

Effect of Pelvic Rocking Technique on the Relief of Low Back Pain among Multigravida Pregnant Women

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ABSTRACT

In third trimester of pregnancy, one of the problems that often arise is back pain. Back pain in pregnant women can be relieved by pelvic rocking exercise performed in a standing, sitting and lying position, both in pairs with the husband or one of the other family members. This study aims to determine the effect of pelvic rocking technique on the relief of low back pain among multigravida pregnant women. This was a pre-experimental study with pre-test and post-test non-equivalent control group design. The study was conducted at Cakranegara Community Health Center. The study samples involved 30 multigravida pregnant women. The statistical test applied here was Wilcoxon test. The results showed that regarding characteristics of respondents, most of them were in the non-risky age group by 23 respondents (76.7%), had low education by 29 respondents (96.7%), were unemployed (Housewives) by 25 respondents (83.3%), had normal BMI by 18 respondents (60.0%), had normal weight by 18 respondents (60.0%), had a parity of >2 by 18 respondents (66.7%) and were in the 25-38 weeks of gestation by 28 respondents (93.3%). After the implementation of pelvic rocking technique, there was a decrease in mean low back pain score by 1.47. Wilcoxon test result obtained a P value of 0.00001. Pelvic rocking technique could relieving low back pain among multigravida pregnant women.

Pada trimester ketiga salah satu masalah yang timbul adalah nyeri punggung. Nyeri punggung pada ibu hamil dapat diredakan dengan latihan gerak panggul (pelvic rocking) dalam posisi berdiri, duduk dan tiduran (terlentang atau miring) yang dapat dilakukan secara berpasangan dengan suami atau salah satu keluarga yang lain. Tujuan penelitian ini untuk mengetahui pengaruh pemberian teknik pelvic rocking terhadap pengurangan nyeri punggung bawah pada ibu hamil multigravida. Desain penelitian pre dan post-test non-equivalent control group. Penelitian dilakukan di wilayah kerja Puskesmas Cakranegara. Sampel adalah ibu hamil multigravida sebanyak 30 orang. Uji statistik menggunakan uji Wilcoxon. Hasil penelitian didapatkan karakteristik responden sebagian besar umur tidak berisiko sebanyak 23 orang (76,7%), pendidikan rendah sebanyak 29 orang (96,7%), ibu tidak bekerja (IRT) sebanyak 25 orang (83,3%), IMT normal sebanyak 18 orang (60,0%), BB sekarang kategori normal sebanyak 18 orang (60,0 %) dan paritas >2 sebanyak 18 orang (66,7%) usia kehamilan 25-38 mg 28 orang (93,3%). Sesudah diberikan teknik pelvic rocking, mean nyeri punggung bawah turun 1.47 point. Hasil uji Wilcoxon didapatkan nilai P value 0.000. Pemberian teknik pelvic rocking berpengaruh terhadap pengurangan nyeri punggung bawah pada ibu hamil multigravida.

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Introduction

Pregnancy is a period full of challenges for women, so that pregnant women need help from various parties, especially husbands to go through the processes of pregnancy and childbirth comfortably

and safely (Aprilia, 2011). It takes time for women to adjust to all of the changes that occur during pregnancy. The majority of pregnant women experience discomfort and anxiety as a result of the changes during pregnancy, for example regarding frequent urination by 50%, vaginal discharge by 15%, constipation by 40%, flatulence by 30%, swelling leg by 20%, leg cramps by 10%, migraine by 20%, striae gravidarum by 50%, hemorrhoids by 60%, shortness of breath by 40%, and back pain by 70%. All of changes contribute to the third trimester discomforts experienced by pregnant women (Astuti, 2009).

Back pain is one of discomforts that can be experienced in the third trimester. Such condition is due to the increased weight being carried to the uterus. The curvature of the spine in pregnant women, an increase in body weight along with the pregnancy progress, a change in body posture, and an imbalance between antagonist and agonist muscles, specifically the erector spine and lumbosacral group, are all known to cause low back pain among pregnant women (Renaningtyas et al., 2014). If a wrong condition or position persists for a long time, it will result in tension in musculus abdominalis (Latief, 2016).

Pelvic rocking is beneficial for strengthening the abdominal and low back muscles, reducing pressure on the blood vessels in the area around the uterus, and pressure on the bladder. In addition, the movement helps the women to relax and complaints of pain in the lumbar, inguinal, vaginal and surrounding areas can be relieved. A study conducted by Zagazig University in Egypt, which was published in *Journal of American Science* (2016), revealed that Pelvic rocking exercise in the management of low back pain was proven to reduce the level of disability during pregnancy which often causes anxiety among pregnant women. Pelvic rocking exercise can minimize or even eliminate low back pain at the end of pregnancy and improve bodily functions and activities of pregnant women in the last trimester, whose movement activities are often limited due to frequent low back pain. The reason for selecting multigravida pregnant women is due to internal factors related to pain reactions, one of which is the previous experience of pain in the previous pregnancy.

Based on data regarding prenatal care services in the Province of NTB in 2018, there were 114,488 pregnant people living in the 10 Districts/Cities of the Province of NTB. There were 117,842 pregnant women who were fully covered by District/City ANC K1 services (102.93%). The District/City K4 services' overall coverage involved 107,968 pregnant women (94.31%) (West Nusa Tenggara Province Health Office, 2018).

According to the recapitulation of data reported by Mataram City Health Office from August through September 2019, the target number of K4 pregnant women in 11 Community Health Centers in Mataram City was 9,722 (63.03%). Cakranegara CHC showed the highest target for pregnant women by 1,329 pregnant women (74.33%), followed by the Karang Pule CHC with the target of 1,296 pregnant women (70.45%), and Tanjung Karang CHC with the target of 1,249 pregnant women (65.25%) (Mataram Health Office, 2019).

A preliminary survey was conducted on January 20–21, 2020 at Cakranegara CHC to obtain a sense of the potential severity of low back pain among multigravida pregnant women who came in for

ANC Visit. Ten multigravida pregnant women who complained of low back pain discomfort at rest participated in the study, the majority of whom complained since 8 months of gestation. There were 6 multigravida pregnant women (60%) with managed severe pain level and 4 multigravida pregnant women (40%) with controlled moderate pain level out of the 10 multigravida pregnant women who complained of low back pain discomfort. The 10 multigravida pregnant women who complained of low back pain were found to be able to manage it by engagement in regular activities.

Applying pelvic rocking technique while standing, sitting, or lying down (supine or on one's side) can help pregnant women with back pain feel better. The muscles in the low back and abdomen can be strengthened through pelvic rocking movement. By briefly removing the fetus from the mother's low back, this activity releases strain on the low back. Additionally, this exercise can lessen strain on the mother's bladder and the blood vessels in the uterus. Additionally, pelvic rocking calms the women and enhances their digestive system (Handajani, 2013).

16 pregnant women participated in a study conducted by Weni Tri Purnani in 2015 entitled "Pelvic Rocking on the Relief of Low back pain among Third Trimester Pregnant Women," at the Blabak CHC in Kandat Sub-District of Kediri District. It was found that 11 respondents (68.75%) had a mild pain after receiving pelvic rocking exercise for back pain, and 5 respondents (31.25%) reported that their back pain had disappeared completely. Therefore, in this study, pelvic rocking movement was hypothesized to have a positive effect on the relief of low back pain discomfort among pregnant women in the third trimester. In this study, a pelvic rocking technique was performed in pairs (Purnani, 2015).

According to a study conducted by Weni Tri Purnani which involved 27 primigravida and multigravida pregnant women, multigravida women were found to have more intense pain than primigravida women. This study had a difference with the previous study since the researchers observed the pelvic rocking technique applied in pairs, specifically for multigravida pregnant women (Purnani, 2015). In this study, pelvic rocking technique was explained via video media as well as printed and electronic books that could be read on Android smartphones. This study aims to determine the effect of pelvic rocking technique on the relief of low back pain among multigravida pregnant women.

Methods

This was a pre-experimental study with one group pre-test and post-test non-equivalent control group design. The study was conducted at Cakranegara Community Health Center. The population in this study was all K4 pregnant women in December 2020 at Cakranegara CHC. The study samples involved 30 multigravida pregnant women who were selected using purposive sampling technique based on inclusion and exclusion criteria. The inclusion criteria included women with complaint of low back pain and gestational age of 29-36 weeks, while the exclusion criteria were those having a history of disease or currently suffering from co-morbidities of pregnancy, and had complications (repeated miscarriage, pregnancy with bleeding, multiple pregnancies). In this study, the pelvic rocking technique was performed in pairs with husbands and/or other family member. The pain scale was assessed using the Numerical Rating Scale (NRS). Based on the normality test using Shapiro Wilk, the data were not

normally distributed (non-parametric) so the Wilcoxon Signed Rank Test (non-parametric test) was applied. The ethical approval was obtained through a letter number 208/UN18.F7/ETIK/2021

Results

Characteristics of Respondents

Table 1. Frequency Distribution of the Characteristics of Respondents

| Characteristic | | n | % |
|---------------------------|---|-----------|------------|
| Age | | | |
| | Risky age (<20 years / >35 years) | 7 | 23.3 |
| | Non-Risky Age (20 – 35 years) | 23 | 76.6 |
| Level of Education | | | |
| | Low (Elementary, junior and senior high school) | 29 | 96.7 |
| | High (Bachelor) | 1 | 3.3 |
| Employment Status | | | |
| | Employed | 5 | 16.7 |
| | Unemployed | 25 | 83.3 |
| BMI | | | |
| | Normal | 18 | 60.0 |
| | Abnormal | 12 | 40.0 |
| Body Mass Index | | | |
| | Normal | 18 | 60.0 |
| | Abnormal | 12 | 40.0 |
| Parity | | | |
| | 2 | 10 | 33.3 |
| | >2 | 20 | 66.7 |
| Gestational age | | | |
| | 16-24 weeks | 2 | 33.3 |
| | 25-38 weeks | 28 | 66.7 |
| Total | | 30 | 100 |

Based on Table 1, it was revealed that most of women had a normal BMI by 18 respondents (60.0%); were in the normal weight category by 18 respondents (60.0%); had parity of >2 by 18 respondents (66.7%); and were in the gestational age of 25-38 weeks by 20 respondents (66.7%), were in non-risky age by 23 respondents (76.7%), had low education by 29 respondents (96.7%), and were unemployed (Housewives) by 25 respondents (83.3%).

Assessment of Low Back Pain Levels Before and After Pelvic Rocking Technique

Table 2. Distribution of Low Back Pain Levels Before and After Pelvic Rocking Technique

| Low Back Pain | Max | Min | Mean | SD |
|---------------|-----|-----|------|-------|
| Before | 7 | 1 | 2.67 | 1.688 |
| After | 7 | 0 | 1.20 | 1.937 |

Based on Table 2, it can be observed that after the implementation of pelvic rocking technique for back pain had a maximum score of 7 and a minimum score of 0. Meanwhile, the mean pain score experienced after the implementation of pelvic rocking technique was 1.20, with a decrease of 1.47 from the mean pain score before the implementation of pelvic rocking technique.

Effect of Pelvic Rocking Technique on the Relief of Low Back Pain among Multigravida Pregnant Women

Table 3. Effect of Pelvic Rocking Technique on the Relief of Low Back Pain

| Low Back Pain | n | Mean | Median | SD | P value |
|---------------|----|------|--------|-------|---------|
| Before | 30 | 2.67 | 2.50 | 1.688 | 0.000 |
| After | 30 | 1.20 | 0.00 | 1.937 | |

Based on Table 3, it can be concluded that the mean pain score experienced by pregnant women after the implementation of pelvic rocking technique was 1.20. It decreased by 1.47 from the mean pain score before the implementation of pelvic rocking technique. Furthermore, the Wilcoxon test result obtained a P value of 0.000, which indicated that pregnant women who performed pelvic rocking technique no longer experienced low back pain.

Discussion

Characteristics of Respondents

To relieve back pain, pelvic rocking technique can be done 2 times a day every 2 days with duration of 30 minutes. However, pelvic rocking technique cannot be performed on pregnant women with a history of disease, co-morbidities, and/or complications of pregnancy (repeated miscarriage, antepartum bleeding, twin pregnancy). In this study, it was discovered that the majority of respondents were in a healthy reproductive stage, and that only a small percentage of respondents were between the age range of 20 and 35. Age has a significant impact on a woman's ability to physically and mentally cope with pregnancy and childbirth. A person under the age of 20 might not be psychologically prepared to experience pregnancy or childbirth. Three things—physical, mental, and financial readiness—are key indicators of pregnancy readiness. Women aged >20 years are typically considered to be ready for pregnancy. A person aged <20 years is considered psychologically less capable of making therapeutic choices. Additionally, the pregnancy may be accompanied by abnormal conditions or states, as well as delivery outcomes including early labor or a small-for-gestational-age infant. A risk factor for the quality of pregnancy and childbirth is related to the woman's readiness to reproduce. According to Surtiningsih, the best maternal age for reproduction is between 20 and 35 years, which is categorized as the healthy reproductive age. The reproductive organs are still developing at the age of 20 years, so that certain complications may occur. When a woman is over 35, her body cells start to regress, notably in the endometrium. Furthermore, her health has also started to deteriorate, and the delivery canal stiffens, which might lead to prolonged labor (Surtiningsih et al., 2016). Furthermore, Sriwenda also found that age had a significant effect on the physical and psychological states of a woman in facing pregnancy and childbirth since a woman aged <20 years might not be psychologically ready to face pregnancy or childbirth. Readiness for pregnancy is determined by 3 factors, namely physical, mental and economic readiness. In general, women are said to be ready to get pregnant in the age of >20 years (Sriwenda & Yulinda, 2016).

The second characteristic to be discussed is parity. Parity is the number of children born to the woman. Parity is an important factor in determining the condition of the mother and fetus both during pregnancy and childbirth. Prawirohardjo states that up to the third parity, the uterus can return to its pre-pregnancy state (Prawirohardjo, 2013).

Education taken by a person is one of the demographic factors that greatly influence the health condition of individuals and society. People with a high degree of education will find it easier to access

health information from a variety of sources and will frequently try to learn more about health-related topics they are aware of.

Low back discomfort in the third trimester of pregnancy is a physiological issue that pregnant women frequently experience. Discomfort below the ribs and above the inferior gluteal region is referred to as low back pain. According to Lichayati and Isma'ul Kartikasari (2013), low back pain is a common problem among pregnant women that might affect them throughout their pregnancy and even after childbirth (Lichayati, Isma'ul Kartikasari, 2013).

Assessment of Low Back Pain Levels Before and After Pelvic Rocking Technique

Measuring the amount of low back pain discomfort before and after receiving the pelvic rocking treatment revealed a reduction. After receiving the pelvic rocking technique, there was a decrease in the mean level of low back pain discomfort by 1.47. The majority of back pain is considered as normal discomfort due to changes in the back's muscles, ligaments, and bones physiology (Fraser, 2009).

Every pregnancy a woman has will be distinct from the ones she has had in the past because pregnancy is a unique experience for women. In order to support the mother deal with certain problems and relieve discomforts, it is crucial for midwives to have knowledge and an awareness of the various pregnancy disorders. Although certain complaints are frequently regarded as "normal discomforts," midwives must keep in mind that the woman may view them as extremely significant discomforts. Then she must be referred to the proper medical professional if the condition progresses to a pathological condition. Hormonal and physical changes brought on by uterine development are the main causes of the discomfort experienced by pregnant women (Fraser, 2009).

Numerous pregnant women experience back pain at any time from the beginning of pregnancy until the postpartum period. Back discomfort during pregnancy is most likely to recur in women who have previously experienced it. Therefore, being able to differentiate between back pain that develops from various causes and back pain due to changes in pregnancy is crucial. Both the development of the uterus, which affects posture, and the effect of relaxing hormone on the ligaments can induce back pain during pregnancy.

Back pain that originates in the lumbosacral region is known as low back pain. Pregnancy induces back lordosis, which is a curvature of the back that stretches the back muscles and creates pain. This condition is brought on by the rising weight of the uterus. A weak abdomen muscle will lead to pain complaints worse because it raises the strain on the spine. Low back pain complaint typically rises as parity rises. Additionally, prolonged walking, excessive slouching, and lifting weights—especially when it is done when the woman is exhausted—can all result in back pain. Pelvic rocking can improve bodily functions and activities among pregnant women in the third trimester, whose mobility activities are frequently restricted due to recurrent low back pain discomfort. Pelvic rocking can reduce or even eliminate low back pain at the end of pregnancy (R. C. L. Wulandari & Wahyuni, 2019).

Effect of Pelvic Rocking Technique on the Relief of Low Back Pain among Multigravida Pregnant Women

Given that the Wilcoxon test obtained a p value of 0.000, it was possible to conclude that pelvic rocking technique implemented among multigravida pregnant women had a positive impact on the relief of low back pain discomfort.

According to the a study conducted by A. Wulandari, M. Rohmah, and E. Suprihatin, 18 respondents had a moderate level of back pain before treatment (60%) and after receiving Pelvic Rocking exercise 26 pregnant women (86.7%) had a mild level of low back pain. Wilcoxon test finding showed a p value of 0.002–0.005, which indicated a substantial impact of pelvic rocking exercise on the relief of low back pain among pregnant women in the third Trimester at Private Practice Midwife "E" in the work area of Bululawang CHC (A. Wulandari et al., 2021).

Pelvic rocking, which involves swaying the pelvis to the front, rear, left, and right sides, is one technique for relieving back discomfort. Pelvic rocking can relieve pain by strengthening the muscles in the pelvis, waist, and back as well as by lowering the baby's head to help it enter the birth canal (Hermina & Wirajaya, 2015).

Pelvic rocking technique aims to decrease the level of discomfort. According to the study finding, the mean pain scale before pelvic rocking was 2.67 with a maximum scale value of 7, and after pelvic rocking was implemented, the mean pain scale decreased by 1.20. Such finding indicated that the implementation of pelvic rocking could actually relieve pain. In fact, pelvic rocking is a technique for shifting the pelvis during a contraction. The right and left sides and circle movements help a pregnant woman to feel more relaxed, and when the pelvis swings and shakes forth and backward, it might decrease the intensity of pain (Aprilia, 2011).

According to a study conducted by Zagazig University in Egypt, which was published in Journal of American Science (2016), revealed that Pelvic rocking exercise in the management of low back pain was proven to reduce the level of disability during pregnancy which often causes anxiety among pregnant women (Elkheshen et al., 2016). Pelvic rocking exercise helps pregnant women in their third trimester, whose movement activities are frequently restricted due to recurrent low back pain. It can enhance body functions and activities. Low back discomfort at the end of pregnancy can be reduced or even completely eliminated through this exercise. As a result, pregnant women experience greater happiness and enjoy their pregnancies, leading to the achievement of the highest possible overall quality of life (R. C. L. Wulandari & Wahyuni, 2019).

Low back pain is primarily brought on by poor body posture during the gestational period. Pregnancy causes the low back to curve more and the abdomen to incline more, which causes pain in the pelvis, thighs, and all the way down to the feet. There is also increased tenderness over the pubic symphysis, which may interfere with its normal function coupled with changes in uterine size, increased fetal weight, fetal head descent, and increasingly active fetal movement. Furthermore, there can be functional limits in everyday activities and numerous missed working hours, especially at productive age. Career women are prone to injury like rib discomfort, and macro consequences becomes the main justification for seeking treatment. Pregnant women with back pain tire easily and are lethargic to perform tasks like home chores and office work (Jimenez, 2000; Bull & Archad, 2007).

Conclusion

There was a relationship between pelvic rocking technique and the relief of low back pain among multigravida pregnant women, with mean decrease in level of 1.47. It is recommended for pregnant women with low back pain to regularly practice pelvic rocking exercise in an effort to relieve back pain discomfort during in the third trimester of pregnancy.

References

- Aprilia, Y. R. (2011). *Gentlebirth melahirkan tanpa rasa sakit*. Jakarta: Gramedia.
- Astuti, H. P. (2009). *Asuhan kebidanan ibu I (kehamilan)*. Yogyakarta: Rohima.
- Bull, E., & Archad, G. (2007). *Simple guide: nyeri punggung* (R. Astikawati & A. Safitri (eds.)). Jakarta: Erlangga.
- Elkheshen, S. A., Mohamed, H. S., & Abdelgawad, H. A. (2016). The effect of practicing pelvic rocking exercise on lowering disability level through decreasing pregnancy related low back pain. *Journal of American Science*, 12(5), 98–103. [https://old.must.edu.eg/Publications/12_29851jas120516_98_103 \(2\) \(1\).pdf](https://old.must.edu.eg/Publications/12_29851jas120516_98_103%20(1).pdf)
- Fraser. (2009). *Buku ajar bidan Myles*. Jakarta: EGC.
- Handajani, S. R. (2013). Pengaruh pelvic rocking terhadap pengurangan nyeri punggung persalinan kala I dan lama waktu persalinan kala II di RSUD Muhammadiyah Delanggu. *Interest: Jurnal Ilmu Kesehatan*, 2(2), 129–132. <http://jurnal.poltekkes-solo.ac.id/index.php/Int/article/view/67>
- Hermira, C., & Wirajaya, A. (2015). *Hypnobirthing the Conny method: menjalani kehamilan dan persalinan dengan nyaman, tenang, bahagia, dan penuh percaya diri*. Jakarta: Gramedia Pustaka Utama.
- Jimenez, S. L. M. (2000). *Kehamilan yang menyenangkan*. Jakarta: Arcan.
- Latief, A. (2016). *Fisioterapi obstetri ginekologi*. Jakarta: EGC.
- Lichayati, Isma'ul, & Kartikasari, R. I. (2013). Hubungan senam hamil dengan nyeri punggung pada ibu hamil di polindes desa Tlanak kecamatan Kedungpring kabupaten Lamongan. *Surya*, 1(XIV), 63–70. https://nanopdf.com/queue/surya-63-vol01-noxiv-april-2013-hubungan-senam-hamil_pdf?queue_id=-1&x=1650283637&z=MTEwLjEzNi4yMTYuNTM=
- Mataram Health Office. (2019). *PWS KIA bulan September*. Mataram: Dinas Kesehatan Kota Mataram.
- Prawirohardjo, Sarwono. (2013). *Ilmu kebidanan*. Jakarta: PT Bina Pustaka Sarwono Prawirohardjo.
- Purnani, W. T. (2015). Pengaruh pelvic rocking terhadap penurunan nyeri punggung pada ibu hamil trimester III. *Seminar Nasional Kesehatan*, 126–130. <http://prosiding.akbiduk.ac.id/assets/doc/170602090400-13.pdf>
- Renaningtyas, D., Sucipto, A., & Chikmah, A. M. (2014). Hubungan pelaksanaan pelvic rocking dengan birthing ball terhadap lamanya kala I pada ibu bersalin di griya hamil sehat Mejasem. *SIKLUS: Journal Research Midwifery Politeknik Tegal*, 3(2). <https://ejournal.poltektegal.ac.id/index.php/siklus/article/view/206>
- Sriwenda, D., & Yulinda, Y. (2016). Efektivitas latihan birth ball terhadap efikasi diri primipara dengan persalinan normal. *Journal Ners Dan Kebidanan Indonesia*, 4(3), 141–147. <https://ejournal.almaata.ac.id/index.php/JNKI/article/view/254>
- Surtiningsih, Susiloretni, K. A., & Wahyuni, S. (2016). Efetifitas pelvic rocking exercises terhadap lama waktu persalinan pada ibu primipara di puskesmas wilayah kabupaten banjarnegara. *Jurnal Keperawatan Sudirman*, 11(2), 117–129. https://scholar.google.co.id/scholar_url?url=https://jks.fikes.unsoed.ac.id/index.php/jks/article/download/660/434&hl=id&sa=X&ei=CFFeYsDNBpyO6rQP-viEEA&scisig=AAGBfm1kyPHWa5R_MlgMxPBILFkt3i7AFA&oi=scholarr

- West Nusa Tenggara Province Health Office. (2018). *Cakupan pelayanan kesehatan ibu hamil*. mataram: Dinas Kesehatan Provinsi NTB.
- Wulandari, A., Rohmah, M., & Suprihatin, E. (2021). Pengaruh pelvic rocking exercise terhadap pengurangan nyeri punggung pada ibu hamil trimester III di PMB “E” wilayah kerja Puskesmas Bululawang kabupaten Malang. *Jurnal Ilmiah Kebidanan*, 7(1), 48–52. <https://journal.stikespembajombang.ac.id>
- Wulandari, R. C. L., & Wahyuni, S. (2019). *Monograf: efektivitas pelvic rocking exercise pada ibu bersalin kala I terhadap kemajuan persalinan dan lama persalinan*. Semarang: EF Press Digimedia.