



Parenting Style and Early Childhood Development among Toddlers in Coastal Communities of Semarang, Indonesia

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Abstract

Early childhood development remains a major public health concern in Indonesian coastal communities, where socioeconomic vulnerability and suboptimal parenting practices may adversely affect developmental outcomes. This study examined the association between parenting styles and early childhood development among toddlers in coastal communities of Semarang, Indonesia, using a convergent mixed-methods design. A total of 371 mothers with children aged 12–59 months were selected through stratified random sampling from nine coastal villages within the Bandarharjo Primary Health Center catchment area. Quantitative data were collected using the Parenting Styles and Dimensions Questionnaire and the Indonesian Pre-Screening Developmental Questionnaire, while qualitative data were obtained through in-depth interviews with mothers, health cadres, midwives, and community leaders. Quantitative data were analyzed using descriptive statistics, Chi-square tests, and logistic regression, whereas qualitative data were analyzed thematically. Democratic parenting was the predominant parenting style (57.7%), and 72.0% of toddlers demonstrated age-appropriate development. Parenting style was significantly associated with child development ($p < 0.001$; Cramer's $V = 0.27$). Logistic regression showed that democratic parenting was associated with better developmental outcomes (OR = 2.94; 95% CI: 1.61–5.37; $p < 0.001$). Qualitative findings revealed that fragmented caregiving, parental workload, limited developmental literacy, and reliance on digital devices as caregiving substitutes influenced parenting practices and child development. These findings highlight the importance of promoting democratic parenting while addressing socioeconomic and contextual barriers to improve developmental outcomes among children in vulnerable coastal communities.

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1. INTRODUCTION

The first five years of life represent a critical period of rapid physical, cognitive, emotional, and social development. During this period, adequate nutrition, responsive caregiving, developmental stimulation, and supportive family environments are essential for achieving optimal developmental outcomes (Baek et al., 2025; Balza et al., 2025). Inadequate caregiving practices and unfavorable environmental conditions during early childhood may increase the risk of developmental delays, behavioral problems, malnutrition, and long-term health consequences. Therefore, promoting optimal child development has become a major global public health priority, particularly in low- and middle-income countries where children are frequently exposed to poverty, nutritional deficiencies, and limited access to healthcare and educational resources (Akram et al., 2024). Globally, millions of children under five years old are estimated to be at risk of failing to achieve their developmental potential due to inadequate nutrition, insufficient psychosocial stimulation, and poor caregiving environments (Thériault-Couture et al., 2025). In Indonesia, child growth and developmental problems remain major public health concerns. National health reports continue to indicate a high prevalence of stunting, underweight, wasting, and developmental disorders among Indonesian children, especially in socioeconomically vulnerable populations (The United Nations Children's Fund (UNICEF), 2020). Among these vulnerable groups, coastal communities face multidimensional challenges that may negatively affect children's growth and developmental status. Families living in coastal areas commonly experience unstable income, low educational attainment, environmental stressors, and limited healthcare accessibility, all of which may influence parenting quality and childcare practices (George et al., 2022).

Preliminary data from Bandarharjo Primary Health Center in 2024 identified persistent nutritional problems among toddlers in coastal Semarang, including stunting (9.59%), underweight (8.38%), wasting (3.92%), and obesity (2.03%). These findings suggest that child health and developmental problems remain significant concerns within coastal populations. In addition, parents in coastal communities frequently work in informal sectors with long and irregular working hours, resulting in limited caregiving time and inconsistent parenting behaviors (Boned-Fustel et al., 2025). Childcare responsibilities are often transferred to grandparents or other family members, potentially reducing emotional interaction and developmental stimulation during early childhood (Kong & Yasmin, 2022). Furthermore, limited literacy regarding child nutrition and development, combined with increasing reliance on digital devices in childcare practices, may further influence children's psychosocial and developmental conditions (Fadlillah & Fauziah, 2022).

Parenting style refers to patterns of parental responsiveness and behavioral control that shape children's developmental experiences (Shengyao et al., 2024). Parenting styles differ in levels of responsiveness and behavioral control, commonly categorized into democratic (authoritative), authoritarian, and permissive approaches, each of which may differently influence children's emotional and developmental experiences (Vasiou et al., 2023). Among the three commonly recognized parenting styles (authoritative, authoritarian, and permissive), authoritative parenting has consistently been associated with more favorable cognitive, emotional, behavioral, and social outcomes, whereas authoritarian and permissive parenting are generally linked to poorer developmental adaptation (Wei et al., 2025; Annisa & Sulistyaningsih, 2022). Recent evidence also highlights that responsive caregiving integrated with nutrition, health, and early learning stimulation supports optimal early childhood development, particularly in socioeconomically disadvantaged settings (Daelmans, Manji, & Raina, 2021). Although numerous studies have examined the association between parenting styles and early

childhood development, evidence from socioeconomically vulnerable coastal communities in Indonesia remains limited (Fadlillah & Fauziah, 2022; Saragih & Fuadah, 2023). Existing Indonesian studies have primarily relied on quantitative approaches and have focused on nutritional status or general parenting behaviors, providing limited understanding of how ecological, occupational, and sociocultural conditions shape caregiving experiences and child development (Trejo & Jannah, 2025). Moreover, few studies have integrated quantitative and qualitative evidence to explain why parenting practices vary within vulnerable coastal settings. Consequently, the contextual mechanisms underlying parenting practices and children's developmental outcomes in Indonesian coastal communities remain insufficiently understood. Addressing this gap is important for developing culturally appropriate parenting interventions and community-based strategies tailored to the needs of vulnerable coastal families.

While quantitative analyses can identify statistical associations between parenting styles and developmental outcomes, they cannot fully explain the contextual experiences underlying caregiving practices in vulnerable coastal communities. A convergent mixed-methods approach therefore enables the integration of statistical findings with parents' lived experiences, providing a more comprehensive understanding of how ecological, occupational, and sociocultural factors shape parenting practices and children's developmental outcomes. To address this knowledge gap, the present study employed a convergent mixed-methods design that integrates quantitative associations with qualitative exploration of contextual caregiving experiences among families living in Indonesian coastal communities. This study was informed by Bronfenbrenner's Ecological Systems Theory, Attachment Theory, and the Parenting Stress Framework. Together, these perspectives suggest that early childhood development is shaped by interactions between caregiver-child relationships and broader ecological, socioeconomic, and environmental contexts that influence parenting practices and caregiving quality (Yang & Oh, 2024; Aprianti et al., 2024; Pan et al., 2025). These complementary frameworks provide the conceptual basis for understanding how parenting styles and contextual caregiving experiences are associated with developmental outcomes among toddlers living in vulnerable coastal communities. This study addresses this knowledge gap by integrating quantitative and qualitative evidence to better understand parenting practices and early childhood development among toddlers living in socioeconomically vulnerable coastal communities of Semarang, Indonesia. Rather than proposing a new theoretical framework, the study extends existing evidence by illustrating how ecological and caregiving contexts are associated with developmental outcomes. Accordingly, this study aimed to examine the association between parenting styles and early childhood development among toddlers in coastal communities of Semarang, Indonesia, using a convergent mixed-methods design. In addition, the study explored contextual caregiving experiences that may help explain the quantitative findings.

Several previous studies have highlighted the important role of parenting practices in supporting optimal child development (Fadlillah & Pangastuti, 2022). Parenting interventions were reported to improve language development, socioemotional functioning, and adaptive behavior among children in low- and middle-income countries (Suvama et al., 2025). Other studies also found that inadequate parenting behaviors contribute to poor nutritional status, insufficient developmental stimulation, and delayed developmental achievement (Wang, 2023).

In the context of early childhood, responsive parent-child interaction provides children with emotional security and consistent developmental stimulation, both of which are essential for language development, social competence, emotional regulation, and self-regulation. Children who experience warm, responsive, and consistent caregiving are

more likely to develop secure attachment, confidence in social interaction, and adaptive behavioural skills that facilitate the achievement of age-appropriate developmental milestones. Therefore, the significant association identified in this study supports the view that parenting style is not merely a family-level behavioural characteristic but also an important determinant of developmental outcomes during the first five years of life (Ayu et al., 2023). This study aims to investigate the relationship between parenting styles and early childhood development among toddlers in a coastal community in Semarang, Indonesia.

2. METHODS

This study employed a mixed-methods design using a convergent parallel approach to examine the association between parenting styles and early childhood development among toddlers in Indonesian coastal communities (Sugiyono, 2020). The quantitative component applied a cross-sectional design involving 371 mothers with toddlers aged 12–59 months selected through stratified random sampling from nine coastal villages in Semarang, Indonesia. Parenting style was assessed using the Parenting Styles and Dimensions Questionnaire (PSDQ) adapted from Robinson et al. (1995), while child developmental status was measured using the Indonesian Pre-Screening Developmental Questionnaire (KPSP). The instruments underwent translation, cultural adaptation, validity, and reliability testing prior to data collection, demonstrating acceptable validity and good internal consistency. The PSDQ was translated using forward-backward translation procedures. Content validity was evaluated by three experts in child health and nursing (CVI=0.92). Construct validity showed factor loadings ranging from 0.56–0.84. Internal consistency was acceptable (Cronbach's α =0.89).

The qualitative component employed a descriptive phenomenological approach involving 12 participants purposively selected to capture diverse perspectives on parenting practices within the coastal community. Participants included mothers, health cadres, midwives, and community leaders who had direct experience with child caregiving or community child health services. Participant recruitment continued until data saturation was achieved, with no new themes emerging from subsequent interviews. Semi-structured interviews explored caregiving practices, developmental stimulation, parental workload, family support, and digital device use in childcare. Quantitative data were analyzed using SPSS version 25 through descriptive statistics, Chi-square tests, and logistic regression analyses. Qualitative interview transcripts were analyzed using ATLAS.ti version 23 following Braun and Clarke's six-phase thematic analysis. Qualitative data were collected through semi-structured interviews lasting approximately 45–60 minutes. The interviews were transcribed verbatim and analyzed using ATLAS.ti version 23 following Braun and Clarke's six-phase thematic analysis. Two researchers independently coded the transcripts, and coding discrepancies were discussed until consensus was reached. Themes were developed by grouping similar codes, reviewing patterns, and refining theme meanings. Researcher reflexivity was maintained through field notes and team discussions to minimize potential bias.

To ensure trustworthiness, the study applied data triangulation, investigator triangulation, member checking, peer debriefing, and audit trails. Integration of quantitative and qualitative findings was performed during the interpretation phase. Quantitative and qualitative data were first analyzed independently and subsequently integrated using joint displays to identify areas of convergence, complementarity, and divergence between statistical associations and participants' contextual caregiving experiences. This integration facilitated a comprehensive interpretation of parenting practices and early childhood development within the ecological context of coastal communities. This study

received ethical approval from the Research Ethics Committee of Universitas Telogorejo Semarang (Ethics Approval No. 105/ VIII/ EC/ P3M/STIKES/2025). Written informed consent was obtained from all participants prior to data collection. Participants were informed about the study objectives, procedures, confidentiality, and their right to withdraw at any time without consequences. The confidentiality of participants' information and interview data was maintained throughout the research process.

3. RESULTS AND DISCUSSION

A total of 371 mothers with toddlers aged 12–59 months participated in this study. The majority of respondents were aged 26–35 years (53.4%), had secondary education (57.4%), and worked in informal sectors (50.1%). Most families lived in coastal areas characterized by economic instability, irregular working hours, and fragmented caregiving arrangements. Democratic parenting was the most dominant parenting style, reported by 214 respondents (57.7%), followed by authoritarian parenting among 93 respondents (25.1%) and permissive parenting among 64 respondents (17.2%).

Table 1. Distribution of characteristics of respondents.

Variable	Category	Frequency (n)	Percentage (%)
Maternal Age	17–25 years	96	25.9
	26–35 years	198	53.4
	36–45 years	77	20.7
Educational Level	Primary school	84	22.6
	Secondary school	213	57.4
	Higher education	74	20.0
Occupation	Housewife	139	37.5
	Informal worker	186	50.1
	Formal worker	46	12.4
Dominant Parenting Style	Democratic (authoritative)	214	57.7
	Authoritarian	93	25.1
	Permissive	64	17.2

Based on the KPSP developmental assessment, most toddlers demonstrated age-appropriate development. A total of 267 toddlers (72.0%) were categorized as having appropriate development, while 71 toddlers (19.1%) were classified as doubtful and 33 toddlers (8.9%) were categorized as delayed. These findings indicate that although most children achieved age-appropriate developmental milestones, a considerable proportion still experienced possible developmental problems that require early detection and follow-up.

Table 2. Distribution of developmental status of toddlers based on KPSP.

Developmental Status	Frequency (n)	Percentage (%)
Appropriate	267	72.0
Doubtful	71	19.1
Delayed	33	8.9
Total	371	100

The Chi-square analysis showed a statistically significant association between parenting style and early childhood developmental status. This finding indicates that parenting style is not independent of child developmental outcomes in coastal communities. The strength of association was moderate, as indicated by Cramer's V value of 0.27.

Table 3. Chi-Square analysis.

Variable	χ^2	df	p-value	Cramer's V	Interpretation
Parenting style and developmental status	28.41	4	<0.001	0.27	Significant moderate association

The Chi-square analysis showed a statistically significant association between parenting style and early childhood developmental status ($\chi^2 = 28.41$; $df = 4$; $p < 0.001$). This finding indicates that parenting style was significantly related to developmental outcomes among toddlers in coastal communities. The Cramer's V value of 0.27 suggests a moderate strength of association, meaning that differences in parenting style were meaningfully associated with variations in children's developmental status.

Table 4. Logistic regression model.

Variable	OR	95% CI	p-value
Democratic parenting	2.94	1.61 - 5.37	<0.001
Higher maternal education	1.88	1.12 – 3.16	0.017
Stable income	1.74	1.03 – 2.95	0.038
Excessive digital exposure	0.49	0.28 – 0.87	0.014

The logistic regression model demonstrated acceptable performance, with Hosmer–Lemeshow $p = 0.62$, Nagelkerke $R^2 = 0.41$, classification accuracy of 78.6%, VIF values below 2.5, and AUC = 0.81. These results indicate that the model had good fit, no serious multicollinearity, and good discriminative ability in identifying toddlers with favorable developmental outcomes. However, because this study used a cross-sectional design, the results should be interpreted as associations rather than causal relationships. Qualitative findings supported the quantitative results by showing that parenting practices in coastal communities were influenced by family caregiving arrangements, parental workload, and the use of digital devices as substitutes for caregiver-child interaction. Three main themes were identified: distributed caregiving system, emotional disengagement due to workload, and digital caregiving substitution.

Stable household income was associated with better developmental outcomes by improving access to nutritious food, healthcare, learning resources, and responsive caregiving (Kaur & Sanches, 2023). In contrast, economic instability in coastal communities, often related to informal employment and uncertain income, may increase parental stress and reduce the quality of caregiver-child interaction, thereby negatively affecting child development (Pratama et al., 2023); (Syahada et al., 2024).

Table 5. Interpretive themes and representative quotes.

Theme	Interpretation	Quote
Distributed caregiving system	Childcare is fragmented across multiple caregivers, reducing developmental consistency	"My child is mostly cared for by my mother because I work all day." (P3)
Emotional disengagement due to workload	Occupational burden reduces responsive caregiver interaction	"After work I am too tired to interact with my child." (P7)
Digital caregiving substitution	Technology replaces direct caregiver-child interaction	"My child becomes calm when watching videos while I finish work." (P10)

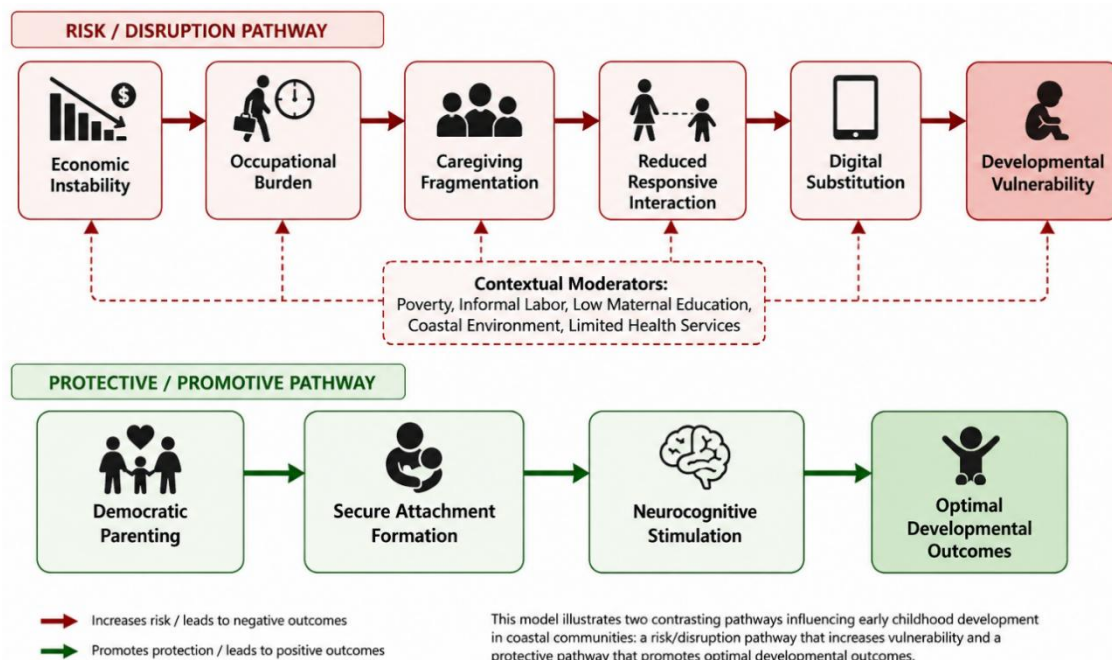


Figure 1. Contextual caregiving disruption model in coastal communities.

The findings indicate that democratic parenting was associated with more favorable developmental outcomes among toddlers in coastal communities. This observation is consistent with previous studies reporting that authoritative parenting is associated with positive emotional, cognitive, and social development among young children (Yudha & Marlina, 2025). Qualitative findings further suggest that responsive communication, consistent caregiver–child interaction, and balanced supervision may help maintain developmental stimulation despite socioeconomic constraints. Conversely, fragmented caregiving arrangements, parental workload, and reliance on digital devices emerged as contextual challenges that may reduce opportunities for responsive interaction. Although these findings are theoretically consistent with Attachment Theory, the cross-sectional design precludes causal inference; therefore, the observed relationships should be interpreted as associations rather than causal effects.

These findings can be further explained by the quality of responsive parent–child interactions during early childhood. Responsive parent–child interaction provides children with emotional security and consistent developmental stimulation, both of which are essential for language development, social confidence, and self-regulation. Therefore, the significant association found in this study supports the view that parenting style is not only a family-level behavioural factor but also an important determinant of developmental outcomes during the first five years of life (Ayu et al., 2023).

An important finding of this study is that 28.0% of toddlers were classified as having doubtful or delayed development. Although most children achieved age-appropriate developmental milestones, this proportion indicates that developmental problems remain an important public health concern in vulnerable coastal communities. Delayed identification of developmental problems may reduce opportunities for timely intervention, highlighting the importance of routine developmental screening through Puskesmas and Posyandu services. The qualitative findings provide an important explanation for the quantitative results. In coastal communities, parenting is strongly influenced by

socioeconomic conditions, parental workload, and shared caregiving systems. Many parents work in informal sectors with irregular schedules, causing childcare responsibilities to be transferred to grandparents or other relatives. Although extended family involvement can provide emotional and practical support, fragmented caregiving may also reduce consistency in stimulation, discipline, feeding practices, and emotional interaction. This situation may reduce the consistency of caregiving practices and developmental stimulation, which may in turn be associated with less favorable developmental outcomes. Beyond parenting style, several contextual factors were also associated with early childhood developmental outcomes. Higher maternal education and stable household income were associated with more favorable developmental status, possibly because they facilitate access to health information, nutritious food, learning resources, developmental services, and opportunities for responsive caregiving. Conversely, excessive digital exposure was associated with less favorable developmental outcomes and was frequently described by participants as a practical response to occupational demands and caregiving constraints rather than solely an individual parenting choice. These findings suggest that parenting practices should be interpreted within the broader socioeconomic context in which families raise their children, particularly in vulnerable coastal communities where economic instability, caregiving arrangements, and access to health information collectively shape children's developmental experiences. Table 6 presents a joint display integrating the quantitative and qualitative findings. While the quantitative results identified statistical associations between parenting style, socioeconomic factors, and child developmental outcomes, the qualitative findings provided contextual explanations regarding caregiving experiences within coastal communities. This integration facilitated a more comprehensive interpretation of the findings. Responsive caregiving practices also contribute positively to emotional security, language acquisition, self-regulation, and adaptive social functioning (Bahmani et al., 2023).

Table 6. Joint display integration of quantitative and qualitative findings.

Quantitative Findings	Qualitative Findings	Integrated Interpretation
Democratic parenting was the dominant parenting style among respondents (57.7%).	Mothers described democratic parenting as involving communication, emotional warmth, and active supervision despite economic limitations.	Responsive and balanced parenting practices were consistently associated with more favorable developmental outcomes among toddlers living in vulnerable coastal communities.
Most toddlers demonstrated age-appropriate development (72.0%).	Health cadres and midwives reported that children receiving regular interaction and stimulation tended to show better social and language abilities.	Consistent caregiver interaction and developmental stimulation were associated with more favorable early childhood developmental outcomes.
Parenting style was significantly associated with developmental status ($\chi^2 = 28.41$; $p < 0.001$; Cramer's $V = 0.27$).	Participants explained that inconsistent caregiving and limited parental involvement often reduced opportunities for developmental stimulation.	Variations in parenting practices were associated with differences in children's developmental experiences within coastal communities.
Democratic parenting was associated with better developmental outcomes	Mothers who maintained responsive communication	Warm, responsive, and structured parenting was associated with favorable

(OR = 2.94; 95% CI: 1.61–5.37).	reported stronger emotional closeness with their children.	emotional, language, and social developmental outcomes.
Higher maternal education was positively associated with favorable developmental outcomes (OR = 1.88; p = 0.017).	Midwives reported that mothers with higher education were more active in seeking developmental information and attending Posyandu activities.	Higher maternal education was associated with better developmental literacy and greater utilization of child health services, which may be linked to more favorable developmental outcomes.
Stable household income was associated with better developmental outcomes (OR = 1.74; p = 0.038).	Parents described financial instability as limiting access to nutritious food, educational toys, and caregiving time.	Economic stability was associated with improved access to nutrition, developmental resources, and caregiving opportunities that may contribute to favorable developmental outcomes.
Excessive digital exposure was negatively associated with developmental outcomes (OR = 0.49; p = 0.014).	Parents admitted frequently using smartphones or videos to calm children while completing work or household tasks.	Digital devices were frequently used as caregiving substitutes, which may be associated with reduced opportunities for direct caregiver–child interaction and developmental stimulation.
A considerable proportion of toddlers experienced doubtful or delayed development (28.0%).	Community leaders and cadres highlighted limited developmental literacy and delayed help-seeking behaviors among parents.	Insufficient parental awareness and delayed developmental monitoring may increase the risk of unrecognized developmental problems.
The mixed-methods findings emphasized contextual caregiving disruption in coastal communities.	Interview participants described fragmented caregiving involving grandparents and multiple family members.	Shared caregiving systems may reduce consistency in discipline, emotional interaction, and developmental stimulation among toddlers.
Quantitative findings demonstrated associations between parenting context and child development.	Qualitative findings revealed sociocultural and occupational pressures influencing caregiving behaviors.	Child developmental outcomes in coastal communities appear to be associated with parenting style as well as broader socioeconomic and environmental conditions.

The joint display analysis suggests that the quantitative and qualitative findings consistently indicate associations between parenting practices, caregiving environments, and early childhood developmental outcomes in coastal communities. Democratic parenting, responsive communication, stable socioeconomic conditions, and consistent caregiver interaction were associated with more favorable developmental outcomes, whereas fragmented caregiving arrangements, occupational demands, and excessive digital exposure emerged as contextual factors associated with less favorable developmental outcomes. Together, both datasets highlight that children's developmental outcomes should be interpreted within broader ecological, socioeconomic, and caregiving contexts rather than as the result of parenting style alone. Given the cross-sectional design, these findings should be interpreted as associative rather than causal relationships. The contextual caregiving disruption identified in this study should therefore be understood as an interpretive framework derived from the integration of quantitative and qualitative findings, rather than as an empirically validated causal pathway. Juniarti et

al. (2023) reported that the use of KPSP significantly improved parental compliance in monitoring child development.

This study is strengthened by its convergent mixed-methods design, comprehensive multivariate analysis, and integration of quantitative and qualitative findings, providing a richer understanding of parenting practices in vulnerable coastal communities. However, the cross-sectional design limits causal inference, while self-reported parenting measures may introduce recall and social desirability bias. Furthermore, the findings may not be fully generalizable beyond Indonesian coastal populations, and residual confounding factors such as nutritional status, paternal involvement, and early educational exposure were not completely controlled (Waningsih et al., 2025).

4. CONCLUSION

This study demonstrates that parenting style and caregiving context are significantly associated with early childhood developmental outcomes in vulnerable coastal communities. Democratic parenting characterized by warmth, responsiveness, and consistent supervision was associated with more favorable developmental achievement, while fragmented caregiving, socioeconomic hardship, occupational burden, and excessive digital exposure emerged as important contextual challenges affecting caregiving quality. These findings highlight that child development is shaped not only by individual parenting behaviors but also by broader ecological and socioeconomic conditions surrounding children and families.

The findings support the implementation of community-based parenting interventions through primary healthcare services, particularly Puskesmas and Posyandu, focusing on responsive caregiving, developmental stimulation, appropriate digital media use, routine developmental screening, and the involvement of all family caregivers, including grandparents. Future research should employ longitudinal or intervention-based study designs to examine temporal relationships between parenting practices and child developmental outcomes and to evaluate the effectiveness of culturally tailored parenting programs in vulnerable coastal communities. This study demonstrates that parenting style and caregiving context are significantly associated with early childhood developmental outcomes in vulnerable coastal communities. Democratic parenting characterized by warmth, responsiveness, and consistent supervision was associated with more favorable developmental achievement, while fragmented caregiving, socioeconomic hardship, occupational burden, and excessive digital exposure emerged as important contextual challenges affecting caregiving quality. These findings highlight that child development is shaped not only by individual parenting behaviors but also by broader ecological and socioeconomic conditions surrounding children and families.

The study emphasizes the urgent need for integrated community-based interventions that strengthen responsive caregiving, developmental literacy, routine developmental screening, and family support systems within coastal populations. Primary healthcare services, including Puskesmas and Posyandu, should play a more active role in providing parenting education and early developmental monitoring, particularly for socioeconomically vulnerable families. Without strengthening caregiving systems and reducing developmental inequalities in resource-limited settings, children in vulnerable coastal communities may continue to face long-term developmental disadvantages that affect their future health, educational attainment, and social well-being.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

AUTHOR CONTRIBUTIONS

Maya Cobalt Angio Septianingtyas conceived and designed the study, developed the research methodology, coordinated the data collection process, performed the data analysis and interpretation, and drafted the original manuscript. Ellyzabeth Sukmawati contributed to the study design, provided methodological guidance, participated in data interpretation, and critically reviewed and revised the manuscript. Achmad Solechan contributed to the research design, supervised the study, validated the findings, and critically reviewed the manuscript for important intellectual content. Siti Juwariyah assisted in data collection, data management, and manuscript revision. Danny Putri Sulistyaningrum contributed to data interpretation, manuscript editing, and the final review of the manuscript. All authors read and approved the final version of the manuscript and agreed to be accountable for all aspects of the work.

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DECLARATION OF ARTIFICIAL INTELLIGENCE USE

The authors used generative artificial intelligence (AI)-assisted technology solely to improve the language quality, grammar, sentence structure, readability, and overall organization of this manuscript. AI-assisted tools were also used to paraphrase selected text to enhance clarity while preserving the original scientific meaning. All scientific content, including the study design, data collection, data analysis, interpretation of the findings, and conclusions, was developed, verified, and approved by all authors. All authors take full responsibility for the accuracy, integrity, and originality of the manuscript.

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