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Phoenix Dactylifera Accelerates Duration The Active Phase of The First Stage of Labor: A Quasi Experiment

Finta Isti Kundarti[1a*], Ira Titisari[1b], Dwi Estuning Rahayu[1c], Budi Susatia[2d], Anis Nurlaili[3e]

[1] Department of Midwifery, Politeknik Kesehatan Kemenkes Malang, Malang, East Java, Indonesia
[2] Department of Blood Bank, Politeknik Kesehatan Kemenkes Malang, Malang, East Java, Indonesia
[3] Department of Midwifery, Politeknik Kesehatan Kemenkes Surabaya, Surabaya, East Java, Indonesia

[a] Email address: fintaistikundarti@gmail.com
[b] Email address: iratitisari@ymail.com
[c] Email address: dwier2006@gmail.com
[d] Email address: budisusatia96@gmail.com
[e] Email address: zahrotulanis@gmail.com

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Abstract
Cases of prolonged labor in women in the world are still quite high. Inadequate uterine contractions are the main cause of complications in women's deaths worldwide. The aim of this study was to determine the effect of Phoenix Dactylifera on the length of labor in the active phase of the first stage. This research was carried out through a Quasi-Experimental design Quasi-Experimental. The 60 participants were divided into 2 groups, the intervention group (30 participants) and control (30 participants) at the Kediri Regency Health Center. Sampling uses simple random sampling. The intervention group was given 70 grams of phoenix dactylifera fruit daily from 37 weeks of gestation until labor, while the control group was given standard care. The results of the Paired t-test, the average length of labor in the first stage of the active phase in the intervension group (m=90.57, SD=56.507) p-value 0.000, and the control group (m= 271.33, SD=151.361) p-value 0.100. The difference in the average of the two groups is tested using an independent t-test. The difference in mean length of labor in the first stage of the active phase posttest in the intervention vs. the control group (m=90.57, SD=56.507vs m=271.33, SD=151.361) p-value 0.000. The difference in length of labor in the first stage of the active phase in the two groups was 180.76 minutes/ (3 hours 36 minutes). The Phoenix Dactylifera can shorten duration of the active phase of labor in the first stage of labor. It is recommended for health workers to give phoenix Dactylifera at the right dose to pregnant women in the third trimester to increase stamina during pregnancy and good uterine contractions.

Keywords: Phoenix Dactylifera, Duration, Labor.

Corresponding Author:

Finta Isti Kundarti
Department of Midwifery, Politeknik Kesehatan Kemenkes Malang, Malang, East Java, Indonesia
Email: fintaistikundarti@gmail.com

1. INTRODUCTION

Cases of prolonged labor in women in the world are still quite high. On average, women giving birth in the world experience delays in the progress of labor. Specifically, in the early stages of the active phase, labor lasts approximately 6.1 to 7.4 hours, and the overall duration of the active labor phase ranges on average from 15.5 to 18.1 hours (Kordi et al., 2017). According to data from the World Health Organization (WHO) in 2020, prolonged labor is the main cause of obstetric complications with an incidence of 69,000 or 2.8% of all women's deaths worldwide. The incidence of prolonged labor is currently estimated at 17% of all births, and almost 70% end with medical intervention such as a Caesarean section (WHO, 2020). Prolonged labor causes birth complications with 1309 cases in Indonesia (Kementerian Kesehatan Republik Indonesia, 2021).

Childbirth is one of the most important crises in a woman's life (Abbasi et al., 2021). Prolonged labor can be caused by a history of cesarean delivery in previous deliveries (Carlhäll et al., 2020), body mass index of pregnant women, abnormalities such as uterine inertia (Lubis et al., 2021) fetal abnormalities and female pelvic abnormalities (Tian et al., 2022). Prolonged labor is also caused by energy abnormalities, absence of cervical opening (Talebi et al., 2020), wrong delivery, big fetus, anxiety (Bante et al., 2021) stress (Henderson & Redshaw, 2019) primiparous and grande multipara (Michalina et al., 2021).

Labor pain is feared by women throughout the world and may affect them negatively (Henrique et al., 2018). Prolonged labor can cause complications for the fetus and the woman (Nasiri et al., 2019), In this case, the fetal complications included various problems, such as head compression (Begley et al., 2019), impaired oxygen supply, decreased low APGAR score (Michalina et al., 2021) as well as fetal or neonatal death (Blankenship et al., 2019). Meanwhile, complications that arise in women are perineal trauma and postpartum bleeding (Ashwal et al., 2020).

Pregnant women who are preparing for childbirth need adequate nutritional support (Ghiasi et al., 2019) due to the frequent frequency of uterine muscle contractions during labor (Kordi et al., 2017). Pregnant women who are preparing for childbirth need adequate nutritional support (Ghiasi et al., 2019) due to frequent contractions of the uterine muscles during labor (Kordi et al., 2017). There are many ways to increase uterine contractions in pregnant women (Kinnunen et al., 2020), like giving honey (Sohrabi et al., 2022), and giving pineapple (Moghani, 2023). The contents of honey are fat (0.1%), protein (0.5%), thiamine (0.1%), riboflavin (3%), niacin (1%), calcium (1%), magnesium (1%), potassium (1%) and phosphorus (1%) (Sohrabi et al., 2022). The contents of pineapple are fat (0.11%), carbohydrates (7.26%), protein (0.21%), vitamin C (13%), riboflavin (0.03%), thiamine (0.04%) and calcium (8%) (Moghani, 2023). Researchers chose dates because Phoenix Dactylifera contains many excellent nutrients (Świąder & Isleten Hosoglu, 2020). Phoenix Dactylifera is rich in nutrients. In Phoenix Dactylifera, there is a substantial composition of important nutrients, including significant carbohydrate content (58%), fat (1%), water (20.35%), protein (3%) as well as various vitamins such as. riboflavin (4.5%), thiamine (4%), folate and folic acid (4%), calcium (6.5%), magnesium (13%), and phytochemicals such as carotenoids, polyphenols, tannins and sterols (Sagi-Dain & Sagi, 2021).

There are types of phoenix dactylifera such as phoenix dactylifera ajwa, phoenix dactylifera safawi, phoenix dactylifera khalas, phoenix dactylifera deglet nour and phoenix dactylifera sukkari (Świąder & Isleten Hosoglu, 2020). Researchers chose phoenix dactylifera sukkari, because phoenix dactylifera sukkari has a very high fatty acid content (0.5%), phoenix dactylifera ajwa contains fatty acids (0.2%), phoenix dactylifera safawi contains fatty acids (0.1%), Phoenix dactylifera khalas contains fatty acids (0.2%), and Phoenix dactylifera deglet nour contains fatty acids (0.2%). Phoenix dactylifera sukkari has a dark brown color and soft

flesh. Phoenix dactylifera has a distinctive sweet taste and a round shape. The composition of the sugar found in Phoenix dactylifera differentiates it from the sugar found in other fruits, such as cane sugar or granulated sugar, which usually have a high sucrose content. In contrast to other sugars, the sugar contained in phoenix dactylifera undergoes a more efficient absorption process in the body, thereby eliminating the need for a longer digestive period (Kordi et al., 2017).

In a previous study, women who consumed 5 dates (70 grams) every day at a gestational age of over 37 weeks had a shorter average latent phase period of labor, namely 510 minutes, in women who consumed phoenix dactylifera compared to those who did not, namely 906 minutes. This shows that there is an effect of giving dates on the progress of the first stage of labor in the latent phase in mothers giving birth (Hiba et al., 2022). The results of this study are in line with other studies explaining that giving dates is effective for uterine contractions in mothers who consume them compared to those who do not consume dates ($p = 0.001$). Another study stated that the group that consumed dates experienced greater cervical dilatation, namely 96%, compared to those who did not consume dates, namely 79%. The incidence of using oxytocin for labor induction was less in those who consumed dates (28%), compared to those who did not consume dates (47 %) and the active period is shorter in pregnant women who consume dates, making it easier for the baby to come out during birth (Nasiri et al., 2019).

From the problems above, it can be concluded that providing nutrition before birth, such as giving dates at the end of pregnancy, actually affects the birthing process. The difference between the researchers in this study is that the previous study used a pre-experimental method with a post-test-only control group design, the number of dates given was 60 grams from 37 weeks of gestation, whereas this study used a quasi-experimental method with a pretest-posttest control group. design, with a total of 70 grams of dates given from 37 weeks of pregnancy until delivery, when eating 3 dates a day one hour before eating. This study aimed to determine whether there was an effect of giving phoenix dactylifera on the length of labor in the first active phase of labor in mothers giving birth.

2. RESEARCH METHOD

This research is quantitative research using a quick experiment design. Using the pretest-posttest control group design method. The research technique involves giving phoenix dactylifera fruit to pregnant women aged 37 weeks of gestation until the first stage of the active phase of labor, where in the first stage of the active phase the subject group will be observed first before being given the phoenix dactylifera fruit and will be observed again after being given the phoenix dactylifera fruit. The population in this study was all 60 pregnant women aged 37 weeks at the Kediri Regency Health Center.

This research was conducted in May – July 2023 at the Kediri Regency Health Center. The sample in this study was pregnant women aged 37 weeks to maximize the administration of phoenix dactilifera in increasing the labor duration, totaling 60 participants who were divided into 2 groups, namely the intervention group (n=30 participants) and the control group (n=30 participants) by the inclusion criteria. The inclusion criteria in this study were women who were willing to consume phoenix dactylifera, pregnant women at term (37 weeks), primigravida and multigravida women, and women who had never consumed herbal medicine during pregnancy. Meanwhile, the exclusion criteria in this study were grandemultigravida women, women who were referred during the research process, women suffering from diabetes mellitus, and pregnant women who did not consume phoenix dactylifera fruit regularly. In this study, simple random sampling was used.

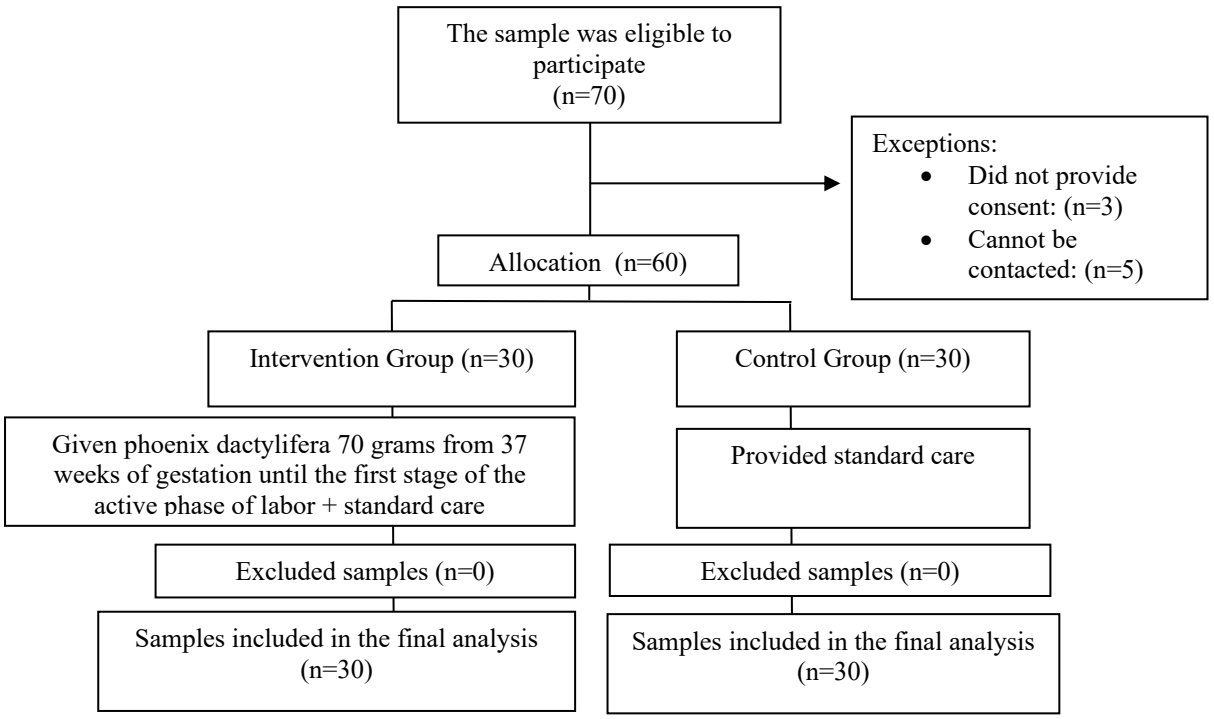

Figure 1. Research Consort (Barbour et al., 2017)

Data collection was carried out by visiting the homes of pregnant women in the Kediri Regency Health Center area, totaling 60 pregnant women participants who were divided into 2 groups, namely the intervention group n=30 participants and the control group n=30 participants. After that, the researcher explained the aims, benefits, and implementation procedures of the research and provided informed consent as proof of agreement to become a participant. In the intervention group, 70 grams of phoenix dactylifera was provided from the 37th week of gestation until the first stage of the active phase of labor and standard care (side position). Phoenix dactylifera is given to pregnant women every week by making home visits. Every day researchers monitored pregnant women consuming phoenix dactylifera and recorded them on a daily observation sheet. Phoenix dactylifera is consumed 3 times every day (1 hour before eating and drinking). Meanwhile, the control group was given standard care (side position) during the first stage of the active phase of labor. The intervention group was observed from the 4th opening (first vaginal examination), then given 70 grams of phoenix dactylifera fruit (6-7 pieces) and observed until the 2nd vaginal examination. While the control group will be observed from the 4th opening (first vaginal examination) then monitored until the 2nd vaginal examination, during monitoring standard care is given, namely the left tilted position.

Data were collected using a labor observation sheet. The duration of labor was calculated from the cervical dilatation of 4 cm (first vaginal examination) to the second vaginal examination. The duration, measured in minutes between the first and second vaginal examinations for each participant, was then averaged for each group (intervention and control). The data were analyzed using the t-test (dependent and independent t-tests) with SPSS version 26. Ethical approval was obtained from the Research Ethics Committee of Poltekkes Kemenkes Malang (Ethical Clearance No. 670/VII/KEPK POLKESMA/2023).

3. RESULTS AND DISCUSSION

This research was conducted on 60 participants consisting of an intervention group of n=30 participants and a control group of n=30 participants. The intervention group was given phoenix dactylifera every day with 70 grams of phoenix dactylifera (6-7 pieces) from 37 weeks

of gestation until the first stage of the active phase of labor. Meanwhile, the control group was given standard midwifery care

Table 1. Characteristics at baseline in the intervention and control group.

Characteristics	Intervention Group (n=30)		Control Group (n=30)		p-value
	F/M	%/SD	F/M	%/SD	
Age (years)	26.36	6.019	24.33	5.245	0.169a
Education					
Elementary school	16	(53%)	16	(53%)	0.061b
Secondary school	12	(40%)	8	(27%)	
High school	2	(7%)	6	(20%)	
Work					
Work	30	(100%)	30	(100%)	0.652c
Doesn't work	0	(0%)	0	(0%)	
Parity					
Primigravida	13	(43%)	19	(63%)	0.324b
Multigravida	17	(57%)	11	(37%)	
Duration (Minutes)	163.83	45.271	170.00	53.494	0.154a

Based on table 1, shows that the mean age of participants in the intervention group was (m=26.36, SD=6.019) and the mean age in the control group was (m=24.33, SD=5.245) years with a p-value of 0.169. The education of the majority of participants from the intervention group and the control group was elementary level, with 32 participants (53%) with a p value of 0.061, the occupation of most of the participants from the intervention group and the control group was working (100%) with a p-value of 0.652, based on partial gravida status. Most of the participants from the intervention group and control group were 32 primigravidas (53%). The duration of labor in the first stage of the active phase in the intervention group had an average of (m=163.83, SD=45.271) with a p-value of 0.154. This shows that there are no significant differences between the intervention group and the control group so that both groups have the same or homogeneous variations

Table 2. Duration of the Active phase of the first stage of labor in the intervention group.

Variables	Intervention Group (n=30)		p-value
	Pretest	Posttest	
	Mean (SD)	Mean (SD)	
Duration (minutes)	163.83 (45.271)	90.57 (56.507)	0.000

Based on table 2, the results show that the average length of labor during the pretest in the intervention group was (m=163.83, SD=45.271) minutes, and the average length of labor during the posttest in the intervention group was (m=90.57, SD=56.507) minutes. The pretest and posttest mean showed that there was an improvement in the length of labor in the intervention group. The results of the paired t-test on length of labor for the intervention group showed significant results, namely p value 0.000. It can be concluded that the length of labor progressed or the first stage of the active phase was shorter after being given phoenix dactylifera in the intervention group.

Table 3. Duration of the Active phase of the first stage of labor in the control group.

Variables	Control Group (n=30)		p-value
	Pretest	Posttest	
	Mean (SD)	Mean (SD)	
Duration (minutes)	182.33 (53.494)	271.33 (151.361)	0.100

Based on table 3, shows the results of the average length of labor during the pretest in the control group, namely (m=182.33, SD=53.494) minutes, and the average length of labor during the posttest in the control group, namely (m=271.33, SD=151.361) minutes. The pretest and posttest mean showed that there was an extension of the length of labor in the control group. The results of the paired t-test on length of labor for the control group showed significant results, namely p value 0.100. It can be concluded that the length of labor was prolonged in the control group.

Table 4. Differences posttest in the active phase of the first stage between intervention groups and control after being given Phoenix dactylifera

Variables	Intervention Group (n=30)	Control Group (n=30)	p-value
	Mean (SD)	Mean (SD)	
Duration (minutes)	90.57 (56.507)	271.33 (151,361)	0.000

Based on table 4, to determine the difference in length of labor in the two groups, namely the intervention group and the control group after being given phoenix dactylifera fruit, an independent t-test was carried out, the results of the analysis showed that the difference in the average length of posttest labor in the intervention group vs the control group was (m=90, 57 minutes / (2 hours 27 minutes) vs m = 271.33 minutes (5 hours 21 minutes). The difference between the average posttest value for the duration of labor in the first stage of the active labor phase in both groups is 180.76 minutes / (3 hours 36 minutes). The results of the independent t-test on the length of labor for both groups showed significant results, namely p value 0.000. This shows that there is a difference in the length of labor in the first stage of the active phase in the two groups after receiving phoenix dactylifera fruit in women giving birth.

This research was conducted on 60 participants consisting of the intervention group n=30 participants, namely pregnant women who were given 70 grams of phoenix dactylifera every day (6-7 pieces) from 37 weeks of gestation until the active first stage of labor. Meanwhile, for the control group, n=30 participants were a group of pregnant women who were given standard midwifery care.

Based on table 2 The results showed that the length of labor accelerated from 163.83 minutes (4 hours) to 90.57 minutes (2 hours 27 minutes) in the intervention group. It can be concluded that the duration of labor in the first stage of the active phase accelerated after the intervention of giving phoenix dactylifera to women giving birth.

The results of this study are in line with other research which explains that consuming phoenix dactylifera at the end of pregnancy has good results and shortens the active phase of the first stage of labor. The 34 primigravida pregnant women participants were divided into 2 groups, namely 17 intervention groups and 17 control groups. The results showed that the average duration of labor in the active phase of the first stage of labor given Phoenix dactylifera was 170 minutes faster and the average duration of labor for participants who were not given phoenix dactylifera was 270 minutes slower, with a P value of 0.000. So it can be concluded that there is an effect of giving phoenix dactylifera fruit on the length of labor in the first stage of the active phase (Ahmed et al., 2018). Another study with Phoenix dactylifera intervention

explained that of the 36 primigravida pregnant women participants who were divided into 2 groups, namely 18 intervention groups and 18 control groups, almost all of the intervention group (78%) experienced progress in the first stage of labor in the active phase > 3 - < 8 hours, The result was a p-value of 0.000. It can be concluded that there is an effect of giving phoenix dactylifera on the length of labor in the first stage of the active phase in women giving birth (Ohorella et al., 2021). The similarity between the above research and our research is that Phoenix dactylifera is given from 37 weeks of gestation. Meanwhile, the difference from the research above is the administration of phoenix dactylifera fruit until the first stage of the active phase of labor, and the statistical tests used.

Labor and birth are normal physiological events (Brunton et al., 2020). Stage I or the opening stage (dilation/stretching phase) (Levy et al., 2020). This is the phase that begins with regular contractions until maximum dilatation (complete opening) (Berta et al., 2019). Divided into two stages, namely the latent phase and the active phase (Wang et al., 2020). In the active phase, uterine contractions increase in intensity, duration, and frequency (Deng et al., 2022). This active phase ends when the cervix reaches 10 cm dilation (Stewart et al., 2019). In primigravida the active phase lasts 6 hours, divided into the acceleration phase which is the phase where the dilation is 3 cm to 4 cm which takes 2 hours, the maximum dilation phase is the phase where the cervix dilates from 4 cm to 9 cm which takes 2 hours, and the deceleration phase is the phase where there is a slowdown in the opening of the cervix from 9 cm dilated to complete dilation which takes 2 hours (Świąder & Isleten Hosoglu, 2020).

The speed of the labor process in the first stage is influenced by the His (Power) factor (Ashagrie et al., 2020). Labor contractions are influenced by the food intake consumed during the labor process (Nasiri et al., 2019). The active phase of first stage labor is the most tiring time for women because they begin to feel pain with varying intensities (Movahedi et al., 2022). This is caused by more active uterine contractions during labor (Caughey, 2020). Weakening of contractions is the most common cause of prolonged labor (Al-Dossari et al., 2020).

Giving phoenix dactylifera at the end of pregnancy has a very big influence on women who will face the birth process. Consuming phoenix dactylifera is thought to be useful in supplying and conserving energy for pregnant women during labor. Consuming phoenix dactylifera at the end of the month before delivery has been shown to have a positive effect on labor and birth outcomes, is a safe supplement to consider as it reduces the need for labor interventions such as labor induction (Youssef et al., 2019). Laboring women who consume Phoenix dactylifera are recognized with higher cervical dilatation and result in lower labor induction (Sagi-Dain & Sagi, 2021).

Labor can last for 20 hours and begins when the cervix begins to dilate from 0 to 3 cm or 4 cm and stronger contractions occur (Sargunam et al., 2019). Giving phoenix dactylifera at the end of pregnancy is very good in shortening the duration of labor. Phoenix dactylifera contains vitamins such as riboflavin, biotin, thiamin, folic acid, and ascorbic acid. Phoenix dactylifera fruit has a high percentage of sugar, carbohydrates, protein and fat. The carbohydrate content of phoenix dactylifera fruit has been proven to increase energy during labor. Increased hormone levels at the end of pregnancy will cause uterine contractions during term. Consuming phoenix dactylifera can save energy and strengthen uterine muscles. The content of phoenix dactylifera can help stretch the uterine muscles and prepare for the birth of the baby (Kordi et al., 2017). Most of the energy used during labor is supplied using oxidative pathways (Kordi et al., 2017). The content of phoenix dactylifera fruit is that fatty acids in the form of linoleic acid will break down into arachidonic and eicosanoids and then stimulate oxytocin receptors in the central nervous system (SPP) directly stimulate oxytocin receptors to stimulate the production of prostaglandin hormones in decidual and amnion cells (Kordi et al., 2017).

The fatty acid content in phoenix dactylifera fruit will be stored in the body as a reserve and will work at the end of pregnancy, because the number of oxytocin receptors will increase in the last month of pregnancy which itself increases the sensitivity and contraction of the

uterine muscles (Wong & Choi, 2023). The fatty acid content in Phoenix dactylifera fruit will work to stimulate oxytocin receptors for approximately 28 days. The prostaglandin hormone is formed in the uterus in response to the secretion of oxytocin and CRH (Corticotropin Releasing Hormone). These changes can increase cervical maturity and trigger an increase in the uterus' sensitivity to oxytocin. This increase in concentration causes sensitivity of the myometrium to oxytocin (Ahmed et al., 2018). The hormone prostaglandin will increase during the birth process and is very effective in causing uterine muscle contractions41. The time required for oxytocin receptors to produce the hormone prostaglandin is approximately 2-5 minutes (Goswami et al., 2022). The prostaglandin hormone will work to increase uterine contractions during labor1. According to the theory described above and the results of this research, the researchers concluded that the results of the analysis obtained were that the average length of labor in the first stage of active phase after being given phoenix dactylifera experienced an acceleration in time in the intervention group.

Based on table 3 shows that the length of labor had slowed down from 182.33 minutes (3 hours 35 minutes) to 271.33 minutes (5 hours 21 minutes). It can be concluded that the length of labor in the active phase of the first stage of labor was delayed in the control group. One non-pharmacological way to speed up the first stage of labor in the active phase is to position yourself on your left side just before delivery (Huang et al., 2019) In line with other research, of the 8 multigravida pregnant women participants who were divided into the intervention group and the control group, 4 people were given the left-side position before delivery. The results showed that 4 pregnant women (50%) experienced progress in the first stage of active phase labor for 3 hours. while 4 people were not given the left side position, the results showed that 1 pregnant woman (13%) experienced a delay in labor during the first stage of the active phase for > 3 hours (Huang et al., 2019)

The progress of the first stage of the active phase is the most difficult, and tiring time and most women begin to feel severe pain or pain (Chor et al., 2019). Because the uterus is starting to become active, adequate strength is needed to start labor (Grenvik et al., 2022). Women who are about to give birth need energy intake that is rich in sugar elements (Dokmak et al., 2020) because of the many contractions of the uterine muscles when the baby is being expelled, especially if it takes a long time (Orey et al., 2023). This is of course also supported by many factors, including the long time during the birth process and the woman's weak strength due to age (Xu et al., 2021) consumption of low-calorie nutrition, women's energy exhaustion, and other factors such as feelings of fear (Blankenship et al., 2020), pain, anxiety (Sheishaa et al., 2019) and the feeling of insecurity felt in the environment and new people around them can trigger disturbances in the progress of labor during the first active phase (Al-Dossari et al., 2020).

According to the theories described above and the results of this research, the researcher concluded that by looking at the average and results of the analysis of the length of labor in the control group, it could be concluded that the length of labor after receiving standard care had not improved but was not significant.

Based on table 4 shows that the average length of labor in the intervention group was 90.57 minutes (2 hours 27 minutes), while the average uterine contractions in the control group was 271.33 minutes (5 hours 21 minutes). It can be concluded that there is a difference in the length of labor in the first active phase of labor in the two groups after being given phoenix dactylifera fruit to women giving birth. The duration of labor in the intervention group was much faster than in the control group.

The results of this study are in line with other studies with 36 participants divided into an intervention group and a control group. For the intervention group, young phoenix dactylifera (60 grams) from 37 weeks of gestation were given. The results showed that the average length

of the first stage of labor for the control group was 930.00 minutes and for the experimental group was 787.14 minutes with a p-value of 0.035, which means that administration of phoenix dactylifera extract was effective in accelerating the first stage of labor (Kordi et al., 2017).

The similarity of the research above is the administration of phoenix dactylifera from 37 weeks of gestation. Meanwhile, the differences between the studies above are the administration of phoenix dactylifera until delivery, the number of phoenix dactylifera consumed, the statistical tests used, the pregnant women who were participants in the previous study were multigravida mothers, while the pregnant women who were participants in this study were primigravida mothers and multigravida mothers.

This research proves that administration of phoenix dactylifera accompanied by standard care (side position) increases the acceleration in the duration of the first stage of the active phase of labor within normal limits of labor speed. Providing additional energy during labor helps mothers maximize their power so that the duration of labor becomes more effective.

The weakness of this study is that it did not use randomization in sampling and did not measure labor pain biomarkers. The advantage of this research is that there were quite a lot of participants included in this research. The implication of this research is to recommend giving phoenix dactylifera as a nutria that can be given from pregnancy to delivery so that the mother's physical condition becomes strong until delivery, which in turn can help the strength of contractions and speed up the length of labor.

4. CONCLUSION

Giving Phoenix Dactylifera from the 3rd trimester of pregnancy can shorten the time of labor in the active phase of the first stage of labor. Providing the correct dose of Phoenix Dactylifera can be a recommendation for health workers as an alternative measure to increase stamina during pregnancy and produce good uterine contractions during labor so as to prevent birth complications. It is hoped that future research can use a larger sample size and can assess biomarkers associated with childbirth.

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