The effect of endorphine massage on the progress of labor of women in labor during the active phase at the health center in the south Jakarta area

Fenti Hasnani[1]*, Dewi Ratna Wulansari[2]

[1,2]Department of Nursing, Ministry of Health Polytechnic Jakarta I

Abstract

The causes of death of pregnant women in DKI Jakarta province are premature rupture of membranes (7.03%), prolonged partus (4.94%), bleeding (3.05%), and by other causes (6.08 In laboring mothers with anxiety will stimulate the endocrine system, hypothalamus, pituitary, and adrenal to secrete the hormone cortisol, thus inhibiting the work of the hormone oxytocin which functions in increasing contractions, one of the efforts to increase uterine contractions (his) in laboring mothers is done endorphine massage.: This research method is a quasi-experiment with 2 groups, namely the control group and the experimental group, aiming to analyze the effect of endorphine massage on the progress of labor of laboring women in active phase I before and after being given endorphine massage. This study used research instruments in the form of partographs and observation sheets. The research sample amounted to 44 respondents with 22 respondents in each group, which was determined by purposive sampling. This research was conducted at the Mampang Prapatan District Health Center and Pesanggrahan District Health Center from February 2023 to April 2024. The results showed the effect of endorphine massage on labor progress with a p-value of 0.000 (p <0.05). The conclusion of this study is that there is an effect of endorphine massage on labor progress.

Keywords: Active phase I, Endorphine Massage, Labor progress

Introduction

Childbirth is a series of stages in which the baby, amniotic membrane, and placenta leave the mother's womb. Normal childbirth is labor when the mother's womb enters the month enough to give birth and there are no complications that complicate labor. The labor period begins when the uterus contracts until the opening is complete (Fauziah, 2015). According to WHO, in 2019 every day in 2017, 810 women worldwide died from complications of pregnancy or childbirth (WHO, 2019). According to the Indonesian Ministry of Health, (2021) in Indonesia in 2021 showed 7,389 cases of maternal death. This shows an increase from 2020 of 4,627 deaths (Kemenkes RI, 2021). According to the Ministry of Health, (2018) in DKI Jakarta province, the deaths of pregnant women are premature rupture of membranes (7.03%), prolonged partus (4.94%), bleeding (3.05%), and by other causes (6.08%) (Kemenkes, 2018).

Uterine inertia, hypertonic uterine contractions and uncoordinated uterine contractions are all types of abnormalities that can occur during prolonged labor. There is a disruption in the first stage, as the active and latent phases get longer. Protraction (lengthening) and arrest (stalling or not progressing) are disorders that occur in the first stage. Slow opening or descent is commonly called protraction disorder. In contrast, arrest can be defined as complete cessation of opening or descent, cessation of dilation, where the cervix does not change for two hours, and cessation of descent, where the fetus does not descend within one hour (Aspiani, 2017). In laboring women who experience anxiety will stimulate the endocrine system, hypothalamus, pituitary, and adrenal to secrete the hormones cortisol, adrenaline nor adrenaline, thus inhibiting the work of the hormone oxytocin which functions in increasing contractions. This causes prolonged partus. The impact of prolonged partus can be dangerous for the mother and fetus, namely intra-partum infection, asphyxia, uterine rupture, kaput sexedanum, bleeding, cesarean section, and others (Mardjan, 2016).

Efforts to reduce pain, provide comfort, and increase contractions in laboring women can be done through exercise (pelvic circling and hip circles), inhaling essential oils, nipple stimulating, and massage

(American Pregnancy Association, 2023) (Gloucestershire Hospital, 2019) (McClain, 2019). Endorphine massage is one of the massages that can be done when the mother enters the first stage to stimulate contractions (Aspiani, 2017; Jam et al., 2025). Endorphine massage is a massage that causes the release of endorphins and oxytocin hormones, where endorphins function to reduce stress and relieve pain (Aprilia, 2014).

Preliminary studies that have been done before stated that as many as 9 mothers (56.2%) in the intervention group experienced acceleration of labor at stage I after being given endorphine massage and as many as 7 people (43.8%) did not experience acceleration. Then in the control group as many as 5 people (31.2%) experienced acceleration of labor at stage I and 11 people did not experience acceleration (68.8%) (Sukma, 2017). According to Ekayani's research, (2017) the opening time to complete the first stage of the intervention group was 478.9 minutes, and the opening time of the control group was 492.5 minutes. The speed of cervical opening is one of the factors of the length of labor. Strong or weak uterine contractions, which are influenced by the hormone oxytocin, are a major factor in the opening of the cervix (Ekayani, 2017). Based on the results of the above exposure, it shows that researchers are interested in conducting research on "The Effect of Endorphine Massage on the Progress of Active Phase I Labor in the South Jakarta Health Center Region".

Materials and Methods

Study site

The research will be conducted at the Mampang Subdistrict Health Center which is the intervention group for endorphine massage and the Pesanggrahan Subdistrict Health Center which is the control group that is not given endorphine massage.

Study design and population

The research design used in this study is Quasi Experiment with Nonequivalent control group research design, where there are two groups, namely the intervention group and the control group as a comparison group. The population in this study were normal laboring mothers in active phase I (>36 weeks).

Sample size and recruitment

Based on the sample calculation using the Lemeshow formula, a sample of 22 people was obtained, with 22 people in the intervention group and 22 people in the control group. Inclusion criteria were normal laboring mothers in active phase I (>36 weeks), primipara and multipara, normal labor, mothers who were willing to be respondents and good general awareness. While the exclusion criteria are mothers with labor complications and are not willing to be respondents. The sampling technique used purposive sampling.

Data collection and tools

The research instruments used were secondary data and primary data. Secondary data is data obtained by researchers through medical records and partograph sheets of two research groups containing maternal age and parity. Furthermore, primary data will be obtained from the results of measurements and observations by researchers directly, through observations using observation sheets containing data on the frequency and duration of his, cervical dilatation, and assessment of pain intensity using the Numeric Rating Scale pain scale.

Data analysis

The collected data was entered into a computerized database after coding using IBM SPSS (version 22). In this study, data normality test has been carried out first using the shapiro-wilk. In this study, data normality test was conducted first using the shapiro-wilk test. The data analysis performed was univariate analysis including maternal age, parity, pain intensity, endorphine massage, and labor progress. Bivariate analysis included Endorphine massage variables and labor progress variables using Chi Square test and Fisher's Exact Test.

Ethical consideration

Ethical approval was obtained as part of this study from the ethics unit of the Tanjung Karang Polytechnic, Indonesia with reference number

No.200/KEPK-TJK/III/2023 on March 16, 2023.

Results

Table 1. Distribution of characteristics of active phase i delivery mothers based on maternal age and parity

Variables	Intervention Group (n = 22) n (%)	Control Group (n = 22) n (%)
Mom's Age in Years		
< 20	2 (9.1%)	1 (4.5%)
20 - 35	20 (90.9%)	21 (95.5%)
Total	22 (100%)	22 (100%)
Parity		
Primiparous	12 (54.5%)	13 (59.1%)
Multiparous	10 (45.5%)	9 (40.9%)
Total	22 (100%)	22 (100%)

Table 1 shows the distribution of characteristics of laboring mothers in active phase I in the intervention and control groups. The highest distribution of maternal age was aged 20-35 years, in the intervention group by 90.9% and the control group by 95.5%. Based on parity, 54.5% of the intervention group were primiparous and 59.1% of the control group were primiparous

Table 2 shows the distribution of pain intensity of laboring women in the intervention group, most of them before the intervention 63.6% experienced moderate pain and after the intervention 77.3% experienced moderate pain. In the control group, before the intervention, most of 59.1% experienced severe pain and after the intervention 86.4% experienced severe pain.

Table 2. Distribution of pain intensity in active phase I delivery mothers

Variables	Intervenstion Group (n = 22)		Control Group (n = 22)	
	Before	After	Before	After
	n (%)	n (%)	n (%)	n (%)
Intensity of Pain				
Moderate Pain	14 (63.6)	17 (77.3)	9 (40.9)	3 (13.6)
Severe Pain	8 (36.4)	5 (22.7)	13 (59.1)	19 (86.4)
Total	22 (100)	22 (100)	22 (100)	22 (100)

Table 3. Distribution of Progress of Labor in Intervention Group and Control Group (n = 44)

Variabel	Group Intervention (n = 22) n (%)	Control Group (n = 22) n (%)
Progress of Labor		
Less	7 (31.8%)	19 (43.2%)
Good	15 (68.2%)	3 (6.8%)
Total	22 (100%)	22 (100%)

Table 3 The progress of labor in the intervention group showed that most of the 68.2% experienced

good progress of labor. In the control group, most of the 90.9% experienced poor labor progress.

Table 4 shows the results of the Fisher Exact's Test obtained a p-value of 0.227 (p>0.05), meaning that there is no difference in the progress of labor of mothers in labor during the active phase I in the intervention group and the control group, it can be concluded that the progress of labor in the control group has a 0.179 greater risk of experiencing poor labor progress than the progress of labor in the intervention group.

Table 4. Differences in progress of active phase i labor in the intervention group and control group (n = 44)

Group	Labor Progress				P-value	OR	95% CI	
	Poor		Good				Lower	Upper
	n	%	n	%				
Intervention Group	7	31.8	15	68.2	0.227	0.179	0.013	2.425
Control Group	19	86.4	3	13.6				

Table 5 shows the results of the Pearson Chi Square test obtained a p-value of 0.000 (p <0.05), meaning that there is an effect of endorphine massage on the progress of labor after the intervention in laboring mothers during the active phase I, it is concluded that giving endorphine massage is 0.074 times greater to experience good labor progress compared to laboring mothers who are not given endorphine massage.

Tabel 5. The effect of endorphine massage on the progress of labor after intervention in active phase I delivery mothers

Administration of Endorphine Massage	Labor Progress				P-value	OR	95% CI	
	Poor		Good					
	n	%	n	%			Lower	Upper
Yes	7	31.8	15	68.2	0.000	0.074	0.016	0.334
No	19	86.4	3	13.6				

Discussion

Characteristics of mothers in labor during the active phase

1.Mother's age

Table 1 shows that the age range of laboring mothers in both groups is mostly 20-35 years old. This is supported by research by Febrianti et al., (2020) that as many as 28 people (93.3%) were aged in the range of 20-35 years (Febrianti *et al.*, 2020). The results of this study are also similar to research by Apriyani et al., (2022) that as many as 17 people (85.0%) were in the age group of 20-35 years. The ideal reproductive age for pregnancy and childbirth ranges from 20 to 35 years. The reproductive system is mature and ready for fertilization at this age.

2.Parity

Table 1 shows that the parity of laboring mothers in both groups was mostly primiparous. This is supported by the results of the study Febrianti et al., (2020) that as many as 19 people (63.3%) were primiparous mothers. Primiparous labor lasts longer than multiparous, so primiparous labor pain lasts longer. Primiparas experience increased fatigue, pain perception, and fear, thus increasing the intensity of pain.

This results in the weakening of the uterus so that uterine contractions are ineffective, then dystocia or prolonged labor that lasts more than 18 hours (length of labor phase I) can occur. Increasing the sense of well-being or reducing the mother's psychological stress can encourage the physiological process of labor. (Batbual, 2021).

3.Pain

Table 2 shows the distribution of pain intensity of laboring women in the intervention group, most of them before and after the intervention experienced moderate pain. In the control group, before and after the intervention, most experienced severe pain. This result is in line with research Maisaroh & Maryani, (2021) that in the intervention group before the intervention as many as 15 people experienced pain with the lowest scale, namely scale 5 and the highest scale 10. After the intervention in the intervention group, it was found that 15 people experienced pain with the lowest scale, namely scale 2 and the highest scale, namely scale 8. Meanwhile, in the control group, it was found that 15 people experienced pain with the lowest pain value, namely scale 6 and the highest scale 8.

The majority of primigravida mothers react to pain with fear and anxiety which increases catecholamine secretion and sympathetic nervous system activity. Epinephrine will stimulate α and β receptors, while norepinephrine will stimulate α. Stimulation of α receptors causes all parts of the uterus to contract and increases uterine muscle tone, thus decreasing uterine blood flow (Alam, 2020).

Progress of labor in active phase i laboring mothers

Table 3 shows the progress of labor in the intervention group, most of which 68.2% experienced good labor progress and 31.8% experienced poor labor progress. In the control group, most of 90.9% experienced poor labor progress and 9.1% experienced good labor progress. The results of this study are supported by

Mustaghfiroh & Hesti, (2022) that in the experimental group with oxytocin massage treatment, the duration of active phase I was at least 1.5 hours and a maximum of 4 hours with an average of 2.65 hours. In the control group (without treatment), the duration of active phase I was at least 4 hours and a maximum of 6 hours with an average of 3.75 hours. According to Hanretty, (2014) progress of labor is measured by an increase in the strength, frequency, and duration of his (assessed by palpation of the abdomen and external abdominal transducer), and cervical dilatation (assessed by vaginal toucher).

Differences in progress of active phase I labor in the intervention group and control group

The results of the current study showed no difference in the progress of labor of active phase I laboring mothers in the intervention group and control group. In this study, the majority of mothers who became respondents were in the same age range and mothers were in a healthy condition. This is in line with research Choirunissa et al., (2019) stated that out of 20 respondents there were treatment groups who were given effleurage massages at the fundus uteri as many as 10 respondents with an average value of 6.39, a standard deviation value of 1.73, a t-value of -0.25 and a p-value = 0.80 greater than α = 0.05, so it can be concluded that Ha is rejected and H_0 is accepted.

According to Aspiani, (2017) there are several factors that affect labor, namely power (mother's energy), passage, passanger, and mother's psychology. The first stage of labor will vary from mother to mother. The more relaxed and mobile a mother is, the shorter the time it takes to get to complete opening. At the onset of labor, mothers should empower themselves by not just curling up in bed. Changing positions every half to two hours will greatly help the labor process (Aprilia, 2014).

Mothers who receive stimulation through endorphine massage make mothers feel relaxed and calm because of the release of endorphin hormones. Then, if the mother feels relaxed, the hormone oxytocin will flow and affect uterine contractions in laboring mothers. Oxytocin stimulates uterine smooth muscle contractions to increase uterine contractility and help expel the fetus during labor.

Oxytocin secretion is enhanced by reflexes originating from the birth canal during labor (Sherwood, 2016).

The effect of endorphine massage on the progress of active phase i maternity labor

The results of the current study showed that there was an effect of endorphine massage on the progress of labor after the intervention in laboring women in the first phase of active labor. This is supported by research Sulistianingsih et al., (2022) the duration of the first stage of labor in the control group was longer than the intervention group (276.19 ± 64.00 and 222.72 ± 57.06) so that there was a significant difference in the duration of labor in the first stage in both groups (p = 0.000).

According to Retnosari et al., (2022) Endorphine massage is a method to stimulate the production of endorphins in the body. Endorphins are hormones that function as natural painkillers, in pregnant women this massage can reduce discomfort. The production of endorphins stimulates the release of oxytocin. Oxytocin stimulates uterine smooth muscle contractions to increase uterine contractility and help expel the fetus during labor. Oxytocin secretion is enhanced by reflexes emanating from the birth canal during labor. Oxytocin plays a key role in the progression of labor. If the uterine response to oxytocin reaches its highest level and regular uterine contractions begin, myometrial contractions progressively increase in frequency, strength, and duration throughout labor until delivery of the fetus (Sherwood, 2016). According to Hanretty, (2014) labor progress is measured by an increase in the strength, frequency, and duration of hiss, as well as cervical dilatation (opening).

Conclusions

Based on the results of research and discussion, it can be concluded that there is an effect of endorphine massage on the progress of labor of laboring women in active phase I after being given endorphine massage in the intervention group and control group with a p-value of 0.000 (p <0.05). Then the characteristics of laboring women in this study were mostly 20-35 years old, primiparous mothers, mothers experiencing moderate pain, and the

progress of labor in the intervention group was mostly category 2, which is good.

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Conflict of interest

The authors declare that they have no competing interests.

References

Alam, H.S. (2020) Upaya Mengurangi Nyeri Persalinan dengan Metode Akupresur. Bandung: Media Sains Indonesia.

American Pregnancy Association (2023) Inducing Labor. Available at: https://americanpregnancy.org/healthy-pregnancy/labor-and-birth/inducing-labor/ (Accessed: 9 January 2023).

Aprilia, Y. (2014) Gentle Birth Balance: Persalinan Holistik Mind, Body, And Soul. Bandung: Qanita.

Apriyani, M.T.P. et al. (2022) Komplikasi Kehamilan dan Penatalaksanaannya. Edited by M. Sari. Jakarta: Get Press.

Aspiani, R.Y. (2017) Buku Ajar Asuhan Keperawatan Maternitas Aplikasi NANDA, NIC, dan NOC. Jakarta: CV. Trans Info Media.

Batbual, B. (2021) Hypnobirthing Dalam Persalinan Konsep dan Aplikasi. Batu: Literasi Nusantara.

Choirunissa, R., Suprihatin and Wahab, M. (2019) 'Pengaruh Pemberian Effluerage Massage Di Fundus Uteri Terhadap Lamanya Persalinan Kala I Pada Multigravida Di Puskesmas Kecamatan Menteng Jakarta Pusat Tahun 2019', Jurnal Akademi Keperawatan Husada Karya Jaya, 5(2), pp. 20–27.

Ekayani, N.P.K. (2017) 'Kombinasi Teknik Relaksasi dan Pijatan Bagi Ibu Bersalin terhadap Penurunan Intensitas Nyeri, Lama Persalinan dan APGAR Score Bayi Baru Lahir', Jurnal Kesehatan Prima, 11(2), pp. 93–103. Available at: http://poltekkes-mataram.ac.id/wp-content/uploads/2018/01/2.-Ni-Putu-Ekayani.pdf.

Fauziah, S. (2015) Keperawatan Maternitas Volume 2: Persalinan. 1st edn. Jakarta: Kencana.

Febrianti et al. (2020) 'Perbedaan Pemberian Endorphine Massage Terhadap Pengurangan Nyeri Di PMB Tias Susianah , S . Tr . Keb Lampung Utara Tahun 2020', Jurnal Maternitas Aisyah (JAMAN AISYAH) Universitas Aisyah Pringsewu, 2(1).

Gloucestershire Hospital (2019) 'The Use of Essential Oils and Massage To Help With Your Labour', pp. 1–4.

Hanretty, K.P. (2014) Ilustrasi Obstetri. 7th edn. Singapore: Elsevier.

Kemenkes (2018) Laporan Riskesdas Provinsi DKI Jakarta 2018. Edited by Kemenkes. Jakarta: Lembaga Penerbit Badan Penelitian dan Pengembangan Kesehatan (LPB).

Kemenkes RI (2021) Profil Kesehatan Indonesia 2021. Jakarta: Kementerian Kesehatan Republik Indonesia.

Maisaroh, S. and Maryani, D. (2021) 'The Effectiveness of Counter Pressure and Endorphin Massage on Reducing Pain during First Stage of Labor in Intrapartum Mothers', in The 8th International Conference on Public Health. Masters Program in Public Health, Universitas Sebelas Maret, pp. 765–771. doi:10.26911/ICPHmaternal.FP.08.2021.14.

Mardjan (2016) Pengaruh Kecemasan Pada Kehamilan Primipara Remaja. Edited by Abrori. Abrori Institute.

Jam, F. A., Ali, I., Albishri, N., Mammadov, A., & Mohapatra, A. K. (2025). How does the adoption of digital technologies in supply chain management enhance supply chain performance? A mediated and moderated model. Technological Forecasting and Social Change, 219, 124225.

McClain, L. (2019) Natural Ways to Induce Labor at Home: Induction Handout. Available at: https://betterbirthblog.org/natural-ways-induce-labor-home/ (Accessed: 9 January

2023).

Mustaghfiroh, L. and Hesti, N.P. (2022) 'Pengaruh Pijat Oksitosin terhadap Lama Kala I Persalinan', Jurnal Ilmiah STIKES Kendal, 12(2), pp. 279–286. Available at: http://journal.stikeskendal.ac.id/index.php/PSKM.

Retnosari, E., Setiawati and Putri, N.C.M. (2022) Buku Ajar Konsep Holistik Massage. Edited by I. Kusumawaty and Yunike. Malang: CV. Literasi Nusantara Abadi. Available at: https://www.google.co.id/books/edition/BUKU_AJAR_KONSEP_HOLISTIK_MASSAGE/RDx2EAAAQBAJ?hl=id&gbpv=1&dq=endorphine massage&pg=PA37&printsec=frontcover.

Sherwood, L. (2016) Human Physiology: From Cells to Systems, Ninth Edition. 9th edn. Cengage Learning.

Sukma, N. (2017) 'Pengaruh Endorphine Massage terhadap Percepatan Persalinan Primipara Kala Fase Aktif di Rumah Sakit Bhayangkara Makassar', Jurnal Ilmu Keperawatan dan Kebidanan Holistic Care, 2(1), pp. 133–137.

Sulistianingsih, A. et al. (2022) 'The Effect of Combination of Pelvic Rocking Exercise and Back Massage to Pain and Duration of Labor in Primigravidae', Open Access Macedonian Journal of Medical Sciences, 10(G), pp. 246–252. doi:10.3889/oamjms.2022.7697.

WHO (2019) 'Maternal Mortality Evidence Brief'. Geneva: Human Reproduction Programme, p. 4.