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Work intensity and prenatal bonding among working antenatal mothers: A mixed-methods inquiry

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Abstract:
The influence of occupational demands on prenatal bonding among working antenatal mothers remains inadequately understood, particularly in low-and middle-income settings. Therefore, it is of interest to explore the work intensity, social support, prenatal bonding and their associations among working antenatal mothers attending a tertiary maternity hospital in Chennai, India, using qualitative interviews and a quantitative survey (n = 60). Three themes emerged: work intensity and physical demands, support systems and prenatal bonding, while most mothers reported high social support (83.33%; 27.10 ± 3.30) and moderate prenatal bonding (70.00%; 70.46 ± 4.52). Social support showed a significant positive correlation with prenatal bonding (r = 0.36, p = 0.01) and younger age, professional employment, adequate sleep and prenatal supplement use were significantly associated with stronger support and bonding. This study advances knowledge by highlighting social support as a key determinant of prenatal attachment and emphasizing the need for workplace-sensitive nursing interventions to strengthen maternal–fetal bonding.

Keywords: Pregnant women, social support, maternal-fetal relations, working women, workload, prenatal care

Background:
The antenatal period is a developmental crossroad in a woman's life, a phase demanding physiological adaptation, emotional re-orientation and, increasingly, the simultaneous management of paid employment. An ever larger share of pregnant women remains in the workforce well into the third trimester. The National Family Health Survey records that 88.1% of pregnant women in Tamil Nadu now receive four or more antenatal check-ups, but women who continue paid work face additional barriers that routine antenatal indicators do not capture. Working antenatal mothers must reconcile physical demands, occupational stressors, time scarcity and the cultural expectation of uninterrupted productivity with the slower, embodied work of pregnancy. The pertinent question is no longer whether women work during pregnancy, but how that work shapes the emotional and relational scaffolding around the unborn child. Work intensity, the cumulative physical, cognitive and emotional load of paid work, has been linked to a range of adverse pregnancy outcomes. A systematic review on working pregnant women concluded that chemical, psychosocial and physical-ergonomic exposures in the workplace are associated with low birth weight, preterm birth, preeclampsia and obstetric complications **[1]**. Where institutional protections are weak, the burden falls on the woman herself and on her informal support network. Social support is the most consistently identified buffer against this burden. A systematic review and meta-analysis covering more than 64,000 pregnant women found that low social support significantly raised the odds of antenatal depression and anxiety, with pooled adjusted odds ratios of 1.18 and 1.97, respectively **[2]**. A qualitative synthesis identified emotional, instrumental, traditional and natal-home support as the four pillars women themselves describe as protective during pregnancy **[3]**. Among pregnant women in a Palestinian cohort, perceived social support correlated positively with both physical and mental quality of life domains, with significant others ranking highest as a support source **[4]**. In urban India, perceived social support was significantly associated with maternal fetal attachment and antenatal well-being and inversely related to antenatal depression among 122 nulliparous expectant mothers **[5]**. A path-analysis study among pregnant women further showed that psychological factors and occupational stress operate alongside social support in explaining the global quality of maternal antenatal attachment **[6]**. Therefore, it is of interest to evaluate the work intensity through the voices of working antenatal mothers; to assess the levels of social support and prenatal bonding; and to examine the correlation and association of these constructs with selected demographic and obstetrical variables.

Materials and Methods:
An exploratory sequential mixed-methods design was used. The qualitative strand followed a phenomenological approach and the quantitative strand a non-experimental descriptive design. Both strands were conducted at the antenatal outpatient department of the Institute of Obstetrics and Gynaecology and Government Hospital for Women and Children, Chennai.

Working antenatal mothers aged 21–40 years, in the second trimester, employed in any sector, able to understand Tamil or English and willing to participate were eligible. Mothers with high-risk pregnancies, comorbidities, severe mental-health disorders, or concurrent participation in another study were excluded. The qualitative strand enrolled six purposively sampled mothers; data saturation was the stopping rule. The quantitative strand enrolled sixty mothers by convenience sampling. Sample size was calculated using an anticipated social-support prevalence of 67.6% (from a published Indian tertiary-care study), 95% confidence and 18% relative precision, yielding a minimum of 57 (rounded to 60). Data were collected using socio-demographic forms, obstetrical variables, a semi-structured open-ended interview schedule, the Maternity Social Support Scale and the Maternal Antenatal Attachment Scale. After Institutional Ethics Committee approval and institutional permission, written informed consent was obtained. Qualitative interviews were audio-recorded, transcribed and translated. Quantitative tools required 10–15 minutes per participant. A pilot study on 10% of the sample refined the tools. Qualitative data were analysed thematically through repeated reading, open coding, theme refinement and final synthesis, with member checking, peer debriefing and triangulation with quantitative findings to establish credibility, trustworthiness and rigor. Quantitative data were coded in Microsoft Excel and analysed in SPSS. Statistical significance was set at $p < 0.05$. Confidentiality, anonymity and the right to withdraw were maintained throughout.

Results:

Among 60 working antenatal mothers in the quantitative phase, 45.00% were 26–30 years old and 38.33% were 21–25 years. Most held a graduate degree (71.67%), worked as skilled (38.33%) or professional (35.00%) employees and 35.00% worked more than 40 hours per week. The predominant income bracket was ₹10,703–₹31,977 per month (58.33%). A majority lived in nuclear families (61.67%), resided in urban areas (88.33%) and were first-time mothers (61.67%); 41.67% were on-site workers. Sleep was 6–7 hours per day in 40.00% and more than 7 hours in 38.33%. Obstetrically, 90.00% had singleton pregnancies, 60.00% attended 1–2 antenatal visits monthly, 45.00% had 3–4 ultrasound scans and 48.33% had never used prenatal supplements. Three themes emerged from the qualitative interviews. Theme 1, Work intensity and physical demands, captured workload changes after conception, physical strain (back pain, dizziness, oedema) and task-specific limitations (climbing stairs, prolonged standing). Theme 2, Support systems, described inconsistent family support, largely informal workplace adjustments and unmet expectations regarding maternity leave and flexible scheduling. Theme 3, Prenatal bonding and emotional well-being, surfaced emotional struggle, isolation and the desire for rest as a precondition for connecting with the baby. The mean MSSS score was 27.10 ± 3.30 (90.33% of maximum); 83.33% reported high and 16.67% moderate support, with no participant in the low category. The mean MAAS score was 70.46 ± 4.52 (74.17% of maximum); 70.00% scored moderate and 30.00% high, with none low. Pearson correlation between MSSS and MAAS scores was $r = 0.36$, $p = 0.01$ a statistically significant, positive, fair correlation. Higher social support was significantly associated with younger maternal age ($\chi^2 = 6.94$, $p = 0.05$), professional employment ($\chi^2 = 6.94$, $p = 0.05$) and six or more hours of sleep ($\chi^2 = 7.77$, $p = 0.05$). Higher prenatal bonding was significantly associated with age 21–25 years ($\chi^2 = 8.84$, $p = 0.01$), adequate sleep ($\chi^2 = 7.70$, $p = 0.05$) and regular prenatal supplement use ($\chi^2 = 17.40$, $p = 0.01$) **(Table 1).**

Table 1: Association of high social support and high prenatal bonding with selected demographic and obstetrical variables (n = 60).

Variable	Category	High SS n (%)	High Bond n (%)	χ^2 SS (p)	χ^2 Bond (p)
Age (years)	21–25	22 (95.66)	12 (52.18)	6.94 (0.05*)	8.84 (0.01*)
	26–30	23 (85.19)	4 (14.81)		
	31–35	6 (60.00)	2 (20.00)		
Employment type	Professional	21 (100.00)	5 (23.81)	6.94 (0.05*)	1.56 (0.67) NS
	Skilled	18 (78.26)	9 (39.13)		
	Semi-skilled	6 (66.67)	2 (22.22)		
	Home worker	6 (85.72)	2 (28.57)		
Sleep / day (h)	< 5	2 (50.00)	0 (0.00)	7.77 (0.05*)	7.70 (0.05*)
	5–6	6 (66.67)	0 (0.00)		
	6–7	22 (91.67)	8 (33.33)		
	> 7	21 (91.30)	8 (34.78)		
Prenatal supplement use	Regularly	11 (68.75)	10 (62.50)	–	17.40 (0.01*)
	Intermittent	2 (66.67)	2 (66.67)		
	Occasionally	12 (100.00)	4 (33.33)		
	Never	26 (89.66)	2 (6.90)		

*SS, social support; Bond, prenatal bonding; NS, not significant *Statistically significant at $p \leq 0.05$.*

Discussion:

This study captures a paradox of contemporary working motherhood: high reported social support coexists with only moderate prenatal bonding. Three interpretive threads help explain it. First, the structure of work itself shapes the space available for bonding. A meta-analysis of 37 studies on physically demanding occupational exposures in pregnancy found a 44% higher risk of preterm birth with long working hours and a 63% higher risk with shift work **[7, 8]**. Our participants were predominantly in skilled or professional roles, many working over 40 hours weekly; in such a context, social support, however high, must compete with sustained occupational load before it can translate into emotional connection with the unborn child. Second, sleep emerged as a

clinically actionable variable on both outcomes (p = 0.05). A cross-sectional study among pregnant women showed that perceived social support and lifestyle behaviours co-vary, while marital disaffection erodes self-care **[9, 10]**. In a pandemic-era cohort, perceived social support and COVID-related appraisal predicted maternal anxiety and depression, which in turn shaped antenatal attachment **[11, 12]**. Among women in late pregnancy, employed participants paradoxically slept better than non-employed counterparts (OR 0.29 for poor sleep; p = 0.002) and sleep quality predicted prenatal and birth outcomes **[13, 14]**. The recurrent pattern is a triangle of support, rest and psychological space-and for working mothers, paid work both constrains and structures that triangle. Third, the strong significant association between prenatal supplement use and bonding (p = 0.01) is most plausibly read as a behavioural marker of engagement with the pregnancy rather than a pharmacological effect; women who attend to micronutrient adherence may also invest more cognitive time in the unborn child. These convergences carry practical implications. Routine antenatal screening for occupational stressors and family-leave access is feasible and clinically meaningful **[15, 16]**, yet remains rare in Indian tertiary maternity care. Nurses are well placed to ask about workload, sleep, supplement adherence and the relational quality of support - and to translate those answers into individualised counselling, workplace advocacy and dyadic interventions that protect both maternal well-being and emerging maternal-fetal attachment **[17, 18].** Limitations include a single-site sample, modest size, non-probability sampling, brief data-collection window and reliance on self-report. The findings are best read as hypothesis-generating for larger multi-site work that includes longitudinal follow-up into the postpartum period.

Conclusion:

Working antenatal mothers reported abundant social support, significantly associated with prenatal bonding, which remained predominantly moderate. Social support alone may be insufficient to strengthen maternal–fetal attachment without adequate rest, workplace flexibility and emotional preparation. Antenatal nursing care should assess work intensity, sleep quality and supplement adherence while providing individualized support to enhance prenatal bonding.

Ethical considerations:

The study protocol was approved by the Institutional Ethics Committee and institutional permission was obtained from the Director, Institute of Obstetrics and Gynaecology (IOG), Chennai. Written informed consent was obtained from all participants.

Conflict of interest: The authors declare no conflict of interest.

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