

ARTICLE INFORMATION

Received: October, 26, 2022

Revised: June, 22, 2023

Available online: July, 03, 2023

at : <http://ejournalmalahayati.ac.id/index.php/nursing/index>

Prevalence of back pain among pregnant women attending public health center in west Lampung, Indonesia

Siska Widiyastika, Aryanti Wardiyah*, Rilyani

Program Studi Ilmu Keperawatan Universitas Malahayati

Corresponding author *E-mail: aryanti@malahayati.ac.id

Abstract

Background: Pregnant women throughout Indonesia are 60-80 percent of pregnant women who experience back pain during pregnancy. The prevalence of pregnant women experiencing low back pain in various regions of Indonesia reaches 60-80 percent. Data from the results of the pre-survey that had been conducted showed that the number of pregnant women at the Sugar Cane Health Center was 100 people, at the Gedung Surian Health Center 172 people, and at the Sumberjaya Health Center 115 people. Interviews were conducted with 10 pregnant women at the *Kebun Tebu* Health Center that 70 percent of the 10 pregnant women experienced back pain during their pregnancy, 40 percent of them were over 30 years old, and 30 percent of them were first pregnancies (primiparous).

Purpose: To determine the prevalence of back pain among pregnant women attending public health center in west Lampung, Indonesia

Method: This study uses a quantitative research type, with correlation analytic methods. The population in this study were pregnant women who were domiciled in the working area of the West Lampung *Kebun Tebu* Health Center with a total of 100 pregnant women. The sampling technique uses total sampling. Measurement of this study using a questionnaire. Data analysis used a frequency distribution test (univariate).

Results: The prevalence of pain scale in this study was from 100 respondents who experienced mild pain as many as 55 respondents and those who experienced moderate pain as many as 30 respondents. There were 15 respondents who did not experience pain but none of the respondents experienced severe pain. And to get information about the treatment of back pain, among them, 60 respondents got information from their families and 40 respondents got information from health workers. However, none of the respondents obtained information from the internet.

Conclusion: relationship between, gestational age, TFU. BMI, TBJ, pain management and information on pain management with back pain in pregnant women with a p-value <0.05.

Keywords: Prevalence; Back Pain; Pregnant women; Public Health Center

INTRODUCTION

Pregnant women throughout Indonesia account for 60-80% of pregnant women who experience back pain

during pregnancy (Mafikasari & Kartikasari, 2015). Pregnancy is a natural process to maintain the

Prevalence of back pain among pregnant women attending public health center in west Lampung, Indonesia

continuity of human civilization. A new pregnancy can occur if a woman has experienced puberty which is marked by menstruation. Pregnancy is divided into 3 trimesters, namely: First trimester of pregnancy between 0-12 weeks. Second trimester of pregnancy between 12-28 weeks. Three pregnancy trimester between 28-40 weeks (Sarwono, 2016).

Low back pain is a common disorder, and pregnant women may have a history of "back pain" in the past. Low back pain often occurs in pregnancy so it is described as a minor disorder in pregnancy, pain symptoms usually occur between 4-7 months of gestation and pain is usually felt in the lower back, sometimes spreading to the buttocks and thighs, and sometimes down to the legs as a sciatica (Robson & Waugh, 2012).

Most pregnant women experience lower back pain during pregnancy. In general, low back pain in pregnant women is associated with several factors, such as: increased body weight and bone physiology (Schröder, Kundt, Otte, Wendig, & Schober, 2016), use of vision in pregnant women increases with the end of pregnancy, and changes in the body (Yoo, Shin & Song, 2015). An increase in back pain is seen during pregnancy (Johnson, 2014). Older women, who have back problems or are unbalanced, are more likely to experience severe lower back pain during pregnancy and later in pregnancy this pain makes it difficult to walk (Fauziah & Sutejo, 2012).

This back pain may be musculoskeletal in nature or may be related to a hip problem such as arthritis. Other complications are lower back pain, increased mobility which can affect activities such as driving a car, childcare and mothering work, lack of sleep, which can cause fatigue and irritability. Dealing with nursing care, such as providing individual training, can reduce symptoms by encouraging mothers to understand their situation, provide backup care, advise nursing, mention positive actions for them (Robson & Waugh, 2012).

The prevalence of pregnant women who experience low back pain in various regions of

Indonesia reaches 60-80% (Wardhani, 2017). The phenomenon of pain in the back of pregnant women is one of the most frequently reported complaints among pregnant women, varying from 50% to 70%, based on previous studies in various countries (Yan, Hung, Gau, & Lin, 2014), even 8 % of them resulted in severe disability. However, there is little empirical evidence to suggest that these events have repercussions in the area of caring for individuals with pain; poorly managed pain increases the risk of continuing pain, reduces quality of life and increases use of curative health services (Nickel, Klement, Byrd, Attarian, Seyler, & Wellman, 2018). Even though the incidence rate is quite high, there are still few pregnant women who seek information about problems that arise with low back pain during pregnancy and their effects. The availability of information about pain during pregnancy and its problems, especially lower back pain in the third trimester, is important for the development of health services for pregnant women (Purnamasari, 2019).

The prognosis for low back pain will be bad if it is not handled properly. Pregnant women who experience low back pain will find it difficult to stand, sit and even move from bed, this causes disruption of their daily routine and affects their quality of life. The bad impact is difficulty walking if the pain has spread to the pelvic and lumbar areas with various impacts that can occur, the problem of low back pain in pregnant women must get treatment (Katonis, Kampouroglou, Aggelopoulos, Kakavelakis, Lykoudis, Makrigiannakis, & Alpantaki, 2011; Aswitami & Mastiningsih, 2018).

Data from the results of the pre-survey that was carried out obtained the number of pregnant women at the Sugar Cane Health Center from March 2021 to March 2022, namely 100 people, at the Gedung Surian Health Center, namely 172 people, and at the Sumberjaya Health Center, namely 115 people. Interviews were conducted with 10 pregnant women at the Sugar Cane Health Center that 7 (70%) of the 10 pregnant women experienced back pain during pregnancy, 4 (40%) of them were over 30 years old, 3

Siska Widiyastika, Aryanti Wardiyah*, Rilyani

Program Studi Ilmu Keperawatan Universitas Malahayati
Corresponding author *E-mail: aryanti@malahayati.ac.id

DOI: <https://doi.org/10.33024/minh.v6i2.8203>

(30%) in One of them is the first pregnancy (primiparous).

RESEARCH METHOD

Type quantitative research, the research design used is cross sectional, a study to study the dynamics of the relationship between factors and effects, by way of approach, observation or data collection at one time (point time approach).

The population in this study were pregnant women who live in West Lampung *Kebun Tebu* Health Center working area with a total of 100 pregnant women. The sampling technique used total sampling. The research design used cross sectional. Using a measuring tool in the form of questionnaire containing notes on the characteristics of the respondent and back pain. Back

pain in pregnant women using a visual aid scale (VAS). With mild pain criteria: very mild pain score 1, uncomfortable pain score 2, pain tolerable score 3; moderate pain: bothersome score 4, very bothersome score 5, severe pain score 6; and for pain severe: very severe score 7, very torturous score 8, unbearable score 9, and unexplainable score 10. Categorized as no pain if score 0 (feel relaxed and comfortable).

Univariate analysis was used to describe each variable and assess the characteristics of the respondents. The data that has been collected is recorded and collected and then presented in the form of mean, median, mode. Bivariate analysis using test Chi-Square. This research has received ethical approval from the Health Research Ethics Commission at the University of Malahayati Bandar Lampung with number 2529/EC/KEP-UNMAL/VI/2022.

Siska Widiyastika, Aryanti Wardiyah*, Rilyani

Program Studi Ilmu Keperawatan Universitas Malahayati
Corresponding author *E-mail: aryanti@malahayati.ac.id

DOI: <https://doi.org/10.33024/minh.v6i2.8203>

RESEARCH RESULTS**Table 1. Demographic Characteristic of Respondents (N=100)**

Variables	Results
Age (Mean±SD)(Range)(Year)	(28.10±4.842)(18-41)
Parity (n/%)	
Primiparous	29/29
Multiparous	67/67
Grande Multiparous	4/4
Gestational Age (n/%)	
12-28 Weeks	56/56
>28 Weeks	44/44
The Fundal Height (n/%)	
≤25 cm	29/29
>25 cm	71/71
BMI (n/%)	
≤25 cm	77/77
>25 cm	23/23
EFW (n/%)	
≤2500gr	54/54
>2500gr	46/46
Back Pain (n/%)	
No pain (0)	15/15
Light (1-3)	55/55
Moderate (4-6)	30/30
Heavy (7-10)	0/0
Pain Management (n/%)	
Take Medicine	29/29
Drink Warm Water	8/8
Massaged	22/22
Check In Medical	15/15
Ignores	26/26
Pain Management Information (n/%)	
Internet	0/0
Family	60/60
Healthcare workers	40/40

Siska Widiyastika, Aryanti Wardiyah*, Rilyani

Program Studi Ilmu Keperawatan Universitas Malahayati
Corresponding author *E-mail: aryanti@malahayati.ac.id

DOI: <https://doi.org/10.33024/minh.v6i2.8203>

Prevalence of back pain among pregnant women attending public health center in west Lampung, Indonesia

Based on table 1 it can be seen that the average age of the respondents is 28.10, the standard deviation is 4.842 and the range is 18-41 years. With parity the majority of multiparous were 67%, the majority of gestational age between 12-28 weeks were 56%, with the majority the fundal height >25 cm were 71%, the majority BMI <25 cm were 77%, the majority EFW <2500 gr were 54%, with pain 55% mild back pain, 29% pain management by taking medicine and 60% information on pain management from family.

Table 2. Factors Associated With Back Pain Symptoms

Variables	Back Pain			p-value
	No pain (n=15)	Light (n=55)	Moderate (n=30)	
Age (n/%)				
Risk (<25 and > 35)	6/40	14/25.5	4/13.3	0.133
(25-35 Years)	9/60	41/74.5	26/86.7	
Parity (n/%)				
Primiparous	2/13.3	20/36.4	7/23.3	0.419
Multiparous	12/80	33/60	22/73.4	
Grande Multiparous	1/6.7	2/3.6	1/3.3	
Gestational Age (n/%)				
12-28 Weeks	12/80	40/72.7	4/13.3	0.000
>28 Weeks	3/20	15/27.3	26/86.7	
The Fundal Height (n/%)				
<25 cm	12/80	16/29.1	1/3.3	0.000
>25 cm	3/20	39/70.9	29/96.7	
BMI (n/%)				
<25 cm	14/93.3	49/89.1	14/46.7	0.000
>25 cm	1/6.7	6/10.9	16/53.3	
EFW (n/%)				
<2500gr	12/80	36/65.5	6/20	0.000
>2500gr	3/20	19/34.5	24/80	
Pain Management (n/%)				
Take medicine	0	16/29.1	13/43.4	0.000
Drink warm water	0	7/12.7	1/3.3	
massaged	0	11/20	11/36.7	
Check in medical	0	11/20	4/13.3	
Ignores	15/100	10/18.2	1/3.3	

Siska Widiyastika, Aryanti Wardiyah*, Rilyani

Program Studi Ilmu Keperawatan Universitas Malahayati
Corresponding author *E-mail: aryanti@malahayati.ac.id

DOI: <https://doi.org/10.33024/minh.v6i2.8203>

Pain Management Information (n/%)				
Family	15/100	29/52.7	16/53.3	0.003
Healthcare worker	0	26/47.3	14/46.7	

Table 2 it is known that of the 24 respondents with age at risk as many as 6 (40%) had no back pain, 14 (25.5%) had mild pain and 4 (13.3%) had moderate pain. And 76 respondents aged 25-35 years, 9 (60%) had no back pain, 41 (74.5%) had mild pain and 26 (86.7%) had moderate pain. The results obtained are a p value of $0.133 > 0.05$, so that H_a is rejected or H_o is accepted, which means that there is no effect of age on back pain.

The number of 29 respondents with primi parous parity, 2 (13.3%) had no back pain, 20 (36.4%) had mild pain and 7 (23.3%) had moderate pain. Of the 67 respondents with multiparous, 12 (80%) had no back pain, 33 (60%) had mild pain and 22 (73.4%) had moderate pain. And of the 4 respondents with grand multiparous, 1 (6.7%) had no back pain, 2 (3.6%) had mild pain and 1 (3.3%) had moderate pain. The results obtained were a p-value of $0.419 > 0.05$, so that H_a was rejected or H_o was accepted, which means that there is no effect of parity on back pain. The number of 56 respondents with a gestational age of 12-28 weeks, 12 (80%) had no back pain, 40 (72.7%) had mild pain and 4 (13.3%) had moderate pain. And 44 respondents with gestational age > 28 weeks, 3 (20%) had no back pain, 15 (27.3%) had mild pain and 26 (86.7%) had moderate pain. The results obtained were a p-value of $0.000 < 0.05$, so that H_a was accepted and H_o was rejected, which means that there is an effect of gestational age on back pain.

The number of 29 respondents with the fundal height < 25 cm, 12 (80%) had back pain, 16 (29.1%) had mild pain and 1 (3.3%) had moderate pain. And of the 71 respondents with the fundal height > 25 cm, 3 (20%) had no back pain, 39 (70.9%) had mild pain and 29 (96.7%) had moderate pain. The results obtained were a p-value of $0.000 < 0.05$, so that H_a was accepted and H_o was rejected, which means that there is an effect of the fundal height on back pain. The

number of 77 respondents with BMI < 25 cm, 14 (93.3%) had no back pain, 49 (89.1%) had mild pain and 14 (46.7%) had moderate pain. And 23 respondents with BMI > 25 cm, 1 (6.7%) had no back pain, 6 (10.9%) had mild pain and 16 (53.3%) had moderate pain. The results obtained were a p-value of $0.000 < 0.05$, so that H_a was accepted and H_o was rejected, which means that there is an effect of BMI on back pain.

The number of 54 respondents with EFW < 2500 gr, 12 (80%) had no back pain, 36 (65.5%) had mild pain and 6 (20%) had moderate pain. And 46 respondents with EFW > 2500 gr as many as 3 (20%) had no back pain, 19 (34.5%) had mild pain and 24 (80%) had moderate pain. The results obtained were a p-value of $0.000 < 0.05$, so that H_a was accepted and H_o was rejected, which means that there is an effect of EFW on back pain.

The number of 29 respondents who treated pain by taking medication, 16 (29.1%) had mild pain and 13 (43.4%) had moderate pain. Of the 8 respondents who treated pain by drinking warm water, 7 (12.7%) had mild pain and 1 (3.3%) had moderate pain. Of the 22 respondents who treated pain with massage, 11 (20%) had mild pain and 11 (36.7%) had moderate pain. Of the 15 respondents who treated pain, they went to a health worker, 11 (20%) had mild pain and 4 (13.3%) had moderate pain. And of the 26 respondents with pain management left alone, as many as 15 (100%) had no pain, and as many as 10 (18.2%) with mild pain and as much as 1 (3.3%) with moderate pain. The results obtained were a p-value of $0.000 < 0.05$, so that H_a was accepted and H_o was rejected, which means that there is an effect of pain management on back pain.

The number of 60 respondents with information on pain management from their families, 15 (100%) had no back pain, 29 (52.7%) had mild pain and 16

Siska Widiyastika, Aryanti Wardiyah*, Rilyani

Program Studi Ilmu Keperawatan Universitas Malahayati
Corresponding author *E-mail: aryanti@malahayati.ac.id

DOI: <https://doi.org/10.33024/minh.v6i2.8203>

Prevalence of back pain among pregnant women attending public health center in west Lampung, Indonesia

(53.3%) had moderate pain. And 40 respondents with information on pain management from health workers did not have back pain, with mild pain as many as 26 (47.3%) and with moderate pain as many as 14 (46.7%). The results obtained were a p-value of 0.003 <0.05, so that H_a was accepted and H_o was rejected, which means that there is an influence of information on pain management on back pain.

DISCUSSION

Average Age

The results of research on the age variable obtained a mean value of 28.10, a median value of 28.00, a mode value of 32, a std deviation value of 4.842, and a minimum value of 18 and a maximum of 41. Age is an important variable in influencing pain in individuals. Back pain in pregnant women is felt by all ages, especially at the age of 35 years, tissue degeneration occurs which causes stability in bones and muscles to decrease. The older a person is, the higher the risk of that person experiencing a decrease in elasticity in the bones which triggers symptoms of low back pain (Andini, 2015).

Age greatly determines the health status of the mother. Pregnant women are said to be at high risk if they are under 20 years old or more than 35 years old. Differences in development will affect the response to pain. These developments are physically and the organs at the age of less than 20 years are not ready to carry out reproductive tasks and are not psychologically mature. Young people or less than 20 years will find it difficult to control pain. Reproductive age of more than 35 years, the physical and function of the organs of the body, especially the reproductive system has decreased (Judha & Sudarti, 2012).

Age is an important variable in influencing pain in individuals. Back pain in pregnant women is felt by all ages, especially those aged <20 years because the mother is not ready to face pregnancy. However, with the large number of pregnant women aged 20-35 years, it is certain that at this age many people experience back pain, especially in the third trimester

(Sarwono, 2016). At the age of > 35 years, tissue degeneration occurs which causes stability in bones and muscles to decrease. The older a person is, the higher the risk of that person experiencing a decrease in elasticity in the bones which triggers symptoms of low back pain (Andini, 2015). From the results of the study, researchers can assume that age can affect the incidence of back pain in pregnant women because if the age <20 years is not yet productive so the organs are not ready to face pregnancy. And age > 35 years is a high risk age for pregnancy.

Average Parity

The results of research on the parity variable obtained a mean value of 1.97, a median value of 2.00, a mode value of 2, a std deviation value of 0.882, and a minimum value of 1 and a maximum of 5. Parity can affect the mother's response to pain. Primigravida mothers do not have experience giving birth compared to multigravida mothers. Mothers who give birth for the first time will feel stressed or afraid in facing labor. Multigravida mothers have already given birth so they already have experience of pain during childbirth. Mothers who already have experience giving birth will be able to respond to this pain (Andini, 2015).

Parity is the number of births a mother has experienced in her life. According to the results of the study there is a relationship between parity and back pain in pregnancy. Pregnant women who have a high parity of more than 5 or equal to four (grande multigravida) are more at risk of experiencing low back pain. This is due to every pregnancy accompanied by childbirth will cause abnormalities in the uterus, in this case there is damage to the blood vessels of the uterine wall which affects the circulation of nutrients to the fetus. This can reduce the function of the muscles and reproductive organs (Mirawati, 2010; Andini, 2015).

From the results of the study, researchers can assume that the more parity in pregnant women, the greater the risk of back pain because of the frequency with which many women experience pregnancy, the

Siska Widiyastika, Aryanti Wardiyah*, Rilyani

Program Studi Ilmu Keperawatan Universitas Malahayati
Corresponding author *E-mail: aryanti@malahayati.ac.id

DOI: <https://doi.org/10.33024/minh.v6i2.8203>

reproductive organs will function again so that there is a greater risk of pregnant women experiencing back pain.

Average Gestational Age

The results of research on the gestational age variable obtained a mean value of 27.79, a median value of 28.00, a mode value of 32, a std deviation value of 3.421, and a minimum value of 20 and a maximum of 34. Back pain occurs in most of the late gestational age. Pregnant women often pull their shoulders and back back to balance when walking. This curvature of the lower back causes the muscles to work too hard, causing pain. Handayany, Mulyani, & Nurlinawati, 2020).

Pain Score in Gestational Age

Pregnancy is the period starting from conception to the birth of the fetus, pregnancy lasts 280 days (40 weeks or 9 months 7 days) and is counted from the first day of the last menstruation (HPHT) (Altahira, 2014). Pregnancy is a new series of events that occur when the ovum is fertilized and the fertilized ovum eventually develops into a term fetus (Lombogia, 2017).

The Fundal Height Average

The results of research on the variable uterine fundus height obtained a mean value of 27.51, a median value of 28.00, a mode value of 30, a std deviation value of 2.464, and a minimum value of 24 and a maximum of 33. Uterine fundal height is related to the weight and height of pregnant women so that it can cause disturbances discomfort i.e. back pain.

BMI Average

The results of research on the variable Uterine Fundal Height obtained a mean value of 24.11, a median value of 23.00, a mode value of 25, a std deviation value of 1,896, and a minimum value of 21 and a maximum of 29. Pregnant women's weight increases normally \pm 6-16 kg, starting from the growth

of the contents of conception and the volume of various organs. A good method for assessing normal weight gain during pregnancy is by using the Body Mass Index (BMI) formula. BMI is calculated as body weight divided by height (in meters) squared (World Health Organization, 2004). Risk factors for LBP include age, body mass index, gender, psychological factors, pregnancy, injury/trauma, other diseases that can cause LBP and daily habits (Fatoni, & Swasti, 2009; Isnain, 2013).

Nutritional status associated with the occurrence of low back pain is overweight and obesity. When a person is overweight, usually excess weight will be distributed to the abdominal area, which means increasing the work of the lumbar spine. When you are overweight, the spine will be stressed to accept the burden that burdens it, resulting in easy damage and danger to the spinal structure. Excess body weight causes abdominal muscle tone to weaken, so that the center of gravity will be pushed to the front of the body and cause lumbar lordosis to increase, which then causes fatigue in the paravertebral muscles. When the body weight increases, the spine will be stressed to receive the load resulting in mechanical stress on the lower back. Mechanical stress that occurs in the long term causes a reaction in the muscle tissue to support the increased load, causing changes in cell shape, cell membranes, ion concentrations and the appearance of integrins in the tissue (Deviyanti, 2003).

BMI does not only cause LBP directly, but also indirectly. This indirect cause has something to do with a combination of other factors that can support the occurrence of LPB. Other factors that are meant are factors that cannot be changed and daily habits that can exacerbate the occurrence of LPB. The factors that cannot be changed are age and gender. Factors of daily habits include smoking, body position in activities, and exercise habits.

EFW Average

The results of research on the variable Uterine Fundal Height obtained a mean value of 2217.25, a

Siska Widiyastika, Aryanti Wardiyah*, Rilyani

Program Studi Ilmu Keperawatan Universitas Malahayati
Corresponding author *E-mail: aryanti@malahayati.ac.id

DOI: <https://doi.org/10.33024/minh.v6i2.8203>

Prevalence of back pain among pregnant women attending public health center in west Lampung, Indonesia

median value of 2480.00, a mode value of 2015, a std deviation value of 749.710, and a minimum value of 750 and a maximum of 3255. EFW is an interpretation of the weight of the fetus in the womb, the greater the EFW, the more pregnant women feel tightness and pain in the back causing discomfort to the mother.

CONCLUSION

There is no relationship between age and parity with back pain in pregnant women with a p-value > 0.05. And there is a relationship between gestational age, fundal height, BMI, EFW, pain management and information on pain management with back pain in pregnant women with a p-value <0.05.

SUGGESTION

For research sites to be able to provide education about back pain to pregnant women through counseling and classes for pregnant women.

For future researchers to be used as a reference in further research and to be able to research with different variables including ethnicity and religion. And in order to be able to correlate this variable with pain or multivariate.

REFERENCES

Altahira, S. (2014). Midwifery Care (pregnancy).

Andini, F. (2015). Risk factors of low back pain in workers. *Jurnal Majority*, 4(1).

Aswitami, G. A. P., & Mastiningsih, P. (2018). The Effect of Acupressure Therapy on Lower Back Pain in Mothers Pregnant TM III in the Work Area of the Abian Semal Health Center 1. *STRADA Scientific Journal of Health*, 7(2), 47-51.

Devianty, I. (2003) Relationship between Worker Characteristics and Work Facility Design to the Incidence of Low Back Pain Male Toll Collector Shift II at PT Jasa Marga Jagorawi

Jakarta. Undergraduate thesis, Diponegoro University. <http://eprints.undip.ac.id/8324/>.

Fatoni, H., & Swasti, K. G. (2009). Correlation between attitude and work position with low back pain among nurses at RSUD Purbalingga. *Soedirman Nursing Journal*, 4(3), 131-139.

Fauziah, S., & Sutejo, N. S. (2012). *Pregnancy Maternity Nursing*. Jakarta: Prenada Media Group.

Handayani, D. A., Mulyani, S., & Nurlinawati, N. (2020). Effect of Endorphin Massage on Pain Intensity Lower Back Trimester Pregnant Women III. *Indonesian Nurse Scientific Journal*, 1(1), 12-23.

Isnain, M. (2013). The Relationship Between Shoe Heel Height And Body Mass Index (BMI) With Complaints of Lower Back Pain at Sales Promotion Girl (SPG) Ramayana Salatiga. *Health Journal Diponegoro University Society*, 2(1), 18708.

Johnson, J. Y. (2014). *Maternity nursing*. Yogyakarta: Rapha Publishing.

Judha, M., & Sudarti, F. A. (2012). The theory of pain measurement and labor pain. *Yogyakarta: Nuha Medika*, 31, 38.

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

Lombogia, M. (2017). *Textbook of Maternity Nursing Concepts, Theories, and Practicum Modules*. Yogyakarta: Indomedia References.

Mafikasari, A., & Kartikasari, R. A. (2015). Sleeping position with the incidence of back pain in pregnant women trimester III. *Surya*, 7(02), 26-34.

Siska Widiyastika, Aryanti Wardiyah*, Rilyani

Program Studi Ilmu Keperawatan Universitas Malahayati
Corresponding author *E-mail: aryanti@malahayati.ac.id

DOI: <https://doi.org/10.33024/minh.v6i2.8203>

Prevalence of back pain among pregnant women attending public health center in west Lampung, Indonesia

- Mirawati, M. (2010). Relationship between gestational age and low back pain in pregnant women at RSIA. Siti Fatima Makassar (Doctoral dissertation, State Islamic University Alauddin Makassar).
- Nickel, B. T., Klement, M. R., Byrd, W. A., Attarian, D. E., Seyler, T. M., & Wellman, S. S. (2018). The James A. Rand young investigator's award: battling the opioid epidemic with prospective pain threshold measurement. *The Journal of Arthroplasty*, 33(7), S3-S7.
- Purnamasari, K.D. (2019). Lower back pain in pregnant women in the second and third trimesters. *Journal of Midwifery and Public Health*, 1(1), 9-15.
- Robson, S. E., & Waugh, J. (2012). *Pathology in Pregnancy Midwifery Management & Care (Medical Disorders in Pregnancy: A Manual for Midwives)*. Jakarta: ECG.
- Sarwono, P. (2016). *Obstetrics Book 4th Edition*. Jakarta: PT Bina Pustaka.
- Schröder, G., Kundt, G., Otte, M., Wendig, D., & Schober, HC. (2016). Impact of pregnancy on back pain and body posture in women. *Journal of physical therapy science*, 28(4), 1199-1207.
- Wardhani, A. S. K. (2017). Application of effleurage massage to reduce lower back pain in trimester pregnant women III at BPM Yuspoeni, Klirong District, Kebumen Regency (Doctoral dissertation, STIKes Muhammadiyah cocky).
- World Health Organization. (2004). Appropriate body-mass index for Asian populations and its implications for policy and intervention strategies. *Lancet*, 363, 157-163.
- Yan, C. F., Hung, Y. C., Gau, M. L., & Lin, K. C. (2014). Effects of a stability ball exercise programme on low back pain and daily life interference during pregnancy. *Midwifery*, 30(4), 412-419.
- Yoo, H., Shin, D., & Song, C. (2015). Changes in the spinal curvature, degree of pain, balance ability, and gait ability according to pregnancy period in pregnant and nonpregnant women. *Journal of physical therapy science*, 27(1), 279- 284.

Siska Widiyastika, Aryanti Wardiyah*, Rilyani

Program Studi Ilmu Keperawatan Universitas Malahayati
Corresponding author *E-mail: aryanti@malahayati.ac.id

DOI: <https://doi.org/10.33024/minh.v6i2.8203>