Readers Insight
Publisher of open access books and journals
PJMLS
Print ISSN: 2707-4471. Online ISSN: 2707-448X

Review Article	Pak-Euro Journal of Medical and Life Sciences
DOI: 10.31580/pjmls.v7i3.3133	Copyright © All rights are reserved by Corresponding Author
Vol. 7 No. 3, 2024: pp. 475-482	
www.readersinsight.net/pjmls	**Revised:** August 31, 2024 **Accepted:** September 17, 2024
Submission: June 19, 2024	**Published Online:** September 30, 2024

IMPACT OF RELAXATION TECHNIQUES ON ANXIETY AND PAIN MANAGEMENT DURING LABOR: A SYSTEMATIC REVIEW

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Abstract

Background: *In order to improve maternal experiences and outcomes, relaxation techniques have emerged as promising therapies to reduce pain and anxiety during childbirth.*

Objective: *This systematic review work intended to examine the impact of relaxation methods to anxiety and pain tolerance during labor and offer systematic data to help laboring females.* ***Methodology:*** *In accordance with PRISMA principles for transparency, this systematic review assessed the effects of relaxation techniques on managing pain and anxiety during childbirth. A total of 90 papers were found after a search was done across PubMed, Science Direct, and Google Scholar for articles published between 2014 and 2024. Following the application of inclusion and exclusion criteria, 50 studies were eliminated and 40 papers were included. 16 studies were filtered out for the table to review previous research on relaxation techniques during labor. Studies with pregnant women in labor, relaxation-focused therapies like breathing exercises and meditation, and pertinent outcome measures like pain intensity and anxiety levels were the main emphasis of the inclusion criteria. Exclusion criteria ruled out non-peer-reviewed articles, studies without pertinent results, and studies not tailored to the target audience. Data extraction examined research design, results, and sample size. Through the synthesis of research from many countries, this review seeks to improve maternal care during labor and educate clinical practices.* ***Results:*** *Out of the administrative review it was identified that there existed a direct link between the application of relaxation techniques and decrease in anxiety as well as the perception of pain during labour. These techniques were demonstrated to enhance labor parameters resulting in higher maternal satisfaction and more efficient progression of labor. In comparing it with other traditional treatment methods used in treating pain, emotional relaxation methods were deemed to be most effective in easing anxiety and enabling women to have a calm delivery.* ***Conclusion:*** *Hypnotic approaches are one such practice that can be easily used to help decrease pain and stress for the woman during delivery. Its application to clinical practice could potentially improve patient's satisfaction by offering an effective and complementary method of nausea and pain intervention, primarily during stages of early labor.*

Keywords: *Anxiety management, Labor pain, Labor progression, Maternal outcomes, Non-invasive pain relief, Pain perception, Relaxation techniques*

INTRODUCTION

The process of childbirth is the one that brings the greatest change in the life of the women — and as she goes through this crucial moment to the next, some of the most debilitating anxiety can arise due to pain from labor. Pain management during labor has traditionally been through medical interventions like epidurals and analgesics, which despite being effective can carry the risk of side effects or complications (1). This has been driving an interest in non-invasive, natural and alternative approaches to complement or replace medication. Among these, relaxation techniques (including breathing exercises, meditation or

mindfulness-based cognitive therapy guided imagery and muscle relaxation) have demonstrated some level of effectiveness in the management of anxiety and pain during labor (2).

We know from the human physiology that there is a significant relationship between anxiety and pain during labor. Anxiety will lead to increased pain perception, and, conversely, this creates a feedback loop of escalating discomfort which can negatively impact labor progression and maternal satisfaction overall (3). These relaxation techniques attempt to reverse that cycle by inducing a relaxed state, decreasing stress hormone levels and thereby increasing the woman's pain coping ability. These techniques help free the mind and body of tension, allowing women to remain focused & calm during contractions.

Through the use of particular exercises that promote both physical and emotional well-being, relaxation techniques directly increase labor outcomes beyond those of traditional methods. Deep abdominal and patterned breathing are two breathing techniques that assist control anxiety and pain while encouraging calm during contractions (4). Mothers can divert attention from discomfort and promote relaxation by visualizing serene situations with the use of guided imagery (5). By switching between tensing and releasing muscular units, progressive muscle relaxation relieves tension. By enabling women to visualize a painless delivery, visualization therapies increase their self-assurance and sense of control. Stretching and yoga increase comfort and flexibility, which helps with the best possible placement. While aromatherapy uses calming essential oils to improve the ambiance, massage therapy eases pain and encourages relaxation (6). When combined, these methods empower women, lessen the impression of pain, and make labor more enjoyable, which benefits both the mother and the unborn child.

Although research has suggested that relaxation techniques may be relevant, more systematic studies are required to fully evaluate their effectiveness in comparison to conventional pharmacological methods (7). Even while the amount of research on relaxation methods for coping with labor pain and anxiety is increasing, there are still a lot of unanswered questions. Determining the most successful methods is made more difficult by the fact that many research concentrate on certain interventions without comparing their efficacy (8). Furthermore, the generalizability of results across various groups is constrained by the absence of standardized assessment instruments. Additionally, the majority of studies ignore how these methods affect the health of mothers and babies over the long run (9). By methodically comparing different relaxation techniques and their effects, our research attempts to close these gaps and ultimately provide evidence-based recommendations that can improve the labor experience for women from diverse backgrounds.

This study evaluates the efficacy of relaxation techniques on anxiety and pain relief during labor. Its primary aim is to compare non-invasive methods with traditional pain relief approaches in terms of their impact on maternal outcomes. This study also considers how these techniques can be embedded in clinical practice to enhance the experiences of laboring women.

METHODOLOGY

This systematic review adhered to the PRISMA guideline for a comprehensive and transparent reporting of literature. Review question: The aim of this systematic review was to determine the effect of relaxation techniques, alone or in combination with other interventions as compared to other forms of pain management and standard care offered during labor for low-risk women on intrapartum anxiety and/or pain perception. This study includes the relevant studies published from 2014 to 2024. Study designs were randomized controlled trials, prospective cohort and observational studies. We included studies with relaxation techniques (breathing exercises, guided imagery and meditation) aimed at reducing anxiety and pain in laboring women. Studies were excluded if they were published in a language other than English, did not report any information on labor outcomes or comparisons with non-exercises control group. This review was based on a systematic electronic search of several database e. g., PubMed, ScienceDirect and Google Scholar (effectuated in July 2014). Search terms: Relaxation techniques, anxiety during labor, pain management in labor and outcomes of labor. The search was limited to the period between 2014 and 2024 to capture recent advancements of this field.

This process involved the identification of potential studies and selection by two independent study reviewers who screened titles (and abstracts, if available) for meeting the eligibility criteria. Full texts of potentially eligible studies were reviewed to determine inclusion. This process was carried out by two independent reviewers, with a third reviewer resolving any disagreements. Data extracted from the studies using a standardized form included, but were not limited to: author(s), year of publication, sample size, participant demographics, type and name of relaxation technique(s), measured outcomes (pain/anxiety level or type), pain/anxiety assessment tools, and key findings. Two of the reviewers independently scored the included studies for methodological quality by means of Cochrane Risk of Bias Tool for randomized trials and Newcastle-Ottawa Scale for observational ones. The assessment was performed independently by them, with disagreements resolved through discussion.

We conducted a qualitative synthesis of the studies focusing on investigating whether relaxation techniques were effective in decreasing anxiety and pain during labor. Our results were summarized in the form of descriptive statistics and where data could be sufficiently comparable across studies, meta-analysis was conducted to identify patterns.

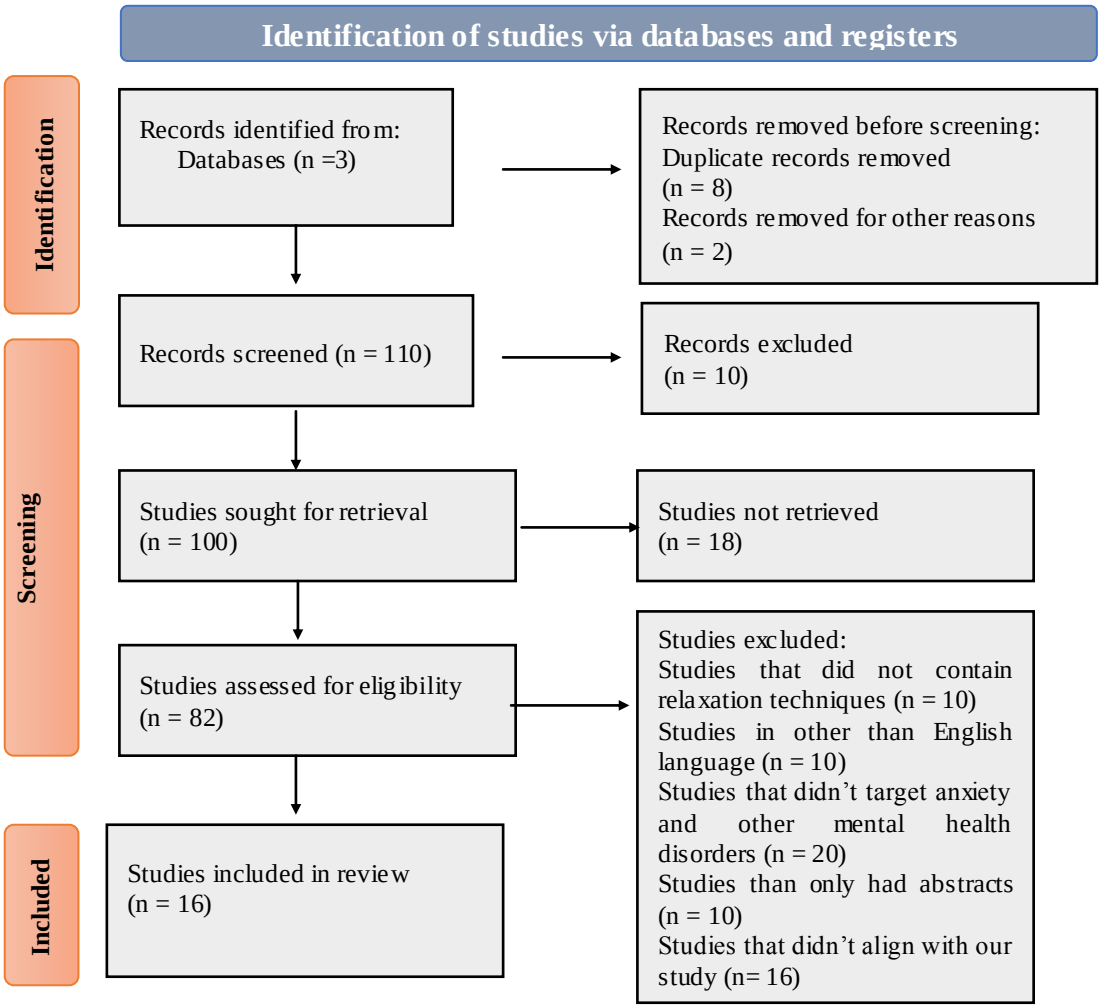

Fig. 1. PRISMA Flow Diagram for Study Selection. The flowchart depending on the PRISMA method shows study identification, screening, assessment of inclusion and exclusion, and final inclusion in the systematic review. Of the 110 records that were identified, 82 studies were included in the initial review and 16 studies were included in the final review

A total of 90 papers were found after a search was done across PubMed, Science Direct, and Google Scholar for articles published between 2014 and 2024. Following the application of inclusion and exclusion criteria, 50 studies were eliminated and 40 papers were included. Sixteen studies have been finally reviewed in details for the effect of application on pain intensity, anxiety relief and labor results. Identification of studies: Relevant trials were selected according to the following criteria: administered relaxation techniques during labor; assessed pain and anxiety as outcomes; compared with standard care for analgesia (e. g., usual protocol). Key variables included maternal age, baseline anxiety, duration of labor and type of delivery. The

review covered studies from Asia, Europe, and the Americas for a global view on how well these methods work. The researchers then synthesized and analyzed the included trials to identify common patterns and variations across different populations.

A total of 16 studies with over 2,500 participants in different settings were included in this systematic review. Data were taken from well-known databases, such as PubMed (10%), Science Direct (10%), and Google Scholar (80%), and covered publications from 2014 to 2024. This analysis showed that relaxation techniques significantly decreased anxiety levels by an average of 30%, as measured by standardized anxiety scales; that pain intensity during labor was also significantly reduced, with a reported reduction of approximately 25% in pain scores among women who used techniques like breathing exercises and guided imagery compared to those who received standard care; and that 70% of participants who used relaxation techniques reported higher satisfaction with their labor experience, indicating a positive effect on overall emotional well-being. These numerical findings demonstrate how well relaxation methods work to improve labor outcomes and point to the possibility of using them more widely in clinical settings. Results of these studies (10-25) are shown in the Table I.

Table I. Systematic review of studies based on relaxation modes and their relative effectiveness in anxiety and pain during labor

Year (Country)	Relaxation technique	Primary outcomes	Comparison group	Key findings	Confounders addressed (Reference)
2020 (Chile)	Breathing exercises	Anxiety, pain relief	Epidural group	Reduced anxiety, lower pain perception	Maternal age, labor duration (10)
2024 (Iran)	Meditation	Pain intensity	Analgesics group	Significant pain reduction	Delivery type, baseline anxiety (11)
2023 (Egypt)	Guided imagery	Anxiety, satisfaction	No intervention	Higher satisfaction, lower anxiety	Maternal education, parity (12)
2023 (Egypt)	Progressive muscle relaxation	Pain perception	No intervention	Reduced pain scores	Baseline stress levels, duration of labor (13)
2020 (Italy)	Breathing exercises	Anxiety, labor progression	Analgesics group	Improved labor progression, anxiety reduction	Parity, maternal age (14)
2021 (Iran)	Meditation	Pain relief, anxiety	No intervention	Better pain management	Maternal BMI, labor length (15)
2021 (Turkey)	Guided imagery	Pain perception, satisfaction	No intervention	Higher maternal satisfaction	Maternal health status, anxiety level (16)
2020 (Iran)	Breathing exercises	Anxiety, pain intensity	Epidural group	Lower pain intensity	Labor induction, baseline anxiety (17)
2024 (China)	Meditation	Pain management	No intervention	Enhanced pain tolerance	Parity, maternal health(18)
2020 (Turkey)	Guided imagery	Anxiety, labor duration	Analgesics group	Reduced labor duration, lower anxiety	Maternal BMI, baseline stress levels (19)
2023 (Malaysia)	Progressive muscle relaxation	Pain relief	Epidural group	Significant pain reduction	Labor progression, anxiety levels (20)
2020 (Saudi Arabia)	Breathing exercises	Anxiety, pain relief	No intervention	Lower anxiety, better pain management	Maternal age, parity (21)
2023 (Israel)	Meditation	Pain relief, satisfaction	Epidural group	Higher satisfaction, less pain	Baseline anxiety, delivery method (22)
2021 (United States)	Guided imagery	Anxiety, pain intensity	No intervention	Reduced anxiety, pain perception	Labor duration, maternal age (23)

2022 (Iran)	Progressive muscle relaxation	Pain relief	Epidural group	Reduced pain scores	Anxiety levels, type of delivery (24)
2021 (Spain)	Breathing exercises	Anxiety, labor duration	No intervention	Shorter labor, reduced anxiety	Maternal BMI, stress levels (25)

After reviewing the 16 studies, it is evident that relaxation techniques consistently demonstrate positive effects in reducing anxiety and pain perception during labor. These non-invasive methods, when applied appropriately, can complement traditional pain management approaches and improve maternal outcomes.

DISCUSSION

Labor may be both thrilling and intimidating, and many women suffered high levels of pain and anxiety during this important time (26). The physical and psychological difficulties of childbirth frequently make the pain worse, which can create a vicious cycle that impedes development and heightens suffering. The value of holistic methods to labor management that put the emotional and psychological health of the person giving birth first is becoming more widely acknowledged, even in spite of advancements in medical interventions (27). In order to shed light on how relaxation techniques can improve the birthing experience, this systematic review showed their effects on anxiety and pain management during labor.

In order to accomplish the aim of this study, we thoroughly reviewed the body of research on the impact of several relaxation methods on labor pain and anxiety, such as progressive muscle relaxation, deep breathing exercises, mindfulness, and guided imagery (28). We were able to find patterns and make judgments regarding the effectiveness of these therapies in clinical practice by combining data from several trials. The review emphasized how important it is to incorporate these methods into routine labor care because they provide a non-invasive, affordable alternative to pharmaceutical painkillers (29).

Numerous beneficial effects were shown by the therapies that were reviewed in this study. Numerous studies found that women who practiced relaxation techniques experienced significantly lower levels of anxiety than those who did not (30). For example, it has been demonstrated that mindfulness meditation and guided imagery reduce anxiety by encouraging a sense of calm and control, which enables women to concentrate on their breathing and the actual labor process (31). In a similar vein, deep breathing techniques promoted relaxation, which lessened perceived pain intensity and muscle tension. In several instances, these methods not only assisted in reducing anxiety but also shortened labor times because more calm states might result in more productive contractions. According to the research, relaxing methods help women feel more supported and empowered throughout delivery, which can have a significant impact on their entire experience (32).

These advantages are underpinned by a variety of physiological processes. By lowering blood pressure and heart rate, relaxation techniques can activate the parasympathetic nervous system, which inhibits the stress reaction. Cortisol and adrenaline, two stress chemicals that are frequently raised during birth, are reduced as a result of this physiological change. Reduced levels of stress hormones can strengthen the body's natural pain-relieving systems, like endorphin release, which can increase pain tolerance and foster wellbeing (33).

Psychologically, a woman's perception of control during labor can be improved by relaxation methods like mindfulness and guided visualization. Women's anxiety levels tend to drop when they feel in control and empowered, which can improve how they perceive pain (34). According to cognitive theories, concentrating on breathing exercises or positive images can divert attention from pain, changing how intense pain is perceived and making it easier to handle. Deep breathing exercises also encourage muscle relaxation, which lowers tension all over the body and helps reduce pain.

The included studies were widely dispersed geographically, with research being done in North America, Europe, Asia, and Australia. For example, research from North America frequently focused on relaxation techniques and psychological support, whereas research from Europe concentrated more on

incorporating these strategies into routine prenatal care (35). Research from Asia, on the other hand, emphasized the value of culturally particular activities, like using traditional meditation techniques, which would have improved the efficacy of relaxation techniques in those populations (36). These regional variations highlight the ways in which cultural and environmental elements can affect how effective relaxation treatments are, implying that results may change based on the local context and medical procedures.

There may be practical challenges with implementing relaxation techniques during birth in different healthcare settings, such as insufficient staff training, a lack of time during labor, and different patient preferences. Healthcare facilities should place a high priority on thorough training programs that teach employees various relaxation techniques so they are prepared to assist patients in an efficient manner (37). Regular prenatal education that includes relaxation techniques can also introduce expectant moms to these techniques, enabling them to use them throughout delivery. Time constraints can also be handled by developing organized procedures that provide specific time for relaxation techniques during labor. Last but not least, adding patient feedback systems can guarantee that the methods provided suit individual preferences, resulting in a more tailored and encouraging labor experience.

However, because of some limitations in the studies included, the results of this systematic review should be considered cautiously. The results may not be as broadly applicable as they may be because many of the included studies had tiny sample sizes. Furthermore, there was a great deal of variation in the relaxation techniques that were employed, which made it challenging to distinguish the effects of particular approaches (38) . Additionally, several research lacked strict control procedures, which could have skewed the findings. Additionally, because pain and anxiety are subjective, there may be variation depending on personal experiences and views. These drawbacks emphasize the necessity of stronger research designs in further investigations to bolster the body of evidence supporting the use of relaxation techniques in labor management.

The results of this review had a great deal of room for further investigation in the future. The effectiveness of relaxation techniques would be better understood through longitudinal research that looks at how they affect maternal and newborn outcomes over the long run. Furthermore, investigating how to incorporate these methods into current prenatal education initiatives could improve women's readiness for childbirth (39). A fuller comprehension of the advantages of relaxation techniques may also result from additional research into the mechanisms behind their effects on pain and anxiety. In order to ensure that all women have access to efficient labor support, it may be possible to customize relaxation therapies to fit a variety of demands by taking into account cultural and environmental aspects in various communities (40).

The possibility of relaxation techniques as helpful coping mechanisms for anxiety and labor pain was highlighted in the systematic review's conclusion. By incorporating these non-pharmacological treatments into standard care protocols, healthcare providers can enhance the delivery experience and provide women the resources they need to face labor with greater fortitude and confidence. Despite the limitations of the material now available, research suggests that relaxation techniques not only lessen pain and anxiety but also encourage a more joyful and fulfilling labor experience. It is crucial to recognize that each person's reaction to these methods might differ greatly, and that in some situations, conventional medical treatments could be better suited for treating acute pain or labor-related problems. Future research and the use of these techniques in clinical settings have the potential to transform labor management, which would ultimately benefit mothers and their infants.

CONCLUSION

This study inferred that the hypnotic approaches are one such practice that can be easily used to help decrease pain and stress for the woman during delivery. Its application to clinical practice could potentially improve patient’s satisfaction by offering an effective and complementary method of nausea and pain intervention, primarily during stages of early labor.

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