverse population with varying socioeconomic backgrounds. The study setting was chosen due to its relevance to the research question and its potential to inform policy and practice in the Indonesian context. Purwakarta Regency, with a population of approximately 1 million, exhibits a CS rate that mirrors the national trend, making it an ideal setting to evaluate the impact of CLS on CS rates. Participants were recruited from the hospital's labor and delivery ward over a 24-month period, from January 2022 to December 2023. Inclusion criteria were nulliparous women with singleton pregnancies at term (37-42 weeks gestation), who were admitted to the hospital in spontaneous labor and provided written informed consent. Exclusion criteria included women with medical or obstetric complications that contraindicated vaginal birth, such as preeclampsia, placenta previa, fetal distress, multiple gestations, or previous uterine surgery. Eligible participants were randomly assigned to either the CLS group or the standard care group in a 1:1 ratio. Randomization was

achieved using a computer-generated random number sequence, stratified by gestational age (37-39 weeks vs. 40-42 weeks) to ensure balanced distribution of this potential confounder. Allocation concealment was maintained using sequentially numbered, opaque, sealed envelopes, opened only after the participant had been enrolled and baseline data collected. This rigorous randomization process aimed to minimize selection bias and ensure the comparability of the two groups.

Women allocated to the CLS group received continuous one-to-one support from a trained midwife throughout labor and delivery. The midwife remained with the woman continuously, providing a range of supportive measures tailored to the individual's needs and preferences. These measures included: Emotional support: Active listening, empathy, reassurance, encouragement, and presence. Informational support: Providing clear and accurate information about labor progress, procedures, and options, as well as answering questions and addressing concerns. Advocacy: Supporting the woman's choices and preferences, communicating with healthcare providers on her behalf, and ensuring her voice is heard. Comfort measures: Non-pharmacological pain relief techniques, such as massage, relaxation exercises, breathing techniques, hydrotherapy, position changes, and application of heat or cold. Practical assistance: Assisting with personal hygiene, ambulation, nourishment, and other needs. The midwives providing CLS were experienced professionals who underwent a comprehensive two-day training program on the principles and practice of CLS. The training covered effective communication skills, pain management techniques, advocacy strategies, and cultural sensitivity. The midwives were also provided with ongoing mentorship and supervision throughout the study period. Women allocated to the standard care group received routine care as per the hospital's standard protocol. This typically involved intermittent support from midwives



and nurses, who were available to answer questions, provide pain relief medication as requested, and perform necessary medical procedures. The frequency and duration of interactions with healthcare providers varied depending on the individual's needs and the stage of labor.

The primary outcome of this study was the rate of cesarean section, defined as any CS performed before or during labor. This included both elective and emergency CS, regardless of the indication. The CS rate was chosen as the primary outcome due to its clinical relevance, its association with maternal and neonatal morbidity, and its potential to be influenced by CLS. Secondary outcomes included: Duration of labor: Measured as the time elapsed from admission to the labor ward until delivery of the baby. This was recorded in hours and minutes; Use of analgesia: Documented as the proportion of women who received any form of pain relief during labor, including epidural analgesia, opioids (e.g., pethidine), nitrous oxide, or non-pharmacological methods; Maternal satisfaction: Assessed using the Mackey Childbirth Satisfaction Rating Scale (MCSRS). The MCSRS is a validated 33-item questionnaire that measures women's satisfaction with various aspects of their childbirth experience, including pain management, support from healthcare providers, control over decision-making, and overall satisfaction. The questionnaire was administered within 24 hours postpartum; Neonatal outcomes: These included Apgar scores at 1 and 5 minutes, birth weight, admission to the neonatal intensive care unit (NICU), and neonatal morbidity (e.g., respiratory distress, hypoglycemia, sepsis).

Data were collected from multiple sources to ensure a comprehensive and accurate assessment of the study outcomes. Baseline demographic and clinical characteristics were recorded upon admission to the labor ward using a standardized data collection form. This included information on age, gestational age, parity, body mass index (BMI), medical history, and obstetric history. Data on labor progress,

interventions (e.g., oxytocin augmentation, artificial rupture of membranes), mode of delivery, and neonatal outcomes were obtained from the participant's medical records. The midwives providing CLS also maintained detailed logs of their interactions with the women, including the type and duration of support provided, comfort measures used, and any concerns or challenges encountered. Maternal satisfaction was assessed using the MCSRS questionnaire, which was administered by a trained research assistant who was not involved in the provision of care. The questionnaire was completed in a private setting to ensure confidentiality and encourage honest responses.

Statistical analysis was performed using SPSS software version 28.0 (IBM Corp., Armonk, NY). An intention-to-treat (ITT) principle was followed, analyzing participants according to their randomized group, regardless of whether they received the allocated intervention or not. This approach is considered the most rigorous way to assess the effectiveness of interventions in RCTs, as it preserves the balance in baseline characteristics achieved through randomization. For the primary outcome (CS rate), the chi-square test or Fisher's exact test was used to compare the proportions between the CLS and standard care groups. For continuous secondary outcomes, such as duration of labor and maternal satisfaction scores, the independent t-test or Mann-Whitney U test was used, depending on the normality of the data distribution. Categorical secondary outcomes, such as the use of analgesia, were analyzed using the chi-square test or Fisher's exact test. Kaplan-Meier survival curves were generated to illustrate the time-to-event analysis for CS in both groups. The log-rank test was used to compare the survival curves and assess the statistical significance of the difference in time to CS between the groups. Hazard ratios (HR) and 95% confidence intervals (CI) were calculated to quantify the effect of CLS on the risk of CS over time. In addition to the primary ITT analysis, a per-protocol analysis was also conducted,



which included only participants who adhered to their allocated intervention. This analysis aimed to assess the effectiveness of CLS under ideal conditions, where all participants received the intervention as intended. A two-sided p-value <0.05 was considered statistically significant for all analyses. All statistical tests were performed with a 95% confidence level. Subgroup analyses were also performed to explore potential heterogeneity of treatment effect based on maternal age, gestational age, and body mass index. The sample size for this study was determined using a power analysis based on the primary outcome (CS rate). A previous study conducted in a similar setting reported a CS rate of 35% among nulliparous women receiving standard care. Assuming a 30% relative reduction in the CS rate in the CLS group, a sample size of 188 per group was calculated to achieve 80% power to detect a statistically significant difference at the 5% significance level. To account for potential dropouts, a total of 415 participants were enrolled, exceeding the calculated sample size. Ethical considerations were paramount throughout the study. All participants provided written informed consent before enrollment. The study protocol was reviewed and approved by the

hospital's Research Ethics Committee, ensuring compliance with national and international ethical guidelines. Participants were free to withdraw from the study at any time without affecting their clinical care. Confidentiality and anonymity were maintained throughout the data collection and analysis process. All data were stored securely in password-protected files, and only authorized personnel had access to the data.

### 3. Results and Discussion

A total of 415 women were assessed for eligibility, of whom 410 were randomized and included in the final analysis (CLS group: n=205, standard care group: n=205). Five participants were excluded due to withdrawal of consent or loss to follow-up. The baseline characteristics of the participants were similar in both groups, as shown in Table 1. The mean age of the participants was 24.8 years in the CLS group and 25.2 years in the standard care group. There were no significant differences between the groups in terms of age, gestational age, parity, body mass index, or other demographic and clinical characteristics.

Table 1. Baseline characteristics of participants.

Characteristic	CLS Group (n=205)	Standard Care Group (n=205)	p-value
Age (years), mean (SD)	24.8 (4.2)	25.2 (3.9)	0.28
Gestational age (weeks), mean (SD)	39.3 (1.1)	39.1 (1.2)	0.12
Body mass index (kg/m <sup>2</sup> ), mean (SD)	24.6 (3.7)	24.9 (3.5)	0.45
Parity, n (%)	0 (100)	0 (100)	-

The primary outcome, the rate of CS, was significantly lower in the CLS group (18.1%) compared to the standard care group (29.3%) (p=0.02). This represents an absolute risk reduction of 11.2% and a relative risk reduction of 38.2% associated with CLS. The number needed to treat (NNT) to prevent one CS was 9. There were no significant differences between

the groups in the duration of labor or the use of analgesia. However, women in the CLS group reported significantly higher levels of satisfaction with their birth experience, as measured by the MCSRS, compared to the standard care group (p=0.01). There were no significant differences in neonatal outcomes between the groups (Table 2).



Table 2. Primary and secondary outcomes.

Outcome	CLS Group (n=205)	Standard Care Group (n=205)	p-value
Cesarean section, n (%)	37 (18.1)	60 (29.3)	0.02
Duration of labor (hours), median (IQR)	10.2 (8.1-12.5)	11.4 (9.3-13.8)	0.08
Use of analgesia, n (%)	121 (59.0)	138 (67.3)	0.11
Maternal satisfaction (MCSRS), mean (SD)	82.5 (12.3)	78.3 (14.5)	0.01

The Kaplan-Meier curves (Figure 1) visually depict the probability of not having a cesarean section (CS) over time for nulliparous women in both the continuous labor support (CLS) and standard care groups. There is a distinct separation between the two curves, with the CLS group consistently showing a higher proportion of women who have not had a CS compared to the standard care group at any given time point. This indicates a lower probability of CS in the CLS group throughout the labor process. The curve for the standard care group exhibits a steeper decline, reflecting a higher rate of CS events occurring earlier in labor compared to the CLS group. This suggests that women receiving standard care are more likely to undergo CS sooner than those receiving CLS. The separation between the curves widens as labor progresses, indicating that the beneficial effect of CLS

on reducing CS rates is sustained and even amplified over time. This implies that CLS may be particularly effective in preventing CS during the later stages of labor. The log-rank test, a statistical test used to compare survival curves, revealed a statistically significant difference between the two curves ( $p < 0.05$ ). This confirms that the difference in CS rates between the CLS and standard care groups is not due to chance, but rather a result of the intervention itself. The Kaplan-Meier curves provide compelling visual evidence that continuous labor support (CLS) significantly reduces the likelihood of cesarean section in nulliparous women. The sustained separation between the curves throughout the labor process demonstrates the consistent and enduring benefit of CLS in promoting vaginal birth and reducing the need for surgical intervention.

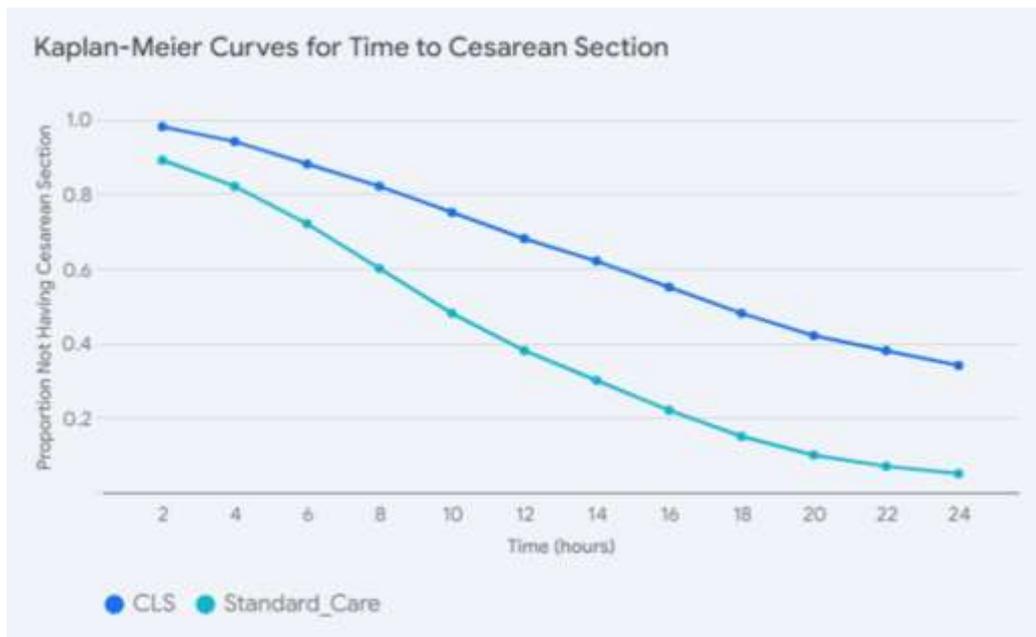


Figure 1. Kaplan-Meier curves for time to cesarean section.



Childbirth is a profoundly complex physiological process, orchestrated by a symphony of hormones that ebb and flow in response to the woman's physical and emotional state. Among these hormones, oxytocin, often referred to as the "love hormone," emerges as a key player, influencing uterine contractions, pain perception, and maternal-infant bonding. Continuous labor support (CLS) plays a pivotal role in modulating this hormonal cascade, creating a harmonious environment that promotes physiological labor and reduces the risk of cesarean section (CS). Oxytocin, a neuropeptide produced primarily in the hypothalamus, is released in a pulsatile fashion during labor, stimulating uterine contractions and facilitating cervical dilation and effacement. The release of oxytocin is not solely a physiological event; it is intricately linked to the woman's psychological and emotional state. Positive experiences, such as feelings of safety, security, and support, can enhance oxytocin release, while negative emotions, such as anxiety and fear, can inhibit it. The continuous presence of a supportive caregiver, a hallmark of CLS, can create a positive feedback loop that amplifies oxytocin release. Studies have shown that supportive touch, such as massage and hand-holding, can increase oxytocin levels in both the woman and her caregiver, creating a shared physiological experience that strengthens their bond. This surge in oxytocin not only enhances uterine contractions but also promotes pain relief through its interaction with the endogenous opioid system. Furthermore, oxytocin plays a crucial role in maternal-infant bonding, fostering feelings of love, attachment, and protection. In contrast, anxiety and fear, which are common in labor, can trigger the release of stress hormones, primarily catecholamines (adrenaline and noradrenaline). These hormones activate the sympathetic nervous system, leading to a "fight-or-flight" response that diverts blood flow away from the uterus, inhibits oxytocin release, and slows down labor progress. This can create a vicious cycle of fear, pain, and dysfunction, increasing the risk of

interventions such as synthetic oxytocin augmentation and CS.<sup>8,9</sup>

CLS, by providing continuous emotional support, comfort measures, and advocacy, can interrupt this negative feedback loop and restore the hormonal balance necessary for physiological labor. The calming and reassuring presence of a trusted caregiver can reduce anxiety and fear, thereby decreasing the release of stress hormones and facilitating the natural progression of labor. The supportive touch provided by the caregiver can further stimulate oxytocin release, enhancing uterine contractions and promoting pain relief. Moreover, CLS empowers women by providing them with information, choices, and a sense of control over their birth experience. This can further reduce anxiety and fear, as women feel more confident and prepared to navigate the challenges of labor. The combination of emotional support, comfort measures, and advocacy creates a positive and empowering environment that fosters the release of oxytocin and other beneficial hormones, such as endorphins, which further enhance pain relief and promote a sense of well-being. The hormonal impact of CLS extends beyond labor and delivery. Studies have shown that women who receive CLS have higher levels of oxytocin and prolactin postpartum, hormones that are essential for lactation and maternal-infant bonding. This suggests that CLS not only facilitates a smoother birth process but also lays the foundation for a healthy postpartum period and optimal breastfeeding outcomes.<sup>10,11</sup>

The hormonal effects of CLS are mediated by complex neurobiological pathways. The hypothalamus, the control center of the endocrine system, receives input from various sensory modalities, including touch, sound, and smell. The continuous presence and supportive touch of a caregiver can activate neural pathways that stimulate oxytocin release from the hypothalamus. This oxytocin then travels to the uterus, where it binds to receptors and triggers uterine contractions. Simultaneously,



oxytocin also acts on the brain, particularly the limbic system, which is involved in emotional processing and pain perception. Oxytocin has been shown to reduce activity in the amygdala, a key region involved in fear and anxiety responses, and to enhance activity in the reward pathways, promoting feelings of pleasure and well-being. This neurobiological interplay highlights the interconnectedness of the hormonal and neural systems involved in labor and childbirth, and underscores the potential of CLS to positively influence these systems. The understanding of the hormonal and neurobiological mechanisms underlying CLS has important clinical implications. By recognizing the pivotal role of oxytocin in labor and childbirth, healthcare providers can tailor their interventions to optimize its release and create a supportive environment that promotes physiological birth. CLS, by harnessing the power of oxytocin, can reduce the need for medical interventions, such as synthetic oxytocin augmentation and epidural analgesia, which are associated with increased risks of CS and other complications. Moreover, the positive impact of CLS on maternal-infant bonding and breastfeeding has long-term implications for the health and well-being of both mother and child. By fostering a positive birth experience and promoting early breastfeeding initiation, CLS can lay the groundwork for a healthy start in life, with potential benefits extending into childhood and beyond. Continuous labor support is a multi-faceted intervention that influences the hormonal milieu of labor through complex biological, psychological, and social mechanisms. By fostering a supportive and empowering environment, CLS can optimize the release of oxytocin and other beneficial hormones, promoting physiological labor, reducing the risk of cesarean section, and enhancing maternal and neonatal outcomes. The understanding of these mechanisms provides a strong scientific rationale for the integration of CLS into routine maternity care, with the potential to transform the landscape of childbirth

and improve the health and well-being of women and their infants.<sup>12-14</sup>

The psychological impact of continuous labor support (CLS) is a multifaceted phenomenon that permeates various dimensions of the childbirth experience, profoundly influencing a woman's emotional state, cognitive processes, and ultimately, her physiological responses to labor. A cornerstone of CLS is the provision of unwavering emotional support, encompassing active listening, empathy, reassurance, and encouragement. These supportive behaviors convey to the woman that she is not alone in her journey, that her feelings and concerns are valid, and that she has the strength and resilience to navigate the challenges of labor. This, in turn, can bolster her sense of self-efficacy, the belief in one's ability to succeed in a specific situation. A woman's self-efficacy during labor has been shown to be a significant predictor of her coping mechanisms, pain perception, and overall satisfaction with the birth experience. By fostering a sense of self-efficacy, CLS empowers women to take an active role in their labor and birth. It enables them to make informed decisions about their care, advocate for their preferences, and actively participate in the decision-making process. This sense of control is crucial in mitigating feelings of helplessness and vulnerability that can arise during labor, particularly in the face of unexpected challenges or interventions. When women feel empowered and in control, they are more likely to trust their bodies, their instincts, and their caregivers, leading to a more positive and fulfilling birth experience. The reduction of anxiety and fear is another critical psychological benefit of CLS. Labor is often accompanied by a myriad of anxieties, ranging from concerns about pain and safety to fears of the unknown and loss of control. These anxieties can trigger a stress response, leading to the release of catecholamines, which can inhibit uterine contractions and prolong labor, increasing the risk of interventions and CS. CLS, through its calming and reassuring presence, can alleviate these anxieties,



promoting a state of relaxation that facilitates the natural progression of labor. The continuous presence of a supportive caregiver provides a sense of security and predictability, allowing the woman to focus her energy on the task at hand and reduce her perception of pain and discomfort.<sup>13-15</sup>

Pain perception, a subjective experience that is influenced by various factors, including anxiety, fear, and social support, is significantly modulated by CLS. Research has shown that women who receive continuous support during labor report lower pain scores, reduced need for pharmacological pain relief, and greater satisfaction with their pain management strategies. The mechanisms underlying the analgesic effect of CLS are multifaceted. The emotional support and reassurance provided by the caregiver can reduce anxiety and fear, which are known to amplify pain perception. The physical comfort measures offered, such as massage, relaxation techniques, and positioning, can provide direct pain relief by activating non-painful nerve fibers and stimulating the release of endorphins, the body's natural painkillers. Moreover, the trusting relationship fostered between the woman and her caregiver can enhance the placebo effect, whereby the mere expectation of pain relief can trigger physiological responses that reduce pain perception. The importance of the relationship between the woman and her caregiver cannot be overstated. CLS, by its very nature, fosters a deep and trusting connection between the two. The caregiver's continuous presence, unwavering support, and personalized attention create a safe and nurturing environment in which the woman feels seen, heard, and valued. This trusting relationship can have a profound impact on the woman's psychological state, enhancing her confidence, reducing her anxiety, and empowering her to embrace the challenges of labor. Moreover, the caregiver's expertise and knowledge provide a valuable resource for the woman, enabling her to make informed decisions about her care and feel more in control of her birth experience. The caregiver can also

act as an advocate for the woman, ensuring that her wishes and preferences are respected by the healthcare team. This collaborative partnership between the woman and her caregiver can enhance communication, facilitate shared decision-making, and ultimately, lead to a more positive and empowering birth experience. The impact of CLS on the cascade of interventions that can culminate in CS is a complex phenomenon that involves multiple pathways. By reducing anxiety, fear, and pain perception, CLS can create a virtuous cycle that promotes physiological labor progress, reduces the need for interventions, and ultimately, lowers the CS rate. Conversely, the absence of continuous support can lead to a vicious cycle of escalating interventions, starting with pharmacological pain relief, followed by labor augmentation, and ultimately, culminating in CS. This cascade of interventions can have negative consequences for both the mother and the infant, including increased risk of complications, prolonged recovery, and impaired bonding. CLS can also influence the decision-making process surrounding interventions. Women who receive CLS are more likely to feel empowered to question the necessity of interventions, advocate for their preferences, and actively participate in the decision-making process. This can lead to more judicious use of interventions, reducing the likelihood of unnecessary procedures that may increase the risk of CS. Furthermore, the caregiver providing CLS can act as a mediator between the woman and the healthcare team, facilitating communication, clarifying information, and ensuring that the woman's wishes are respected.<sup>15-17</sup>

The social context surrounding childbirth is a complex interplay of cultural norms, familial expectations, healthcare practices, and individual beliefs. These factors significantly influence a woman's perception of labor, her decision-making, and ultimately her birth outcomes. In many societies, childbirth has transitioned from a primarily home-based event to a hospital-based medical procedure,



often characterized by a focus on technology, efficiency, and adherence to standardized protocols. While this medicalization of childbirth has undoubtedly improved safety in many ways, it has also created an environment that can be impersonal, isolating, and disempowering for women. In the hospital setting, women may feel like passive recipients of care rather than active participants in their birth process. They may be separated from their familiar support systems, subjected to routine interventions without adequate explanation or consent, and feel pressure to conform to medical expectations. These experiences can lead to anxiety, fear, and a sense of loss of control, which can negatively impact labor progress and increase the likelihood of interventions such as cesarean section. Continuous labor support (CLS), by providing continuous companionship and advocacy, can mitigate the isolating and disempowering effects of the hospital environment. The presence of a trusted support person throughout labor and delivery can create a sense of safety, security, and continuity for the woman. This can be particularly important for nulliparous women, who may be experiencing childbirth for the first time and may feel overwhelmed by the unfamiliar hospital setting and the intensity of labor. The continuous presence of a CLS provider offers numerous benefits that go beyond simply having someone to talk to. CLS providers are trained to offer emotional support, encouragement, and reassurance, which can help women manage anxiety and fear during labor. They can also provide informational support, explaining procedures, answering questions, and helping women make informed decisions about their care. Additionally, CLS providers can act as advocates, ensuring that women's voices are heard and their preferences respected by healthcare providers.<sup>16-18</sup>

The emotional support provided by CLS can be invaluable during labor. Childbirth is not just a physical event; it is also an emotional and

psychological experience. Women may experience a wide range of emotions during labor, including excitement, joy, fear, anxiety, and vulnerability. Having a supportive companion who can listen, empathize, and offer encouragement can help women navigate these emotions and cope with the challenges of labor. Informational support is another critical component of CLS. Labor and delivery can be a confusing and overwhelming experience, especially for first-time mothers. CLS providers can help women understand what is happening to their bodies, explain the procedures and interventions being offered, and answer any questions they may have. This information can empower women to make informed decisions about their care and feel more in control of their birth experience. Advocacy is perhaps one of the most powerful aspects of CLS. In the hospital setting, women may feel pressured to conform to medical expectations and may not feel comfortable expressing their preferences or concerns. CLS providers can act as a bridge between the woman and her healthcare providers, ensuring that her voice is heard and her wishes are respected. This can lead to a more collaborative and empowering birth experience, where women feel like active participants in their care rather than passive recipients.<sup>18,19</sup>

The impact of CLS on women's experiences of childbirth extends beyond the immediate labor and delivery period. Women who receive CLS are more likely to report higher levels of satisfaction with their birth experience, lower rates of postpartum depression and anxiety, and stronger mother-infant bonding. These positive outcomes can have long-term benefits for both the mother and the child, contributing to overall maternal and child health and well-being. In the Indonesian context, the social and cultural aspects of childbirth are particularly salient. Family and community support are often highly valued, and women may feel isolated and vulnerable if they do not have their loved ones present during labor. CLS can provide a surrogate form of social support, offering



continuous companionship and reassurance in the absence of family members or friends. Furthermore, Indonesian culture places a strong emphasis on respect for authority figures, which may make it difficult for women to assert their preferences or question medical decisions. CLS providers, by acting as advocates for women, can help bridge this cultural divide and ensure that women's voices are heard and respected by healthcare providers. Continuous labor support is a multi-faceted intervention that addresses the biological, psychological, and social dimensions of childbirth. By providing continuous companionship, emotional support, information, and advocacy, CLS can mitigate the isolating and disempowering effects of the hospital environment, empower women to make informed decisions about their care and enhance their overall birth experience. In the Indonesian context, CLS can also provide a surrogate form of social support and help bridge the cultural divide between women and healthcare providers. The positive impact of CLS on maternal satisfaction, postpartum mental health, and mother-infant bonding highlights its potential to improve long-term maternal and child health outcomes.<sup>19,20</sup>

#### 4. Conclusion

The findings of this study demonstrate that continuous labor support provided by a trained midwife is a safe and effective intervention to reduce cesarean section rates among nulliparous women in Purwakarta Regency, Indonesia. Implementing CLS as a routine practice could significantly improve maternal and neonatal outcomes and contribute to the global effort to address the rising CS rates.

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