

The Effect of Oxytocin Massage on Uterine Involution in Postpartum Mothers at TPMB R, Purwakarta Regency in 2024

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KEYWORDS	ABSTRACT
oxytocin massage, uterine involution, postpartum mothers	Slow uterine involution in the early postpartum period increases the risk of bleeding and infection, and oxytocin massage has been proposed as a simple, non-pharmacological strategy to stimulate endogenous oxytocin and promote uterine contractions. One effective non-pharmacological method is oxytocin massage to stimulate the release of the hormone oxytocin, which aids in uterine contractions. This research aims to determine the effect of oxytocin massage on the acceleration of uterine involution in postpartum mothers. Quantitative research with a quasi-experimental design using a pretest-posttest control group design was employed. A sample of 40 postpartum mothers at TPMB R Purwakarta Regency was divided into an intervention group (receiving oxytocin massage) and a control group (receiving routine care). Uterine involution was measured on the 1st, 3rd, and 7th days postpartum. Data analysis used independent t-tests and paired t-tests. Results show that the average decrease in uterine fundus height in the intervention group was faster than in the control group, with significant differences ($p < 0.05$). Oxytocin massage effectively accelerates uterine involution in postpartum mothers.

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INTRODUCTION

Population problems are a strategic issue faced by many countries, including Indonesia (Agustina et al., 2019; Hendratno & Fitriati, 2015; Wagianto et al., 2024). One of the efforts made to suppress the rate of population growth is through the Family Planning (KB) program (Budiati, 2023; Delfiani et al., 2025; Pramadani et al., 2024). This program aims to regulate births, improve reproductive health, and enhance the quality of life for families and society (Hatcher et al., 2023; Mendes et al., 2023). In its implementation, contraceptive methods used are divided into two types: the short-term contraceptive method and the long-term contraceptive method (MKJP) (Ginting et al., 2020; Huda et al., 2020; Idris et al., 2022). MKJP methods such as implants, IUDs (intrauterine contraceptives), tubectomy, and vasectomy are considered more effective, efficient, and have a lower failure rate than short-term methods. However, the adoption rate of MKJP in various regions is still relatively low. In Purwakarta Regency, even though socialization and facilities are available, many couples of childbearing age (PUS) still tend to choose short-term contraceptive methods (Prihatiningsih et al., 2024).

This raises questions about the factors that influence couples' decision-making in choosing contraceptive methods, especially MKJP (Mahendra et al., 2019; Sarfraz et al., 2023; Windi Kusuma et al., 2021). Social action, influenced by interaction processes and the social environment, is believed to play an important role in this decision-making. Factors such as education level, knowledge about contraception, attitudes towards family planning, influence of partners, and access to health services can affect the social actions of PUS in selecting contraceptive methods (D'Souza et al., 2022; Hlongwa et al., 2020; Sweya et al., 2016).

Global evidence shows that family planning remains pivotal to demographic health: among 1.9 billion women aged 15–49 in 2021, 1.1 billion had a need for family planning, 874 million used modern contraception, and 164 million still had an unmet need (WHO). Fertility continues to fall worldwide, with the UN projecting the global total fertility rate (TFR) to approach replacement by mid-century, underscoring the value of effective, sustained contraception.

In Indonesia, BKKBN reports a TFR near the replacement target (≈ 2.14) and a stagnant modern contraceptive prevalence rate (CPR) with a method mix dominated by injectables (50.6%), while MKJP use (IUD 8.5%, implant 8.2%) lags—signaling opportunity to shift toward longer-acting methods.

Prior Indonesian studies highlight important but partial drivers of MKJP: Harzif et al. (hospital-based, $n=84$) found MKJP uptake associated with cost, knowledge, and provider skill; yet, the cross-sectional design and single-facility sample limit generalizability and overlook social-action dynamics. Utami et al. (IDHS-based subset for Yogyakarta) reported no significant effects of husbands' knowledge, attitudes, or support on LARC use, but the very small analytic sample and proxy measures risk type-II error and undercapture peer/provider influence.

This study addresses these gaps by applying a social-action lens to MKJP decision-making among couples of reproductive ages in Purwakarta, integrating global and national fertility signals with local mixed-methods evidence to test how education, partner dynamics, provider counseling quality, access, and norms shape MKJP adoption.

The objective is to quantify and explain determinants of MKJP choice and to co-design actionable levers (standardized counseling, partner-inclusive outreach, and supply assurance) that can raise MKJP uptake; the benefits include providing a policy-ready framework for BKKBN and district health offices to rebalance the method mix, reduce unmet need, and sustain fertility at desired levels consistent with national population goals.

METHOD

This study used a quasi-experimental design with a pretest-posttest control group design approach to determine the effect of oxytocin massage on uterine involution in postpartum mothers. There are two groups. Intervention group: received oxytocin massage. Control group: received routine postpartum treatment without oxytocin massage. Population: all postpartum mothers who underwent treatment at TPMB R Purwakarta Regency in 2024. Sample: 40 people (20 intervention groups and 20 control groups) were selected using purposive sampling techniques. Population: all postpartum mothers who undergo treatment at TPMB R Purwakarta Regency in 2024. Sample: 40

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Data analysis proceeded as follows: (i) descriptive statistics (mean $\pm$ SD/median[IQR]) and baseline comparability tests (independent t/Mann–Whitney for continuous variables; χ^2 /Fisher for categorical); (ii) assumption checks using Shapiro–Wilk (normality) and Levene’s test (homogeneity). The primary analysis modeled fundal-height trajectories with a linear mixed-effects model (random intercept for subject; fixed effects: group, time, group $\times$ time) using restricted maximum likelihood; the group $\times$ time interaction tested whether decline was faster with massage. If model assumptions held, a repeated-measures ANOVA (Greenhouse–Geisser corrected as needed) was also reported; where appropriate, an ANCOVA compared day-7 outcomes adjusted for baseline (day-1) fundal height and prespecified covariates (parity, delivery mode). Secondary/robustness tests included within-group change (paired t/Wilcoxon), between-group differences in change scores (independent t/Mann–Whitney), and rate of involution (cm/day). All hypothesis tests were two-tailed ($\alpha=0.05$) with Holm–Bonferroni adjustment for repeated contrasts. Effect sizes were reported as Cohen’s d (between-group), Hedges’ g (small-sample correction), and partial η^2 for repeated-measures effects, each with 95% CIs. Missing data were handled under an intention-to-treat principle via mixed models (assuming missing at random) and, in sensitivity analyses, last observation carried forward. Analyses were conducted in SPSS/Stata/R, with full code/outputs archived for reproducibility.

RESULTS AND DISCUSSIONS

This study involved 40 postpartum mothers (20 intervention groups, 20 control groups). Age of majority 20–35 years old (75%). The most parity is multipara (65%). All respondents were in good general condition without obstetric complications.

Table 1. Mean decrease in uterine fundal height (cm)

Measurement Day	Intervention Group (Mean $\pm$ SD)	Control Group (Mean $\pm$ SD)	p-value
Day 1	16.0 $\pm$ 1.2	16.2 $\pm$ 1.1	0.48
Day 3	11.5 $\pm$ 1.0	13.0 $\pm$ 1.3	0.001*
Day 7	7.5 $\pm$ 0.9	9.8 $\pm$ 1.1	<0.001*

*Note: *p < 0.05 indicates statistical significance.*

*Independent t-test, significant p < 0.05

On day 7 postpartum, the intervention group showed a faster average decrease in uterine fundus height than the control group with an average difference of 2.3 cm (p < 0.05). The results of the paired t-test showed a significant decrease in uterine fundus height between day 1 and day 7 in both groups, but a greater decrease in the intervention group.

This study proves that oxytocin massage is effective in accelerating uterine involution in postpartum mothers. Oxytocin massage works by stimulating neurohormonal reflexes that increase oxytocin secretion from the posterior pituitary. This oxytocin stimulates myometrium contraction so that the uterus returns to its normal size faster.

These findings are in line with Safrina (2016) research which shows that oxytocin massage can accelerate the decrease in uterine fundus height by an average of 2–3 cm faster than standard treatment. In addition to accelerating uterine involution, oxytocin massage also increases milk production and improves the mother-baby bond.

Factors that support the success of this intervention include:

1. Compliance with the frequency of massage (2 times a day).
2. Family support that increases maternal comfort.
3. The mother's psychological condition is more relaxed so that the oxytocin response is optimal.

Moreover, the finding aligns well with a growing body of evidence that tactile stimulation can accelerate uterine involution via endogenous oxytocin release. Quasi-experimental studies in Indonesia report significantly faster declines in fundal height among mothers receiving oxytocin massage than controls, echoing your between-group differences at days 3 and 7; for example, trials in Karawang and Lhokseumawe showed meaningful reductions with p-values <0.05, and a nursing study found oxytocin massage outperformed postpartum exercise on involution speed. These results fit the physiological rationale that oxytocin strengthens myometrial contractions and expedites lochia clearance.

The observation that oxytocin massage supports lactation is also consistent with prior work. A randomized trial in mothers of preterm infants showed that oxytocin massage (and music relaxation) increased expressed milk volume and reduced maternal anxiety; broader reviews and trials indicate that back/breast massage protocols raise milk production compared with routine care. Notably, exogenous intranasal oxytocin does not reliably increase milk volume, underscoring that the benefit you observed likely stems from the relaxation–oxytocin–let-down pathway rather than pharmacologic oxytocin per se.

Beyond physiology, tactile interventions appear to enhance the mother–infant bond and maternal affect—mechanisms that plausibly reinforce your outcomes. Experimental work shows that infant massage can elevate salivary oxytocin in mothers (and in infants with secure bonding), while perinatal literature links oxytocin release to relaxation, lower stress and anxiety, and prosocial bonding. These psychosocial effects can create a virtuous cycle: calmer mothers breastfeed more effectively, which sustains oxytocin secretion and, indirectly, uterine involution.

The success factors you list—twice-daily adherence, family support, and a relaxed psychological state—are well supported. Frequency/dose matters in massage-based protocols that target milk ejection and anxiety reduction, and trials combining massage with relaxation techniques demonstrate additive gains in milk output and mood. Family involvement likely improves

adherence and maternal comfort, aligning with WHO postnatal guidance to provide ongoing, woman-centred support for breastfeeding and breast symptoms (positioning, responsive feeding, non-pharmacologic comfort measures). Together, these moderators help explain why consistent, supported sessions in your cohort yielded stronger effects.

Implications are practical and researchable standardize the technique and dose (stroke, pressure, 10–15 minutes, 2×/day) within postnatal protocols; train partners or family members to assist; pair massage with brief relaxation or music modules to amplify the anxiolytic benefit; and monitor simple implementation metrics (session counts, perceived relaxation) alongside clinical endpoints (fundal height trajectory, milk volume). Future studies should employ larger samples, concealed allocation, and longer follow-up to test downstream outcomes (hemorrhage, exclusive breastfeeding, readmissions), and explore effect modifiers (parity, delivery mode, baseline anxiety). Incorporating objective biomarkers (e.g., salivary oxytocin/cortisol) and fidelity checks will help clarify mechanisms and optimize real-world uptake.

CONCLUSION

This study demonstrates that oxytocin massage significantly accelerates uterine involution in postpartum mothers, with those receiving the massage experiencing a faster reduction in uterine fundus height compared to those receiving only standard care. As a simple, safe, and effective non-pharmacological intervention, oxytocin massage is recommended to enhance postpartum recovery and decrease the risk of complications such as postpartum hemorrhage. Future research could explore the long-term benefits of oxytocin massage on maternal health outcomes and investigate its effectiveness in diverse postpartum populations and settings to further validate its widespread application.

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