Original Research

Nurturing Care Practices and Developmental Outcomes in Acutely Ill Children Aged 12-36 Months: A Cross-Sectional Study

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ABSTRACT

Background: The period from 12 to 36 months represents a critical window for child development, yet the relationship between nurturing care practices and developmental outcomes during acute illness remains poorly understood. This study aimed to determine the relationship between maternal nurturing care practices and the developmental status of acutely ill children aged 12-36 months in Bantul Regency, Yogyakarta, Indonesia.

Methods: A cross-sectional descriptive-analytic study was conducted among 70 mother-child pairs recruited through consecutive sampling. Maternal nurturing care practices were assessed using a modified questionnaire adapted from UNICEF Knowledge, Attitudes, and Practices tools. Child development was evaluated using the Indonesian Pre-Screening Development Questionnaire (KPSP). Maternal depression was measured using the Beck Depression Inventory-II. Data were analyzed using Fisher's exact test, with statistical significance set at p<0.05.

Results: The majority of mothers (57.1%) demonstrated poor nurturing care practices, while 84.3% of acutely ill children showed age-appropriate development. Most mothers (80.0%) were aged 20-35 years, had secondary education (50.0%), and were not experiencing depression (68.6%). Fever was the most common acute illness (44.3%), with a median duration of 3 days. No statistically significant association was found between maternal nurturing care practices and child development status (p=0.331, OR=2.250, 95% CI: 0.543-9.330). Additionally, established developmental predictors including maternal education (p=0.745), family economic status (p=1.000), and maternal depression (p=0.873) showed no significant associations with developmental outcomes.

Conclusion: These findings highlight the need for context-specific nurturing care assessment tools and longitudinal research designs to better understand the complex dynamics between caregiving practices, acute illness, and developmental outcomes in young children.

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INTRODUCTION

Early childhood development during the toddler period (12-36 months) represents a critical window characterized by rapid neurobiological maturation and foundational skill acquisition across multiple developmental domains. This period establishes the framework for lifelong cognitive, social, emotional, and physical capabilities (Prasma et al., 2022). Child development encompasses progressive maturation manifesting through observable milestones in gross and fine motor skills, language acquisition, social interaction, and adaptive behaviors (Hayuningtyas et al., 2020).

Globally, approximately 250 million children under five years face substantial risk of not achieving their developmental potential due to multiple risk factors including poverty, inadequate nutrition, poor health outcomes, and insufficient caregiving stimulation (Black et al., 2017). In Indonesia, developmental concerns affect an estimated 7.5% of children under five years, representing a significant public health burden (Kementerian Kesehatan Republik Indonesia, 2022). Health status emerges as a particularly influential determinant, with children experiencing frequent or severe illness demonstrating elevated risk for developmental delays (Badan Pusat Statistik, 2023).

Acute illnesses constitute a common experience for young children worldwide. In Indonesia, prevalent acute conditions include diarrhea, pneumonia, and acute respiratory infections (Kementerian Kesehatan Republik Indonesia, 2021). These conditions can precipitate decreased appetite, fatigue, and reduced engagement in play and social interaction—the primary mechanisms through which toddlers acquire new skills (Djalilova et al., 2023). While single episodes of short-term illness typically produce reversible effects, recurrent acute illnesses can cumulatively compromise long-term developmental outcomes (Naufal et al., 2023; Rokhman & Nana, 2020). This direct link between acute illness burden and developmental risk underscores the importance of understanding caregiving practices during illness episodes.

The World Health Organization and UNICEF developed the evidence-based Nurturing Care Framework identifying five essential components: good health, adequate nutrition, safety and security, opportunities for early learning, and responsive caregiving (World Health Organization & UNICEF, 2022). Responsive caregiving serves as the foundational element facilitating effective delivery of all other components, enabling caregivers to recognize and meet children's evolving needs while promoting secure attachment relationships.

Cultural factors significantly influence caregiving practices in Indonesia. Javanese culture, predominant in Yogyakarta, emphasizes communal child-rearing where extended family members actively participate in childcare (Midu et al., 2021). Traditional beliefs about childhood illness causation and treatment may affect care-seeking behaviors and home management practices. In Yogyakarta specifically, the convergence of traditional values with urbanization creates diverse caregiving patterns that warrant empirical examination. The region's healthcare infrastructure, including community health centers (Puskesmas) and integrated health posts (Posyandu), provides accessible primary care, yet acute childhood illnesses remain prevalent, particularly

respiratory infections and febrile conditions associated with the tropical climate and population density.

Despite widespread endorsement of the Nurturing Care Framework, implementation challenges persist across diverse contexts, including Indonesia. Assessment data revealed incomplete coverage of several nurturing care components in Indonesia, with some indicators falling below the 70% coverage threshold considered necessary for population-level impact (Black et al., 2021). The relationship between contextually adapted nurturing care practices and children's developmental outcomes during acute illness remains poorly understood. This knowledge gap is significant because limited empirical research has examined how caregiving quality specifically during illness episodes influences developmental trajectories in resource-limited settings where families face competing demands and constraints.

This study was conducted in Bantul Regency, Special Region of Yogyakarta, which reported the highest average number of sick toddler healthcare visits (1,308 visits) among five districts in the province during 2023. This epidemiological context provides an important opportunity to examine the intersection of nurturing care practices and child development within a setting characterized by high acute illness prevalence. This research aimed to determine the relationship between maternal nurturing care practices and the developmental outcomes of acutely ill children aged 12-36 months in Bantul Regency. Specific objectives included: characterizing maternal nurturing care practices among mothers of acutely ill toddlers, assessing developmental status during acute illness episodes, and examining associations between nurturing care quality and developmental outcomes within this vulnerable pediatric population.

MATERIALS AND METHOD
Study Design and Setting
This study employed a descriptive-analytic design with a cross-sectional approach to examine the relationship between nurturing care practices and developmental status of acutely ill children aged 12-36 months. This design enables efficient examination of associations between nurturing care practices and developmental outcomes at a defined time point, providing preliminary evidence to guide more resource-intensive longitudinal investigations.

Participants and Sampling
The study sample consisted of 70 mother-child pairs recruited through non-probability consecutive sampling. Sample size was determined using G*Power 3.1.9.7 software based on the following parameters: statistical test (correlation: bivariate normal model), expected effect size (medium effect, r=0.30 based on previous studies examining caregiving-development associations), alpha level (α=0.05, two-tailed), and desired statistical power (1-β=0.80). These calculations yielded a minimum required sample size of 67 participants. To account for potential incomplete responses, 70 participants were recruited.

Inclusion criteria for mothers were serving as the primary caregiver of the child, willingness to participate, and having a child aged 12-36 months with acute illness (acute diarrhea, fever, acute ear infection, cough, or difficulty breathing lasting <14 days) who had been examined using the Integrated Management of Childhood Illness (IMCI) protocol at Puskesmas Banguntapan II. Exclusion criteria included mothers or

children with disabilities, congenital abnormalities, and children classified as requiring immediate referral (red classification) according to IMCI guidelines.

Data Collection Procedures

Data were collected through structured interviews conducted by four trained enumerators (nursing graduates with experience in community health research). Enumerators underwent a standardized two-day training program covering study objectives, interview techniques, questionnaire administration protocols, and ethical considerations. Training included practice sessions with role-playing scenarios and inter-rater reliability assessments to ensure consistent question interpretation and response recording. The structured interview approach was selected over self-administered questionnaires to ensure consistent understanding of questions across participants with varying literacy levels, reduce self-completion bias, and allow clarification of ambiguous responses while maintaining standardized administration.

To minimize recall bias, several strategies were implemented. For childcare practices, questions focused on a limited recall period (the past seven days for routine practices and the current illness episode for illness-specific care). Questions emphasized specific, frequency-based behaviors rather than general assessments (e.g., "How many times did you read or tell stories to your child in the past week?" rather than "Do you frequently read to your child?"). For childhood illness history, mothers were asked about concrete symptoms and healthcare-seeking behaviors during the current episode using temporal anchoring ("Since your child became ill, how many times...").

Data Collection Instruments
Nurturing Care Practices Assessment

Maternal nurturing care practices were assessed using a modified questionnaire developed by Amiatun, adapted from the UNICEF Knowledge, Attitudes, and Practices (KAP) questionnaire and the instrument used by Gaikwad in Telangana, India (Amiatun, 2022; Gaikwad et al., 2020). The questionnaire yielded a mean score of 64.76 with a standard deviation of 8.422. The cut-off points for categorizing practices as "good" versus "poor" were set at the mean score (≥60.21 for good practices, <60.21 for poor practices).

Child Development Assessment

Child development was evaluated using the Indonesian Pre-Screening Development Questionnaire (*Kuesioner Pra Skrining Perkembangan*, KPSP), a validated screening tool widely used in Indonesian healthcare settings. The KPSP demonstrates good inter-rater reliability with coefficients of 0.82 between health cadres and 0.72 between health cadres and physicians. Development was categorized as appropriate, questionable, and deviant.

Maternal Depression Assessment

Maternal depression was measured using the Beck Depression Inventory-II (BDI-II), originally developed by Beck and adapted into Indonesian by Maulida and Ginting (Ginting et al., 2013; Maulida, 2012). The instrument consists of 21 items with demonstrated reliability (Cronbach's alpha = 0.896) and validity ($r > 0.6$) in the Indonesian context. Depression severity was categorized as none, mild, moderate, or severe.

Data Analysis

Data analysis was conducted using SPSS version 25.0. Univariate analysis described participant characteristics using frequencies, percentages, means, and medians as appropriate. Bivariate analysis employed Fisher's exact test to examine associations between nurturing care practices and child development. Fisher's exact test was selected over the Chi-square test because expected cell frequencies in several contingency table cells were below five, violating Chi-square assumptions. Fisher's exact test provides accurate p-values regardless of sample size or expected cell counts, making it the appropriate choice for this dataset. Chi-square test was used for variables meeting the assumption of expected cell counts ≥5. Effect sizes were reported using odds ratios with 95% confidence intervals. Statistical significance was set at $p<0.05$.

Ethical Considerations

All participating mothers provided written informed consent after receiving comprehensive information about the study purpose, procedures, confidentiality measures, and their right to withdraw without penalty. Given that the study population included acutely ill children, additional safeguards were implemented to protect vulnerable participants. Assessments were conducted only when children were stable (not in acute distress) and scheduled according to maternal preference to minimize disruption to rest and care routines.

Mothers were offered the opportunity to reschedule if their child appeared unwell for assessment. Children identified with developmental concerns during screening were referred to appropriate healthcare services for comprehensive evaluation. The study protocol was reviewed and approved by the Ethics Committee of the Faculty of Medicine, Public Health, and Nursing, Universitas Gadjah Mada (Ethical Clearance Number: KE/FK/1416/EC/2024).

RESULTS

Participant Characteristics

Table 1 presents the demographic and clinical characteristics of the study participants. The majority of mothers (50.0%) had secondary education levels, were aged 20-35 years (80.0%), and were not experiencing depression (68.6%). Most families (65.7%) had household incomes above the regional minimum wage. Among the children, 54.3% were female, with the largest age group being 24-29 months (27.14%). Fever was the most common acute illness (44.3%), with a median illness duration of 3 days (range: 1-14 days).

Table 1. Participant Characteristics (n=70)

Characteristic	n	%	Median (Min-Max)
Maternal Characteristics			
Education Level			
Low	12	17.1	
Middle	35	50.0	
High	23	32.9	
Maternal Age			
<20 years	1	1.4	
20-35 years	56	80.0	
>35 years	13	18.6	

Characteristic	n	%	Median (Min-Max)
Family Economic Status			
Below minimum wage	24	34.3	
Above minimum wage	46	65.7	
Maternal Health Status			
Healthy	60	85.7	
Ill	10	14.3	
Maternal Depression			
None	48	68.6	
Mild	14	20.0	
Moderate	8	11.4	
Severe	0	0	
Child Characteristics			
Gender			
Male	32	45.7	
Female	38	54.3	
Age Groups			
12-14 months	12	17.1	
15-17 months	5	7.1	
18-20 months	8	11.4	
21-23 months	9	12.9	
24-29 months	19	27.1	
30-35 months	13	18.6	
36 months	4	5.7	
Type of Acute Illness			
Cough	11	15.7	
Cough and diarrhea	1	1.4	
Cough and cold	3	4.3	
Fever	31	44.3	
Fever and cough	5	7.1	
Fever, cough, and cold	8	11.4	
Fever and diarrhea	2	2.9	
Fever and cold	4	5.7	
Diarrhea	2	2.9	
Cold	3	4.3	
Acute Illness Duration (days)			3 (1-14)

Nurturing Care Practices

Table 2 shows the distribution of nurturing care practices among participating mothers. The majority of mothers (57.1%, n=40) demonstrated poor nurturing care practices, while 42.9% (n=30) exhibited good practices according to the assessment criteria.

Table 2. Distribution of Maternal Nurturing Care Practices (n=70)

Nurturing Care Practices	n	%
Good (≥60.21)	30	42.9
Poor (<60.21)	40	57.1

Table 3 presents the distribution of nurturing care practices across different maternal and child characteristics. Good nurturing care practices were most prevalent among mothers with secondary education (34.3%), aged 20-35 years (35.7%), in good health (34.3%), without depression (28.6%), with household incomes above the minimum wage (24.3%), and with male children (24.3%).

Table 3. Nurturing Care Practices by Participant Characteristics (n=70)

Characteristic	Good Practices		Poor Practices	
	n	%	n	%
Maternal Education				
Low	8	11.4	4	5.7
Middle	24	34.3	11	15.7
High	11	15.7	12	17.1
Maternal Age				
<20 years	0	0	1	1.4
20-35 years	25	35.7	31	44.3
>35 years	5	7.1	8	11.4
Family Economic Status				
Below minimum wage	13	18.6	11	15.7
Above minimum wage	17	24.3	29	41.4
Maternal Health Status				
Healthy	24	34.3	36	51.4
Ill	6	8.6	4	5.7
Maternal Depression				
None	20	28.6	28	40.0
Mild	6	8.6	8	11.4
Moderate	4	5.7	4	5.7
Severe	0	0	0	0
Child Gender				
Male	17	24.3	15	21.4
Female	13	18.6	25	35.7

Child Development Status

Table 4 presents the developmental status of acutely ill children across different age groups. The majority of children (84.3%, n=59) demonstrated age-appropriate development, while 15.7% (n=11) showed concerning development, including 12.9% (n=9) with questionable development and 2.9% (n=2) with deviant development.

Table 4. Developmental Status of Acutely Ill Children Aged 12-36 Months by Age Group

Age Group	Appropriate Development		Concerning Development			
			Questionable		Deviant	
	n	%	n	%	n	%
12-14 months	8	11.4	3	4.3	1	1.4
15-17 months	5	7.1	0	0	0	0
18-20 months	7	10.0	1	1.4	0	0
21-23 months	9	12.9	0	0	0	0
24-29 months	15	21.4	3	4.3	1	1.4
30-35 months	11	15.7	2	2.9	0	0

Age Group	Appropriate Development		Concerning Development			
			Questionable		Deviant	
	n	%	n	%	n	%
36 months	4	5.7	0	0	0	0
Total	**59**	**84.3**	**9**	**12.9**	**2**	**2.9**

Relationship Between Covariates and Child Development

Table 5 shows the associations between maternal and child characteristics and developmental outcomes. None of the examined covariates—maternal education (p=0.745), maternal age (p=0.513), family economic status (p=1.000), maternal depression (p=0.873), or child gender (p=0.756)—showed statistically significant associations with child development status (p>0.05).

Table 5. Association Between Participant Characteristics and Child Development Status (n=70)

Characteristic	Appropriate Development		Concerning Development		p-value
	n	%	n	%	
Maternal Education					0.745[b]
Low	11	15.7	1	1.4	
Middle	28	40.0	7	10.0	
High	20	28.6	3	4.3	
Maternal Age					0.513[b]
<20 years	1	1.4	0	0	
20-35 years	48	68.6	8	11.5	
>35 years	10	14.3	3	4.3	
Family Economic Status					1.000[b]
Below minimum wage	20	28.6	4	5.7	
Above minimum wage	39	55.7	7	10.0	
Maternal Depression					0.873[b]
None	41	58.6	7	10.0	
Mild	11	15.7	3	4.3	
Moderate	7	10.0	1	1.4	
Severe	0	0	0	0	
Child Gender					0.756[a]
Male	26	37.1	6	8.6	
Female	33	47.1	5	7.1	

[a]Chi-square test; [b]Fisher's exact test

Primary Outcome: Relationship Between Nurturing Care Practices and Child Development

Fisher's exact test revealed no statistically significant association between nurturing care practices and developmental outcomes (p=0.331). Among children whose mothers demonstrated good nurturing care practices, 90.0% (n=27) showed appropriate development, compared to 80.0% (n=32) of children whose mothers had poor nurturing

care practices. The odds ratio was 2.250 (95% CI: 0.543-9.330), indicating no significant difference in developmental outcomes between groups.

Table 6. Association Between Maternal Nurturing Care Practices and Child Development Status

Nurturing Care Practices	Child Development Status		p-value	OR	95% CI
	Appropriate n (%)	Concerning n (%)			
Good	27 (38.6)	3 (4.3)	0.331	2.250	0.543-9.330
Poor	32 (45.7)	8 (11.4)			

DISCUSSION

This study aimed to determine the relationship between maternal nurturing care practices and the developmental status of acutely ill children aged 12-36 months in Bantul Regency. The primary finding revealed no statistically significant association (p=0.331) between the quality of maternal nurturing care practices and developmental outcomes of children during acute illness, contradicting established early childhood development frameworks (World Health Organization & UNICEF, 2018). This counterintuitive result emerged despite 57.1% of mothers demonstrating poor nurturing care practices, while 84.3% of their acutely ill children exhibited age-appropriate development according to the Kuesioner Pra Skrining Perkembangan (KPSP) tool. Furthermore, well-established developmental predictors including maternal education, maternal age, family economic status, and maternal depression showed no significant associations with developmental outcomes in this cohort.

The absence of a statistically significant relationship between nurturing care and child development during acute illness can be understood through several interconnected factors. The transient nature of the illnesses studied represents a primary explanation for this unexpected finding. The median illness duration of three days, with common conditions including fever, cough, and diarrhea, likely had minimal impact on the fundamental developmental trajectory established over the preceding 12 to 36 months of life.

Child development represents a cumulative, long-term process built over months and years (Prasma et al., 2022), and brief acute illnesses constitute a minuscule fraction of a toddler's developmental timeline. While such illnesses may cause temporary behavioral changes including increased clinginess, sleep disturbances, or irritability, they typically fail to derail established developmental patterns (Maharani et al., 2024). The literature supports that severe, recurrent, or prolonged illnesses significantly impact development (Naufal et al., 2023; Rokhman & Nana, 2020), whereas single, short-term acute illnesses produce temporary effects with normal developmental progression resuming after recovery.

This suggests a potential threshold effect whereby the duration and severity of illnesses within this sample remained insufficient to cause developmental deviations detectable by screening instruments. The impact of a three-day fever on a child's ability to perform developmental tasks may be observable momentarily but lacks the profound, sustained influence necessary to alter overall developmental classification. The non-significant finding therefore does not negate the effects of acute illness but rather indicates that such effects in this specific context were too minor and temporary to manifest as formal developmental delays.

The study finding that 84.3% of children demonstrated age-appropriate development despite acute illness and suboptimal caregiving practices underscores the concept of developmental resilience. This resilience reflects positive adaptation in the face of adversity, supported by external protective factors including stable caregiving relationships and supportive environments (Masten & Gewirtz, 2006). A crucial unmeasured variable in this cross-sectional design is the children's pre-illness developmental status and the quality of care received when healthy. The high rate of normal development suggests that most children entered their acute illness with robust developmental foundations built over their entire young lives, which served as powerful buffers against the dual stressors of illness and potentially suboptimal caregiving.

Methodological considerations may also explain the non-significant associations observed. The assessment of nurturing care during acute illness presents unique challenges, as caregiving priorities appropriately shift during such periods. The WHO/UNICEF Nurturing Care Framework encompasses five components: good health, adequate nutrition, safety and security, responsive caregiving, and opportunities for early learning (World Health Organization & UNICEF, 2018).

During acute illness, responsive caregiving—including recognizing illness signs, providing comfort, administering medication, and ensuring hydration—becomes paramount, while opportunities for active learning are necessarily reduced to allow rest and recovery (World Health Organization & UNICEF, 2022). The modified nurturing care questionnaire used in this study, adapted from general-purpose tools (Amiatun, 2022; Gaikwad et al., 2020), may have inadvertently penalized mothers who appropriately prioritized responsive care over stimulating activities, creating a measurement paradox where optimal illness-specific caregiving was misclassified as poor nurturing practice.

The KPSP's characteristics as a screening tool further contribute to the methodological limitations. As a screening instrument designed for efficient use by health workers to identify children requiring further evaluation (Herawati et al., 2024; Lutfiya & Purnomo, 2019), the KPSP primarily detects significant or persistent developmental deviations rather than subtle, transient regressions accompanying short illnesses. Its sensitivity and specificity, while generally adequate, may vary compared to gold-standard diagnostic instruments (Simangunsong et al., 2012). Children who are temporarily less active or communicative due to illness might still pass the majority of age-appropriate KPSP items, leading to appropriate development classification despite subtle temporary impairments that more sensitive diagnostic tools might detect.

The descriptive finding that 57.1% of mothers exhibited poor nurturing care practices aligns with broader evidence suggesting suboptimal implementation of the Nurturing Care Framework in Indonesia. A collaborative UNICEF and Countdown to 2030 report noted incomplete data on several nurturing care components in Indonesia, with some indicators falling below 70% coverage (Black et al., 2021). Similarly, Midu et al. (2021) found 41.9% of mothers in their sample demonstrated less adequate parenting styles (Midu et al., 2021). This prevalence should not be interpreted as individual maternal failings but rather reflects systemic and socioeconomic constraints limiting caregivers' capacity. Financial strain, family stress, and lower parental education can impede parents' ability to provide cognitively stimulating and emotionally nurturing interactions (Kalil & Ryan, 2020), indicating a broader public health challenge requiring systemic family support.

The lack of statistically significant associations between child development and established predictors including maternal education (p=0.745), family socioeconomic status (p=1.000), and maternal depression (p=0.873) contrasts sharply with extensive international and Indonesian research. Meta-analyses consistently demonstrate maternal education as one of the strongest predictors of positive child health and development through enhanced knowledge of nutrition, health-seeking behaviors, and developmental stimulation provision (Rezaeizadeh et al., 2024). Higher socioeconomic status provides access to material and social resources creating enriching environments for child development (Bradley & Corwyn, 2002), while maternal depression represents a well-documented risk factor for developmental delays through impaired mother-child interactions (Rogers et al., 2020).

The absence of these expected relationships most likely represents statistical artifacts resulting from methodological limitations. With a sample size of 70, the study is significantly underpowered to detect true effects of these variables, increasing Type II error risk where real associations exist but remain undetected due to insufficient statistical power (Button et al., 2013; Oakes, 2017). Additionally, sample homogeneity limits statistical variability, with 80% of mothers in ideal childbearing age ranges, 82.9% having middle or high education levels, 65.7% earning above regional minimum wages, and 68.6% showing no depression signs. When limited variation exists in both predictor variables and outcome measures (only 15.8% of children showed non-appropriate development), identifying significant relationships becomes statistically challenging. These non-significant findings should therefore be interpreted cautiously as likely consequences of methodological limitations rather than challenges to established developmental science.

Despite these methodological considerations, the study addresses a clinically relevant and under-researched intersection of caregiving and development during acute illness in toddlers, a critical developmental stage. The use of standardized, locally validated instruments including the KPSP for developmental screening and Beck Depression Inventory-II for maternal depression adds measurement rigor and comparability (Ginting et al., 2013; Lutfiya et al., 2024). Strong ethical oversight including formal ethical clearance and informed consent ensures appropriate research conduct with children and families.

Limitations

This study's conclusions are constrained by several significant limitations that must be acknowledged for proper interpretation of findings. The cross-sectional design prevents establishing causality or temporal precedence (Carlson & Morrison, 2009), missing crucial pre-illness baselines and post-illness recovery trajectories essential for understanding acute illness impacts on child development. By collecting data at a single point during illness, the study cannot determine whether nurturing care practices influenced developmental outcomes or whether a child's temperament and developmental status during illness influenced maternal caregiving behaviors.

The use of non-probability consecutive sampling at a single health center introduces selection bias and severely limits generalizability of findings (Etikan et al., 2016). The sample may not represent the broader population of Bantul Regency, particularly excluding families who seek care at private facilities or hospitals, or those with very mild illnesses who do not seek formal healthcare. This sampling approach

risks creating a cohort that does not reflect the full spectrum of illness severity or socioeconomic backgrounds present in the general population.

The small sample size of 70 mother-child pairs represents a major methodological constraint, providing limited statistical power and increasing the likelihood that non-significant findings for both primary hypotheses and covariates represent false negatives (Button et al., 2013; Fraley & Vazire, 2014). Pediatric research often requires larger samples to account for high developmental variability, and this sample size may be insufficient to detect true associations that exist in the population.

Finally, the study failed to account for potentially crucial confounding variables including the frequency and severity of past illnesses, paternal and extended family caregiving roles, broader community support systems, and the child's pre-illness developmental trajectory, all of which can significantly influence both parenting practices and child development outcomes (Evans, 2006; Nursal et al., 2025).

Implications

Despite non-significant primary associations, these findings carry important implications for nursing practice across multiple settings. For primary care settings (Puskesmas, Posyandu), community nurses should integrate developmental monitoring with acute illness management. Specific actions include screening children for developmental milestones during sick-child visits using the KPSP across all four domains (gross motor, fine motor, language, and social-personal); providing responsive caregiving guidance emphasizing symptom recognition, comfort measures, and adequate hydration during illness; and establishing follow-up protocols to assess developmental recovery after illness resolution. Community nurses and trained health cadres (kader) at Posyandu can deliver group education sessions for parents on nurturing care principles adapted to illness contexts.

For secondary and tertiary care settings (hospitals, outpatient clinics), pediatric nurses should expand their role beyond acute disease management to include psychosocial support for children and families. Specific responsibilities include assessing developmental status during hospitalization or outpatient visits; providing anticipatory guidance on maintaining developmental activities during convalescence; coordinating with community nurses to ensure continuity of developmental support following discharge; and identifying families requiring additional support services. Post-illness follow-up should include developmental reassessment and counseling on resuming and potentially enhancing developmental stimulation to compensate for missed learning opportunities during illness periods.

Across all settings, nurses should educate parents that nurturing care during illness appropriately prioritizes responsive caregiving—physical comfort, symptom management, adequate hydration and nutrition, and stress reduction. This educational approach can alleviate parental guilt about providing reduced developmental stimulation during illness when rest and recovery are paramount. Healthcare providers should integrate nurturing care principles into existing frameworks such as IMCI, strengthening counseling components with specific, practical guidance on responsive caregiving during acute illness.

CONCLUSION

This study investigated the relationship between maternal nurturing care practices and development of acutely ill toddlers in Bantul Regency, finding no significant

statistical association contrary to established theoretical frameworks and research hypotheses. This unexpected result likely reflects the confluence of several factors including the transient nature of acute illnesses studied, the inherent resilience of childhood development, and significant methodological limitations encompassing cross-sectional design, small sample size, and potential measurement mismatch between instruments and the acute illness context. This study should not be interpreted as diminishing the fundamental importance of nurturing care in child development. Instead, it calls for a more nuanced, context-specific understanding of how to apply nurturing care principles during the particular stressors and demands of childhood illness periods. The findings highlight the critical need for methodologically rigorous, longitudinal research designs to fully comprehend the complex dynamics between caregiving practices, acute illness experiences, and developmental outcomes in young children.

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