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The effectiveness between of yoga and birth ball in reducing labor pain: *a systematic review*

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Abstract

Purpose: Identify the effectiveness between Yoga *and birth ball* in decreasing labor pain intensity. **Methods:** This study used a systematic review design with the PRISMA-SR checklist. This systematic review referred to three steps, namely, (1) search strategy, (2) selection criteria, and (3) data extraction and quality assessment. The article search used 2 databases: ScienceDirect and Pubmed and ResearchRabbit. **Results:** Of 14 articles, 7 discuss Yoga's effectiveness in diminishing labor pain, and another 7 discuss birthing balls' efficacy in alleviating labor pain. Yoga and birth balls effectively reduce childbirth pain intensity. **Conclusion:** Besides, a combination of Yoga and birth ball or a combination of birth balls and counterpressure or free position when entering childbirth reduces labor pain. Yoga could also be combined with back massage, aromatherapy, or hypnosis. Future studies are expected to analyze the level of effectiveness between birthing balls and Yoga in reducing labor pain intensity in both developing and developed countries.

Keywords: birthing ball; labor pain; pregnant women; prenatal yoga; yoga

INTRODUCTION

Labour, the process of delivering products of conception, typically begins after 37 weeks of gestation, spontaneously vaginally or per-abdominally. It ensues from progressive uterine contractions facilitating cervical dilation, effacement, and descent of the fetal head, leading to labor pain. While pharmaceutical pain management during labor remains contentious due to potential adverse effects on both the woman and fetus [1], non-pharmaceutical methods offer cost-effective, straightforward, and efficient alter- natives across societal levels, devoid of adverse effects [2].

Many non-pharmaceutical efforts can be made to reduce labor pain, such as warm and cold compresses, hydrotherapy, counterpressure, knee compressions, position, Yoga and breathing exercises, back or posture, birthing balls, aromatherapy, music therapy, hypno-therapy, acupuncture, and others [3]. Birthing balls can be an alternative method to reduce labor pain. Base [4] explains that birthing balls have been gradually used in labor because of their flexibility and elasticity. They are useful for relaxing the pelvic muscles and relieving pressure on the fetus's lowest part, which can reduce labor pain [5].

Based on research done by [6] reveals that the birthing ball therapy can be implemented at birth by seated astride on the ball and shaking the pelvis from one side to the other alternately, leaning on the ball with the body kneeling on the floor while hugging the ball then moving the pelvis from one side to the other, or placing the ball on the chair then leaning over the ball and moving the body right and left. Most respondents chose to sit on the ball so they would not easily feel tired carrying too much weight on their stomach, and the force of gravity could still help lower the baby's head.

Besides, Yoga can be used to reduce labor pain. Yoga is a non-pharmaceutical effort to increase the mother's strength and flexibility while increasing their capability to become more consistent with their body and labor response [7]. Yoga is a body and mind exercise origina-

ting from India that is recognized as a health gymnastics for psychological, various immune conditions, and pain. In contrast, prenatal Yoga is a modified form adapted to an expectant mother's condition. Regular prenatal Yoga in the third trimester can help get physically and mentally more relaxed and flexible to adapt to unpleasant situations during labor [8].

A previous study [9] shows that 5.14% of the respondents experience discomfort during the pretest before practicing prenatal Yoga, and only 2.51% experience discomfort after prenatal Yoga. Besides, prenatal Yoga has a significant effect in alleviating discomfort during the third trimester. It aligns with a study conducted by [10] that prenatal Yoga performed for 1 hour with a frequency of 4 times in trimester III can reduce labor pain in stage II, speed up stage II, and prevent perineal rupture. The statistical tests showed a significant effect of Yoga pregnancy on birth pain, with an average pain scale of 3.80 in stage I in the Yoga pregnancy group. It means that the mother still feels pain but can still be endured or controlled in the mild to moderate pain category. Meanwhile, in respondents who practiced prenatal Yoga, the pain scale in the first stage was 6.47, indicating that the pain was bothersome and required effort to endure.

Yoga and birth balls are beneficial in relieving pain during childbirth. Recent research may suggest that both methods can help reduce pain during childbirth and improve mother's comfort. Yoga can help pregnant mothers regulate breathing, reduce stress, and increase muscle strength. Exercises in Yoga can also help improve posture and increase flexibility, all of which can help reduce pain during childbirth. Meanwhile, the use of birth balls has also been shown to be effective in reducing birth pain by reducing pressure on the pelvic bone and helping the pregnant mother find a comfortable position during the delivery process. Thus, the novelty in this study will discuss the effectiveness of Yoga and the birth ball in reducing birth pain. This study aims to critically examine and analyze relevant published literature on the subject.

METHODS

This systematic review consisted of three steps: (1) search strategy, (2) selection criteria, and (3) data extraction and quality assessment.

Step 1: Search strategy. This review used the PICO framework: Population, Intervention, Comparison, and Outcome. The question in this systematic review was, "What is the latest obstetric scientific evidence regarding the effectiveness of Yoga and birthing balls in reducing labor pain?" The review used 2 databases, ScienceDirect and Pubmed and Gray Literature of Research Rabbit.

Search strategy - PICO framework

Population: Pregnant women OR Pregnant mother OR Pregnancy

Intervention: Birthing ball OR Birth ball exercises OR Birth balls AND Yoga OR Prenatal Yoga OR Yoga pregnancy

Comparison: None

Outcome: Labor pain OR Birth pain OR Labor pain intensity

Selection criteria

Inclusion

1. Published International and National
2. Article using Indonesian and English
3. Original research article
4. Research Articles of Quantitative (Quasi-experiments and RCT)

Exclusion

1. Not published in the scientific journal
2. Review, opinion article
3. Book, thesis, paper
4. Thesis, dissertation

Step 3: Data extraction and quality assessment.

In the assessment of quality assessment of the research, the article used the Critical Appraisal Tool Joanna Briggs Institute (JBI) and PRISMA-SR 2020 chosen referencing for the literature study because it has a complete and detailed checklist [11]. In this research of 14 articles there are 12 Quasi-Experimental studies and 2 Randomized Controlled Trials are known to have a decent score with category grade A.

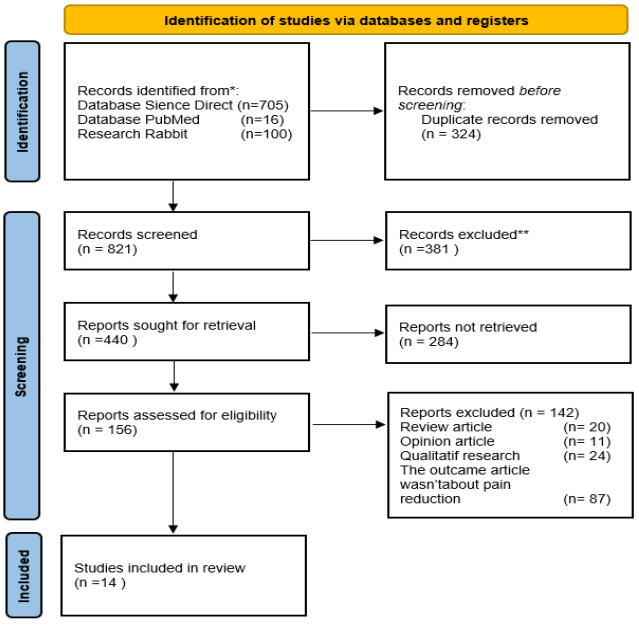

Diagram 1. PRISMA *flow chart*

RESULTS

The article search using some keywords to the database obtained 820 articles consisting of 705 articles from Science Direct, 16 articles from PubMed, and 100 articles from Research Rabbit. All articles were input in Mendeley, and 324 were deleted; nevertheless, an article duplication check was completed. Then, the researcher manually selected the titles and abstracts of 440 research articles and eliminated 381 articles as they did not match the title and topic of discussion. A total of 156 articles were considered feasible, and then 142 articles were eliminated because they did not meet the inclusion criteria. Only 14 articles met the criteria.

Seven articles discuss the efficacy of Yoga in reducing the intensity of labor pain, and another 7 discuss the effectiveness of birthing balls in reducing the intensity of labor pain. A total of 12 articles used the quantitative method, and 2 articles used RCT. The articles used in this systematic review come from some countries, namely the United States, China, Taiwan, India, and Indonesia. In measuring the level of pain it is known that 10 articles are using VAS, 3 articles using Numeric Rating Scale, as well as 1 article using Biophysical Profile (BPP) with a Nonstress test (NST).

The effectiveness of Yoga in reducing labor pain

Table 1 presents the analysis of the 7 articles that used prenatal Yoga interventions to reduce pain intensity, it concluded that prenatal Yoga effectively reduces labor pain. As proven by research [12], after using prenatal Yoga, there was a reduction in the level of pain. It should be noted that Yoga makes vaginal births more enjoyable, reduces premature births and heavy labor of newborns, and shortens labor time. In line with research [21], 2 prenatal Yoga intervention group participants were compared to the control group. Reduce labor pain intensity by using prenatal Yoga principles, which emphasize proper breathing techniques, composure, and meditation on the mother's body and mind so that the mother can deal with pain better [20].

Study analysis showed the variances in back pain levels pre and post-prenatal Yoga showed a significant reduction of 2 points on the pain scale. Yoga is a tangible effort to achieve balance and unity between the physical body, mind, and spirit. Yoga is useful for forming tight body postures, building flexible and strong muscles, and cleansing the CNS system in the posterior bone. Maternal discomforts may diminish during the final trimester of pregnancy, reducing complaints among women in their third trimesters, including back pain [22]. The etiology of low back pain in pregnancy has not been fully elucidated. Still, it is often ascribed to mechanical, hormonal, or bodily changes in pregnancy, reduction of the plantar arch, knee hyperextension, and hip anteversion. Compression of the great vessels by pregnancy reduces blood flow to the spine and can cause lower back pain, especially in late pregnancy [26].

Participating in pregnancy exercise as often as possible can maintain a healthy body and reduce back pain in pregnant women because pregnancy exercise has muscle-oriented movements for fitness and function during labor [23]. Gentle, inclusive movements by regulating breathing in a way that minimizes or reduces back pain experienced by pregnant women during pregnancy. Besides that, prenatal Yoga also forms a straight body position and forms supple and powerful muscles, cleanses the central nervous system of the spine [12]. In addition, Iyengar Yoga for primigravida mothers reduces birth pain and anxiety. Thus, the Iyengar Yoga technique can be a high-quality method to promote successful and safe delivery. In addition, the analgesic abilities to practice Yoga can be a viable option in many therapeutic conditions [19].

Research [27] explained that pregnant women feel after doing prenatal Yoga that the body goes through a stretching process; the muscles relax so that good blood circulation occurs for the body and naturally produces endorphins to help relieve pain and relieve pain. Create a happy feeling. The average value of the research [15] indicates that The treatment group experienced a decrease in pain intensity compared to the control group. It signifies that the Yoga treatments demonstrated greater efficacy in alleviating back pain than those that did not receive the Yoga treatment. It shows that combining Yoga pregnancy therapy with aromatherapy massage improved beta-endorphin levels in the treatment group compared to the control group.

Prenatal Yoga exercises carried out during classes for pregnant women have a positive effect because they can increase the knowledge of pregnant women that their back pain can be overcome by doing physical activities such as prenatal Yoga. Prenatal Yoga is also effective and has many benefits for the mother and the womb. Exercise supports pregnancy, birth and child care and can be done during childbirth. One of the sports during pregnancy is Yoga [28]. In addition, prenatal Yoga has the benefit of increasing comfort in the delivery process. Practicing Yoga includes physical posture exercises, breathing techniques and meditation. Apart from that, prenatal Yoga is also beneficial for increasing the baby's birth weight and reducing complications in childbirth. Other benefits of prenatal Yoga are maintaining the emotional and physical health of pregnant women, reducing the pain felt in pregnant

women, increasing muscle strength, and increasing energy storage and flexibility of the body [29].

The effectiveness of birthing balls in reducing the intensity of labor pain

Table 1 also shows that 7 articles discuss birth balls in reducing labor pain. The birth ball is a technique where the mother sits on a ball during labor, which offers the advantage of assisting in pain reduction. It proves highly effective in promoting the necessary energy during childbirth; an upright posture will support the process of birth and Assist the fetal position to achieve an ideal posture to make childbirth easy under normal conditions [30]. Research [13] explained that birth ball exercises could reduce labor pain responses compared to birthing mothers who did not receive birth-ball exercises. When entering the first stage, the treatment group was given a birth ball intervention combined with a free position. It aligns with the research undertaken by [31]; during the initial measurement (after the first 30 minutes) and the subsequent measurement (after the second 30 minutes), a notable distinction was observed between the exercise treatment groups among the born children.

Likewise, research [14] explained that of the 60 samples in this study, the average pain level during the first active phase of labor in the group who received birth-ball training was lower than the average pain level in the control group who did not receive birth-ball training. In the experimental group, during the active phase of the first stage of labor (dilation of the cervix >4 cm) and in primigravida mothers, it is recommended to participate in four exercises in two different positions. Exercising the birth-ball upright position (standing, walking, squatting) helps mothers to reduce pain in the early phase of labor. This position reduces the pain response in the lumbar area by reducing pressure on the nerves in and around the iliosacral joint [32]. Research conducted by [17], Accelerated primary labor progression to active stage differed between the intervention group who had birthing balls 2-3 times a day during the last trimester compared to the control group. Using the birthing ball for a mother can help reduce pain; this study also supports the opinion [33], which states that a birthing ball is an ergonomic tool for women in labor that allows them to take more comfortable positions to improve the labor process.

In research [16], using the birthing ball on the respondent for 30-60 minutes will be reassessed for pain intensity after 30 minutes. With this technique, the mother will be more relaxed and relaxed to reduce tension due to the release of endorphins which can help reduce the patient's pain scale. In addition, feelings of relaxation and calm can change oxidation levels [32]. Self-efficacy is known to significantly mediate the relationship between labor-ball training and labor, with large differences in pain scores between the two groups. The clinical implementa- tion of the labor ball training program may be an effective adjunct to improve labor efficiency and reduce pain in postpartum women [24]. The same was stated by [34], which concluded that birth ball training could reduce pain. It is evidenced by the study results, with the treatment group having a lower average pain score than the control group.

In the counterpressure birth ball action to reduce labor pain in the active phase I stage, pressure massage is given on the mother's sacrum using the midwife's base or fist for 20 minutes every 1 hour during labor [25]. Given the importance of facilitating vaginal births in women the implementation of birth ball exercises is recommended because they are a very useful essentially non-pharmaceutical and inexpensive strategy to reduce the rate of surgical intervention [35]. In the research [18], the birthing ball treatment was more effective in reducing pain levels than the control group of respondents. Overall positioning and movement while using a birthing ball contribute to the comfort and progression of labor. The results of this study are supported by research [34], which states that labor can be released with body positions that support gravity and positions that accelerate neck expansion, such as walking, kneeling and sitting.

The benefits of birthing balls during labor include reducing pain and anxiety, reducing the use of pethidine relieving rotation, shortening the duration of the first stage of labor and increasing maternal satisfaction and well-being [36]. Non-pharmacological pain reduction techniques are best for short periods, for pain relief that only lasts a few minutes, for example, during an invasive procedure or while waiting for labor [4]. However, other factors can affect the decrease in the intensity of labor pain, namely anxiety and support from the husband or closest family [37].

Measurement of pain scale

Of the 14 selected articles, 8 utilize the VAS measurement instrument, with 3 focusing on Yoga and 5 on the birth ball. As indicated by research [19], the pain scale in the control group is 8, while in the intervention group, it is 4. Consequently, the visual analogue score in the Yoga group significantly outperformed that of the control group, suggesting that the practice of Iyengar Yoga can be adapted to alleviate labor pain in primigravida mothers.

Table 1. The effectiveness of prenatal yoga and birth ball on delivery pain

Authors, Location	Study design	Participants	Intervention description	Control condition	Outcome measure	Effectiveness
A1 [19], Indonesia	Quantitative, Quasi-Experimental. A true experiment with a posttest-only control group design	Involving 59 primigravida mothers: 29 participants in the control group (without Yoga) and 30 in the treatment group who received Iyengar Yoga. The participants are 20-35 years old primigravida women with 30 weeks of gestation.	30 participants receiving Iyengar Yoga once a week with a duration of 90 minutes of each session for twelve weeks (three months	29 participants in the control group without Yoga	Visual Analog Scale (VAS)	The group practicing modified Iyengar Yoga exhibits significantly lower labor pain scores than the control group. Subjects who experience lower pain levels during childbirth tend to have normal vaginal delivery, babies with average weight, and no complications in the postpartum period.
A2 [20], Indonesia	Quantitative, Quasi-Experimental with Static Group Comparison strategy	Respondents are 24-29 years old participated in prenatal Yoga, namely 25 participants (41.7%) out of 60 total Yoga participants	Hypnosis and prenatal Yoga	Prenatal Yoga	Numeric Rating Scale (NRS) and questionnaire	The Yoga group has lower mean labor pain scores at baseline, and the difference increases during labor. Thus, Prenatal hypnosis and prenatal Yoga have a significant impact on reducing labor pain (p-value 0.000).
A3 [21], Amerika	RCT (randomized controlled trial)	The participants are women without pregnancy complications between 28-36 weeks, with a non-anomaly single-female fetus who does not smoke, use drugs, or have previous involvement with Yoga.	Special training in prenatal Yoga	No intervention	Biophysical Profile (BPP) with Nonstress Test (NST)	Overall, pain and discomfort during labor reported by subjects in the exercise group is 7.5, considerably lower compared to the control group is 9.
A4 [22], Indonesia	Quantitative, quasi-experimental design, divided into control and intervention groups	Involving 30 women pregnancies in the trimester III as samples out of 50 population of women pregnancy	Prenatal Yoga on Back Pain	20 respondents were in the control group or without treatment.	Numeric Rating Scale (NRS)	Practicing prenatal Yoga impacts reducing back pain among pregnant women during the third trimester. The average level of back pain in the treatment group before and following the intervention is recorded as 4.60 (± SD 0.828) and 2.07 (± SD 0.7999), respectively.
A5 [12], Indonesia	Quantitative, Quasi-experimental with pretest and posttest with control group design	Involving 32 women pregnancies in the trimester III who experienced back pain as samples	Engaging in prenatal Yoga during the third trimester can alleviate back pain, namely with repeated gentle Yoga movements.	No treatment for the control group	VAS and observation	While after doing Prenatal Yoga, 29 people (90.6%) experienced mild pain. It indicates a significant difference in back pain levels pre- and post-participation in pregnancy Yoga.

A6 [23], Indonesia	Quantitative, pre-experimental	Involving 16 participants taken from the population of pregnant women in their third trimester who encounter back pain in Kampung Baru Village, Tanjunganom Sub-district, Nganjuk District.	Prenatal Yoga	No comparison group	Numeric Rating Scale (NRS)	The result obtains a p-value of 0.000 ($p<0.05$). It implies that prenatal Yoga impacts reducing back pain among pregnant women in their third trimester.
A7 [15], Indonesia	A control group with adopted posttest	Involving participants with a gestational age of 28-40 weeks who attend Yoga pregnancy or undergo weekly aromatherapy back massage sessions for four weeks.	Back massage using aromatherapy and prenatal Yoga	The control group only follows the pregnancy exercise once a month	VAS	Yoga pregnancy therapy and aromatherapy massage significantly impact the variation in average back pain and levels of beta-endorphins.
A8 [13], China	Quantitative, randomly divided into observation and control groups	Involving primiparous mothers were divided into the control and observation groups with 55 mothers. The control group comprises mothers aged 24-37 years with a gestation period of 38-41 weeks. Meanwhile, the observation group consists of mothers aged 23-36 years who have a gestation period of 37-42 weeks	Giving a birthing ball intervention combined with a free position when entering the first labor stage for the observation group	When the 3 cm dilatation occurs, the control group is sent to the labor room, and the process of labor occurs in a traditional position, either lying down or partially reclined.	VAS and General Comfort Questionnaire (GCQ)	Birthing ball combined with free delivery helps reduce pain, increase comfort, reduce post-birth bleeding, shorten labor stage time
A9 [14], India	Quantitative, quasi-experimental design	Involving 60 primigravida mothers. They are divided into the control and experimental groups, with 30 participants each selected by successive sampling. Inclusion criteria are primigravida postpartum mothers (18-35 years) gestational age of more than 37 weeks.	Birthing balls treatment (65 cm) for primigravida mothers (experimental group) During the active phase of the labor initial stage. Primigravida mothers are encouraged to participate in four exercises in two different positions.	20 respondents in the control group do not receive the birthing ball intervention	VAS	The analysis of labor pain (VAS score) in both the control and experimental groups reveals the average and standard deviation of the VAS score for each group. 9.4 ± 1.13 and 8.36±.97 respectively.
A10 [17], Indonesia	Quantitative, quasi-experimental with pretest and posttest design	Involving 30 participants selected using a consecutive sampling technique. The participants are divided into intervention and control groups, with 15 participants each.	Birthing balls treatment in the last trimester 2-3 times a day for 3 months	The control group consists of pregnant women without the birthing ball intervention.	VAS	There are influences on using the birth ball, like reducing physical complaints and making early birth differences during active phases.
A11 [16], Indonesia	Quantitative, Quasi-experimental with one group pretest-posttest design	Involving 30 participants selected using a total sampling technique.	After the Birthing ball is treated for 30-60 minutes, the intensity of pain and anxiety will be reassessed after 30 minutes.	No birthing ball intervention	VAS	There's a difference in maternal anxiety in the birth rate by a fraction of 2.10. Utilizing a delivery balloon also suggests a reduction in maternal pain, with an average variance ranging from 5.52 to 6.03.
A12 [24], Taiwan	RCT (randomized	Involving 48 respondents in the intervention group and 39 in the control group. The inclusion criteria	The birth ball program comprises a booklet spanning 26 pages and a	Participants receiving standard nursing and midwifery care in the	VAS	The presence of self-efficacy plays a crucial role in mediating the connection

	controlled trial)	are women at 30-32 weeks of gestation, 18 years old or older, and single pregnancy.	19-minute videotape. Then The participants are requested to perform the exercises and assume the positions for at least 20 minutes, three times per week, over 6-8 weeks.	form of 10-12 routine physical examinations and labor education		between birthing ball training and the experience of labor pain. Self-efficacy plays a role in mediating the variability of outcomes.
A13 [25], Indonesia	Quantitative, Quasi-experimental with one group pretest-posttest design	Involving 16 mothers in labor with pretest and posttest assessments.	Utilizing a counterpressure birth ball alleviates labor pain during the active phase of the first stage. Applying counter pressure massage on the mother's sacrum bone using the base or fist of the midwife for 20 minutes every hour throughout labor.	No intervention	VAS	The result of the mean counterpressure with birthing balls is 6.4 out of 7.7 with a p-value of 0.000, meaning that there is a significant correlation between a decrease in the labor pain scale.
A14 [18], Indonesia	Quantitative, quasi-experimental design, divided into control and intervention groups	Involving 30 participants consisting	The utilization of a birthing ball intervention to alleviate pain during the active first stage of labor, along with the implementation of an observation sheet to facilitate its usage.	No intervention	VAS and observation	After the birthing ball intervention, the labor pain scale is 4.46. Using a birthing ball has proven to be successful in diminishing pain levels.

In line with research conducted by [25], use the VAS, shows a reduction in pain levels before and after receiving counter pressure treatment with a birth ball, namely moderate pain with a scale of 7-9, down to a scale of 1-3 with mild pain and severe pain for 1 participant when the intervention was given to 0%.

The average level of labor pain before being given the counter pressure treatment with a birth ball was 7.9. In contrast, the average pain level after being given the counterpressure birth ball treatment was reduced to 6.4. These results indicate that labor pain decreased before and after the intervention.

The research conducted by [20], who used the Numeric Rating Scale (NRS) measurement, showed a control group with 6 participants with mild pain with a score of 2-3 and 24 participants with moderate pain with a score of 4-6. Then for the intervention group, there were 23 participants with mild pain with a score of 2-3 and 7 participants with moderate pain with a score of 4-6. The mean value of labor pain intensity in the intervention group was 2.70, and in the control group was 4.33. The group treated with prenatal hypnosis and prenatal Yoga showed less labor pain than the control group.

In research [21] that used the Biophysical Profile (BPP) With a Nonstress Test (NST), the continuation of uterine contractions without pain was noted in 2 Yoga participants and 1 of 6 control participants. Additionally, 9% of Yoga participants resumed pain-free labor after the intervention compared with 22% in the control group. These criteria are exercise during pregnancy, obesity and nutrition during pregnancy. All participants were tested before and after the intervention, which generally consisted of a Doppler ultrasound of the umbilical and uterine arteries, non-stress testing, biophysical profile, maternal blood pressure, and maternal heart rate.

DISCUSSION

The findings suggest that both prenatal Yoga and the use of a birthing ball can effectively alleviate childbirth pain. Prenatal Yoga, through specific movements, addresses various discomforts associated with pregnancy, enhances physical fitness, and reduces stress levels. Furthermore, it aids expectant mothers in adapting to the physical changes brought about by pregnancy. Similarly, birthing ball exercises, encompassing standing and sitting positions, enhance pelvic mobility and are thought to facilitate labor induction while providing support to the perineum, thereby alleviating labor pain.

Assessing pain effectively is crucial, and the Visual Analogue Scale (VAS) stands out as a highly effective tool for this purpose [38]. Its advantages include sensitivity, cost-effectiveness, and universality, making it suitable for all patients. However, utilizing the VAS instrument requires precision and depends on the patient's comprehension [39]. To prevent pain from escalating into more severe conditions, it is imperative to measure pain levels accurately and provide timely interventions [38]. Alternatively, the Numeric Rating Scale (NRS) can be employed for pain management, aiming to alleviate or eliminate the client's pain, albeit with limitations in selecting appropriate descriptors [39].

From a social perspective, this research holds promise, particularly for pregnant mothers across diverse communities. Utilizing alternative methods such as Yoga and birth ball can offer affordable and accessible options, transcending social and economic barriers. Additionally, showcasing the benefits of these methods can enhance public awareness regarding holistic prenatal care, ultimately improving maternal and infant health outcomes. Despite its effectiveness, the VAS may pose challenges, particularly when dealing with unconscious patients, although its sensitivity, reliability, and ease of use remain unparalleled.

The significance of this article is that two interventions can be used to reduce labor pain. However, this study has some limitations, such as no comparison between birthing balls and Yoga in reducing the labor pain intensity, and articles used dominated by quasi-experimental research designs with characteristics of the region of Indonesia.

CONCLUSION

Of all articles that have been analyzed, both birthing balls and Yoga effectively reduce labor pain intensity. Besides, a combination of birthing balls and Yoga or a combination of birthing balls and counterpressure or free position when entering the first stage can lower labor pain. Indeed, Yoga can be combined with back massage, aromatherapy, or hypnosis. It is also known that the greater dominant pain-measuring instrument was the use of Scale Visual Analog (VAS). Future studies are expected to analyze and evaluate the comparison of the level of effectiveness between birthing balls and Yoga in reducing labor pain intensity in developing and developed countries.

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