

ICASH-A042

THE CORECT BODY MECHANIC PRINCIPLE AND LOW BACK PAIN IN THE THIRD TRIMESTER PREGNANT WOMEN

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ABSTRACT

Background: Low back pain is one of the inconveniences in pregnant women which normally will increase along with the increasing of gestational age because this pain is caused by the shift of the center of gravity in a woman and her posture. The good body mechanic is needed to establish the safe and comfortable daily activities during pregnancy and to prevent and reduce back pain.

Aims: This study aimed to analyze the correct body mechanic principle with low back pain complaints in the third trimester pregnant women at the work region of Kambangan health center Sub-district Lebaksu Tegal Regency.

Method: This study used cross-sectional design. The population used in this research is pregnant women of the third trimester in the working area of Kambangan health center, Lebaksu Sub District Tegal, population in this study as much 36 third trimester pregnant women and 24 respondents as sample.

Result: There were 58.3% of the respondents who had good body mechanic, while 45.8% of the respondents experienced back pain. The bivariate analysis indicated that there was a correlation between body mechanic and back pain in the third trimester pregnant women with the p-value of 0.011.

Conclusion: The results of this study indicate that the correct body mechanic principle can prevent low back pain in the third trimester pregnant women at Kambangan Health Center Lebaksu Sub-district Tegal Regency and to reduce low back pain in pregnant women, midwives need to provide health education about the correct body mechanic during pregnancy to prevent low back pain.

Keywords: Body mechanic, Low Back Pain, Pregnant women

INTRODUCTION

Low back pain is one of the inconveniences in pregnant women which its intensity normally will increase along with the gestational age because this pain is caused by the shift of the center of gravity in a woman and her posture. These posture changes are caused by an enlarged uterine weight, excessive bending walking without rest and weight lifting [1-5]. Prolonged back pain in pregnant women can lead to a change

in the role, which is pregnant women become dependent on the help another person to do their duties in other words the daily activity of that women is disturbed and about 30% of women with low back pain during pregnancy, adversely impacts life quality, requiring frequent periods of bed rest, and leading to work absences. In addition, low back pain in pregnant women can also cause disturbance of sleep patterns and insomnia that can be bad for the physical and psychological conditions of pregnant women and their fetus [6, 7].

To prevent low back pain complaints and establish safe and comfortable daily activities during pregnancy, pregnant women need proper body mechanics, a body position to adjust body changes in especially the backbone lordosis, including the correct way of standing, the sitting, wakes up from sleeping position, lifting position, and squatting position. Research suggests that lower back pain is significantly related to the use of body mechanics and working pressure on nursing working in the general ward and special units including intensive care units and emergency room [8-10]. This present study aims to analyze the correct body mechanic principle with low back pain complaints in the third trimester pregnant women at the work region of Kambangan health center Sub-district Lebaksiu Tegal Regency.

METHODS

This study used cross-sectional study to perform relation of the correct body mechanic principle with low back pain at one time. Population used in this research was 24 third trimester pregnant woman in working area of Kambangan Health Center Subdistrict Lebaksiu Tegal Regency, amounting to 36 pregnant women. Nonprobability sampling was used in this research with purposive sampling by inclusion and exclusion criteria. The inclusion criteria in this research is third trimester pregnant women, primi or multigravida, has no history of back pain before pregnancy, while the exclusion criteria is pregnant women with grande multigravida (pregnancy ≥ 5) and pregnant women who have a history of low back pain before pregnancy [11]. The data collection tool used in this research was questionnaire, contains 21 questions pertaining to body mechanics in pregnant women who meet the inclusion criteria. The questionnaire lists the implementation of principle of body mechanic during pregnancy, including body mechanic when lying and wake up from sleep, sitting, standing and body mechanic when lifting the load and the intensity of the pain is measured by the scale of intensity of numerical pain. The data was analyzed using Fisher-Exact test, to know the relationship between the two variables with significance $\alpha = 0.05$ [12].

RESULTS

Table 1. Cross table on body mechanics and low back pain in third trimester pregnant women

Body Mechanics	Low Back Pain				Total		p-value	OR
	Yes		No		frequency	%		
	frequency	%	frequency	%	frequency	%		
Not Good	8	33.33	2	8.33	10	41.66	0.011	14.667
Good	3	12.50	11	45.83	14	58.33		
Total	11	45.8	13	54.2	24	100		

Table 1 presents the body mechanics and low back pain in the participated trimester pregnant women. Of 24 women, more than half have good body mechanics (58.33%), and only 3 of them experience low back pain. In another hand, of the total pregnant women, 10 of them have not good body mechanics, and only two have no experience to low back pain. This data suggests a correlation between body mechanics to low back pain, at significance level of 0.011. By the statistical analysis, we noted that having good body mechanics lesser the potentiality to having low back pain 14.67 times.

DISCUSSION

Most of the respondents have good mechanical body which lies in lying and waking positions. It is not advisable for the mother to sleep on her back because it can lead to hypotension due to depression of the inferior vena cava by the uterus, three or four pillows sufficient to shoot the shoulders and Head to avoid it, sloping position is a comfortable position during pregnancy. On awakening from the lying position, the mother should bend her knees, roll to one side, then use her arms to push the body into a sitting position [2, 13]. Respondents who have good mechanics chose a chair that can support the thighs and back and lean back on the back of the chair with an upright and he did not use high heeled footwear but heeled. This is because the posture of pregnant women should be erected with the abdomen and the butt is contracted. High-heeled footwear causes the balance of the mother to shift too far forward and better replaced with moderate or low heeled footwear [14, 15].

Noticed from the pregnant women who have poor body mechanics in this present study do lot of bending position when doing daily activities, such as sweeping, mopping, washing clothes, and bending when picking up objects under or on the floor. Most respondents who have poor body mechanics are primigravida.

In this study, there were 11 pregnant women who experience back pain with different pain intensity. There were 2 mothers with mild pain, 7 with moderate pain, and severe pain in the other 2 participants. The intensity of the pain is measured by the scale of intensity of numerical pain. The low back pain was due to anatomical changes in pregnant women, the lordosis backbone due to compensation from enlargement of the uterus to the anterior position, and the lordosis that shifts the weight center of weight back toward the two limbs. Since the hormonal factors, the sacroiliac, sacrococcygeal and pubis joints increase the mobility that may lead to a change in the attitude of the mother. The structure of the ligaments and muscles (muscles) of the middle and lower spine are under severe pressure [16, 17].

These changes physiologically cause discomfort in the musculoskeletal form of back pain. The pregnant women who experienced an anatomic changes may have back pain in pregnant women since their excessive activities that lead to the tiredness, stretch on the back, and bowing motions (i.q., bending, walking without rest, and lifting weights) [2, 18].

In another study also mentioned that the standing position has long been identified as a factor that aggravates pain and rest as a major contributing factor. This data speaks in favor of muscle involvement in lumbar flavor reported by pregnant women. In addition, back pain in pregnancy was resulted from the growth of the uterus causing postural changes, as well as the effects of relaxing hormone on the ligaments. The uterine growth increases abdominal distension and leads to a tilted pelvis forward, decreased abdominal muscle tone, and increased weight gain at the end of pregnancy require re-adjustment [3, 19, 20].

Using chi-square test, it was found a significant correlation between body mechanic and back pain in third trimester pregnant woman at Health Center *Kambangan* Sub-district, Lebaksiu Regency, Tegal, Indonesia (p value = 0.011). Maternal adaptations often make women lead to back pain and possible injury. Poor posture and body mechanics cause discomfort and increase the likelihood of injury. While good body mechanics can prevent and eliminate back pain. Appropriate body mechanics can reduce the risk of musculoskeletal system injury and facilitate body movement that allows physical mobilization without muscle tension [21]. Even the authors realized the small population size and the absence of control group hard limit the generalization, however, from this study, among the participants, good body mechanics can reduce the risk of having low back pain 14.67 times.

CONCLUSIONS

This present study suggest that the correct body mechanic principle in pregnant women can prevent low back pain among the third trimester pregnant women. It is expected a role of health provider, especially the midwives, to provide education about the correct body mechanic principle in pregnant women from the second trimester of pregnancy in reducing low back pain.

REFERENCES

- [1]. George JW, Skaggs CD, Thompson PA, Nelson DM, Gavard JA, Gross GA. A randomized controlled trial comparing a multimodal intervention and standard obstetrics care for low back and pelvic pain in pregnancy. *American journal of obstetrics and gynecology*. 2013;208(4):295. e1-. e7.
- [2]. Diane M Fraser MA. *Myles Buku Ajar Bidan*. Jakarta: EGC; 2009.
- [3]. Carvalhoa M LLC, Terceiroa C, Pintoa D, Silva M.N , Cozera G.A, et al. Low back pain during pregnancy. *Sociedade Brasileira de Anestesiologia*. 2017;67(3).
- [4]. Alloya A, Wahyuni MK. *Beda Pengaruh Antara Senam Hamil Dengan Kompres Hangat Dan Massage Terhadap Penurunan Nyeri Punggung Bawah Pada Ibu Hamil Trimester III: Universitas Muhammadiyah Surakarta*; 2016.
- [5]. Bhardwaj A, Nagandla K. Musculoskeletal symptoms and orthopaedic complications in pregnancy: pathophysiology, diagnostic approaches and modern management. *Postgraduate medical journal*. 2014;postgradmedj-2013-132377.
- [6]. Yan C-F, Hung Y-C, Gau M-L, Lin K-C. Effects of a stability ball exercise programme on low back pain and daily life interference during pregnancy. *Midwifery*. 2014;30(4):412-9.
- [7]. Jodi A R, Janeta N. Sleep patterns and sleep disturbances across pregnancy. *Sleep Medicine*. 2015.
- [8]. Puskdiknakes. *Asuhan Antenatal*. Jakarta: Depkes; 2003. p. 74-88
- [9]. Thomas AC, K.; Nageshwar V. Effectiveness of Video Assisted Teaching Programme on Knowledge Regarding Practice of Body Mechanics among Staff Nurses in Selected Hospitals, Moradabad. *Indian Journal of Public Health Research & Development*. 2017;8(2):39-42.
- [10]. Jung K, Suh S. Relationships among nursing activities, the use of body mechanics, and job stress in nurses with low back pain. *Journal of muscle and joint health*. 2013;20(2):141-50.
- [11]. Notoatmodjo S. *Metodologi Penelitian Kesehatan*. Jakarta: Rineka Cipta; 2010.
- [12]. Saryono. *Metodologi penelitian kesehatan: penuntun praktis bagi pemula*. Yogyakarta: Mitra Cendikia Press; 2011.
- [13]. Fauziah Fatmawati F, Sulastri SK, Kes M, Faizah Betty R. *Upaya Pemenuhan Rasa Nyaman Pada Ibu Hamil Trimester-III Dengan Nyeri Punggung: Universitas Muhammadiyah Surakarta*; 2017.
- [14]. Winata H. Kaitan Pemakaian Sepatu Hak Tinggi dengan Lordosis Lumbal. *Jurnal Kedokteran Meditek*. 2015;20(52).
- [15]. Kendall JC, Bird AR, Azari MF. Foot posture, leg length discrepancy and low back pain—Their relationship and clinical management using foot orthoses—An overview. *The Foot*. 2014;24(2):75-80.
- [16]. Wiknjosastro. *Ilmu kebidanan*. Jakarta: Yayasan bina pustaka sarwono prawirohardjo; 2008.
- [17]. Thornburg KL, Bagby SP, Giraud GD. *Maternal Adaptations to Pregnancy*. Knobil and Neill's Physiology of Reproduction: Two-Volume Set: Elsevier Inc.; 2014.
- [18]. Naser SSA, AlDahdooh RM. Lower Back Pain Expert System Diagnosis and Treatment. *Journal of Multidisciplinary Engineering Science Studies (JMESS)*. 2016;2(4):441-6.
- [19]. Thabah M, Ravindran V. Musculoskeletal problems in pregnancy. *Rheumatology international*. 2015;35(4):581-7.
- [20]. Wahyuni S RA, Nurhidayati E. Perbandingan Transcutaneous Electrical Nerve Stimulation Dan Kinesio Taping Terhadap Penurunan Skala Nyeri Punggung Bawah Pada Ibu Hamil Trimester III Di Puskesmas Juwiring Kabupaten Klaten. *Motorik Jurnal Ilmu Kesehatan (Journal Of Health Science)*. 2016;11(23).
- [21]. Kang S-W. The use of body mechanics principle, clinical-practice fatigue, and practice satisfaction of nursing students. *NursingPlus Open*. 2017;3:6-10.