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Systematic Review

The Effect of Endorphin Massage on Reducing The Intensity of Back Pain in Third Trimester Pregnant Women: A Systematic Review

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ABSTRACT

Background: During the period of pregnancy, the mother will experience physical and psychological changes that will cause discomfort, one of them is back pain. Persistent pain not resolved immediately can result in chronic pain. Endorphin massage is a non-pharmacological method with touch or light massage techniques that can provide a feeling of calm and comfort to pregnant women who are entering late pregnancy until before labor. This study aimed to determine the effect of endorphin massage on decreasing back pain intensity in third trimester pregnant women.
Subjects and Method: This systematic review uses three databased article searches, namely Pubmed, Research Gate and Schoolar with a publication time of the last 5 years. The criteria inclusion were pregnant women who experienced back pain and given endorphin massage. There was no comparison, quasi-experimental research design, randomized control and trial, qualitative research, cross-sectional. Articles published in 2015 – 2020 both of Indonesian and English Article. The exclusion criteria were the article with systematic review method.
Results: Nine articles that met the inclusion criteria were used in this study. The article mostly discusses the effect of endorphin massage on reducing back pain intensity in third trimester pregnant women (7 articles) and compares the effect of endorphin massage with other non-pharmacological therapies (2 articles) with 5 articles using a pre-experimental research design and 4 articles using a research design. Quasy-experiments and the average number of samples in the articles reviewed were more than 250 subjects.
Conclusion: Endorphin massage is effective in reducing the intensity of back pain in the third trimester of pregnant women.

Keywords: éndorphin massage, back pain, pregnant women.

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BACKGROUND

Pregnancy is a very meaningful thing for husband and wife, but during the period of pregnancy, pregnant women will experience changes both physically and psychologically. Increasing gestational age results in the increasing angle of the spinal curve known as the sway back and forward pelvic motion, causing the ligament tissue to tense up and if the wrong position lasts a long time it will

cause tension in the connective tissue of the joints and muscles, causing fatigue muscles and leads to pain (Emilia and Harry, 2010).

Hormonal changes are also very influential. The hormone progesterone and the hormone relaxin cause relaxation of connective tissue and muscles. This occurs maximally in the last week of pregnancy, this relaxation process provides an opportunity for the pelvis to increase its capacity in preparation for childbirth, the pubic bone softens to resemble the joint, the sacrococcigus joint loosens causing the coccigis bone to shift towards the back of the unstable hip joint. pregnant women this causes lower back pain (Pantiawati and Saryono, 2010).

The results of a survey in England and Scandivina reported as many as 50% of pregnant women suffer from back pain. The majority of pregnant women are affected by their first pregnancy. 80% of women suffering from low back pain claim that it affects their routine and daily life. 10% of them reported that they could not work, Katonis et al. (2011) also mentioned that if back pain is not treated properly it can cause the quality of life of pregnant women to become worse.

Pain can be relieved by pharmacological and non-pharmacological therapy. Pharmacological pain control is more effective than non-pharmacological methods, however pharmacological therapy tends to be more expensive and has the potential to have side effects. In pregnancy, pharmacological methods are also feared to affect the health of the mother, fetus, as well as for the progress of labor (Saudia and Sari, 2018). Meanwhile, according to Potter and Perry (2010), non-pharmacological methods can be carried out through activities without drugs, including distraction techniques, self-hypnosis, reducing pain perception, and massage stimulation, warm baths, hot or cold compresses.

Endorphin massage is a part of non-pharmacological techniques, which is a type of massage with a light touch that can be given to pregnant women from the time before delivery. This massage can stimulate the body to release endorphin compounds which are natural pain relievers and can create a feeling of comfort (Aprilia, 2010). The purpose of this study was to determine the effect of endorphin massage on reducing back pain intensity in third trimester pregnant women.

SUBJECTS AND METHOD

1. Study Design

This study was systematic review. The data used in this research is secondary data. The literature search in this study used three databases with high to low quality criteria PUBMED, Research Gate, and Schoolar with articles related to the effect of endorphin massage on reducing the intensity of back pain in pregnant women in the third trimester, using the keywords endorphin massage, back pain, with a period of 5 years, between 2015 to 2020.

Population in this study were all national and international articles/ journals related to the effect of Endorphin Massage on reducing back pain intensity in third trimester pregnant women.

2. Inclusion Criteria

The inclusion criteria were pregnant women in the third trimester who experienced back pain and had endorphin massage, the sample was not comparable, the research design was quasi-experimental, randomized control and trial, qualitative research, cross-sectional, the results explained the effect of endorphin massage on decreasing intensity back pain for pregnant women, articles published in 2015 – 2020 and articles in Indonesian and English.

3. Exclusion Criteria

The exclusion criteria for pregnant women in the third trimester who experienced back pain but did not receive endorphin massage, there were comparison samples, articles using a systematic review method, the results did not explain the effect of endorphin massage on reducing the intensity of back pain for pregnant women.

4. Variable Operational Definition

Endorphin Massage was touch and massage techniques are carried out on the back and along the spine (forming the letter V) and on the neck, ears, arms and inner thighs in the third semester of pregnant women who experience back pain.

Back pain was pain or unpleasant feeling such as stabbing in the back or spine in the mother in the third trimester of pregnant.

5. Instrument

This study uses a PICO framework to search the article. The PICO concept originally introduced by Richardson et al. (1995). This is a framework designed to help build clinical questions that are used in evidence-based practice (EBP) as well as used in literature search strategies, which consist of:

a. Population/problem is the population or problem to be analyzed in accordance with the themes that have been determined in this study
b. Intervention is a study management action with a theme that has been determined in this research.
c. Comparation is intervention or other treatment that is used as a comparison, if there is no one can use the control group in the selected study
d. Outcomes is the results or outcomes obtained in previous studies that are in accordance with the themes that have been determined in this study.

6. Data Analysis

Data analysis in this study uses the steps in conducting a systematic review according to Hasibuan (2010). There are problem formulation, searching for literature, data evaluation and analysis and interpretation. The procedures for analyzing and interpreting search results are looking for similarity (compare), dissimilarity (contrast), giving views (criticizing), comparing (synthesize) and summarizing.

RESULTS

Based on the results of a literature search, 233 articles matched the keywords. The search results that have been obtained were then checked for duplication, it was found that there were many similar articles so that the article was excluded and there were 66 articles left. Then the researchers screened through titles and abstracts (n = 32), then 19 articles were rejected because they were not in accordance with PICO (population, independent variables, and conclusions). A total of 13 articles were fully reviewed, an assessment which was carried out based on the eligibility of the inclusion and exclusion criteria obtained 9 articles that could be used in this study. The results of the study article selection can be described in the Flow Diagram below (Figure 1).

The results of the data search obtained 9 articles that met the inclusion criteria and were fully reviewed. The article mostly discussed the effect of endorphin massage on reducing the intensity of back pain in third trimester pregnant women (7 articles) and the rest compared the effect of endorphin massage with other non-pharmacological therapies (2 articles).

The population used in each article is third trimester pregnant women with complaints of back pain in Puskesmas and the Independent Midwife Practice (PMB). 4 articles (Handayany and Mulyani, 2020; Cahyani et al., 2020; Saudia and Sari, 2018; Podungge, 2019) using the population of pregnant women in Puskesmas and 5

articles (Diana, 2019; Sulistyawati, 2018; Kartikasari and Nuryanti, 2016; Puspasari, 2018; Hartati et al., 2019) using the population of pregnant women in the work area of the Midwife Independent Practice (PMB).

The average number of samples in the articles reviewed is more than 250 subjectss. Diana (2019) and Handayany and Mulyani (2020) articles each with 20 subjects, Sulistyawati (2018) and Kartikasari and Nuryanti (2016) with 28 subjects each. Article of Cahyani et al. (2020) with a total sample of 42 subjects, article by Puspasari (2019) with 30 subjects, article by Hartati et al. (2019) with 34 subjects and 2 other articles by Saudia and Sari (2018); Podungge (2019), with the numbers of subjects was 30 subjects and 22 subjects. The results of the article search are explained below (Table 1).

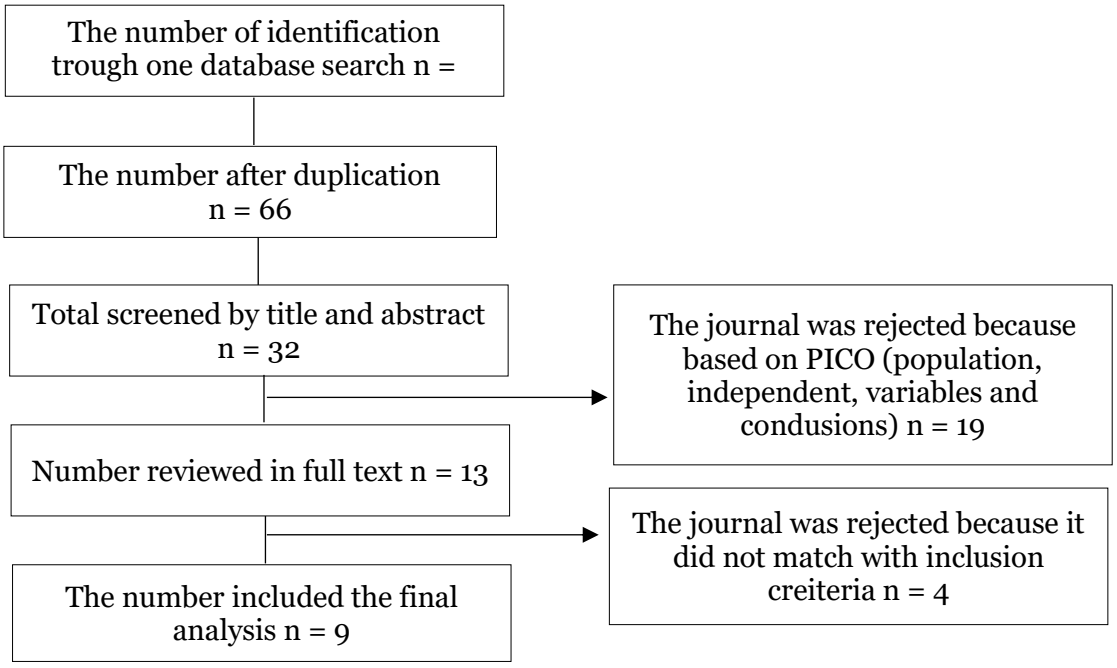

Figure 1. Systematic Review Flow Diagram based on PRISMA 2009 (Polit and Beck, 2013)

DISCUSSION

Based on the results of a review of 9 articles, it was found that several factors that cause back pain in pregnant women include age, occupation, and parity. According to the theory of Prawirohardjo (2014), the ideal age for a woman to get pregnant is 20-35 years. Then, according to Bobak (2014), anatomical and physiological changes during pregnancy do not fully recover after the end of pregnancy and labor. Some changes will persist, such as the appearance of striae gravidarum. As with muscoloskeletal changes, muscle tone will stretch in the previous pregnancy and will not recover as it did before pregnancy, especially if you do not do proper physical activity or exercise. As a result, the uterine and abdominal muscles will relax. Weakness in these muscles results in failure to support the enlarged uterus so that the curvature of the back lengthens. Thus back pain will usually increase with the amount of parity.

Table 1. Search Results for Systematic Review

Author (Year)	Title	Methods	Results	Databased
Diana (2019)	Endorphin massage is effective in reducing back pain in the third trimester of pregnant women (at BPM Lulu Surabaya)	D: Pre-experimental S: purposive sampling V: endorphin massage, back pain I: Numerical Rating Scale (NRS) observation sheet A: Wilcoxon test	The results showed that 12 women (60%) experienced moderate back pain before being given endorphin massage. After being given endorphin massage, most of the mothers experienced mild back pain, namely 14 people (70%).	Research Cate
Sulistyawati (2018)	The Effect of Endorphin massage on Decreasing the Intensity of Back Pain in Pregnant Women	D: Pre-Experiment S: consecutive sampling V: endorphin massage, back pain I: SOP for the Endorphin massage technique and the Bourbanis scale A: Wilcoxon test	Most of the third trimester pregnant women before the endorphin massage experienced severe pain as many as 19 people (67.9%). And most of the third trimester pregnant women after endorphin massage experienced moderate pain as many as 18 people (64.3%).	Schoolar
Nurlinawati et al. (2020)	Effect of Endorphin massage on Lower Back Pain Intensity in third Trimester Pregnant Women	D: Pre-experiment S: accidental sampling V: endorphin massage, back pain I: SOP for the Endorphin massage technique and the Numerical Rating Scale (NRS) observation sheet A: Wilcoxon test	The results showed that before endorphin massage, almost half (45%) of all pregnant women experienced severe pain and after endorphin massage none of the respondents (0%) experienced severe pain.	Schoolar
Kartikasari and Nuryanti (2016)	The Effect of Endorphin massage on Decreasing the Intensity of Back Pain in Pregnant Women	D: Pre-experiment S: consecituve sampling V: endorphin massage, back pain I: SOP for the Endorphin massage technique and the Boubanis Scale A: Wilcoxon test	The results showed that before the endorphin massage, most of the third trimester pregnant women experienced pain severe and after doing Endorphin massage reduced to moderate pain.	Schoolar
Cahyani et al. (2020)	The Effect Of Endorphin massage Towards Decreasing Low Back Pain In Third Trimester Pregnant Women	D: Quasi-experimental S: total sampling with 42 respondents V: endorphin massage, low back pain I: scale of Mankoski pain A: Wilcoxon test	From the research results, 15 people (71.4%) experienced moderate pain before giving endorphin massage and 2 people (9.5%) experienced severe pain. and after being given endorphin massage 6 people (28.6%) did not	Research Gate

			experience back pain, 12 people (57.1%) had mild pain, 3 people (14.3%) experienced moderate pain and none of them experienced severe pain.	
Puspasari (2019)	The Effect of Endorphin Massage on Reducing Back Pain in Third Trimester Pregnant Women at PMB Cicih Rukaesih in 2018	D: Pre-experiment S: total sampling V: endorphin massage, back pain I: Numerical Rating Scale (NRS) observation sheet A: Wilcoxon test	The results showed that before the endorphin massage, pregnant women in the third trimester experienced severe pain as much as 18 (60.0%) and after doing endorphon massage experienced moderate pain as much as 20 (66.7%).	Schoolar
Hartati et al. (2019)	Increasing the Comfortable Feel for Pregnant Women Through the Endorphin massage	D: Quasy-experiment S: purposive sampling with V: endorphin massage, back pain I: Numerical Rating Scale (NRS) observation sheet A: dependent t-test and independent t-test	The results showed that the mean value of the intervention group before being given endorphin massage (pre-test) was 5.23 and after doing endorphin massage (post-test) it fell to 3.52.	Research Gate
Saudia and Sari (2018)	The difference between the effectiveness of endorphin massage and warm compresses in reducing back pain in the third trimester of pregnant women at the Regional Health Center, Sekota Mataram	D: Quasi-experiment S: Purposive sampling V: endorphin massage, back pain, warm compresses I: Numerical Rating Scale (NRS) observation sheet A: Independent T-Test test	The results showed that the mean value before and after the endorphin massage was 1.933, while the mean value before and after the warm compress was 0.733. From these results, it can be seen that the Massage Endorphin treatment is more effective than the warm compress treatment in reducing back pain in the third trimester of pregnant women	Research Gate
Podungge (2019)	Endorphin massage and Pregnancy Exercise as a Method to Relieve Lower Back Pain in Trimester III Pregnant Women	D: Quasi-experiment S: Purposive sampling V: endorphin massage, back pain, Pregnancy exercise I: Visual Analog Scale (VAS) A: bivariate test	From the research results obtained pregnancy exercise (p = 0,000) and endorphin massage (p = 0,000) where (p <0.05) so there is an effect of pregnancy exercise and endorphin massage to reduce back pain for third trimester pregnant women	Pubmed

DISCUSSION

The intensity of back pain before being given endorphin massage was categorized into mild pain, moderate pain and severe pain. A total of 4 articles showed that most respondents experienced severe pain, 3 other articles showed that most respondents experienced moderate pain. In line with this, according to Uliyah (2014), pain is a condition in the form of unpleasant feelings that is very subjective because pain feelings are different for each person. matters of scale or grade, and only the person can describe or evaluate the pain they are experiencing.

In the articles of Sulistyawati (2018), Handayany and Mulyani (2020) and Kartikasari and Nuryanti (2016) endorphin massage was taught to her previous husband, the goal is that husbands can do endorphin massage anytime when pregnant women experience back pain. The results showed that the endorphin massage performed by the husband had a more active effect in reducing pain intensity compared to the endorphin massage performed by researchers. This happens because there is a bond between husbands and pregnant women when doing endorphin massage, the mother will feel more comfortable and relaxed.

Then, in the articles Diana (2019), Sulistyawati (2018), Kartikasari and Mulyani (2016), Puspasari (2019) and Podungge (2019) mention that endorphin massage can be given at any time during third trimester pregnant women who experience back pain with a duration of 30 minute. In the article Hartati et al. (2019) states that endorphin massage is given for 3 consecutive days with a duration of 20 minutes.

The article Cahyani et al. (2020) states that endorphin massage should be given to pregnant women in the third trimester with a pregnancy of more than 36 weeks. In line with this, according to Kuswadi (2014) in his book Endorphin massage should be done on pregnant women with a gestation of more than 36 weeks because apart from endorphins, massage can also stimulate the release of the hormone oxytocin.

From the results of a systematic review showing the intensity of back pain after being given endorphin massage, it was found that the number of respondents who initially experienced severe pain decreased to moderate pain, mild pain to no pain. According to Shenoy (2019), stimulation of the skin in the form of Endorphin massage which is carried out on third trimester pregnant women who experience back pain, uses the theory of gate control on pain transmission. This theory develops in terms of neuro-physiological mechanisms involving peripheral and central pain control. According to this theory, afferents consist of two groups of fibers, namely large diameter groups (A-beta) and small diameter fibers (A-delta and C). These two afferent groups interact with the substance gelantinose and function as a modulator (control gate) against A-beta, A-delta and C. When the substance gelantinose (SG) is active, the gate will close. Conversely, if the SG decreases its activity, the gate will open. SG activity depends on the aroused afferent group. B-endorphin inhibits PGE2 production via the cyclooxygenase pathway. Increased amount of β-endorphin and decreased PGE2 stimulate non-nociceptive and nociceptive inhibition, so that the SG is active and the control gate closes (Bialosky et al., 2009; Vigotsky and Bruhns, 2015).

Based on the results of systematic analysis, 7 out of 9 articles stated that endorphin massage was effective in reducing the intensity of back pain in third trimester pregnant women, this was indicated by the p (0.05). So it can be concluded that there is an effect of endorphin massage on the intensity of back pain in third trimester pregnant women. In line with Irawati's (2018) theory,

endorphins are a combination of endogenous and morphine, which are substances in the body that are elements of proteins produced by body cells and the human nervous system. Endorphin massage is a touch and massage technique for pregnant women. This technique can help provide a sense of calm and comfort during and before childbirth. This is because massage stimulates the body to release endorphin compounds which are pain relievers and can cause feelings of comfort.

In the article of Saudia and Sari (2018) which compared the effectiveness of endorphin massage and warm compresses. Based on the independent T-test endorphin massage and warm compresses both have an effect on reducing back pain. However, seen from the average treatment, the biggest effect is the endorphin massage treatment. This is in accordance with Manurung et al. (2013) which states that the effectiveness of the warm compress method is equivalent to other methods but it will be more effective when combined with other non-pharmacological methods.

Another study conducted by Podungge (2019) compared the effectiveness of pregnancy exercise and endorphin massage. There is a significant effect between giving pregnancy exercise and endorphin massage. However, the treatment of pregnancy exercise is more influential in reducing back pain. Exercising regularly with a duration of 30 minutes at least once a week can help improve blood circulation and make stiff muscles flexible, as well as reduce discomfort or pain. While giving a back massage with regular movements for 30 minutes is also expected to increase the relaxation and comfort felt by pregnant women. Both of these techniques (pregnancy exercise and back massage) can release endorphins, which are natural pain relievers. Based on the results of the analysis, it can be concluded that endorphin massage is effective in reducing the intensity of back pain in the third trimester of pregnant women.

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Midwifery Department of Health Polytechnic Surakarta.

AUTHORS' CONTRIBUTION

Researcher 1: as the inventor and is responsible for the content as well as the correspondent author. Researcher 2: a member of the researcher who is tasked with assisting in research activities and preparing research reports. Researcher 3: a member of the researcher in charge of assisting in the technical implementation of research and preparation of research reports.

CONFLICT OF INTEREST

There is no conflict of interest in this study.

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REFERENCES

Aprilia Y (2010). Hypnostery: relax, comfortable, and safe during pregnancy and childbirth (Hipnostetri: rileks, nyaman, dan aman saat hamil dan melahirkan). Jakarta: Gagas Media.

Bialosky JE, Bishop MD, Price DD, Robinson ME, George SZ (2009). The Mechanisms of Manual Therapy in the Treatment of Musculoskeletal Pain: A Comprehensive Model. Man Ther. 14(5): 531–538. https://dx.doi.org/10-.1016%2Fj.math.2008.09.001.

Bobak L, Lowdermilk DL, Jensen MD. (2014). Keperawatan maternitas (Maternity nursing) Edisi 4. Jakarta: EGC.

Cahyani IA, Winarsih S, Arfiana (2020). The effect of endorphin massage towards

decreasing low back pain in third trimester pregnant women. Midwifery and Nursing Research. 2(1): 41–45. doi: 10.31983/manr.v2i1.5520.

Denney AS, Tewksbury R (2013). How to write a literature review. Journal of criminal justice education. 24(2): 218-234. https://doi.org/10.1080/10511253.2012.730617

Diana W (2019). Endorphin massage efektif menurunkan nyeri punggung ibu hamil trimester III (Endorphyn massage effectively reduces back pain i the third trimester of pregnancy). J Health Sci. 12(02): 62-70. doi: 10.33086/jhs.v12i02.1128

Emilia O, Freitag H (2010). Tetap bugar dan energik selama hamil (Stay fit and energic during pregnancy). Jakarta: AgroMedia.

Hall H, Cramer H, Sundberg T, Ward L, Adams J, Moore C, Sibbritt D, Lauche R (20160. The effectiveness of complementary manual therapies for pregnancy-related back and pelvic pain: A systematic review with meta-analysis. Medicine (Baltimore). 95(38):e4723. doi: 10.1097/MD.0000000000004723.

Handayany DA, Mulyani S (2020). Pengaruh endorphin massage terhadap intensitas nyeri punggung bawah ibu hamil trimester III (The effect of endorphin massage on the intensity of lower back pain in third trimester pregnant women). Jurnal Ilmiah Ners Indonesia. 1(1): 12-23. Retrieved from https://online-journal.unja.ac.id/JINI/article/view/9230

Hartati R, Rahayu AOS, Tanberika FS, Islami AP (2019, November). Increasing the comfortable feel for pregnant women through the endorphin massage. In Journal of Physics: Conference Series. 1351(1): 012091. doi: 10.1088/1742-6596/1351/1/012091.

Zainal A (2007). Metodologi penelitian pada bidang ilmu komputer dan teknologi informasi; konsep, teknik, dan aplikasi (Research methodology in the field of computer science and information technology; concepts, techniques and applications). Jakarta: Universitas Indonesia.

Jannah N (2012). Buku ajar asuhan kebidanan): kehamilan (Textbook of midwifery care: pregnancy) Yogyakarta: CV Andi Offset.

Juwita L (2019). Literature review: pengaruh massage therapy terhadap nyeri persalinan kala satu (Literature review: the effect of massage therapy on the first stage labor pain). Jurnal Ners LENTERA. 7(2): 114-129. Retrieved from: http://journal.wima.ac.id/index.php/NERS/article/view/2115

Kartikasari RI, Nuryanti A (2016). The effect of endorphin massage on reducing the intensity of back pain in pregnant women (Pengaruh endorphin massage terhadap penurunan intensitas nyeri punggung ibu hami). 1(1): 297–304. Retrieved from: http://103.97.100.145/index.php/psn12012010/article/view/2110/2137.

Katonis P, Kampouroglou A, Aggelopoulos A, Kakavelakis K, Lykoudis S, Makrigiannakis A, Alpantaki K (2011). Pregnancy-related low back pain. Hippokratia. 15(3): 205.

Nursalam S (2015). Metodologi penelitian ilmu keperawatan: pendekatan praktis (Nursing research methodology: a practical approach). Ed. 4. Jakarta: Salemba Medika.

Manurung S, Nuraeni A, Lestari TR, Soleha L, Suryanti, Nurhaeni H, Paulina K, et al. (2013). Pengaruh teknik pemberian

kompres hangat terhadap perubahan skala nyeri persalinan pada klien primigravida (The effect of warm compress techniques on changes in labor pain scale in primigravida clients). Jurnal Health Quality. 4(1): 1 – 76. Retrieved from: https://www.poltekkesjakarta1.ac.id/wp-content/uploads/legacy/jurnal/dokumen/7PENGARUH%20TEKNIK%20PEMBERIAN%20KOMPRES%20HANGAT%20TERHADAP%20PERUBAHAN%20SKALA%20NYERI%20PERSALINAN%20PADA%20KLIEN%20PRIMIGRAVIDA%202013.pdf

Kuswandi L (2014). The miracle of hypnobirthing (Keajaiban hypno-birthing). Jakarta: Pustaka Bunda.

Podungge Y (2019). Endhorpin massage and pregnancy exercise as a method to relieve lower back pain in trimester III pregnant women. Health Notions. 3(4): 166-172. Doi: http: //heanoti.com/index.php/hn/article/ view/334.

Richardson WS, Wilson MC, Nishikawa J, Hayward RS (1995). The well-built clinical question: a key to evidence-based decisions. Acp j club. 123(3): A12-A13. Retrieved from: https://pubmed.ncbi-.nlm.nih.gov/7582737/

Pantikawatai I, Saryono (2010). Pregnancy care (Asuhan kehamilan). Yogyakarta: Nuha Medika.

Polit DF, Beck CT (2013). Essentials of nursing research: Appraising evidence for nursing practice. Lippincott Williams & Wilkins, Philadelphia.

Potter PA, Perry AG (2010). Fundamental of Nursing Textbooks, Process Concepts, and Practices. Edition 4 volume 2) (Buku Ajar Fundamental Keperawatan, Konsep Proses, dan Praktik. Edisi 4 volume 2). Jakarta: EGC.

Puspasari H. (2019). Pengaruh endorphine massage pada pengurangan rasa nyeri punggung pada ibu hamil trimester III di PMB Cicih Rukaesih Tahun 2018 (The effect of endorphin massage on reduing of back pain in third trimester pregnant women at PMB Cicih Rukaesih in 2018). Syntax Literate. Jurnal Ilmiah Indonesia. 4(3): 59-71. Retrieved from: http://www.jurnal.-syntaxliterate.co.id/index.php/syntax-literate/article/view/568.

Yeyeh A, Yulianti L, Maimunah SL (2009). Asuhan kebidanan I (kehamilan (Midwifery care I (pregnancy). Jakarta: Trans Info Medika.

Saudia BEP, Sari ONK (2018). Perbedaan efektivitas endorphin massage dengan kompres hangat terhadap penurunan nyeri punggung ibu hamil trimester III di Puskesmas wilayah kerja Sekota Mataram (The differences effectivity between endorphin massage and warm compresses on reducing back pain in the third trimester of pregnant women in the public health center in mataram working area). Jurnal Kesehatan Prima. 12(1): 23-29.

Sugiyono (2016). Quantitative, qualitative and R&D research methods (Metode Penelitian Kuantitatif, Kualitatif dan R&D). Bandung: Alfabeta.

Sulistyawati H. (2018). Pengaruh endorphin massage terhadap penurunan intensitas nyeri punggung ibu hamil (studi di BPM Lia Astari Kec. Mojoagung Kab. Jombang) (The effect of endorphin massage on reducing the intensity of back pain in pregnant women (study at BPM Lia Astari Mojoagung Jombang). Jurnal Kebidanan. 16(1): 9-14. https://doi.org/10.35874/jib.v1-6i1.399.

Team Hypnobirthing Indonesia (2016). Modul panduan pelatihan basic hypnosis & hypnobirthing (Basic hypnosis

& hypnobirthing training guide module). Jakarta: Hypnobirthing Indonesia.

Uliyah M, Aziz AL (2014). Keterampilan dasar praktik klinik untuk kebidanan (Basic clinical practice skills for midwifery). Jakarta: Salemba Medika.

Vigotsky AD, Bruhns RP (2015). The role of descending modulation in manual therapy and its analgesic implications: A narrative review. Pain Res Treat. 2017: 1535473. https://dx.doi.org/10-.1155%2F2017%2F1535473.

Wiarto G (2017). Bone and joint pain. (Nyeri tulang dan sendi). Yogyakarta: Gosyen Publishing.