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The Relationship Between Gestational Age, Parity, Nutritional Status with the Incidence of LBP in Pregnant Women

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ABSTRACT

Background : Low Back Pain (LBP) is pain that arises in the lower back of the body, including the lower spine, waist, pelvis, and can radiate to the buttocks or legs. LBP is one of the most common pains in pregnant women with an incidence of about 60%-90%.

Objective: The purpose of the study was to determine the relationship between gestational age, parity and nutritional status of pregnant women with the incidence of low back pain based on the Oswestry Disablity Index (ODI).

Method: The research design used was non-experimental with a cross sectional research approach. This research was conducted at Wirahusada Medical Center Clinic Makassar 2022 and there were 95 research samples. This research data uses primary data from the results of filling out questionnaires by respondents. Data were processed using SPSS with the Chi-Square test.

Result: The results showed that gestational age has a P-value of 0.000 (P<0.05) which means it has a significant relationship with LBP, parity has a P-value of 0.000 (P<0.05) which means it has a significant relationship with LBP, nutritional status based on LILA has a P-value of 0.020 (P<0.05) which means it has a significant relationship with LBP, and nutritional status based on BMI has a P-value of 0.000 (P<0.05) which means it has a significant relationship with LBP.

Conclusion: The results showed that there was a relationship between gestational age, parity, and nutritional status of pregnant women with the incidence of low back pain based on the Oswestry Disability Index at the Wirahusada Medical Center Clinic Makassar 2022 with a p-value <0.05.

Keywords: Low Back Pain in Pregnant Women, Gestational Age, Parity, Nutritional Status

INTRODUCTION

Pregnancy is a unique period for every woman. Pregnancy brings many changes to a woman. Most women experience discomfort during pregnancy, this can be caused by hormonal changes and physical changes related to uterine development (1).

During pregnancy, various physical changes can occur, which begin in the first trimester to the third trimester. Changes in the first trimester include morning sickness, frequent urination, dizziness, feeling tired. In the second trimester there are changes such as changes in the skin, and can feel the baby's movements. For the third trimester includes back pain, sleep problems, discharge from the breasts, difficulty breathing, and feeling contractions in the abdomen (2).

One of the most common pains in pregnant women is low back pain. The incidence of low back pain in pregnant women is around 60%-90% (3). Pain is an unpleasant sensory sensation and experience resulting from tissue damage, either actual or potential, or described in terms of damage. This phenomenon can differ in terms of intensity, quality, and duration. Although pain is a sensation. However, pain has cognitive and emotional components and is described as a form of suffering (4).

Predisposing factors for back pain in pregnant women include a growing uterus that causes changes in posture and along with the development of pregnancy that causes stretching of the supporting ligaments which is generally felt by the mother as a painful stabbing spasm called ligament pain. This is what causes back pain. Other factors include weight gain, the effect of relaxin hormones on the ligaments, a history of back pain, and parity and activity. The severity of back pain increases with parity. Back pain can also occur when doing one or various activities, such as walking without rest, excessive bending, lifting weights, especially when these activities are carried out in women who are tired (5).

Back pain experienced by pregnant women is a complaint that is often experienced in the second trimester and third trimester, and it is estimated that around 70% of pregnant women complain of some form of back pain at some point in pregnancy, labor, or in the postpartum period. Back pain often increases in intensity as pregnancy progresses. Back pain during pregnancy peaks between the 24th and 28th week of gestation (6).

In research conducted by Purnamasari (2019) it was found that out of a total of 30 respondents, most experienced moderate pain, namely 73.33%, 10% experienced mild pain, and 16.67% severe pain. 86.66% experienced back pain for less than 24 hours, 6.67% experienced pain that lasted for one day and 6.67% experienced pain for several days. The accompanying symptoms reported were nausea and vomiting 50% and emotional disturbances (3).

Based on the results of research conducted by Dewita (2023) entitled "Analysis of Factors Affecting Pain in Pregnant Mothers in Karang Raharja Village" shows that the factors that influence pain in pregnant mothers are age, parity and nutritional status. Maternal parity is a variable that greatly affects the incidence of back pain (7). Based on the above background, the researcher is very interested in conducting research on the relationship between gestational age, parity and nutritional status of pregnant women with the incidence of low back pain based on the Oswestry Disability Index (ODI) in pregnant women at the Wirahusada Medical Center Clinic Makassar 2022.

METHOD

The method used in this study was non-experimental with a cross-sectional approach. This study was conducted in the working area of Wirahusada Medical Center Clinic Makassar in the period of April to June 2022 with a population of 2048 pregnant women in the working area of Wirahusada Medical Center Clinic Makassar. The sampling was carried out using purposive sampling technique that met the inclusion criteria and did not meet the exclusion criteria with a total sample of 95 samples.

The method of data collection uses primary data. Primary data were obtained through direct observation to measure upper arm circumference and anthropometry as well as filling out questionnaires containing demographic data, gestational age, parity, and the Oswestry Disability Index questionnaire. The data obtained were then analyzed using Statistical for Social Science (SPSS). Univariate analysis showed the distribution and percentage of each variable. Bivariate analysis used the Chi-Square test to determine the relationship between gestational age, parity, and nutritional status of pregnant women with the incidence of low back pain based on the Oswestry Disability Index.

The variables in this study were measured based on the results of a questionnaire of respondent characteristics. parity is assessed based on the number of births, namely parity 0 is called nulliparous, parity 1 is called Primiparous and parity 2 is called multiparous. Then nutritional status is measured using upper arm circumference, if Upper Arm Circumference <23.5 cm then classified into Chronic Energy Deficiency and if Upper Arm Circumference ≥23.5 cm then classified into not Chronic Energy Deficiency. Scoring in the study is in accordance with the provisions in the standard Oswestry Disability Index (ODI) questionnaire. The minimum value is 0 and the maximum value for each section is 5. The score is then calculated by adding up each part 0-5 so the total maximum value is 50. The number

of parts answered by the respondent is divided by 50 and then multiplied by 100. If there is one part that is not answered, then only the one that is answered is counted. The total score is 0-100%.

This study has received permission from the Health Research Ethics Committee of the Faculty of Medicine and Health Sciences, UIN Alauddin Makassar with No. B.237/KEPK/FKIK/IV/2022. It was declared ethically feasible according to 7 (seven) WHO Standards 2011, namely 1) Social Value, 2) Scientific Value, 3) Equalization of Burden and Benefits, 4) Risk, 5) Inducement / Exploitation, 6) Confidentiality and Privacy, and 7) Informed Consent, which refers to the 2016 CIOMS Guidelines. This is as indicated by the fulfillment of the indicators of each standard.

RESULTS

Based on the research that has been done, the following data is obtained:

Table 1 Frequency distribution of respondent characteristics of pregnant women at Wirahusada Medical Center Clinic 2022

Characteristics		n	%
1.	**Age**		
	a. 20-25 Years	34	35.8
	b. 26-30 Years	39	41.1
	c. 31-35 Years	19	20.0
	d. 36-40 Years	2	2.1
	e. > 40 Years	1	1.1
2.	**Education**		
	a. High School	25	26.3
	b. Diploma	3	3.2
	c. Bachelor	57	60.0
	d. Magister	9	9.5
	e. Doctor	1	1.1
3.	**Occupation**		
	a. Housewife	45	47.4
	b. Self-employed	7	7.4
	c. Employee of Private Sector	16	16.8
	d. Lecturer	5	5.3
	e. Civil Servant	20	21.1
	f. Dentist	1	1.1
	g. Nurse	1	1.1
4.	**Trimester**		
	a. Trimester 1	12	12.6
	b. Trimester 2	40	42.1
	c. Trimester 3	43	45.3
5.	**Parity**		
	a. Nullipara	33	34.7
	b. Primipara	24	25.3
	c. Multipara	38	40.0
6.	**Upper Arm Circumference**		
	a. Chronic Energy Deficiency	8	8.4
	b. No Chronic Energy Deficiency	87	91.6
7.	**BMI**		
	a. Mildly Emaciated	7	7.4
	b. Normal	44	46.3
	c. Light Fat	23	24.2
	d. Heavy Fat	21	22.1
8.	**ODI**		
	a. Mild Pain	20	21.1
	b. Moderate Pain	50	52.6
	c. Severe Pain	23	24.2
	d. Most severe pain	2	2.1
	Total	**95**	**100.0**

Based on Table 1 characteristics of respondents, it was found that the majority of pregnant women were in productive age, namely 26-30 years old as many as 39 respondents (41.1%). Furthermore, the majority have a bachelor's degree with 57 respondents (60.0%). Then regarding work, it was found that the majority worked as housewives with 45 respondents (47.4%). Furthermore, regarding the gestational age of pregnant women, the

majority are in the third trimester, namely 43 respondents (45.3%). The picture of parity in respondents is multiparous with a total of 38 respondents (40.0%). For nutritional status based on Upper Arm Circumference, the majority did not experience Chronic Energy Deficiency (SEZ) with 87 respondents (91.6%) and the majority of body mass index was in the normal category, namely 44 respondents (46.3%). For pain experienced by respondents, most were on a moderate pain scale with a total of 50 respondents (52.6%).

Table 2 Relationship between gestational age and the incidence of low back pain at Wirahusada Medical Center Clinic 2022

Gestational Age		ODI				Total	X^2	p-value
		Mild Pain	Moderate Pain	Severe Pain	Most severe pain			
Trimester 1	n	7	5	0	0	12	24.821	0.000
	%	58.30%	41.70%	0.00%	0.00%	100.00%		
Trimester 2	n	12	20	8	0	40		
	%	30.00%	50.00%	20.00%	0.00%	100.00%		
Trimester 3	n	1	25	15	2	43		
	%	2.30%	58.10%	34.90%	4.70%	100.00%		
Total	n	20	50	23	2	95		
	%	21.10%	52.60%	24.20%	2.10%	100.00%		

Based on table 2 shows that as many as 7 respondents (58.30%), who experienced mild pain and as many as 5 respondents (41.70%) who experienced moderate pain in trimester 1. Furthermore, as many as 12 respondents (30.00%) experienced mild pain, as many as 20 respondents (50.00%) experienced moderate pain and as many as 8 respondents (20. 00%) who experienced severe pain in trimester 2. Furthermore, during trimester 3 as many as 1 respondent (2.30%) who experienced mild pain, as many as 25 respondents (58.10%) who experienced moderate pain, as many as 15 respondents (34.90%) who experienced severe pain and as many as 2 respondents (4.70%) who experienced the most severe pain. In the results of this study obtained a p-value of 0.000. So it is concluded that there is a significant relationship between gestational age and the incidence of low back pain. the higher the gestational age, the heavier the lbp experienced.

Table 3 Relationship between Parity and the Incidence of Low Back Pain at Wirahusada Medical Center Clinic 2022

Parity		ODI				Total	X^2	P-Value
		Mild Pain	Moderate Pain	Severe Pain	Most severe pain			
Nullipara	n	16	14	3	0	33	26.143	0.000
	%	48.50%	42.40%	9.10%	0.00%	100.00%		
Primipara	n	2	15	6	1	24		
	%	8.30%	62.50%	25.00%	4.20%	100.00%		
Multipara	n	2	21	14	1	38		
	%	5.30%	55.30%	36.80%	2.60%	100.00%		
Total	n	20	50	23	2	95		
	%	21.10%	52.60%	24.20%	2.10%	100.00%		

Based on table 3 shows that as many as 16 respondents (48.50%) experienced mild pain, as many as 14 respondents (42.40%) experienced moderate pain and as many as 3 respondents (9.10%) experienced severe pain in nulliparous parity status. Furthermore, there were 2 respondents (8.30%) who experienced mild pain, as many as 15 respondents (62.50%) who experienced moderate pain, as many as 6 respondents (25.00%) who experienced severe pain and as many as 1 respondent (4.20%) who experienced the most severe pain in primiparous parity status. Furthermore, in multiparous parity status, 2 respondents (5.30%) experienced mild pain, 21 respondents (55.30%) experienced moderate pain, 14 respondents (36.80%) experienced severe pain and 1 respondent (2.60%) experienced the most severe pain. In this study obtained a p-value of 0.000. So it can be concluded that there is a significant

relationship between parity and the incidence of low back pain. The more frequent childbirth, the heavier the lbp experienced.

Table 4 Relationship between Nutritional Status based on Upper Arm Circumference and the Incidence of Low Back Pain at Wirahusada Medical Center Clinic 2022

Upper Arm Circumference		ODI				Total	X^2	P-Value
		Mild Pain	Moderate Pain	Severe Pain	Most severe pain			
Chronic Energy Deficiency	n	5	3	0	0	8	9.807	0.020
	%	62.5%	37.5%	0.0%	0.0%	100.0%		
No Chronic Energy Deficiency	n	15	47	23	2	87		
	%	17.2%	54.0%	26.4%	2.3%	100.0%		
Total	n	20	50	23	2	95		
	%	21.1%	52.6%	24.2%	2.1%	100.0%		

Based on table 4 shows that as many as 5 respondents (62.5%) experienced mild pain and as many as 3 respondents (37.5%) experienced moderate pain in pregnant women whose nutritional status LiLA or Upper Arm Circumference experienced Chronic Energy Deficiency or SEZ. Furthermore, pregnant women who did not experience Chronic Energy Deficiency or SEZ were 15 respondents (17.2%) who experienced mild pain, 47 respondents (54.0%) who experienced moderate pain, 23 respondents (26.4%) who experienced severe pain and 2 respondents who experienced (2.3%) who experienced the most severe pain. In the results of this study obtained a p-value of 0.020. So it is concluded that there is a relationship between nutritional status based on upper arm circumference and the incidence of low back pain.

Table 5 Relationship between Nutritional Status based on BMI (Body Mass Index) and the Incidence of Low Back Pain at Wirahusada Medical Center Clinic 2022

BMI		ODI				Total	X^2	P-Value
		Mild Pain	Moderate Pain	Severe Pain	Most severe pain			
Mildly Emaciated	n	4	3	0	0	7	47.522	0.000
	%	57.10%	42.90%	0.00%	0.00%	100.00%		
Normal	n	14	27	3	0	44		
	%	31.80%	61.40%	6.80%	0.00%	100.00%		
Light Fat	n	2	15	6	0	23		
	%	8.70%	65.20%	26.10%	0.00%	100.00%		
Heavy Fat	n	0	5	14	2	21		
	%	0.00%	23.80%	66.70%	9.50%	100.00%		
Total	n	20	50	23	2	95		
	%	21.10%	52.60%	24.20%	2.10%	100.00%		

Based on table 5 shows that as many as 4 respondents (57.10%) experienced mild pain, as many as 3 respondents (42.90%) experienced moderate pain in mild thin nutritional status. Furthermore, as many as 14 respondents (31.80%) experienced mild pain, as many as 27 respondents (61.40%) experienced moderate pain, and as many as 3 respondents (6.80%) experienced severe pain in normal nutritional status. Furthermore, in mild fat nutritional status, 2 respondents (8.70%) experienced mild pain, as many as 15 respondents (65.20%) experienced moderate pain and as many as 6 respondents (26.10%) experienced severe pain. Furthermore, in severe fat nutritional status there were 5 respondents (23.80%) who experienced moderate pain, as many as 14 respondents (66.70%) who

experienced severe pain and as many as 2 respondents (9.50%) who experienced the most severe pain. In this study obtained a p-value of 0.000. So it can be concluded that there is a significant relationship between nutritional status based on body mass index and the incidence of low back pain. The greater the body mass, the heavier the lbp experienced.

DISCUSSION

Low back pain is a common musculoskeletal problem during pregnancy with an estimated prevalence ranging from 30-78% in the United States, Europe and parts of Africa. (8) Back pain that occurs can increase in intensity with increasing gestational age due to a shift in the center of gravity and changes in posture during pregnancy. (9)

Gestational age is one of the factors that affect low back pain because the greater the gestational age, the size and weight of the uterus increases. The heavier uterus size will put pressure on the muscles and joints of the spine, resulting in low back pain. Increased body weight due to the presence of a fetus in the womb causes an increase in the angle of curvature of the spine. Thus resulting in decreased flexibility, and lumbar mobility. (10).

Low back pain that occurs in pregnant women is caused by the enlargement of the uterus. The fetus that continues to develop as the gestational age increases, the body's weight point is more inclined forward so pregnant women need to adjust their body position to maintain balance. As a result, the body tries to pull the back further back, the lower spine becomes more curved or lordosis. This is what causes tension in the ligaments and muscles in the back so that it can cause back pain (11).

Low back pain in pregnancy can occur from early pregnancy, and in each trimester the intensity of pain will change. The first trimester there is an increase in relaxin hormone which causes the spinal ligament to stretch so that there is instability in the position of the spine. Changes in pain are increasing in the second trimester, this is due to the enlargement of the uterus and the center of gravity of the body so that pain is increasingly felt. The third trimester of pregnancy low back pain can be more severe, even low back pain can be felt throughout the day because the uterus is getting bigger and the workload of the spine to support it is getting heavier. (12)

The results of this study are in line with the research of Ulfah (2017), in which the results of the chi-square test obtained a p-value of 0.036, which means that there is a significant relationship between gestational age and the incidence of low back pain. Purnamasari (2019) in his research also found that low back pain felt by pregnant women starts from the second trimester to the third trimester which is a common complaint that often occurs in pregnant women, and it is estimated that 70% of pregnant women complain of some form of back pain at some point in pregnancy with the highest prevalence of pregnant women experiencing moderate pain.

About 50-70% of pregnant women have reported low back pain during the second and third trimesters of pregnancy (13). Back pain that occurs during pregnancy will usually increase as the gestational age increases, the woman's posture will change to compensate for the weight of the growing uterus. The mother will try to maintain body balance by pulling the shoulders back due to the enlargement of the abdomen so that the spine is curved inward excessively. Followed by relaxation of the sacroiliac joints, which accompanies changes in posture, causing increased back pain (14).

Parity is the number of children born by a mother, either alive or dead (15). Pregnant women with multiparous and grandemultiparous parity status have a higher risk of experiencing low back pain compared to primiparous mothers. (16) This is caused by anatomical and physiological changes that occur during pregnancy which are irreversible. Changes in muscle tone in multiparous and grandemultiparous women are weaker so that the muscles are not strong enough to support the enlarged uterus in subsequent pregnancies, this will increase the risk of low back pain. Primiparous women usually have very good abdominal muscles. This is because the muscle has never experienced stretching before. (17).

The results of this study are in line with the research of Salam B (2016), in which the results of the chi-square test obtained a p-value of 0.007, which means that there is a significant relationship between parity and the incidence of low back pain. Lala (2019) in her research also found that based on the data obtained from 32 respondents there were 12 primigravida respondents and 20 multigravida respondents. (14).

The results of research from Resmi, et al showed that there was a significant relationship between parity and back pain in pregnancy. The more often and the more a woman is pregnant and gives birth, the greater the risk compared to women who are primiparous. High parity status will increase the risk of experiencing back pain. The more often a woman is pregnant and gives birth, the more the risk of back pain is experienced. In women with multiparous and grandemultiparous parity status, changes that occur during pregnancy cannot fully recover after pregnancy and childbirth are over. Some of the changes that occur will persist. Likewise, abdominal muscle tone that has been stretched during previous pregnancies cannot recover as before pregnancy. (9).

Based on the results of the analysis between Upper Arm Circumference and the incidence of low back pain presented in table 1.4 shows that the majority of respondents did not experience Chronic Energy Deficiency or SEZ with a total of 87 respondents with the majority experiencing moderate pain. While those who experienced Chronic

Energy Deficiency or SEZ were 8 respondents with the majority experiencing mild pain with a total of 5 respondents (62.5%) while as many as 3 respondents (37.5%) experienced moderate pain.

The nutritional status of pregnant women can be determined by measuring the size of the upper arm circumference. If it is less than 23.5 cm, pregnant women are considered chronically energy deficient, so pregnant women can be at risk of giving birth to low birth weight babies. (18) Measurement of upper arm circumference provides an overview of the condition of muscle tissue and the fat layer under the skin, so a decrease in upper arm circumference indicates a decrease in muscle mass or fat tissue, or both which are used as parameters to see the risk of chronic energy deficiency in pregnant women. (19)

Unstable weight gain in pregnant women can lead to overweight or obesity during pregnancy, which can indicate an increase in body mass index in pregnant women. This results in the spine having to be able to support weight gain during pregnancy. This weight gain increases the undue workload on the spine and back muscles and causes changes in gravity, causing complaints of low back pain. (20) The greater the weight gain during pregnancy, the greater the likelihood of joint instability and increased lumbar lordosis so that this can result in pain in the lower back (21). Unstable weight gain also during pregnancy can indicate a high body mass index, indicating a greater burden on tendons, ligaments and joints. The enlarged uterus and increased breast volume shift the body's center of gravity forward, resulting in complaints of low back pain. (22)

The results of this study are in line with the research of Gharaibeh et al (2018) which shows the frequency of low back pain in pregnant women is 76% where body mass index is one of the factors associated with the risk of low back pain complaints in pregnant women with a p value <0.05 which is statistically significant. Pricillia (2020) in her research also obtained the results of the chi-square test with a p-value of 0.006 which means there is a significant relationship. Excess weight is identified as a risk factor, because the greater the weight during pregnancy, the greater the likelihood of instability in the sacroiliac joint and increased lumbar lordosis, resulting in pain in the lower back. (21)

CONCLUSION

From the results of the research that has been done, it can be concluded that there is a relationship between gestational age, parity and nutritional status of pregnant women with the incidence of low back pain based on the Oswestry Disability Index (ODI) in pregnant women at the Wirahusada Medical Center Clinic Makassar 2022.
Advice for mothers to avoid problems during pregnancy or before experiencing back pain during pregnancy, pregnant women should diligently exercise lightly. To relieve lower back pain. For future researchers it is recommended that they can pay attention to other variables that can affect the level of low back pain.

ADVICE

Based on these data, it is important to remember that every individual and pregnancy is unique, and back pain can be caused by a variety of complex factors. Therefore, appropriate care and precautions should be tailored to the needs of each pregnant woman to reduce the risk and manage back pain during pregnancy. for example, if the individual has excess weight, the individual can lose weight.

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