



SHORTENING THE DURATION OF THE SECOND STAGE OF LABOR AND INCREASING COMFORT WITH ESA CHAIR

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Abstract

Background: The duration of labor is an important indicator of maternal and infant safety. The success and length of labor is influenced by birthing position. The ESA chair is designed to facilitate an upright position during labor, which, in theory, speeds up the birth process and increases maternal comfort. **Objective:** to analyze the comparison of the duration of mothers using ESA chairs and delivery beds at independent midwives in Tasikmalaya city. **Method:** This study used a quasi-experimental approach with a two-group-posttest-only design, namely interventions in the group of mothers giving birth using ESA chairs and the group of mothers giving birth using delivery beds. The sampling technique used a total of 24 respondents. Data analysis used the Mann-Whitney test. **Results:** The results of the analysis showed that the duration of labor between the two groups showed that the average duration of labor in the ESA Chair group (34.23) was significantly faster than the average duration of labor in the "Delivery Bed" group (51.45). The results of statistical analysis using the Mann-Whitney test showed a p-value of 0.000. **Conclusion:** ESA chairs are more effective than delivery beds in shortening the duration of labor in mothers.

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INTRODUCTION

Labor is the process of opening and thinning the cervix, allowing the fetus to descend into the birth canal. Birth is the process by which the fetus and amniotic fluid are pushed out through the birth canal.¹ Normal labor and delivery is the process of expelling the fetus during full-term pregnancy (37 to 42 weeks), spontaneous delivery in a cephalic presentation, occurring within 18 hours, without complications for either the mother or the fetus.²

The success and duration of labor are influenced by several factors: passage (birth canal), passenger (fetus and placenta), strength, maternal position, and maternal psychology. In labor with normal passage and passenger, maternal strength, position, and psychology are crucial factors in determining the success and duration of labor.³ Smooth muscle tension, hormonal influences, nutritional intake, and fatigue influence maternal strength. The mother's position during labor can influence anatomical and physiological adaptations to the birth canal. An appropriate position can provide several benefits, such as providing comfort and improving circulation, increasing the mother's strength for pushing, and supporting the force of gravity, which helps the head descend.⁴

The World Health Organization (WHO) estimates that 70-80% of pregnant women experience low-risk complications during labor and delivery. Maternal mortality remains a global problem.⁶ According to the WHO, the global maternal mortality rate is 189 per 100,000 live births due to labor and pregnancy. Meanwhile, in Southeast Asia (ASEAN), the maternal mortality rate is 218 per 100,000 live births.⁵ This indicates that Indonesia's achievements in reducing maternal mortality have not yet met the 2030 Sustainable Development Goals (SDGs) target. Based on district/city health profile data in West Java province, the number of maternal deaths in 2020 was 745 cases, or 85.77 per 100,000 live births, an increase of 61 cases compared to 684 cases in 2019.⁷ The causes of maternal death are still dominated by bleeding (27.92%), hypertension during pregnancy (28.86%), infection (3.76%), circulatory system disorders (heart) (10.07%), metabolic disorders (3.49%), and other causes (25.91%) (West Java Health Profile 2020). Maternal mortality due to delivery is extremely high, necessitating appropriate intervention. The use of ESA chairs is an effective way to reduce the risk of complications during childbirth by providing optimal positioning for a smooth birth and ensuring maternal comfort. Research on the use of ESA chairs can help health workers improve their services and reduce maternal mortality due to complications during childbirth.⁸

One factor contributing to the high maternal mortality rate (MMR) and infant mortality rate (IMR) is the mother's unpreparedness for childbirth. A safe delivery requires physical and mental preparation from pregnancy, including routine check-ups, a healthy diet, and physical exercise. The fetus's condition must be monitored regularly to ensure optimal positioning and health. Selecting an appropriate delivery location and support from family or professionals are crucial for the mother's comfort.⁹ Pain management can be achieved through relaxation techniques or medical intervention,

if necessary. After delivery, attention to early breastfeeding. Monitoring the mother's health, and emotional support aid the recovery process. With thorough preparation, childbirth can be a safe and comfortable experience for both mother and baby. Improving maternal comfort during labor through proper birthing positions can help facilitate easier births and shorten labor durations. This can reduce maternal mortality rates caused by prolonged labor, obstructed labor, and other complications.¹⁰

In an effort to reduce maternal and neonatal mortality rates, clean, safe, and complication-preventive normal delivery care is crucial. This represents a paradigm shift in midwifery, from addressing complications to being more proactive in preparing for and preventing complications.¹¹ One proactive measure proven to be beneficial is support for the mother during labor, which includes providing comfort and choosing an appropriate birthing position. The speed of labor is an indicator of the success of maternal health services, as prolonged labor can increase the risk of complications for both mother and baby. Conversely, a rapid and controlled delivery can reduce these risks.¹²

An upright position during labor offers many benefits for both mother and baby. This position helps the mother feel calmer and reduces pressure on blood circulation, allowing more oxygen to flow to the baby.¹³ Furthermore, by utilizing gravity, upright positions such as standing, walking, or squatting can help accelerate the descent of the baby's head, thus shortening the duration of labor. Women who use this position generally feel more comfortable and satisfied during labor.¹⁴ Upright position during the active phase of the first stage of labor can accelerate the descent of the head due to gravity, thus shortening the first stage by approximately one hour. It can improve self-control over pain and reduce pressure on blood circulation, thus providing a greater oxygen supply to the baby, which is very beneficial for both mother and baby.¹⁵

The ESA chair is a new innovation in obstetrics to help speed up the duration of labor. The main advantage of the ESA chair in accelerating the delivery process is that it utilizes gravity to support the faster descent of the fetal head into the birth canal. The ESA chair also helps increase maternal comfort, reduces muscle tension, and allows for better control during the pushing phase. This position allows the mother to participate more actively in the labor process and provides a greater sense of control compared to a lying-down position. The ESA chair can shorten labor duration and increase maternal comfort.¹⁶ This study aims to test the effectiveness of the ESA chair compared to a delivery bed on labor duration in mothers.

METHODS

This study employed a design with a quasi-experimental with non-equivalent Control Group Design. The study was conducted at Independent Midwife Practice Center (TPMB) X in Tasikmalaya City from May to June. The population consisted of 24 respondents, the mother gave birth in the second stage of labor. The sampling technique used a total of 24 respondents. The sample was divided

into two groups: 12 respondents using the ESA chair and 12 respondents using the delivery bed. The inclusion criteria in this study were mothers giving birth in the second stage of labor, mothers giving birth who did not have any complications and who indicated they could have a normal birth. Respondents began receiving intervention by climbing onto the delivery bed and the ESA chair in the second stage of labor. Assessment of labor duration was conducted from the second stage until the baby was born.

Data collection was conducted by recording delivery times in the group using the ESA chair and the group using the delivery bed. This aimed to determine the difference in the duration of second-stage labor between respondents using ESA chairs and respondents using delivery beds. Record time is done by looking at the partograph or labor analysis data for each respondent. Supporting data was collected from the medical records of women in labor.

The instruments used were partograph observation sheets and medical record forms. Data analysis used the Mann-Whitney test. The Mann-Whitney test is a non-parametric statistical test for comparing median differences between two independent (unpaired) groups when the data are ordinal, interval, or ratio but not normally distributed. In this study, the Mann-Whitney test was used to compare the duration and comfort of groups of respondents who used single chairs and delivery beds.

All respondents agreed and signed informed consent to participate in this study. This study has passed the health research ethics review (KEPK) of the Tasikmalaya Ministry of Health Polytechnic, No. DP.04.03/F.XXVI.20/KEPK/320/2025. In research on the ESA chair designed to improve maternal comfort and shorten the duration of labor, researchers must uphold strict ethical principles. First, they must obtain informed consent from each participant after clearly explaining the study's purpose, procedures, benefits, and potential risks. Second, they must prioritize the safety of both mother and baby by following medical standards and ensuring supervision by qualified health professionals. Third, participants' personal data and privacy must be kept confidential. Additionally, researchers must secure approval from an institutional ethics committee before conducting the study. They should remain transparent, report findings honestly, and immediately stop the study if any significant risks arise.



A. Design of ESA Chair



B. Design of Delivery Bed

Figure 1. Differences In Design Between A Single Chair And A Delivery Bed

RESULTS

The analysis of delivery duration analysis was conducted on 24 respondent for mothers using ESA chairs and the Delivery Bed shows that of the 12 mothers giving birth using ESA chairs, the lowest delivery speed was 25'45" and the highest was 39'55". The average was 34'12". The analysis of the duration of labor for mothers using a delivery bed shows that of the 12 mothers, the lowest labor speed using a delivery bed was 40'10" and the highest was 60'00" with an average of 50'87". The results can be seen in Table 2.

Table 2. Duration of Labor Using a ESA Chair and Delivery Bed for Mothers

Group	Average	Minimum	Maximum	N
ESA'Chair	34.12	25.45	39.55	12
Delivery Bed	50,87	40,10	60,10	12

The analysis of labor duration in pregnant women using ESA chairs and delivery beds showed a significant difference. Pregnant women using ESA chairs had a shorter duration and were more effective in accelerating labor compared to the group using delivery beds, with a p-value of 0.000 ($p < 0.50$). The results can be seen in Table 3.

Tabel 3. Duration of Labour In Pregnant Women Using ESA Chairs And Delivery Beds

Group	Average	N	<i>p-value</i>
ESA'Chair	34.12	12	
Delivery Bed	50.87	12	0.000

DISCUSSION

The results of a study on the duration of delivery using the ESA Chair for 12 mothers showed that the average delivery speed was 33'23". This means that in general, mothers who used the ESA Chair had a delivery speed around that value. The minimum recorded delivery speed was 25'45",

while the maximum value reached 39'55". This range provides an overview of the variation in delivery speed within the ESA Chair user group.

The use of an ESA chair in this study is an intervention factor that can help minimize these obstacles. The vertical position of the ESA chair utilizes the force of gravity, helping to functionally expand the pelvic canal and accelerate fetal descent.¹⁶ Upright birthing positions such as sitting or squatting can accelerate the active phase of labor and reduce the need for medical intervention.¹⁸ The use of an ESA chair significantly shortened the duration of labor compared to bed delivery.¹⁹

The average value of 34'12" can be used as a basis for assessing whether the delivery process is characterized by rapid, normal, or slow labor in the context of pregnant women. This aligns with previous research that has explored the benefits of birth chairs and shown that women who birth in chairs feel stronger and safer than those who do not.²⁰ Approximately 69% of women who use chairs report improved pushing technique and shorter labor durations, indicating a positive effect of birth chair use.²²

This invention is also supported by previous literature that the use of birth chairs can shorten the first and second stages of labor, increase pushing efficiency, and provide a more comfortable birth experience for the mother. Furthermore, the total delivery time was shorter with the use of the BC-MK15 birth chair compared to a conventional bed.¹⁰ From a psychological perspective, maternal comfort during labor is an important factor in facilitating a smooth birth process. When the mother feels calmer, has more control over her body, and is able to actively participate in pushing, her body will be more responsive to the demands of labor. Stimulates contractions, thus accelerating fetal dilation and delivery. ESA chairs allow mothers to sit in a comfortable position, provide optimal back support, and allow for freedom of movement, thus strengthening their active role in the birthing process. Furthermore, the use of ESA chairs impacts the efficiency of healthcare services. Shorter delivery times reduce the workload of healthcare workers and allow for faster service to subsequent patients. Furthermore, by reducing the risk of prolonged labor, complications such as postpartum hemorrhage and infection, as well as surgical procedures such as vacuum extraction or cESArean section, can be reduced.¹⁶

The results of a study on delivery duration using a delivery bed for 12 mothers showed an average of 50'87". The minimum recorded delivery speed was 40.10", while the maximum reached 60.00. This indicates a wide range of delivery speed variations among mothers in this group. This aligns with research²³ had states that the delivery process is a very challenging journey, especially when mothers have to deal with intense pain and lack of support from those closest to them. At times like this, having a comfortable bed becomes crucial. A good bed can help mothers cope with pain, feel more relaxed, speed up the labor process, and improve the overall birth experience.⁹

Many studies and clinical experiences have shown that the supine position on the delivery bed is not entirely beneficial physiologically for the mother and fetus. This position allows the uterus to compress the inferior vena cava, which can reduce blood return to the heart, impacting uterine perfusion and fetal blood flow. This can potentially result in a decreased fetal heart rate and increased maternal discomfort and fatigue.³

The analysis of labor duration in mothers using the Single Chair and the Delivery Bed showed a significant difference in duration scores. Statistical analysis using the Man-Whitney test yielded a p-value of 0.000. α (0.05) indicates a significant difference between the ESA chair and the delivery bed. Overall, a visual comparison between the two groups showed that the average labor duration in the "delivery bed" group (50.87) was significantly longer than the average labor duration in the "ESA chair" group (34.12). This indicates that the use of an ESA chair may expedite the delivery process for mothers compared to the use of a delivery bed.

The primary advantage of an ESA chair in expediting the delivery process is its use of gravity, which supports a more rapid descent of the fetal head into the birth canal. The upright position of the ESA chair facilitates optimal fetal orientation and strengthens uterine contractions, thereby accelerating cervical dilation and a smoother delivery.¹⁶ The ergonomic position offered by the ESA chair also helps increase maternal comfort, reduces muscle tension, and allows for better control during the pushing phase. This position allows the mother to participate more actively in the birth process and provides a greater sense of control.¹⁰

The results of this study provide important insights for midwifery practice, both in Independent Midwife Practices and other healthcare facilities. One key consideration is the use of alternative delivery positions, such as sitting with an ESA chair, as part of the standard delivery position. This approach focuses not only on maternal comfort but also on the efficiency of the birth process and reduces the risk of unnecessary medical interventions.⁵

Research on the use of the ESA chair has several strengths and limitations. Its strengths lie in providing practical recommendations for health services to consider the ESA chair as an alternative birthing position, particularly for mothers, in order to optimize labor duration and improve maternal comfort. The study also encourages mothers to share information about birthing positions and opens opportunities for more comprehensive future research, including aspects such as pain intensity, fetal position, neonatal outcomes, and maternal psychological responses. However, the study has limitations, including a limited sample size, restricted research area, and insufficient control of confounding variables, which may affect the generalizability of the findings.

The recommendations in this study are: Health services are encouraged to consider the use of ESA chairs as a birthing option, particularly for mothers. This is to optimize position duration and

improve maternal comfort. It is hoped that women in labor will be able to share information about birthing positions. Future research is recommended to involve a larger sample size, expand the research area, and consider other confounding variables to strengthen the generalizability of the findings. Furthermore, research should not only focus on labor duration but also include other aspects such as pain intensity, maternal comfort level, fetal position, neonatal outcomes, and maternal psychological responses during labor. This is important for a more comprehensive understanding of the impact of ESA chairs on the overall delivery experience.

CONCLUSION

The average delivery duration for mothers using a Portable Chair (ESA Chair) was 34.12 minutes, shorter than the average delivery time of 50.87 minutes used on a delivery bed. This indicates that an ESA chair is more effective than a delivery bed in shortening the duration of labor for mothers.

Health services are encouraged to consider the use of ESA chairs as a birthing option, particularly for mothers. This is to optimize position duration and improve maternal comfort. It is hoped that women in labor will be able to share information about birthing positions. Future research is recommended to involve a larger sample size, expand the research area, and consider other confounding variables to strengthen the generalizability of the findings. Furthermore, research should not only focus on labor duration but also include other aspects such as pain intensity, maternal comfort level, fetal position, neonatal outcomes, and maternal psychological responses during labor. This is important for a more comprehensive understanding of the impact of ESA chairs on the overall delivery experience.

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Declarations

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