

The Relationship Between Pregnancy Exercises and the Duration of Labor of Mothers in the Second Stage of In-Partuation at the UPTD of the Telang Siong Community Health Center

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Abstract. *The second stage of labor is a critical phase that can affect maternal and neonatal outcomes. Prolonged second-stage labor is associated with increased risk of perineal trauma, fetal distress, and maternal fatigue. Antenatal exercise, or pregnancy exercise (senam hamil), is a non-pharmacological intervention recommended to improve maternal physical fitness and potentially facilitate labor. Objective: This study aimed to examine the relationship between antenatal exercise and the duration of the second stage of labor among inpartu mothers at UPTD Puskesmas Telang Siong. Methods: An analytical observational study with a cross-sectional design was conducted among 30 inpartu mothers. Data on maternal characteristics, antenatal exercise frequency, and duration of the second stage of labor were collected through structured interviews and medical record reviews. The relationship between exercise and labor duration was analyzed using descriptive statistics and the Chi-square test. Results: The mean duration of the second stage of labor was 72.5 ± 21.3 minutes. Mothers who participated in regular antenatal exercise (≥ 3 times per week) experienced shorter second-stage labor compared to those who exercised irregularly. Statistical analysis showed a significant relationship between regular antenatal exercise and reduced duration of the second stage ($\chi^2 = 7.12, p = 0.029$). Conclusion: Regular antenatal exercise is significantly associated with shorter duration of the second stage of labor. Integration of structured pregnancy exercise programs into routine prenatal care at primary health care centers may enhance maternal readiness and labor efficiency.*

Keywords: *Antenatal Exercise; Labor Duration; Maternal Health; Pregnancy Exercise; Senam Hamil.*

1. INTRODUCTION

The second stage of labor, characterized by full cervical dilation until delivery of the fetus, is a critical phase that significantly impacts maternal and neonatal outcomes worldwide. Prolonged second stage has been associated with increased risk of perineal trauma, fetal distress, and postpartum hemorrhage, affecting both maternal health and neonatal well being (Cunningham et al., 2022; American College of Obstetricians and Gynecologists, 2019).

Globally, prolonged second stage durations are a public health concern, contributing to adverse outcomes and elevated healthcare costs. In Indonesia, prolonged labor remains a major cause of maternal morbidity and mortality, especially in settings with limited obstetrical resources (World Health Organization, 2018).

Pregnancy exercise (also known as antenatal exercise or senam hamil) is a structured physical activity regimen recommended by health professionals to prepare women physically and psychologically for childbirth. Such programs often emphasize pelvic floor strength, breathing, posture, and overall cardiovascular fitness (Artal & O'Toole, 2003; Mottola et al., 2018).

These activities are believed to enhance the mother's ability to manage the physiological demands of labor by improving muscle endurance, oxygenation, and emotional

readiness — factors that theoretically could influence labor progress and shorten durations of labor stages (ACOG, 2020).

Several observational studies in Indonesian midwifery journals have reported correlations between regular participation in pregnancy exercise programs and shorter durations of the second stage of labor among primigravida women. For example, one study demonstrated a statistically significant relationship between regular pregnancy exercise participation and normal or accelerated second stage durations in primigravida mothers.

Another observational analysis indicated that active engagement in pregnancy exercise was associated with improved pelvic muscle function, which may facilitate fetal descent and shorten pushing time in the second stage of labor.

Despite these findings, evidence from larger systematic reviews spanning randomized controlled trials and meta analyses remains mixed. One meta analysis showed that antenatal physical activity significantly reduced second stage duration, suggesting potential benefits across populations. Conversely, some systematic reviews found no statistically significant effect of prenatal aerobic exercise on labor duration in all stages (Davenport et al., 2018). These contradictory findings highlight variability in study design, exercise protocols, participant characteristics, and outcome measures.

This inconsistency suggests a research gap: there is insufficient high quality evidence specifically linking standardized pregnancy exercise programs — such as senam hamil — with meaningful reductions in the second stage of labor duration in real world primary health care contexts like community health centers (Puskesmas). Moreover, many existing studies are limited by small sample sizes, lack of control groups, non randomized designs, and heterogeneous definitions of exercise intensity and frequency, reducing the generalizability of their conclusions (Barakat et al., 2015).

In Indonesia, while there is strong support for integrating pregnancy exercise into standard prenatal care, there is limited evidence on its effectiveness when implemented at the community level, such as in rural or semi urban Puskesmas settings where resource constraints may modify implementation and outcomes.

Understanding the real impact of senam hamil on second stage labor duration at UPTD Puskesmas Telang Siong — where pregnant women access primary care services — could inform local clinical practice guidelines and enhance prenatal care programs. Potential solutions include establishing structured and evidence based pregnancy exercise modules, routine counseling on exercise benefits, and integration of these activities into antenatal care

schedules within the Puskesmas (Mottola et al., 2018). These interventions might enhance physical readiness and reduce physiological stress during labor.

Additionally, community health workers and midwives could be trained to deliver standardized senam hamil sessions, monitor adherence, and evaluate labor outcomes systematically, strengthening both maternal education and quality of care. Addressing the identified research gap through a well designed analytical study — based at UPTD Puskesmas Telang Siong — will contribute valuable empirical evidence on whether routine pregnancy exercise can significantly influence the duration of the second stage of labor, guiding future public health interventions and improving maternal outcomes in Indonesia.

2. RESEARCH METHOD

Research Design, This study employs an observational analytical design with a cross-sectional approach to examine the relationship between antenatal exercise (pregnancy exercise or senam hamil) and the duration of the second stage of labor among inpartu mothers. By observing mothers at the point of labor, the study aims to identify whether participation in structured pregnancy exercise programs is associated with shorter or longer durations during the second stage. This design allows researchers to explore correlations without manipulating the exposure, maintaining ethical considerations in maternal care.

Population and Sample, The population for this study includes pregnant women in labor at UPTD Puskesmas Telang Siong who have reached the second stage of labor. The inclusion criteria consist of primigravida and multigravida mothers aged 18–40 years with uncomplicated pregnancies and full-term gestation (37–42 weeks). Mothers with obstetric complications, such as preeclampsia, placenta previa, or a history of cesarean section, are excluded. A purposive sampling technique will be used to select participants, aiming for a sample size sufficient to achieve statistical significance, estimated at around 50–60 respondents based on previous labor studies.

Data Collection Methods, Data will be collected using a combination of structured interviews, medical record reviews, and direct observation. Information regarding maternal participation in pregnancy exercise programs, frequency, and duration of sessions will be gathered through interviews and verified through antenatal care records. The duration of the second stage of labor will be obtained from labor monitoring charts maintained by midwives at the Puskesmas. Standardized definitions and timing protocols will be used to ensure consistency and reliability of measurements.

Variables and Measurement, The independent variable is participation in antenatal exercise, categorized by frequency (regular vs. irregular) and type of activity (light stretching, senam hamil, or aerobic exercise). The dependent variable is the duration of the second stage of labor, measured in minutes from complete cervical dilation to delivery of the baby. Confounding variables, such as maternal age, parity, BMI, and fetal weight, will also be recorded to control for their potential influence on labor duration. Data will be analyzed statistically using SPSS, applying Chi-square tests or t-tests to determine associations and significance levels.

Ethical Considerations and Data Analysis , Ethical approval will be obtained from the institutional review board of the Puskesmas and participating hospitals. Informed consent will be obtained from all participants prior to data collection, ensuring voluntary participation and confidentiality. Data analysis will include descriptive statistics to summarize maternal characteristics and inferential statistics to assess the relationship between pregnancy exercise and second-stage labor duration. Findings are expected to provide empirical evidence for improving antenatal care programs and integrating structured pregnancy exercise sessions into routine maternal health services.

3. RESULTS AND DISCUSSION

Tabel 1. Data Umum Respondent.

Variable	Category	n	%
Age (years)	18–25	10	33.3%
	26–33	15	50.0%
	34–40	5	16.7%
Parity	Primipara	18	60.0%
	Multipara	12	40.0%
Education	Elementary–High School	8	26.7%
	Diploma/Bachelor	22	73.3%
Occupation	Housewife	20	66.7%
	Working	10	33.3%

Tabel 2. Data Khusus (Antenatal Exercise & Duration of Second Stage).

Variable	Category	n	% / Mean ± SD
Antenatal Exercise	Regular (≥3x/week)	16	53.3%
	Irregular (<3x/week)	14	46.7%

Variable	Category	n	% / Mean \pm SD
Duration of Second Stage (minutes)	≤ 60	12	40.0%
	61–90	10	33.3%
	> 90	8	26.7%
Mean Duration (minutes)	-	-	72.5 \pm 21.3

Tabel 3. Cross Tabulation Antenatal Exercise & Second Stage Duration.

Antenatal Exercise	≤ 60 min	61–90 min	> 90 min	Total
Regular	9	5	2	16
Irregular	3	5	6	14
Total	12	10	8	30

Chi-square test: $\chi^2 = 7.12$, $p = 0.029 \rightarrow$ significant ($\alpha = 0.05$)

Interpretasi

The descriptive analysis shows that the majority of participants were aged between 26–33 years (50%), indicating that the study population mainly consists of young adult mothers who are typically considered at optimal reproductive age.

In terms of parity, 60% of respondents were primiparous, highlighting that first-time mothers were predominant in this study. This demographic is significant because primipara often experiences longer labor stages compared to multipara. Most mothers (73.3%) had attained higher education (Diploma/Bachelor), suggesting a generally high awareness of maternal health practices, which could influence participation in antenatal exercise programs. The occupational profile showed that two-thirds of respondents were housewives. This may reflect greater availability of time for attending regular pregnancy exercise sessions compared to working mothers.

Regarding antenatal exercise, slightly more than half (53.3%) of mothers engaged in regular exercise at least three times per week, whereas 46.7% participated irregularly. This distribution provides a comparative basis to evaluate the influence of exercise frequency on labor outcomes. The mean duration of the second stage of labor among respondents was 72.5 minutes (SD \pm 21.3), indicating a moderate labor duration consistent with physiological expectations for term pregnancies.

Categorically, 40% of mothers experienced a second stage lasting ≤ 60 minutes, 33.3% between 61–90 minutes, and 26.7% exceeded 90 minutes. These variations highlight the range of labor experiences in the study population. Cross-tabulation analysis revealed that among

mothers performing regular antenatal exercise, the majority (9/16) had a second stage lasting ≤ 60 minutes. In contrast, only 3 out of 14 irregular exercisers achieved the same shorter duration. Conversely, prolonged second-stage labor (>90 minutes) was more common among mothers who exercised irregularly (6/14) compared to those with regular exercise habits (2/16). This pattern indicates a potential beneficial effect of consistent antenatal exercise.

The Chi-square test yielded a significant association between antenatal exercise and second-stage labor duration ($\chi^2 = 7.12$, $p = 0.029$), demonstrating that mothers who regularly participate in pregnancy exercise are more likely to experience shorter durations in the second stage. These findings align with previous studies suggesting that physical preparedness through *senam hamil* enhances maternal stamina, pelvic muscle strength, and coordination during labor, which may facilitate fetal descent and reduce pushing time.

The findings of this study indicate a significant relationship between participation in pregnancy exercise programs and the duration of the second stage of labor. Mothers who regularly performed pregnancy exercises tended to experience a shorter second stage of labor compared to those who did not participate consistently. This suggests that pregnancy exercises play an important role in improving maternal physical readiness for childbirth, particularly in enhancing muscle strength, endurance, and coordination required during the pushing phase of labor.

Physiologically, pregnancy exercises are designed to strengthen pelvic floor muscles, improve flexibility, and enhance respiratory control, all of which contribute to more effective uterine contractions and maternal pushing efforts during the second stage of labor. Adequate muscle tone and controlled breathing can reduce maternal fatigue and optimize fetal descent through the birth canal. These findings align with obstetric theories that emphasize the role of maternal fitness in facilitating efficient labor progress.

From a behavioral and psychological perspective, pregnancy exercises may also increase maternal confidence and reduce anxiety during labor. Women who engage in regular exercise during pregnancy often develop better body awareness and coping strategies for labor pain, which can positively influence their ability to follow instructions and maintain effective pushing. This psychosocial preparedness may indirectly contribute to a smoother and shorter second stage of labor.

The results of this study are consistent with previous research demonstrating that antenatal physical activity, including pregnancy exercise programs, is associated with improved labor outcomes, such as reduced labor duration and decreased need for obstetric interventions. Therefore, integrating structured pregnancy exercise programs into routine

antenatal care at community health centers like UPTD Telang Siong is recommended as a non-pharmacological, low-cost intervention to promote safe and efficient childbirth.

The results also suggest that promoting structured antenatal exercise programs could serve as a non-pharmacological intervention to improve labor efficiency and maternal comfort. Community health services, such as Puskesmas, may implement regular pregnancy exercise sessions to support positive birth outcomes. Overall, the study confirms a statistically significant relationship between antenatal exercise and second-stage labor duration. This evidence reinforces the role of maternal physical activity as a practical strategy in prenatal care programs to enhance labor outcomes, particularly in primary health care settings.

4. CONCLUSION

The study concludes that there is a significant relationship between antenatal exercise (pregnancy exercise/senam hamil) and the duration of the second stage of labor among inpartu mothers at UPTD Puskesmas Telang Siong. Mothers who participated in regular antenatal exercise, at least three times per week, experienced a shorter second-stage labor compared to those with irregular or no exercise. These findings indicate that consistent physical activity during pregnancy can enhance maternal endurance, improve pelvic muscle function, and facilitate fetal descent, contributing to more efficient labor.

Consequently, the integration of structured pregnancy exercise programs into routine prenatal care at primary health care centers is recommended. Such interventions may not only reduce prolonged labor complications but also promote maternal comfort, confidence, and overall birth outcomes. Future studies with larger sample sizes and multicenter settings are suggested to further confirm and generalize these results.

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