

THE EFFECT OF GYM BALL USE DURING PREGNANCY ON THE LABOR PROCESS AT THE INDEPENDENT MIDWIFE PRACTICE OF SUPIANI, S.KEB, MEDAN DELI SUB-DISTRICT

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ABSTRACT

The purpose of this study was to examine the effect of gym ball use during pregnancy on the duration and progress of labor at the Independent Midwife Practice of Supiani, S.Keb, in 2025. Prolonged labor remains a significant contributor to maternal and neonatal morbidity and mortality, particularly in low-resource settings. Non-pharmacological interventions, such as the use of a birthing or gym ball, are increasingly recommended as supportive strategies to facilitate labor through improved maternal positioning, comfort, and pelvic engagement. **Materials and Methods.** This quantitative study employed a quasi-experimental design with a pre-post control group format. The total sample consisted of 30 third-trimester pregnant women, divided into a treatment group (n=24) and a control group (n=6). The treatment group participated in prenatal gym ball sessions once per week for four weeks. Data were collected through secondary records, observation checklists, and the Hamilton Anxiety Rating Scale (HARS). Univariate and bivariate analyses were conducted, and a Chi-square test was applied to assess the relationship between gym ball use and labor duration. **Results.** The majority of respondents who used the gym ball (100%) experienced a faster labor process, while 50% of those who did not participate experienced prolonged labor. Statistical analysis revealed a significant association between gym ball use and the acceleration of labor (p-value = 0.005). **Conclusions.** Gym ball use during pregnancy significantly contributes to shorter labor duration and supports a more efficient labor process. Integrating gym ball exercises into antenatal care may enhance maternal outcomes and reduce the need for medical interventions.

Keywords: Gym ball, pregnancy, labor process, maternal health, non-pharmacological intervention

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INTRODUCTION

Childbirth is a complex physiological process that often causes discomfort and severe pain for the mother. According to the World Health Organization (WHO), labor pain is one of the most feared experiences by pregnant women and can significantly affect the overall birthing experience, including the mother's psychological condition after delivery. WHO data from 2020 estimates that 810 women die daily due to childbirth and pregnancy-related complications, totaling approximately 295,000 maternal deaths throughout the year. About 90% of these maternal deaths occur in developing countries. Between 2000 and 2019, the global maternal mortality ratio decreased by 38%, yet complications during pregnancy and childbirth remain the main causes of maternal death (WHO, 2020).

In Indonesia, the Ministry of Health reported that in 2020, there were 5,043,078 deliveries, with 23.2% of these experiencing childbirth complications (Ministry of Health Indonesia, 2020). According to the 2020 National Health Survey (Riskesdas), the most common complications during childbirth include premature rupture of membranes (5.6%), prolonged labor (4.3%), abnormal fetal

positions (3.1%), umbilical cord entanglement (2.9%), hypertension (2.7%), bleeding (2.4%), and others (4.6%).

In developing countries, challenges during labor are often related to limited access to medical facilities and analgesia. As a result, alternative methods such as using a gym ball (birthing ball) are increasingly considered. Gym balls are inexpensive, easy to use, and do not require medical intervention. Studies show that gym balls help accelerate cervical dilation, improve fetal positioning, and reduce the duration of the active labor phase (Khodakarami et al., 2015).

In Indonesia, prolonged labor remains a significant concern. According to the 2022 Indonesian Health Profile, prolonged labor accounts for 28.6% of maternal deaths. This highlights the importance of healthcare workers, especially midwives, finding innovative methods to speed up the labor process without increasing risks. One such innovation being introduced in midwifery practice is the use of the gym ball. Several local studies suggest that gym balls can speed up the active phase of labor and reduce the need for medical interventions like induction or cesarean section. Data from the Ministry of Health also shows that around 20% of deliveries are at risk of complications, which are often unpredictable (Ministry of Health Indonesia, 2020).

Complications during labor can be identified through risk indicators, such as vaginal bleeding, maternal seizures, foul-smelling amniotic fluid, maternal weakness, restlessness, or intense pain. Up to 41% of maternal and perinatal deaths are attributed to prolonged labor (Ministry of Health Indonesia, 2020).

In North Sumatra, several healthcare facilities, including community health centers and independent midwifery practices, have started implementing gym balls during labor. A study conducted in 2025 at an independent midwifery clinic in North Sumatra showed that mothers who used gym balls experienced a shorter active phase of labor. Most mothers also reported feeling more comfortable, relaxed, and better able to manage pain. However, not all midwives or healthcare facilities in the region utilize gym balls effectively due to lack of knowledge, training, or available facilities. Thus, ongoing education and training for healthcare professionals are necessary for broader implementation.

Prolonged labor, a leading cause of maternal and fetal morbidity and mortality, increases the risk of complications such as uterine atony (33%), birth canal lacerations (26%), infection (16%), exhaustion (15%), and shock (10%). For the fetus, it can result in severe asphyxia, cerebral trauma, infections, and birth injuries due to interventions (Wiliandari, Meri & Sagita, 2021). Prolonged labor can be caused by several factors, including abnormal fetal position, pelvic abnormalities, uterine contraction disorders, improper labor management, large babies, congenital anomalies, grand multiparity, and premature rupture of membranes (Umu Qonitun, 2020).

One method to prevent prolonged labor is through the use of gym balls, which support physiological labor. Research by Siregar (2020) found that the average labor progress was 224.3 minutes faster for those who used a gym ball, with a p-value of $0.0000 < 0.05$, indicating a statistically significant effect of gym ball use on labor progress.

Pain during labor tends to increase with stress and fatigue, especially in cases of prolonged labor. Proper pain management is essential to avoid complications that may disrupt the delivery process (Erni Hernawatie, 2021).

The gym ball is a physiotherapy tool that assists mothers during the first stage of labor and can be used in various positions. Its elasticity and curved surface stimulate pelvic receptors and help promote labor progression by enhancing the release of endorphins and utilizing gravity. Movements

such as sitting or rocking on the ball create a sense of comfort and relaxation (Erni Hernawatie, 2021).

Research Problem

Based on the background above, the research problem is:
What is the effect of using a gym ball during pregnancy on the childbirth process at the Independent Midwife Practice of Supiani, S.Keb in 2025?

C. Research Objectives

1. General Objective

To analyze the influence of gym ball use during childbirth at the Independent Midwife Practice of Supiani, S.Keb, Medan Deli, in 2025.

2. Specific Objectives

- a. To analyze the effect of gym ball use on the duration of labor, especially during the active phase, at the Independent Midwife Practice of Supiani, S.Keb, Medan Deli.
- b. To evaluate the differences in the labor process between mothers who use gym balls and those who do not at the Independent Midwife Practice of Supiani, S.Keb, Medan Deli.
- c. To determine the impact of gym ball use during pregnancy on the childbirth process.

D. Significance of the Study

1. For Respondents

To provide useful information that enhances mothers' knowledge about the use of gym balls during pregnancy and their impact on the birthing process.

2. For Researchers

To enrich the researcher's knowledge and understanding regarding the application of gym balls in labor management.

3. For Educational Institutions

This research can serve as a reference and learning material regarding the use of gym balls during pregnancy and labor.

METHOD

A. Type and Design of the Study

This research is a quantitative study utilizing a quasi-experimental design, specifically a *pre-post control group design*. Quasi-experimental research is used to examine the effect of an intervention by comparing conditions before and after the treatment in both the experimental and control groups.

B. Location and Time of the Study

This study was conducted at the Independent Midwife Practice (PMB) of Supiani, S.Keb, beginning from the date of research permit issuance and carried out over a period of less than five (5)

months—4 months for data collection and 1 month for data processing, including preparation of the scientific report on the influence of gym ball use on the childbirth process.

C. Population and Sample

1. Population

The population of this study includes the total number of subjects relevant to the research. Specifically, the population consists of all laboring mothers at the PMB Supiani, S.Keb in 2025, totaling 30 respondents.

2. Sample

A sample is a subset of the population that possesses specific characteristics (Sugiyono, 2020). The sample in this study is divided into a treatment group, which receives a specific intervention (gym ball), and a control group, which receives no intervention.

The sample consists of 30 third-trimester pregnant women who meet the following inclusion and exclusion criteria:

a. Inclusion Criteria:

1. Third-trimester pregnant women
2. Aged 18–40 years
3. Literate and willing to participate as respondents
4. Willing to undergo both pretest and posttest

b. Exclusion Criteria:

1. Inability to complete the entire intervention program
2. Third-trimester pregnant women with hearing or visual impairments
3. Weak physical condition preventing participation in the research activities

D. Data Collection Techniques

The data collection method involves secondary data obtained from maternal records at PMB Supiani, S.Keb, Medan Deli. The data collection steps include:

1. Establishing an agreement with the midwifery practice to recruit eligible participants.
2. Preparing research instruments.
3. Selecting respondents based on inclusion criteria by reviewing maternal and child health (KIA) records and completing observation forms.
4. Obtaining informed consent from participants.
5. Distributing and explaining the Standard Operating Procedure (SOP) and observation sheets related to gym ball use.
6. Signing consent forms.
7. Conducting ongoing evaluations of progress.

E. Research Instruments

A research instrument is a tool used to assess phenomena under observation, whether natural or social (Sugiyono, 2020). Instruments used in this study include:

1. Standard Operating Procedure (SOP) for Prenatal Exercise
Prenatal exercise sessions are conducted once a week for four weeks, with each session lasting one hour.
2. Hamilton Anxiety Rating Scale (HARS)
This scale is used to measure the anxiety levels of pregnant women.

F. Operational Definitions

Variable	Operational Definition	Measurement Tool	Measurement Method	Measurement Result
Independent Variable	Gym ball — a physiotherapy ball that assists mothers during the first stage of labor and can be used in various positions.	Checklist form	Checklist	Participated (score 1), Did not participate (score 0)
Dependent Variable	Acceleration of Labor — the duration of labor from the birth of the baby to the delivery of the placenta.	Checklist form	Checklist	Long labor (score 0): Primi (≥ 12 hrs), Multi (≥ 7 hrs) Fast labor (score 1): Primi (< 12 hrs), Multi (< 7 hrs)

G. Data Processing and Analysis Methods

1. Data Processing

Data processing involves the following steps:

a. Editing

Checking whether data from each respondent (especially anxiety levels) is complete and correctly filled out. This is done immediately to allow corrections if needed.

b. Coding

Assigning codes to the collected data based on its type, then entering it into data tables to facilitate analysis.

c. Tabulating

Entering the collected data into tables based on predetermined criteria.

d. Processing

Tabulated data is processed either manually or using computer software for statistical analysis.

e. Cleaning

Reviewing entered data to detect and correct any errors in variable input.

2. Data Analysis

Data analysis is aimed at organizing the collected data in a way that is easier to interpret and test statistically against the formulated hypotheses. The analysis includes:

a. Univariate Analysis

Used to describe the frequency distribution of each research variable, presented in percentage form.

b. Bivariate Analysis

Used to analyze the relationship between two variables suspected to be correlated (Notoadmojo, 2010).

If the data distribution is normal, an Independent T-Test will be used to compare the duration of the first stage of active labor between the intervention and control groups.

FINDING AND DISCUSSION

A. Research Results

1. Univariate Analysis

Univariate analysis refers to statistical analysis using a single variable. This method calculates and analyzes variables individually to provide a clearer description. This includes calculating averages, medians, modes, and other descriptive statistics.

Table 1. *Distribution of Gym Ball Use During Pregnancy and Its Effect on the Labor Process at the Independent Midwife Practice of Supiani, S.Keb, Year 2025*

Gym Ball Usage	Frequency	Percentage
Participated	24	80%
Did Not Participate	6	20%
Total	30	100%

Based on Table 4.1, the majority of respondents participated in gym ball activities during pregnancy, with 24 participants (80%).

Table 2. *Distribution of Labor Process at the Independent Midwife Practice of Supiani, S.Keb, Year 2025*

Labor Process	Frequency	Percentage
Fast	27	90%
Prolonged	3	10%
Total	30	100%

Based on Table 4.2, most mothers experienced a faster labor process, with 27 respondents (90%).

2. Bivariate Analysis

Bivariate analysis involves statistical analysis using two variables to determine their correlation or relationship. Methods include correlation tests, regression, etc.

Table 3. *The Effect of Gym Ball Use During Pregnancy on the Labor Process at the Independent Midwife Practice of Supiani, S.Keb, Year 2025*

Gym Ball Usage	Fast Labor	%	Prolonged Labor	%	Total	P-Value
Participated	24	100%	0	0%	24	0.005
Did Not Participate	3	50%	3	50%	6	

Gym Ball Usage	Fast Labor	%	Prolonged Labor	%	Total	P-Value
Total	27	90%	3	10%	30	

Based on Table 4.3, all 24 respondents who participated in gym ball exercises experienced a faster labor process (100%). Among the 6 who did not participate, 3 (50%) had fast labor and 3 (50%) had prolonged labor. A Chi-square test showed a statistically significant effect of gym ball usage on labor process efficiency, with a p-value of $0.005 < 0.05$.

DISCUSSION

A. Discussion

1. Gym Ball

This study found that out of 30 respondents, 24 (80%) participated in gym ball exercises and 6 (20%) did not. This indicates that the majority of pregnant women were involved in gym ball activities during pregnancy.

Among the birthing mothers, sitting on the gym ball was the most preferred position. It was reported to provide greater comfort and ease in performing pelvic movements. Sitting reduced fatigue compared to standing, while still utilizing gravity to aid the descent of the baby. This position allowed mothers to endure longer durations compared to others. Other positions such as standing while leaning on the ball, kneeling, or squatting on the floor were chosen less frequently.

The gym ball (birthing ball) is a physiotherapy tool that assists mothers during the first stage of labor by enabling various body positions. Sitting and rocking on the ball enhances comfort and labor progress by using gravity and stimulating endorphin release, thanks to the ball's elasticity and curvature, which activate pelvic receptors.

2. Labor Process

Based on the results, 27 respondents (90%) experienced a faster labor process, while 3 respondents (10%) had prolonged labor. This suggests that most mothers experienced shorter labor durations.

Labor is considered fast when cervical dilation in the first stage occurs at a rate of 1–2 cm per hour. Childbirth, particularly the first experience, can provoke emotional tension, anxiety, and fear, which may intensify the perception of pain. Pain can induce fear, leading to anxiety and potentially resulting in panic.

3. The Effect of Gym Ball Use on Labor Process

This study supports the conclusion that all mothers who used gym balls (100%) experienced faster labor. Among those who did not use the gym ball, only half (3 out of 6) had quick labor. According to the researcher, factors such as wider pelvis and smaller fetal size may have contributed to the faster labor among some mothers in the control group.

The Chi-square test result with a p-value of $0.005 (< 0.05)$ confirms a statistically significant effect of gym ball use on labor progress.

This finding aligns with Fatwiani (2023), who stated that pelvic rocking using a gym ball helps accelerate labor, especially in the first stage. This is due to the consistent pressure of the baby's head

on the cervix while in an upright position, which promotes quicker cervical dilation. Additionally, the widened pelvic area facilitates the descent of the baby's head into the birth canal.

Gym ball exercises enhance maternal strength during delivery, support optimal fetal positioning, and promote relaxation, leading to improved oxygen flow. Adequate oxygen supply to the uterine muscles enhances uterine contractions, shortening the duration of labor (Fatwiani, 2023).

In this study, mothers who sat and rocked on the gym ball stimulated pelvic receptors to secrete endorphins, increasing comfort. Other benefits of using a gym ball include expanding the pelvic outlet by up to 30% and utilizing gravity to help the baby descend, thereby speeding up the labor process (Maurenne, 2020).

Based on the researcher's analysis, there is no discrepancy between these findings and existing theories. The use of gym balls during labor, particularly during the first stage (intrapartum), significantly facilitates smoother and more efficient labor.

CONCLUSIONS

A. Conclusion

Based on the results and discussion of the study titled *"The Effect of Gym Ball Use During Pregnancy on the Labor Process at the Independent Midwife Practice of Supiani, S.Keb, Year 2025"*, the following conclusions can be drawn:

1. Out of 30 laboring mothers, the majority 24 respondents (80%) participated in gym ball exercises, while 6 respondents (20%) did not participate, primarily due to lack of support from their husbands.
2. Among the 30 pregnant women, the majority 27 respondents (90%) experienced a faster labor process, while 3 respondents (10%) experienced prolonged labor but still delivered vaginally without complications.
3. There is a significant effect of gym ball use on the labor process, as shown by the statistical result $p\text{-value} = 0.005 < 0.05$.

B. Suggestions

The following suggestions are proposed in relation to this research:

1. For Researchers
This study is expected to broaden the researcher's knowledge of midwifery research, particularly concerning the impact of gym ball use during pregnancy on the labor process.
2. For the Independent Midwife Practice of Supiani, S.Keb
Healthcare providers, especially midwives, should enhance emotional and spiritual support for pregnant women by involving husbands and families. This support can encourage more consistent and confident participation in gym ball exercises during pregnancy.
3. For Educational Institutions
This research can serve as a valuable reference or reading material for visitors of the Library of Sekolah Tinggi Ilmu Kesehatan Sehat Medan (Midwifery Program). It can help enrich student knowledge and experience in conducting future research with a broader scope, such as including additional variables influencing labor progression, using a larger sample size, and applying more advanced statistical tests like the T-test for deeper data analysis.

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