



Exercise for Pain Relief in Yoga is Effective in Reducing Pelvic Girdle Pain During the Third Trimester of Pregnancy

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ABSTRACT

Background: Pelvic girdle pain (PGP) is one of the most common pelvic pains during pregnancy. PGP often occurs in pregnant women with an incidence of around 25%. Several methods have been developed to relax muscles or ligaments that can alleviate pelvic pain.

Purpose: This study aimed to determine the effectiveness of exercise for pain relief in yoga in reducing pelvic girdle pain during the third trimester of pregnancy.

Methods: This was a non-randomized controlled experimental study of 50 pregnant women in the third trimester with pelvic pain. The study was conducted in an antenatal clinic that provides prenatal yoga class. The treatment group (25 pregnant women) was given prenatal yoga for 2 weeks and the control group was provided with regular prenatal care. The level of pain was measured using a visual analog scale (VAS) with score from 0 to 10 before and after 2 week-prenatal yoga was given.

Results: The level of pelvic pain was lower in the treatment group that was given prenatal yoga for pain relief. The mean value of pelvic pain before intervention was 4.36 and after intervention was 2.08. The two groups had different scores for pelvic pain (p value = 0.000 and mean difference -2.28). There was a significant effect of prenatal yoga for pelvic pain relief on the intervention group. The mean difference was -2.130 (95% CIs = -2.583, -1.657), p value was 0.000.

Conclusion: Exercise for pain relief in yoga was effective in reducing pelvic girdle pain during the third trimester of pregnancy. Pregnant women with pelvic girdle pain may practice a combination of regular pregnancy exercise and prenatal yoga to lessen the pain.

Keywords: *prenatal exercise, yoga, pelvic girdle pain, pregnancy*

BACKGROUND

Pelvic girdle pain (PGP) emerges as a distinctive challenge during pregnancy, characterized by discomfort localized between the iliac crests, gluteal folds, and sacroiliac joints. The global prevalence of PGP spans from 24% to 50% among pregnant women, with an astonishing 50% experiencing this condition worldwide (Engeset et al., 2014a; Levac et al., 2012). The Cochrane library further indicates that nearly 1/5 of pregnant women contend with pelvic pain, emphasizing the widespread impact of this condition (Liddle & Pennick, 2015).

The multifaceted etiology of PGP during pregnancy encompasses hormonal, biomechanical, genetic, metabolic, and degenerative factors (Dong et al., 2020; Hinobayashi et al., 2013). A noteworthy longitudinal study conducted in Sweden, involving 530 pregnant women, elucidates that 10% of these women endure persistent PGP, underscoring the imperative for comprehensive management to mitigate potential long-term implications on quality of life and delivery complications (Elden et al., 2016; Dufour & Daniel, 2018).

In the Iranian context, a cross-sectional study unveils the pervasive nature of PGP during pregnancy, reporting an incidence rate of 1 in 2 women and an average pain intensity rating of 5.6 on the visual analogue scale (Mousav et al., 2007). These findings not only underscore the global significance of PGP but also highlight the urgency for healthcare professionals to address its implications through early diagnosis and targeted interventions.

The elusive etiology of pelvic pain remains a subject of investigation, with studies suggesting a correlation with hormonal and biomechanical factors (Stuge, 2012; Vleeming et al., 2008; Wang et al., 2004). Hormonal shifts, particularly those involving the relaxing hormone, contribute to ligament alterations, potentially precipitating pain without precise neuromotor control.

In the comprehensive management of PGP, diverse strategies come into play, including tailored exercises during pregnancy, access to information for preventing severe pain, and an understanding of causative factors (Engeset et al., 2014b). Recognizing yoga as an exercise modality, studies vividly demonstrate its efficacy in mitigating pain and discomfort during pregnancy (Jiang et al., 2015; Sun et al., 2010). Furthermore, yoga emerges as a secure and efficacious approach for alleviating anxiety, depression, stress, back pain, and sleep disorders during pregnancy (Hamdiah et al., 2017; Romano et al., 2010).

Understanding the prevalence, causes, and management of pelvic girdle pain (PGP) during pregnancy is crucial due to its complexity. Evidence-based interventions, like prenatal yoga, effectively alleviate discomfort and enhance overall maternal well-being. Embracing such strategies provides a holistic approach to managing PGP in pregnant women, ensuring a comfortable and healthy pregnancy journey. In conclusion, a comprehensive understanding of PGP, along with evidence-based interventions like prenatal yoga, is essential for promoting maternal comfort and well-being during pregnancy.

OBJECTIVE

This study aims to determine the effectiveness of yoga-based exercise for pain relief in reducing pelvic girdle pain during the third trimester of pregnancy, taking into account diverse demographic and clinical factors. Through rigorous examination, we seek to provide valuable insights for optimizing PGP management strategies and enhancing maternal well-being during this critical phase.

METHODS

In this non-randomized controlled experimental study, 50 pregnant women in their third trimester experiencing pelvic girdle pain with a pain scale ≥ 4 , and without complications during pregnancy, were included. Selection criteria encompassed pregnant women with a pain score ≥ 4 on the visual analogue scale, devoid of pregnancy risk factors, receiving routine antenatal care from the beginning, and expressing willingness to participate as research respondents. Exclusion criteria comprised non-adherence to continuous relaxation practices and inadequate exercise frequency.

Employing purposive sampling, the sample was intentionally divided into two groups: the treatment group, consisting of 25 pregnant women receiving prenatal yoga for pain relief, and the control group, comprising 25 pregnant women receiving regular prenatal care. Both groups underwent assessment on a pelvic girdle pain scale, utilizing a visual analogue display, before and after a two-week intervention period.

The visual analogue scale, a validated and reliable pain measurement tool (Boonstra et al., 2008; De Boer et al., 2004), was utilized to gauge participants' pain responses compared to a questionnaire with multi-item questions. The treatment group, previously trained at a maternity home offering prenatal yoga class, was instructed to practice yoga independently at home for at least 30 minutes a day, three times a week, over two weeks. Compliance with the home yoga regimen was monitored through an online messaging application, ensuring adherence to the prescribed schedule. A checklist form was provided for tracking scheduled yoga practices. The accuracy of the independent exercise process, as outlined in the informed consent approved at the study's commencement, was entrusted to each respondent in the second week.

Both groups underwent reassessment using the same pelvic girdle pain measurement tool (visual analogue scale). Dependent t-tests (paired t-tests) and independent t-tests (independent mean difference tests) were conducted to evaluate the mean difference in pelvic pain before and after the intervention in the treatment group (prenatal yoga) and before and after regular prenatal care in the control group.

Approval for this study, involving human subjects, was obtained from the Ethics Committee of Jakarta III Health Polytechnic, as indicated by letter No. KEPK-PKKJ3/031/IV/2017.

RESULTS

Of the 50 respondents who were divided into 2 groups (treatment group and control group), it was found that most women from both groups were pregnant for the first time (primigravida) ($> 50\%$). Most of them had never had a child (76% in the treatment group and 56% in the control group). The mean age of respondents in the treatment group was 28 years, and in the control-group 29 years. The gestational age in both groups was above the average of 32 weeks.

Table 1. Respondent characteristics based on pregnant women with pelvic girdle pain

Variables	Total Number (n)	Intervention Group	Control Group
Age (years old), Mean	50	28.64	29.16
Gestational week (week), Mean	50	33.4	32.92
Gravida, n (%)	50	25	25
1. Primigravida		18 (72)	14 (56)
2. Multigravida		7 (28)	11 (44)

Parity, n (%)	50	25	25
1. 0		19 (76)	14 (56)
2. ≥ 1		6 (24)	11 (44)

Table 2. Level of pelvic girdle pain at the third trimester of pregnancy before and after intervention

Parameter	Treatment group				Control group			
	Mean	Min	Max	SD	Mean	Min	Max	SD
Pelvic pain score on initial examination	4,36	4	6	0,638	4,32	4	6	0,627
Pelvic pain scores after 2 weeks of intervention	2,08	1	4	0,909	4,20	3	5	0,707

Based on table 2, the average pelvic pain score before intervention in the treatment group was 4.36 and in the control group 4.32. After the intervention, the average pain score of the treatment group was 2.08 and the control group 4.20. The treatment group had a lower pain score than the control group after being given an intervention in the form of prenatal yoga for pain relief.

Table 3. Effect of exercise for pain relief in yoga on all pregnant women with pelvic girdle pain in the third trimester of pregnancy (n=50)

Parameter	Mean	Mean difference	SD	95% CIs	P value
Pelvic pain score at initial examination	4,34				
Pelvic pain scores after 2 weeks of intervention	3,14	-1,200	1,355	0,815 – 1,585	0,000

Table 3 shows the difference of pelvic pain scores before and after all respondents received intervention in the form of a combination of prenatal yoga and regular prenatal care (the mean is 4.34 and 3.14 respectively) (mean difference is 1.200). A combination of prenatal yoga for pain relief and regular prenatal care gave a significant effect that could lessen pelvic girdle pain in the third trimester of pregnancy ($p < .000$)

Table 4. The effectiveness of exercise for pain relief in yoga in reducing pelvic girdle pain during the third trimester of pregnancy

Pelvic girdle pain	Mean	Mean difference	SD	95% CI	P value
Treatment group	2,08	- 2,120	0,230	-2,583, -1,657	0.000
Control group	4,20				

Based on table 4, there was a significant reduction in pain before and after intervention in the treatment group compared to the control group. Statistically, prenatal yoga gave a significant effect in reducing pelvic girdle pain on pregnant women during the third trimester of pregnancy (mean different = -2.120, $p < .000$).

DISCUSSION

Our study examined the effectiveness of prenatal yoga in reducing pelvic girdle pain in a group of pregnant women. The results revealed that the treatment group that was given prenatal yoga showed a significant decrease in pelvic pain score compared to the control group that was only provided with regular prenatal care. Exercise for pain relief in yoga proved to be more effective in reducing pelvic girdle pain compared to regular prenatal care.

The results of this study are consistent with a randomized controlled trial conducted in Brazil that involved 60 pregnant women with lumbopelvic pain. This trial found that the hatha yoga exercise was effective in reducing pain after 10 time-practice (Martín-García et al., 2020). In addition, a prospective randomized controlled pilot clinical trial involving 115 pregnant women without complications in Israel showed that yoga was safe for pregnant women without any adverse effects and it was able to improve biomechanics (gait speed, turn time, double support time and instrumented timed-up and go), so that it has the effect of reducing bodily discomfort due to pelvic pain (Holden et al., 2019).

Reports from literature review of 10 randomized controlled trial studies that have been evaluated state that yoga exercise is safe for pregnant women who are at high risk of developing or experience lower back pain during pregnancy ($p < 0.05$). Yoga is a more effective exercise than walking or standard prenatal exercise. Experimental research on 92 pregnant women who experienced depression and anxiety during pregnancy showed that yoga proved to be effective in reducing depression, anxiety, leg pain and back pain when practiced at least 20 minutes a day for 12 weeks ($p = 0.05$) (Ivanova et al., 2018). The results of these studies are consistent with the results of our study that prenatal yoga for pain relief was able to significantly reduce pelvic girdle pain when performed for 30 minutes a day.

Prenatal Yoga exercise may reduce pain related to several body mechanisms in the psycho-neural-endocrine regulatory system structure through the hypothalamus-pituitary-adrenal axis which rebalances the central nervous system (Campbel et al., 2014). In addition, yoga affects biomechanics of the body by lowering plasma concentrations of stress hormones (cortisol and catecholamines) (Field et al., 2013; Kamei & Toriumi, 2000; Martins & Pinto E Silva, 2014).

Our research has several advantages. It is an experimental study using standardized yoga training techniques. The number of samples used is considered to represent the minimum number of samples for intervention research. This study, however, also has some drawbacks. For example, respondents were practicing prenatal yoga only for 2 weeks, but this drawback was overcome by the frequency of doing yoga (at least 3 times a week). Besides that, monitoring yoga that is done by pregnant women at home is only done through an online message application and a list of forms that must be filled out by pregnant women every time when they do yoga exercises at home, so it is possible for pregnant women to do not according to standards that may occur.

CONCLUSION

In conclusion, our study demonstrates that practicing prenatal yoga, three times a week for at least two weeks, with sessions lasting a minimum of 30 minutes, effectively reduces pelvic girdle pain (PGP) during the third trimester of pregnancy. This intervention proves beneficial for health workers, particularly midwives, enabling early detection of potential low back pain in pregnant women. Such proactive measures can prevent the development of chronic pain disorders, positively impacting maternal well-being in the future. Our findings advocate for the integration of prenatal yoga into routine antenatal

care, providing a practical and effective approach for managing discomfort during pregnancy. Further research, including randomized controlled trials, is warranted to strengthen evidence and enhance the applicability of prenatal yoga in addressing PGP.

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