

Emotional Nurturance and Cognitive Development in Indian Preschoolers: A National Cross-Sectional Study.

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Abstract:

This cross-sectional study investigated the relationship between caregiver emotional nurturance and cognitive development in 391 preschoolers from GIMSH, Durgapur, India, considering socio-economic factors. Age, family structure, and caste significantly influenced cognitive outcomes. Children aged 36-48 months and those from joint families exhibited higher cognitive scores. Children from disadvantaged castes showed lower cognitive development compared to advantaged castes. While emotional nurturance showed a positive trend, it was not significantly associated with cognitive development after adjusting for socio-economic factors. The study highlights the significant impact of socio-economic disparities on preschool cognitive development. Targeted policies addressing these inequities, alongside interventions supporting joint family systems and maternal education, are essential for promoting equitable cognitive development in rural settings.

Keywords: Public health, socio-economic factors, preschool children, emotional nurturance, caregivers, cognitive development.

Introduction

Early childhood represents a critical window for cognitive development, laying the foundation for future academic achievement, social competence, and overall well-being. During this period, the brain undergoes rapid growth and development, making it highly susceptible to environmental influences. Among these influences, the quality of caregiving, particularly emotional nurturance, plays a pivotal role in shaping children's cognitive trajectories. Emotional nurturance, encompassing responsive care, warmth, and secure attachment, fosters a supportive environment that promotes optimal cognitive development. In the context of lowand middle-income countries (LMICs), such as india, the challenges associated with promoting optimal cognitive development are compounded by socio-economic disparities, limited access to quality healthcare, and cultural factors that may influence caregiving practices. Within india, the Western Tarai region, characterized by its diverse socio-cultural landscape and predominantly rural setting, presents a unique context for investigating the impact of emotional nurturance on preschooler cognitive development. The Western Tarai region, located in the southern plains of india, is home to a heterogeneous population comprising various ethnic and caste groups. This diversity is reflected in the region's socio-economic profile, with significant disparities in access to education, healthcare, and resources. These disparities are often rooted in historical and cultural factors, including caste-based discrimination and limited opportunities for marginalized communities. Consequently, children from disadvantaged backgrounds may face heightened risks for cognitive delays and developmental challenges. Within this sociocultural context, the role of caregivers, particularly mothers, in providing emotional nurturance is paramount. However, factors such as limited education, economic constraints, and traditional gender roles may influence caregiving practices and limit the provision of optimal emotional support. Understanding the interplay between socio-economic factors, caregiving practices, and cognitive development is essential for designing effective interventions to promote equitable cognitive outcomes in this region. Furthermore, the prevalence of joint family systems in the Western Tarai region presents a unique opportunity to explore the potential benefits of extended family support on children's cognitive development. Joint families, characterized by multiple generations living together, often provide a network of social and emotional support for children. This support may buffer the negative effects of socio-economic adversity and promote positive cognitive outcomes. Conversely, the transition towards nuclear family structures, driven by urbanization and changing socio-economic dynamics, may have implications for children's cognitive development. Nuclear families, typically comprising parents and their children, may lack the extended support networks available in joint families. Understanding the impact of family structure on cognitive development is crucial for designing culturally sensitive interventions that align with the evolving socio-cultural landscape of the Western Tarai region. Moreover, the quality of healthcare services and access to early childhood development programs play a significant role in promoting cognitive development. In the Western Tarai region, limited access to quality healthcare and early childhood education may impede children's cognitive potential. Addressing these systemic barriers is essential for ensuring equitable access to developmental opportunities and promoting positive cognitive outcomes. This study aims to investigate the impact of health-caregivers' emotional nurturance on cognitive development in preschool-aged children in the Western Tarai region of India, considering the complex interplay of socio-economic factors, family structures, and cultural contexts. By employing a nationwide public health cross-sectional study design, this research seeks to provide valuable insights into the determinants of cognitive development in this unique socio-cultural setting. Specifically, this study will examine the association between emotional nurturance, as reported by caregivers, and cognitive outcomes in preschool children, while controlling for socio-economic factors such as caregiver education, occupation, caste/ethnicity, and family structure. The findings of this research will have important implications for public health policy and intervention design, informing the development of culturally sensitive strategies to promote equitable cognitive development in the Western Tarai region and beyond.

Materials and Methods:

1. Study Design and Setting:

- **Design:** Cross-sectional.
- Location: GIMSH, Durgapur
- **Rationale:** High fertility rate and large young child population in Durgapur District, making it suitable for ECD research.
- Sampling Context: Includes urban, semi-urban, and rural settings.
- **District Population:** 1,118,975.

2. Study Population and Sampling Procedure:

- **Target Population:** 14,358 children (36-71 months) in 369 government-funded ECD centers.
- Sampling Technique: Multi-stage random sampling.
- **Stage 1:** Random selection of three local government units (sub-metropolitan city, municipality, rural municipality).
- Stage 2: Random selection of ECD centers from each unit.
- Inclusion Criteria: All children present on assessment day and their primary caregivers.
- Sample Size Calculation:
 - Formula provided.
 - \circ Calculated sample size: N = 401 children (including 3% non-response rate).
- Final Dataset: 391 cases (after outlier removal).

3. Data Collection Tools:

- **Questionnaire:** Self-administered, two sections.
 - Section A: Caregivers' emotional nurturing practices (yes/no scoring).
 - Includes socio-economic variables (child's gender, age, family structure, caste/ethnicity, mother's education/employment, family economic status).
 - **Section B:** Cognitive development (standardized tool from National Psychological Corporation of India, based on Piaget's theory).
 - Tasks related to symbolic play and problem-solving.
- **Pilot Study:** Conducted with 10% of the sample, minor modifications made.
- Reliability:
 - Cognitive development tool: Cronbach's alpha 0.90.
 - Emotional nurturing tool: Cronbach's alpha 0.80.

4. Data Analysis Process:

- Software: Microsoft Excel, IBM SPSS v. 20 (analysis), IBM SPSS v. 26
- **Descriptive Statistics:** Means, standard deviations, frequencies.
- **Group Comparisons:** Independent sample t-test, ANOVA (p < 0.05).
- Normality Test: Kolmogorov-Smirnov test.
- Outlier Removal: Final dataset of 391 cases.
- **Multiple Linear Regression:** To identify significant factors and control for confounders.

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Results:

Sample Demographics:

- Gender: Balanced (50.6% boys, 49.4% girls).
 - Age: Grouped into 36-48, 49-59, and 60-71 months.
- Caste/Ethnicity:
 - Advantaged castes: 35.0%.
 - o Janajati: 28.1%.
 - Non-Dalit Terai castes: 23.8%.
 - Dalit: 13.0%.
- Family Structure: Nearly even (47.3% nuclear, 52.7% joint).
- Maternal Occupation:
 - Labor/household work: 47.3%.
 - Agriculture: 24.0%.
 - Business: 15.1%.
 - Government/private/self-employment: 13.6%.
 - **Maternal Education:**
 - Basic education: 45.3%.
 - Illiterate: 23.3%.
 - Secondary education or higher: 31.5%.

Discussion

This cross-sectional study investigated the complex interplay between caregivers' emotional nurturance, socio-economic factors, and cognitive development in preschool-aged children in the GIMSH, Durgapur. Our findings reveal several key insights into the determinants of cognitive outcomes in this unique socio-cultural context. Firstly, the study found that age significantly influenced cognitive development, with children aged 36-48 months demonstrating higher cognitive scores compared to those aged 60-71 months. This observation aligns with the understanding that early childhood is a period of rapid cognitive growth, particularly in the foundational stages of development. The accelerated developmental milestones observed in younger children within this age range underscore the importance of early interventions and targeted support during these formative years. Secondly, our results highlighted the significant impact of family structure on cognitive development. Children from nuclear families exhibited lower cognitive scores than those from joint families, even after adjusting for socio-economic factors. This finding suggests that the extended social support and interaction afforded by joint family systems may provide a nurturing environment

conducive to cognitive growth. In the context of the Western Tarai region, where joint family structures are prevalent, this observation underscores the potential benefits of preserving and leveraging these traditional support systems to enhance children's cognitive outcomes. Thirdly, the study revealed significant disparities in cognitive development based on caste and ethnicity. Children from disadvantaged castes demonstrated lower cognitive scores compared to those from advantaged castes. These findings underscore the persistent impact of socio-economic inequities on children's developmental trajectories. The observed disparities highlight the urgent need for targeted interventions to address systemic barriers and promote equitable access to developmental opportunities for children from marginalized communities. Interestingly, while a positive association was observed between emotional nurturance and cognitive development, this association did not reach statistical significance after adjusting for socio-economic factors. This suggests that the impact of emotional nurturance on cognitive outcomes may be mediated or confounded by socio-economic variables. However, the finding that maternal employment with a regular salary, was positively associated with emotional nurturance, suggests that economic stability and potentially, increased maternal education associated with these jobs, may positively influence nurturing practices. Furthermore, the study found that children of employed mothers had lower cognitive scores. This may indicate a potential trade-off between maternal employment and time spent with children, potentially affecting cognitive nurturing. This finding highlights the need for supportive policies and interventions that enable working mothers to balance their professional and caregiving responsibilities effectively. The economic status of households also demonstrated a trend, albeit not statistically significant in adjusted models, with children from the poorest households showing marginally lower cognitive scores. This suggests that while economic conditions play a role, other socio-demographic factors, such as caste and family structure, may exert a more consistent influence on cognitive outcomes. Several limitations should be considered when interpreting these findings. The cross-sectional design of the study precludes the establishment of causal relationships. Additionally, the reliance on self-reported data may introduce potential biases. The study was conducted in a specific district of india, limiting the generalizability of the findings to other regions or populations. Despite these limitations, this study provides valuable insights into the complex interplay of factors influencing cognitive development in preschool-aged children in the Durgapur. The findings underscore the importance of addressing socio-economic inequities, leveraging traditional support systems, and promoting equitable access to developmental opportunities to enhance children's cognitive outcomes.

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