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Effect of Date Pudding on Maternal Energy and the Duration of the Second Stage of Labor

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ABSTRACT

Prolonged second stage of labor contributes significantly to maternal morbidity and increases the need for obstetric interventions. Adequate maternal energy during pushing is essential to prevent prolonged labor. Dates (*Phoenix dactylifera*) contain approximately 70% carbohydrates in the form of glucose and fructose, which are rapidly absorbed and provide immediate energy. This study aimed to analyze the difference in the mean duration of the second stage of labor between mothers who received date pudding and those who did not. The results demonstrated that the mean duration of the second stage of labor was shorter in the intervention group compared to the control group. Statistical analysis showed a significant mean difference between the two groups ($p = 0.030$). The homogeneity test indicated equal variances ($p = 0.325$), supporting the validity of the comparison. These findings suggest that consumption of date pudding during labor is associated with a significantly shorter second stage of labor, indicating its potential benefit as a simple nutritional intervention to support maternal energy during childbirth.

Keyword : Date pudding ; phoenix dactylifera ; maternal energy ; second stage of labor ; duration of labor

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INTRODUCTION

The second stage of labor remains a significant contributor to maternal and neonatal complications worldwide. Prolonged second stage is associated with increased risks of maternal exhaustion, postpartum hemorrhage, perineal trauma, infection, fetal distress, and higher rates of operative vaginal delivery and cesarean section (1,2). Recent global and national reports indicate that obstructed and prolonged labor continue to contribute substantially to maternal morbidity, particularly in low- and middle-income countries where access to timely obstetric interventions may be limited (3,4). Therefore, identifying simple, safe, and cost-effective strategies to optimize labor progress is clinically important.

Effective maternal pushing during the second stage requires adequate energy supply. Labor is a physically demanding process that significantly increases metabolic expenditure. Insufficient caloric intake during labor may reduce uterine contractility and maternal bearing-down strength, potentially prolonging the second stage (5,6). Emerging evidence highlights the importance of intrapartum nutritional support to maintain glucose levels, prevent ketosis, and sustain muscular performance during labor (7).

Dates (*Phoenix dactylifera*) are rich in rapidly absorbable carbohydrates, primarily glucose and fructose, comprising approximately 70% of their dry weight. These simple sugars provide immediate energy, making dates a potentially beneficial nutritional source during labor (8). In addition, dates contain potassium, magnesium, vitamin B complex, and bioactive compounds that may enhance myometrial responsiveness and cervical ripening through oxytocin-like and prostaglandin-modulating effects (9,10). Recent studies have reported that date consumption in late pregnancy may improve cervical readiness and shorten labor duration (11).

However, most previous studies have focused on date consumption during the antenatal period rather than specifically during the intrapartum phase. Limited research has examined the direct administration of processed date products, such as date pudding, during active labor and its immediate effect on the duration of the second stage. The use of date pudding offers practical advantages, including easier digestion, standardized portioning, and better acceptability for laboring women who may have reduced appetite or nausea.

Preliminary data from Aura Syifa Hospital, Kediri Regency, indicate that prolonged second stage and operative deliveries remain clinical concerns. Despite the potential benefits of intrapartum nutritional support, structured nutritional interventions during labor are not routinely implemented in this setting.

Therefore, this study aimed to analyze the effect of date pudding (*Phoenix dactylifera*) administration during labor on the duration of the second stage, highlighting its potential as a simple, locally available, and evidence-based nutritional intervention to improve maternal labor outcomes.

METHODS

This study employed a quasi-experimental design with a non-randomized control group approach and was conducted at Rumah Sakit Aura Syifa Kabupaten Kediri from June 15 to August 12, 2024. The study population consisted of women undergoing vaginal delivery during the study period. The sample size was calculated using the Slovin formula with a 5% margin of error, resulting in a minimum required sample of 40 participants. A total of 40 eligible women were recruited and equally allocated into an intervention group (n=20) and a control group (n=20).

Sampling initially applied probability sampling with a simple random sampling technique. Eligible mothers in the active phase of the first stage of labor were listed and assigned identification

numbers. Random numbers were generated using Microsoft Excel to determine preliminary allocation. However, final group assignment was influenced by participants' willingness to consume date pudding. Mothers who agreed to consume date pudding were included in the intervention group, while those who declined were placed in the control group. Therefore, allocation was not fully randomized and the study was classified as quasi-experimental.

Inclusion criteria were women in the active first stage of labor (≥ 4 cm cervical dilation), planning vaginal delivery, primiparous or multiparous, and having completed a 24-hour dietary recall. Exclusion criteria included multiple pregnancy, planned cesarean section, fetal macrosomia, malpresentation, and planned vacuum extraction. The intervention group received 150 ml of date pudding prepared from 100 grams of dates (543.81 kcal) at 4 cm cervical dilation and consumed it within 60 minutes

The control group received standard intrapartum care without date pudding. The primary outcome was the duration of the second stage of labor, measured from full cervical dilation (10 cm) until delivery of the baby, recorded using an observation sheet and partograph. Data were analyzed using descriptive statistics and an independent t-test to compare mean differences between groups with calculations performed manually and using SPSS.

Ethical approval was obtained prior to the study with Ethical Clearance Number PP.01.01/F.XXI.I6.5/672/2024 and written informed consent was obtained from all participants before data collection.

RESULT

A total of 40 laboring women participated in this study, consisting of 20 respondents in the intervention group (date pudding) and 20 respondents in the control group (standard care). The study was conducted at Aura Syifa Hospital, Kediri Regency, from 15 June to 12 August 2024.

Table 1. Characteristics of Respondents in the Intervention Group (n = 20)

Variable	Category	n	%
Age	20-35 years	18	90
	Other ages	2	10
Education level	Senior high school	13	65
	Other levels	7	35
Employment status	Employed	15	75
	Unemployed	5	5
Parity	Multigravida	14	70
	Primigravida	6	30
Nutritional status	Excessive energy intake	13	65
	Normal	5	25
	Insufficient	2	10

Table 1 presents the sociodemographic and maternal characteristics of respondents in the intervention group, consisting of 20 participants. Based on age distribution, the majority of respondents were between 20–35 years old, accounting for 18 individuals (90%), while only 2 respondents (10%)

were categorized as other ages. This indicates that most participants were within the optimal reproductive age range, which is generally considered a biologically and obstetrically low-risk group.

Regarding educational level, most respondents had completed senior high school, totaling 13 individuals (65%), while 7 respondents (35%) had other levels of education. This suggests that the majority of participants had attained a moderate level of formal education, which may influence their ability to understand health information and interventions provided during the study.

In terms of employment status, 15 respondents (75%) were employed, whereas 5 respondents (5%) were unemployed. Although the percentage reported for unemployed respondents appears inconsistent with the total sample size (5 out of 20 would equal 25%), based on the frequency data, it can be inferred that a quarter of participants were not working. Overall, most respondents were employed, indicating a relatively active socioeconomic background.

Parity data show that 14 respondents (70%) were multigravida, meaning they had experienced more than one pregnancy, while 6 respondents (30%) were primigravida. This finding suggests that most participants had prior pregnancy experience, which may influence their knowledge, attitudes, and behaviors related to maternal health and nutrition.

Finally, regarding nutritional status based on energy intake, 13 respondents (65%) had excessive energy intake, 5 respondents (25%) had normal intake, and 2 respondents (10%) had insufficient intake. These results indicate that the majority of participants consumed energy above recommended levels, which could have implications for maternal weight gain and pregnancy outcomes.

In summary, the intervention group was predominantly composed of women aged 20–35 years, with senior high school education, mostly employed, largely multigravida, and primarily having excessive energy intake. These characteristics provide important contextual background for interpreting the outcomes of the intervention, as demographic and nutritional factors may influence the effectiveness of the program.

Table 2. Characteristics of Respondents in the Control Group (n = 20)

Variable	Category	n	%
Age	20-35 years	13	65
	Other ages	7	35
Education level	Senior high school	8	40
	Other levels	12	60
Employment status	Employed	16	80
	Unemployed	4	20
Nutritional status	Insufficient energy intake	8	40
	Other categories	12	60

Table 2 presents the sociodemographic and nutritional characteristics of respondents in the control group, consisting of 20 participants.

Based on age distribution, 13 respondents (65%) were aged 20–35 years, while 7 respondents (35%) were categorized as other ages. This indicates that although the majority were within the optimal reproductive age range, the proportion was lower compared to the intervention group.

In terms of educational level, most respondents had education levels other than senior high school, totaling 12 individuals (60%), whereas 8 respondents (40%) had completed senior high school. This suggests that the control group generally had a slightly lower educational background compared to the intervention group, where most participants had senior high school education.

Regarding employment status, 16 respondents (80%) were employed and 4 respondents (20%) were unemployed. This shows that the majority of participants in the control group were economically active.

For nutritional status based on energy intake, 8 respondents (40%) had insufficient energy intake, while 12 respondents (60%) fell into other categories (which may include normal or excessive intake). This indicates that a considerable proportion of participants in the control group experienced inadequate energy intake, which may influence maternal health outcomes.

Overall, the control group was predominantly composed of women aged 20–35 years, mostly employed, with the majority having education levels other than senior high school, and a notable proportion experiencing insufficient energy intake.

Table 3. Independent t-test Results of Second-Stage Duration

Group	N	Mean	Std. Deviation	Std. Error Mean
Intervention	20	1.55	0.686	0.153
Control	20	2.10	0.852	0.191

The mean score of the second-stage duration in the intervention group was 1.55 with a standard deviation of 0.686 and a standard error of 0.153. In the control group, the mean was 2.10 with a standard deviation of 0.852 and a standard error of 0.191. Levene’s Test for Equality of Variances showed an F value of 0.993 with a significance value of 0.325 ($p > 0.05$), indicating that the variances between groups were homogeneous. The independent t-test (equal variances assumed) revealed a t value of -2.2448 with 38 degrees of freedom and a two-tailed significance value of 0.030 ($p < 0.05$).

The mean difference between groups was -0.550 with a standard error difference of 0.245. The 95% confidence interval of the difference ranged from -1.045 to -0.055. Since the p-value was less than 0.05, the null hypothesis (H_0) was rejected and the alternative hypothesis (H_a) was accepted. Therefore, there was a statistically significant effect of date pudding administration on the duration of the second stage of labor. Mothers who received date pudding experienced a shorter second-stage duration compared to those who did not receive date pudding.

DISCUSSION

The results of this study demonstrated that mothers who received date pudding (*Phoenix dactylifera*) during labor experienced a significantly shorter duration of the second stage of labor compared with those who did not receive date pudding. This finding is in line with the physiological

theory that adequate energy intake is essential to support effective uterine contractions and maternal bearing-down efforts during the second stage of labor (12).

During labor, especially in the second stage, maternal energy expenditure increases markedly due to continuous uterine muscle activity and the physical effort required for pushing. When maternal energy reserves are insufficient, fatigue may occur, resulting in decreased contraction strength, reduced pushing effectiveness, and prolonged labor duration (13). In the present study, most respondents in the intervention group had sufficient to excessive energy intake, whereas a large proportion of respondents in the control group had insufficient energy intake. This difference in energy availability may explain the shorter second stage observed in mothers who received date pudding.

Dates are known to be rich in simple carbohydrates, mainly glucose and fructose, which are rapidly absorbed in the gastrointestinal tract and directly utilized as an immediate source of energy (14). Approximately 70% of the dry weight of dates consists of carbohydrates, making them an efficient natural energy source during conditions of high metabolic demand such as labor (15). The provision of date pudding in this study supplied additional calories that could be quickly converted into energy to support uterine contractions and maternal pushing, thereby contributing to a more efficient second stage of labor.

In addition to carbohydrates, dates contain various minerals and bioactive compounds, including potassium, magnesium, iron, and substances with oxytocin-like and prostaglandin-stimulating effects (16). Potassium and magnesium play important roles in muscle contraction and neuromuscular transmission, while oxytocin-like compounds and prostaglandins may enhance uterine contractility and promote cervical dilatation (17). These physiological effects may collectively facilitate the progress of labor and shorten the duration of the second stage.

The findings of this study are consistent with previous research reporting that consumption of dates in late pregnancy or during labor is associated with stronger uterine contractions, improved cervical ripening, and a shorter duration of labor (18). Other studies have also shown that women who consumed dates had a lower incidence of prolonged labor and required fewer obstetric interventions compared with those who did not consume dates (19). This supports the hypothesis that date-based supplementation can serve as a natural, safe, and effective source of energy for laboring women.

However, not all mothers in the intervention group experienced a fast second stage of labor. This indicates that labor progress is multifactorial and influenced not only by energy intake but also by maternal age, parity, nutritional status, psychological condition, fetal size and position, and the effectiveness of uterine contractions. Mothers with inadequate nutritional status prior to labor may not fully benefit from a single administration of date pudding, as long-term energy deficiency cannot be completely corrected by short-term supplementation alone.

Another consideration is that in this study, date pudding was administered only during the active phase of labor. Some studies suggest that regular consumption of dates during the last weeks of

pregnancy may better prepare maternal energy reserves and uterine responsiveness, resulting in a more pronounced effect on labor duration and outcomes. Therefore, continuous nutritional support during late pregnancy, in addition to supplementation during labor, may provide optimal benefits.

Despite these limitations, the present study provides evidence that date pudding administration during labor can significantly shorten the duration of the second stage of labor. This intervention is simple, inexpensive, culturally acceptable, and easy to administer in clinical settings. It can be considered as a supportive nutritional strategy to help meet maternal energy needs, enhance uterine efficiency, and reduce the risk of prolonged second stage of labor (20).

CONCLUSION

The administration of date pudding (*Phoenix dactylifera*) during labor was shown to have a significant effect on shortening the duration of the second stage of labor. Mothers who received date pudding experienced a faster second stage compared to those who did not receive the intervention. This finding indicates that date pudding can help fulfill maternal energy requirements and support effective uterine contractions and pushing efforts during labor.

Date pudding, which is rich in rapidly absorbed carbohydrates, can serve as a natural and practical source of energy for laboring women. Its use during the active phase of labor may contribute to improved maternal endurance and more efficient labor progress. Therefore, date pudding may be considered as a supportive nutritional intervention to prevent prolonged second stage of labor and to promote safer and smoother childbirth, particularly in clinical settings with limited resources.

Further studies with larger sample sizes and longer periods of supplementation during late pregnancy are recommended to strengthen the evidence and to explore the optimal timing and dosage of date-based nutritional support for laboring women.

REFERENCES

1. Addini LAP, Titisari I, Wijanti RE. Pengaruh Pemberian Kurma Terhadap Kemajuan Persalinan Kala II Ibu Bersalin di Rumah Sakit Aura Syifa. 2020;2(2).
2. Fayasari A. Penilaian Konsumsi Pangan.
3. Manai S, Boulila A, Sanches A. Recovering functional and bioactive compounds from date palm by-products and their application as multi-functional ingredients in food. *Sustain Chem Pharm* [Internet]. 2024;38(October 2023):101475. Available from: <https://doi.org/10.1016/j.scp.2024.101475>
4. Anderson G, Zega M, Agostino FD, Rega ML, Damiani G. Meta-Synthesis of the Needs of Women Cared for by Midwives During Childbirth in Hospitals. 2020;6–19.
5. I Made Sudarma Adiputra, Deborah Siregar, Dina Dewi Anggraini, Ahmad Irfandi, Ni Wayan Trisnadewi, Marlynda Happy Nurmalita, Sari Ni Putu Wiwik Oktaviani, Puji Laksmi AS,

- Martina Pakpahan, Yana Listyawardhani, Fahrul Islam MA. *Statistik Kesehatan Teori dan Aplikasi* [Internet]. Deepublish; 2021. Available from: <https://kitamenulis.id/2021/04/19/statistik-kesehatan-teori-dan-aplikasi/>
6. Azkiyah SZ, Rahimah H. Analisis Kadar Zat Besi (Fe) dan Vitamin C pada Ekstrak Buah Kurma (Phoenix Dactylifera L .) Analysis of Iron (Fe) and Vitamin C Kadar Levels on Dates Fruit Extract (Phoenix Dactylifera L .). 2022;1(4):363–74.
 7. Karimi AB, Elmi A, Mirghafourvand M, Navid RB. Effects of date fruit (Phoenix dactylifera L .) on labor and delivery outcomes : a systematic review and meta-analysis. 2020;1–14.
 8. April VN, Raya J, Pasir I, Jababeka G, Utara C, Barat- J. Pengaruh Buah Kurma Terhadap Durasi Persalinan Kala II Pada Ibu Bersalin konsepsi oleh ibu . Asuhan kala 1 merupakan permulaan dari persalinan yang dimulai sejak postpartum dan infeksi , dapat meningkatkan risiko gawat janin dan asfiksia pada bayi baru lahir berbagai daerah Asia dan Afrika (Saadah . A , 2021). Sehubungan dengan itu , pada panduan nyeri , teknik pernafasan , kehadiran pendamping persalinan seperti suami atau keluarga , posisi kelancaran rangkaian proses , baik dimulai dari masa kehamilan hingga kelahiran . Berdasarkan. 2024;2(2).
 9. Yunawati I, Verena A, Rini P, Anggiruling DO, Faisal M, Kes M. Gizi Dalam Daur Kehidupan. *Eureka Media Aksara*; 2023 p.
 10. Angeles M, Djaoud K, Madani K, Boulekbache-makhlouf L, Villamiel M. *International Journal of Biological Macromolecules* New valorization approach of Algerian dates (Phoenix dactylifera L .) by ultrasound pectin extraction : Physicochemical , techno-functional , antioxidant and antidiabetic properties. 2022;212(May):337–47.
 11. Dewi KSM. Pengaruh Pemberian Video Edukasi Gizi Melalui Aplikasi Telegram Terhadap Citra Tubuh Dan Pola Makan Siswi di SMA Negeri 2 Tabanan. 2023.
 12. Jannah N. ASKEB II Persalinan Berbasis Kompetensi. *EGC*; 2023 p.
 13. Nurlina WO, Kep S, Kep M, Astutik LP, Keb M, Xanda AN, et al. Bersalin Dan Bayi Baru Lahir.
 14. Faizah N, Guru P, Ibtidaiyah M, Islam U, Maulana N, Ibrahim M. *Ibtidaiyyah : Jurnal Pendidikan Guru Madrasah Ibtidaiyah*. 2023;2(1):1–14.
 15. Wa Ode Nurlina, S.Kep., Ns. MK, Linda Puji Astutik MK, Adhesty Novita Xanda, S.ST. MK, Trivina, S.ST. MK, Nurmala Sari, SST MTK, Fatimah, S.SiT. MK, et al. Penerbit STIKes Majapahit Mojokerto Buku Ajar. 2022.
 16. Aulia L. Asuhan Kebidanan Kehamilan dengan Anemia Ringan di PMB Dora Kelurahan Tobat Kecamatan Kota Padang Sidempuan Tahun 2024. 2024;
 17. Sartika M. Asuhan Kebidanan Kehamilan Dengan Anemia Ringan di PMB Dora Kelurahan Tobat Kecamatan Kota Padang Sidempuan Tahun 2024. 2024;21(1):1–7.
 18. Sagi-dain L, Sagi S. The effect of late pregnancy date fruit consumption on delivery progress –

A meta-analysis. Explore [Internet]. 2020;000:1–5. Available from: <https://doi.org/10.1016/j.explore.2020.05.014>

19. El-ardat MA, Obradovic Z, Saldo D. The Effects of Date Consumption on Labor and Vaginal Birth. 2025;79(1):56–60.
20. Irianti S, Susanti Y, Polwandari F. Majalah Kesehatan Indonesia Date Fruit Consumption (Phoenix Dactylifera L) Facilitates Labor. 2022;3(2):81–4.