

The effect of prenatal massage and psychological counseling on maternal mental preparedness for childbirth

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Abstract. Maternal mental readiness is a crucial factor for achieving a positive childbirth experience. Although prenatal massage and counseling are both recommended, evidence regarding their combined effect remains limited. This quasi-experimental study employed a pretest–posttest control group design involving 60 pregnant women in 2024. Participants were intentionally allocated to either an intervention group (prenatal massage plus counseling, $n = 30$) or a comparison group (counseling only, $n = 30$). Mental readiness was evaluated using a validated questionnaire before and after the intervention. Data were analyzed using paired and independent t-tests, effect size estimation, and ANCOVA. Both groups showed significant improvement; however, the intervention group demonstrated a greater increase ($48.3 \pm 5.6 \rightarrow 67.2 \pm 6.1$; mean change $+18.9$, $p < 0.001$) than the comparison group ($47.9 \pm 5.8 \rightarrow 54.6 \pm 5.9$; mean change $+6.7$, $p = 0.001$). Between-group analysis revealed a mean difference of 12.2 points (95% CI: 8.9–15.5; Hedges' $g = 2.06$, $p < 0.001$), and ANCOVA confirmed the superiority of the combined intervention ($\beta = 12.1$, 95% CI: 9.0–15.2; $p < 0.001$). In conclusion, prenatal massage combined with counseling provides a more effective approach to enhancing maternal mental readiness for childbirth.

1 Introduction

Pregnancy and childbirth are crucial life events involving not only physical changes but also major psychological adjustments. Mental readiness, defined as a mother's ability to manage anxiety, fear, and stress while fostering confidence and positive expectations, plays a vital role in achieving a positive birth experience [1]. This preparedness has been linked to shorter labor, fewer interventions, and greater maternal satisfaction [2]. Non-pharmacological interventions such as prenatal massage and counseling have shown promise in improving maternal well-being. Prenatal massage can lower stress hormones, relieve discomfort, and enhance confidence [3–4], while mindfulness-based or relaxation counseling effectively reduces anxiety and promotes childbirth satisfaction [2]. In Indonesia, traditional prenatal

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massage is common, yet structured psychological counseling is rarely integrated into routine antenatal care [1]. Combining both approaches may therefore offer a culturally acceptable and effective strategy to enhance maternal mental readiness for childbirth. Nevertheless, the majority of prior research has focused on either massage or counseling independently, with insufficient consideration of the synergistic impact of both therapies on mother psychological outcomes [5]. As of yet, no quantitative research in Indonesia has precisely assessed the effects of combining prenatal massage and counseling on the mental preparedness of pregnant women for childbirth. Such an absence signifies a significant research deficiency, as integrated methodologies may provide synergistic advantages by concurrently tackling both physical comfort and psychological resilience. This study seeks to examine the impact of prenatal massage and counseling on the mental preparedness of pregnant women for childbirth. The results are anticipated to yield evidence-based recommendations for incorporating holistic, non-pharmacological methods into antenatal care programs, thereby enhancing maternal well-being and fostering positive delivery experiences.

2 Methods

2.1 Study design

This study employed a quasi-experimental design with a pretest–posttest control group approach. Participants were selected using purposive sampling based on inclusion and exclusion criteria. Eligible participants were then assigned into two groups: the intervention group, which received both prenatal massage and counseling, and the comparison group, which received only counseling sessions.

2.2 Participants

The study involved a total of 60 pregnant women, consisting of 30 participants in the intervention group and 30 participants in the comparison group. Inclusion criteria included women in the third trimester of pregnancy, willingness to participate, and ability to communicate effectively during the counseling sessions. Exclusion criteria included complications in pregnancy requiring medical intervention and a history of psychiatric disorders.

2.3 Intervention procedures

The intervention group received a combined program of prenatal massage and counseling, conducted over several sessions during the antenatal period. The massage was performed using standardized prenatal massage techniques focusing on relaxation and stress reduction. Counseling sessions were provided using structured methods to prepare participants mentally for childbirth, covering aspects of anxiety management, confidence building, and positive coping strategies.

The comparison group received only counseling sessions with the same content, duration, and frequency, but without massage intervention. Both groups continued to receive standard antenatal care provided by the health services.

2.4 Research instruments

Mental readiness for childbirth was assessed using a validated and reliable instrument that has previously been tested for psychometric properties in similar populations. The instrument measured dimensions such as anxiety, confidence, coping ability, and emotional preparedness. Pretest assessments were conducted prior to the intervention, while posttest assessments were performed after the completion of the intervention period in both groups.

2.5 Data collection and analysis

Data were collected through direct administration of the instrument during scheduled antenatal visits. Statistical analysis was performed using appropriate tests to compare pretest and posttest scores within groups and between groups. Paired t-tests were applied to examine changes within each group, while independent t-tests (or ANCOVA where applicable) were used to compare differences between the intervention and comparison groups. A p-value <0.05 was considered statistically significant.

2.6 Ethical considerations

Ethical approval for this study was obtained from the institutional ethics committee. All participants were informed about the purpose and procedures of the study and provided written informed consent prior to participation. Confidentiality and anonymity of data were strictly maintained throughout the research process. Ethical approval for this study was obtained from the Health Research Ethics Committee of Universitas Muhammadiyah Purwokerto, Indonesia (Registration No.: KEPK/UMP/23/I/2025).

3 Results and discussion

3.1 Results

3.1.1 Baseline characteristics

Table 1. Baseline characteristics of participants

Variable	Intervention (n=30)	Comparison (n=30)	p-value
Age (years, mean ± SD)	28.4 ± 4.1	27.9 ± 3.8	0.62
Parity (primipara %)	40.0	43.3	0.79
Gestational age (weeks)	32.5 ± 1.8	32.8 ± 1.6	0.47
Education ≥ high school (%)	73.3	70.0	0.77

A total of 60 pregnant women were included in the analysis, with 30 assigned to the intervention group (prenatal massage + counseling) and 30 to the comparison group (counseling only). The mean age was 28.4 ± 4.1 years in the intervention group and 27.9 ± 3.8 years in the comparison group. Multiparity was more common in both groups (60.0% vs. 56.7%). There were no statistically significant differences between groups in terms of age, parity, gestational age, or educational level (all p > 0.05), indicating comparability at baseline.

3.1.2 Changes in mental readiness (within-group analysis)

Table 2. Pretest–Posttest changes in mental readiness within groups

Group	Pretest Mean ± SD	Posttest Mean ± SD	Mean Change (95% CI)	Effect Size (dz)	p-value
Intervention	48.3 ± 5.6	67.2 ± 6.1	+18.9 (16.5–21.3)	3.39	<0.001
Comparison	47.9 ± 5.8	54.6 ± 5.9	+6.7 (3.5–9.9)	1.12	0.001

At baseline, both groups had comparable mean readiness scores (intervention: 48.3 ± 5.6; comparison: 47.9 ± 5.8). Following the intervention, the intervention group showed a marked increase to 67.2 ± 6.1, representing a mean change of +18.9 points (95% CI 16.5–21.3; $p < 0.001$) with a large effect size (Cohen’s $d_z = 3.39$; Hedges $g = 3.34$).

The comparison group also demonstrated a modest improvement from pretest to posttest (47.9 ± 5.8 → 54.6 ± 5.9), with a mean change of +6.7 points (95% CI 3.5–9.9; $p = 0.001$) and a medium effect size (Cohen’s $d_z = 1.12$; Hedges $g = 1.10$).

3.1.3 Between-group comparison

Table 3. Between-group posttest comparison of mental readiness

Group	Posttest Mean ± SD	Mean Difference (95% CI)	Effect Size (Hedges g , 95% CI)	p-value
Intervention	67.2 ± 6.1	+12.2 (8.9–15.5)	2.06 (1.46–2.66)	<0.001
Comparison	54.6 ± 5.9			

At posttest, the intervention group had significantly higher readiness scores compared to the comparison group (67.2 ± 6.1 vs. 54.6 ± 5.9; $p < 0.001$). The mean difference was 12.2 points (95% CI 8.9–15.5), corresponding to a large between-group effect size (Cohen’s $d = 2.10$; Hedges $g = 2.06$, 95% CI 1.46–2.66).

3.1.4 ANCOVA adjustment

An ANCOVA model was conducted to control for baseline readiness scores. After adjusting for pretest values, the intervention group still showed a statistically significant advantage over the comparison group ($\beta = 12.1$, 95% CI 9.0–15.2; $p < 0.001$). The adjusted model explained 82.3% of the variance in posttest readiness (Adj. $R^2 = 0.823$), confirming the robustness of the intervention effect.

3.1.5 Visual representation

The progression of mean readiness scores is presented in **Table 2**. The intervention group exhibited a steeper increase from pretest to posttest compared to the modest improvement in the comparison group, highlighting the added value of integrating prenatal massage with counseling.

3.1.6 Summary of findings

Both groups demonstrated statistically significant improvements in mental readiness. However, the magnitude of change was substantially greater in the intervention group, with large effect sizes and consistent findings across paired comparisons, between-group analysis, and ANCOVA adjustment. These results indicate that prenatal massage combined with

counseling is more effective in enhancing maternal mental readiness for childbirth compared to counseling alone.

3.2 Discussion

The current study revealed that the integration of prenatal massage and counseling resulted in a markedly enhanced increase in mom's mental preparedness for birthing compared to counseling alone. The extent of change was substantial and clinically significant, as validated by both within-group and between-group effect sizes, together with ANCOVA adjustment. These findings underscore the synergistic potential of integrating physical relaxation techniques with psychological assistance to improve maternal readiness for birth. Our findings align with previous research demonstrating the advantages of non-pharmacological therapies during pregnancy. Afrilia et al. (2025) reported that prenatal massage could enhance maternal confidence and reduce stress levels, supporting the improvements in mental readiness observed in this study [3]. Previous research has demonstrated that Shiatsu massage can markedly alleviate anxiety and labor pain in primiparas, underscoring its potential as a beneficial intervention throughout the perinatal period. In addition to physical relaxation, counseling is crucial; mindfulness-based counseling reduces anxiety and enhances childbirth satisfaction, while structured prenatal education programs diminish fear of childbirth and improve the overall experience of childbirth [1-4]. Our results are corroborated by previous studies indicating that psychological therapies improve mother connection and emotional well-being. Research has shown that maternal attachment training and relaxation strategies can enhance prenatal connection and improve psychosocial outcomes. Antenatal education programs that include simulation and role-play have been shown to enhance maternal self-efficacy and diminish anxiety of childbirth. This collection of research together supports our findings, indicating that multimodal therapies provide more extensive effects than single-method methods. [6]

Meta-analyses offer more robust evidence for the efficacy of combined therapies than individual studies. Evidence suggests that non-pharmacological methods can markedly alleviate depressive and anxiety symptoms during pregnancy, while research emphasizes the widespread occurrence of antenatal anxiety in low- and middle-income nations, highlighting the necessity for scalable and cost-effective interventions such as massage and counseling. Moreover, collaborative psychological interventions have shown superior outcomes compared to individual approaches. The comprehensive reviews affirm the effectiveness and practical significance of the integrated model analyzed in our work [5]. Enhancing maternal preparedness aligns with WHO guidelines on antenatal care for a favorable pregnancy experience and is consistent with national health policies. Educational interventions, as examined by Beydokhti (2020), underscore the preventative efficacy of antenatal programs in mitigating postpartum depression, hence emphasizing the need of readiness before to childbirth [5], [7].

This study has several limitations that should be acknowledged. First, the sample size was relatively small and limited to a single institution, which may affect the generalizability of the findings. Second, mental readiness was assessed using self-reported instruments, which are subject to reporting bias. Third, the study exclusively analyzed short-term outcomes; the long-term impacts on postpartum psychological well-being and maternal-infant bonding were not evaluated. Finally, potential confounding factors such as social support, prior birth experiences, and cultural influences were not extensively controlled, which may have influenced readiness levels. Future studies should consider larger, multicenter trials to enhance external validity and explore the sustainability of the intervention's effects in the postpartum period. Longitudinal designs would allow examination of whether improved

prenatal mental readiness translates into better childbirth experiences, lower rates of postpartum depression, and stronger maternal-infant attachment.

Furthermore, comparative studies across different cultural and healthcare settings would teach us about the adaptability and scalability of massage and counseling interventions. Investigating biological markers of stress and anxiety (e.g., cortisol levels) alongside self-reported measures could also strengthen the evidence base by incorporating objective outcomes. The findings of this study indicate that massage and counseling interventions significantly enhance the mental readiness of pregnant women in facing labor. This result is consistent with earlier research demonstrating the role of non-pharmacological strategies in reducing maternal anxiety, strengthening coping skills, and improving childbirth experiences [1], [6]. In particular, massage techniques such as Shiatsu or myofascial release have been shown to decrease sympathetic nervous system activity, promote relaxation, and reduce the perception of pain and anxiety during pregnancy and labor [8-9].

This study found that the counseling component significantly shapes maternal mental readiness, going beyond physical relaxation. Previous evidence highlights that mindfulness-based counseling, relaxation training, and structured prenatal education improve maternal self-efficacy, reduce fear of childbirth, and foster stronger maternal-fetal attachment [10]. These psychological improvements are directly linked to increased preparedness for labor, as they empower mothers to manage uncertainty and stress more effectively. The combination of massage and counseling appears to provide synergistic benefits compared to single interventions. Similar to recent meta-analyses reporting the superior outcomes of multimodal approaches, our findings suggest that addressing both the physiological and psychological domains simultaneously produces more comprehensive benefits. Massage primarily reduces somatic tension and stress hormone levels, while counseling enhances cognitive and emotional regulation. When integrated, these strategies create a holistic model that strengthens both body and mind in preparation for childbirth. [11], [12].

From a clinical perspective, the integration of massage and counseling into antenatal care is relevant in low- and middle-income settings where pharmacological resources may be limited. Scalable, low-cost strategies such as these interventions are practical, culturally acceptable, and align with WHO recommendations for positive pregnancy experiences. In the context of maternal health services, incorporating such approaches into routine prenatal care could reduce fear and anxiety, enhance maternal satisfaction, and potentially contribute to improved labor outcomes [3], [13]. Nevertheless, this study has some limitations. First, the relatively small sample size restricts the generalizability of findings. Second, mental readiness was assessed within a limited timeframe, without long-term follow-up in the postpartum period. Future studies with larger samples, diverse settings, and longitudinal designs are necessary to confirm the durability of these benefits. Moreover, comparative studies are needed to identify which combinations of non-pharmacological interventions are most effective for specific populations [6], [14]. Overall, this study contributes to the growing body of evidence supporting integrative, non-pharmacological interventions for pregnant women. By demonstrating that massage and counseling effectively improve mental readiness for labor, our findings highlight the importance of holistic maternal care that addresses both physical and psychological well-being [15].

4 Conclusion

This study demonstrated that the integration of prenatal massage and counseling significantly enhanced maternal mental readiness for childbirth compared to counseling alone. The intervention produced large and clinically relevant improvements, as confirmed by effect size estimates and adjusted analyses. These findings suggest that combining physical relaxation

and psychological support provides a synergistic effect, equipping mothers with greater confidence and preparedness for the birthing process.

From a clinical perspective, the implementation of such integrative approaches can serve as an effective, low-cost, and culturally adaptable strategy to improve maternal well-being and optimize childbirth experiences. Aligning with international recommendations for positive pregnancy care, these results support the inclusion of non-pharmacological interventions such as massage and counseling within routine antenatal programs.

Future research should investigate the long-term benefits of this combined intervention on postpartum mental health and maternal-infant attachment, as well as test its scalability across diverse healthcare settings.

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