



Research Article

Postpartum comfort and mother-infant bonding: Implications for early child development and family-based intervention¹

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Abstract

This descriptive cross-sectional study aimed to examine postpartum comfort levels and mother-infant bonding among mothers admitted to the Obstetrics Unit of Ege University Medical Faculty Hospital (EUMFH), and to identify factors influencing these outcomes. The sample consisted of 153 mothers who met the inclusion criteria and gave birth within the preceding three days. Data were collected using the Mother-Infant Introductory Information Form, the Postpartum Comfort Scale (PCS), and the Mother-Infant Bonding Scale (MIBS). The mean total PCS score was 95.37 ± 39.05 , indicating a moderate-to-low postpartum comfort level. Positive bonding scores averaged 1.86 ± 0.91 and negative bonding scores averaged 0.79 ± 0.61 . Statistically significant differences were found between postpartum comfort and maternal age ($p < 0.001$), number of pregnancies ($p < 0.001$), number of living children ($p < 0.001$), intentionality of pregnancy ($p < 0.001$), and type of anesthesia ($p < 0.05$). Mothers aged 38–47 years reported the lowest comfort levels. Primigravid mothers demonstrated significantly higher comfort and positive bonding scores compared to multigravid mothers. These findings underscore the importance of individualized care in the postpartum period to optimize maternal comfort and strengthen mother-infant attachment.

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Introduction

The postpartum period — referred to clinically as the puerperium — commences immediately after placental delivery and encompasses the subsequent six to twelve weeks during which the maternal organism returns to its pre-gestational state. This phase constitutes a physiologically and psychosocially complex transition for both the mother and the newborn, involving rapid hormonal shifts, uterine involution, initiation of lactation, and the assumption of new caregiving roles (Karakaplan & Eryılmaz, 2007; Esencan & Şimşek, 2017).

Despite its clinical significance, the postpartum period remains a phase during which mothers frequently experience unmet physical and emotional needs. Postpartum haemorrhage, puerperal infection, and venous thromboembolism represent the leading physiological risks, while postpartum depression, role adjustment difficulties, and disrupted mother-infant attachment constitute major psychosocial concerns (WHO, 2010; ACOG, 2018). Ensuring maternal comfort during this period is therefore not only a therapeutic priority but also a prerequisite for optimal infant care and healthy attachment formation.

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Katharine Kolcaba's Comfort Theory (1991, 2003) provides a comprehensive theoretical framework for understanding and measuring patient comfort in nursing practice. The theory conceptualizes comfort across four contextual dimensions — physical, psychospiritual, sociocultural, and environmental — and three taxonomic states: relief, ease, and transcendence. Kolcaba operationalized these dimensions through the General Comfort Questionnaire (GCQ), which was subsequently adapted for Turkish postpartum populations as the Postpartum Comfort Scale (PCS) by Karakaplan and Yıldız (2010).

Mother-infant bonding, a concept rooted in Bowlby's Attachment Theory (1969) and further elaborated by Ainsworth, refers to the enduring emotional tie formed between the mother and her newborn during the sensitive period following birth. Contemporary developmental science has established that the quality of this early bond extends well beyond the neonatal phase, exerting a profound influence on children's long-term developmental trajectories. Secure early attachment predicts superior cognitive outcomes in infancy and childhood, including higher scores on standardized language, memory, and executive function assessments (Kok et al., 2015; Belsky & Fearon, 2002). Neuroimaging research further demonstrates that secure maternal bonding is associated with healthier prefrontal cortical development — a region critical for learning, attention regulation, and problem-solving — highlighting a direct neurobiological pathway through which postpartum bonding shapes cognitive development (Kim et al., 2020).

Beyond cognition, early mother-infant bonding is a cornerstone of children's social-emotional development. Children who experience warm, responsive early caregiving develop greater emotional regulation capacities, demonstrate more prosocial behaviours, and show lower rates of behavioural dysregulation across childhood (Bretherton, 1992; Sroufe et al., 2005). Conversely, insecure or disrupted attachment in infancy is a robust predictor of anxiety, aggression, social withdrawal, and externalizing behavioural problems in the preschool and school-age years (DeKlyen & Greenberg, 2008). The transition to formal schooling itself is significantly shaped by early bonding quality: children with secure attachment histories demonstrate better preschool social competence, more constructive peer relationships, greater classroom engagement, and smoother adaptation to the structured demands of the early educational environment (Pianta et al., 1997; O'Connor & McCartney, 2007). These findings collectively position the postpartum period — and the quality of bonding established therein — as a critical determinant not only of infant health but of children's educational readiness and school adjustment.

Given this confluence of evidence, it is imperative that postpartum clinical care extend beyond the immediate physiological management of the mother to encompass a developmental perspective, recognizing that interventions promoting maternal comfort and mother-infant bonding during the first days of life may yield long-term benefits for the child's cognitive, social-emotional, and educational outcomes.

While prior studies have examined postpartum comfort (Birgili, 2020; Derya et al., 2021; Erkaya et al., 2017) and mother-infant bonding (Kirca & Savaşer, 2017; Engin & Kuzlu Ayyıldız, 2021) independently, the relationship between these two constructs — and the demographic and obstetric factors that jointly influence them — remains incompletely understood in Turkish tertiary-care settings. The present study was therefore designed to address this gap.

Objectives

The present study aimed to: (1) determine postpartum comfort levels of mothers hospitalized in the Obstetrics Unit of EUMFH; (2) identify sociodemographic, obstetric, and neonatal factors associated with postpartum comfort and mother-infant bonding; and (3) discuss implications for early child development and family-centred intervention.

Method

Study Design and Setting

A descriptive, cross-sectional design was employed. The study was conducted in the Obstetrics Unit of Ege University Medical Faculty Hospital (EUMFH), İzmir, Türkiye — a tertiary referral centre operating 34 single-room wards with a capacity for 44 patients and an average daily delivery rate of eight births. The typical postpartum hospitalization duration is one day following vaginal delivery and two days following Caesarean section.

Participants

The target population comprised all women who delivered at EUMFH during the preceding year ($N = 1,850$). Using the known-population sampling formula with a 95% confidence interval and a 5% margin of error, the minimum required sample size was calculated as 318. A power analysis conducted using G*Power 3.1.9.2, based on an effect size of $d = 0.62$ (derived from Semerci, 2019), indicated that 138 participants were required to achieve $\alpha = 0.05$ and $1 - \beta = 0.95$. Due to time constraints, 153 mothers were enrolled via purposive sampling, yielding adequate statistical power.

Inclusion criteria: ≥ 18 years of age; Turkish as primary language; literate; no psychiatric diagnosis or perceptual impairment; delivered within the preceding three days; verbal informed consent. Exclusion criteria: high-risk pregnancy; multiple gestation; severe maternal or neonatal complications; preterm birth (< 37 weeks); conception via assisted reproductive technology.

Data Collection Instruments

Three instruments were used:

Mother-Infant Introductory Information Form (MIIF). A researcher-developed 23-item questionnaire covering sociodemographic (9 items), obstetric history (11 items), and neonatal characteristics (3 items).

Postpartum Comfort Scale (PCS). Developed by Karakaplan and Yıldız (2010); 34-item, 5-point Likert-type scale measuring physical, psychospiritual, and sociocultural comfort. Scores range from 34 to 170; higher scores indicate greater comfort. Cronbach's $\alpha = 0.78$ in the present study.

Mother-Infant Bonding Scale (MIBS). Turkish adaptation (Karakulak, 2009) of Taylor et al.'s (2005) original scale. Eight items, 4-point Likert format. Higher total scores indicate greater bonding difficulties. Cronbach's $\alpha = 0.80$ in the present study.

Data Collection Procedure

Data were collected through face-to-face interviews in the Obstetrics Unit. A pilot test was carried out with 10 eligible mothers to assess item clarity; these participants were excluded from the main analysis. Verbal informed consent was obtained from all participants prior to data collection.

Statistical Analysis

Data were analyzed using SPSS Statistics version 23. Normality was confirmed through skewness and kurtosis values (both within ± 2.0). Parametric tests were employed: independent samples t-test (two-group comparisons), one-way ANOVA with post-hoc LSD, Scheffe, or Tukey tests (multi-group comparisons), and Pearson correlation analysis. Significance threshold: $p < 0.05$.

Ethical Considerations

The study was approved by the Medical Research Ethics Committee of Ege University and the relevant institutional authority of EUMFH. Written permissions for scale use were obtained from scale developers and authors of Turkish adaptations. Verbal informed consent was obtained from all participants.

Results

Sociodemographic and Obstetric Characteristics

The sample comprised 153 postpartum mothers. The majority were aged 28–37 years (52.3%), held a university degree or above (41.8%), and were not employed outside the home (66.0%). Regarding economic status, 71.2% reported income roughly equal to expenditure. The vast majority (94.8%) had married by choice, and 91.5% lived in households of 3–5 persons.

Regarding obstetric history, 37.3% were primigravid, 64.1% delivered by Caesarean section (CS), and 35.9% vaginally. Among CS deliveries, spinal anesthesia was most common (46.4%), followed by general (9.8%) and epidural (7.8%) anesthesia. Most pregnancies (81.7%) were planned. Infant sex was approximately equal (50.3% female). Early breastfeeding initiation (within the first hour) was reported by 69.3% of mothers.

Postpartum Comfort Scale Scores

The mean total PCS score was 95.37 ± 39.05 (scale range: 34–170), indicating below-mid-range postpartum comfort. CS mothers scored 95.62 ± 39.42 and vaginal delivery mothers 94.93 ± 38.75 ; this difference was not statistically significant ($p > 0.05$).

Significant differences in total and subscale PCS scores were observed for:

Maternal age ($p < 0.001$): Mothers aged 38–47 years reported significantly lower physical, psychospiritual, and sociocultural comfort than younger groups (LSD post-hoc).

Number of pregnancies ($p < 0.001$): Primigravid mothers demonstrated higher comfort on all subscales vs. multigravid mothers (Scheffe post-hoc).

Number of living children ($p < 0.001$): Mothers with one living child reported significantly higher comfort than those with two or more children (Scheffe post-hoc).

Intended pregnancy ($p < 0.001$): Planned-pregnancy mothers reported significantly higher comfort on all dimensions.

Prior birth experience ($p < 0.001$): First-time mothers had higher PCS scores than experienced mothers.

Type of anesthesia ($p < 0.05$): Epidural anesthesia was associated with significantly higher physical ($p = 0.034$), psychospiritual ($p = 0.040$), and total postpartum comfort ($p = 0.042$) compared to other modalities.

No significant PCS differences were observed for marital consent, infant sex, or miscarriage history (all $p > 0.05$).

Mother-Infant Bonding Scale Scores

The mean positive bonding score was 1.86 ± 0.91 and the mean negative bonding score was 0.79 ± 0.61 , reflecting moderate positive and low negative bonding levels.

Significant predictors of bonding scores included:

Maternal age (positive bonding, $p = 0.005$): Mothers aged 38–47 years demonstrated significantly lower positive bonding than those aged 18–27 years. No age-related difference in negative bonding ($p > 0.05$).

Number of pregnancies ($p < 0.001$): Primigravid mothers had higher positive and lower negative bonding scores (Tukey post-hoc).

Number of living children ($p < 0.001$): Mothers with one living child had higher positive and lower negative bonding scores (Scheffe post-hoc).

Intended pregnancy ($p = 0.005$): Planned-pregnancy mothers had higher positive bonding.

Type of anesthesia (positive bonding, $p = 0.026$): Epidural anesthesia was associated with higher positive bonding (Scheffe post-hoc).

Prior birth experience ($p < 0.001$): First-time mothers demonstrated higher positive and lower negative bonding scores.

No significant bonding differences were found by marital consent, infant sex, or miscarriage history (all $p > 0.05$).

Discussion

This study provides a comprehensive examination of postpartum comfort and mother-infant bonding in a Turkish tertiary-care obstetric setting. The mean PCS total score of 95.37 ± 39.05 is consistent with findings from Birgili (2020) (mean: 110.42 ± 9.12) and Derya et al. (2021) (subscale scores ranging 31.94–45.97), both indicating moderate postpartum comfort levels. The observed score approximates the midpoint of the PCS scale range (34–170), suggesting that a substantial proportion of mothers experience suboptimal postpartum comfort — a clinically actionable finding.

No significant difference in postpartum comfort was found between CS and vaginal delivery groups ($p > 0.05$), consistent with Erkaya et al. (2017) and Ünal and Şenol (2022). This finding suggests that mode of delivery per se may not be the predominant determinant of postpartum comfort when other variables are accounted for.

Advanced maternal age (38–47 years) was significantly associated with lower comfort and reduced positive bonding. Older mothers may face compounded physiological recovery challenges and heightened psychological burden, consistent with evidence that advanced reproductive age is associated with increased obstetric complexity and reduced psychosocial resilience (Çankaya et al., 2017). From a developmental perspective, impaired bonding in older mothers

warrants particular clinical attention, as reduced positive bonding at this stage may translate into downstream effects on the child's cognitive and social-emotional development.

The finding that multigravid mothers reported significantly lower comfort and weaker bonding aligns with the physical depletion hypothesis: each successive pregnancy may incrementally reduce maternal physiological reserve and psychosocial coping capacity. Critically, weaker bonding in multigravid families has implications for the developmental environment of all children in the household, not only the newborn, as maternal emotional availability is a shared resource across siblings.

The association between intended pregnancy and higher comfort and bonding scores reinforces the importance of reproductive autonomy in shaping postpartum psychological outcomes. This parallels findings from Birgili (2020) and Kirca and Savaşer (2017). The developmental implications are significant: children born from planned pregnancies are more likely to enter a family context characterized by higher maternal responsiveness — a key driver of early cognitive stimulation, language development, and emotional security.

Epidural anesthesia was associated with significantly higher postpartum comfort and positive bonding, corroborating Orak and Beydağ (2023), who demonstrated that general anesthesia was associated with the lowest postpartum comfort scores in both the first 24 and 48 postoperative hours. Epidural anesthesia may facilitate earlier maternal engagement with the newborn — including skin-to-skin contact, breastfeeding initiation, and responsive caregiving — during the sensitive bonding window immediately following delivery.

Primiparity was consistently associated with superior postpartum comfort and stronger bonding. First-time mothers may approach the postpartum period with greater anticipatory motivation and fewer competing caregiving demands. Given that secure early bonding in first-time mothers has been linked to stronger child cognitive outcomes (Belsky & Fearon, 2002) and smoother preschool social adjustment (Pianta et al., 1997), supporting primiparity-associated bonding quality represents a high-value clinical investment.

Conclusion and Implications for Practice

This study demonstrates that postpartum comfort and mother-infant bonding are differentially influenced by maternal age, gravidity, parity, intended pregnancy status, prior birth experience, and type of anesthesia. Mode of delivery did not independently predict comfort or bonding outcomes. These findings have implications that extend beyond immediate obstetric care to encompass early child development, family-based educational intervention, and the integration of health and education systems.

Implications for Parental Education Programs

Structured parental education programs — initiated antenatally and continued throughout the postpartum hospitalization period — represent a first-order intervention to promote maternal comfort and strengthen mother-infant bonding. Such programs should address the physiological and psychosocial demands of the postpartum period, provide evidence-based guidance on responsive caregiving and breastfeeding, and equip parents with knowledge of infant developmental cues. The present findings suggest that mothers at highest risk — those who are older, multigravid, or experiencing unintended pregnancies — should be prioritized for intensive educational support.

From a child development standpoint, parental education programs that explicitly frame early bonding as a developmental investment may increase parental motivation and engagement. Educational curricula should incorporate evidence linking responsive early caregiving to children's cognitive readiness, language acquisition, and social-emotional competence, thereby supporting the developmental aspirations of parents alongside their immediate wellbeing.

Implications for Early Intervention

For mothers demonstrating indicators of suboptimal postpartum comfort or impaired bonding — particularly those in high-risk demographic subgroups identified in this study — proactive early intervention is warranted. Early psychosocial interventions, including nurse-led comfort enhancement protocols, postpartum bonding support groups, and home visiting programs, have demonstrated efficacy in improving maternal wellbeing and attachment quality. Given the robust evidence linking early bonding quality to children's preschool adjustment (O'Connor & McCartney, 2007) and

long-term social-emotional outcomes (Sroufe et al., 2005), investment in early postpartum intervention yields developmental dividends well beyond the neonatal period.

Future research should evaluate the effectiveness of structured postpartum comfort and bonding intervention programs on children's developmental outcomes at ages 3, 5, and beyond — thereby translating the clinical and developmental rationale articulated here into evidence-based practice guidelines.

Health–Education Integration

The findings of this study highlight the need for systematic integration between postpartum health services and early childhood education and development frameworks. Postpartum nursing teams are ideally positioned to serve as early bridges between maternal health care and early childhood development pathways. Collaboration between obstetric units, developmental pediatrics, and early childhood education professionals — through shared care protocols, referral networks, and family support services — can ensure that mothers and infants at developmental risk are identified early and connected with appropriate community-based resources.

At a policy level, the evidence presented here supports the embedding of developmental screening, parental education, and bonding assessment within standard postpartum hospital care protocols, and the co-location of early childhood development support within obstetric and postnatal healthcare settings. Integrating the child development lens into postpartum care represents not only a clinical imperative but also an educational equity strategy, given the well-established links between early bonding quality and children's school readiness and long-term educational trajectories.

Limitations and Future Directions

The study was conducted in a single tertiary-care centre, limiting generalizability to community or primary-care settings. The cross-sectional design precludes causal inference. Data were collected during acute postpartum hospitalization (days 0–3), which may not reflect longer-term comfort and bonding trajectories. Future studies should employ longitudinal designs, larger and more diverse samples, and include direct assessment of child developmental outcomes.

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