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Parental Feeding Practices and Nutritional Status Among Preschool Children in Urban Indonesia: Implications for Family-Centered Nursing

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ABSTRACT

Introduction: Parental feeding practices significantly influence children's eating habits and growth. In Indonesian urban settings, shifting diets and lifestyles have created a double burden of malnutrition. This study examined the relationship between parental feeding practices and the nutritional status of preschool children in West Jakarta, Indonesia.

Methods: A cross-sectional survey was conducted among 255 caregiver–child pairs (children aged 3-6 years) recruited from early childhood education centres in West Jakarta. Caregivers completed the Indonesian-adapted Child Feeding Questionnaire (CFQ), which classified feeding approaches as responsive or non-responsive. Children's weight and height were measured, and nutritional status classified using WHO growth standards. Descriptive statistics were applied, followed by chi-square tests to examine associations between feeding practices and sociodemographic characteristics. Spearman's rank correlation assessed the relationship between feeding practices and nutritional status. Multivariable multinomial logistic regression estimated adjusted associations controlling for maternal education, household income, recent illness, and participation in growth and development screening.

Results: Among caregivers, 143 (56.1%) reported responsive feeding, while 112 (43.9%) used non-responsive feeding. Higher maternal education and household income were significantly associated with responsive feeding ($p < 0.05$), whereas recent illness was associated with non-responsive feeding. Feeding practices showed a weak but significant correlation with nutritional status ($r = 0.123$; 95% CI: 0.001-0.242 $p = 0.04$), explaining 1.5% of the variance. However, after adjustment, feeding practices were not independently associated with nutritional status. Recent illness increased the odds of undernutrition (aOR = 3.16; 95% CI: 1.61-6.21), while participation in growth and development screening demonstrated protective associations against undernutrition and overnutrition.

Conclusion: Responsive feeding showed a modest association with nutritional status in bivariate analysis, while child health status and preventive service engagement emerged as stronger independent correlates. Integrating responsive feeding education into pediatric and community nursing practice may support family-centered strategies addressing determinants of child nutrition in urban settings.

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INTRODUCTION

Feeding practices during early childhood are widely recognised as key determinants of children's growth and long-term health. Parental behaviours—such as pressuring the child to eat, restricting certain foods, monitoring food intake, and responding to hunger and satiety cues play central roles in shaping children's eating experiences (1). Evidence shows that non-responsive feeding, including coercive or overly controlling strategies, can disrupt children's self-regulation of energy intake and contribute to both undernutrition and obesogenic eating patterns in later life. Conversely, responsive feeding, which emphasises sensitivity to children's cues and shared control during meals, is recognized as a cornerstone of healthy dietary habits and positive growth trajectories (2,3). From a theoretical perspective, these caregiver feeding behaviours can be understood within the Social Ecological Model, which conceptualises child nutritional outcomes as the interaction between caregiver behaviour, household dynamics, and broader socioeconomic environments.

In Southeast Asia, the nutritional landscape is undergoing a profound transformation, where persistent undernutrition coexists with increasing rates of overweight and obesity among young children, a pattern known as the double burden of malnutrition (4,5). Indonesia exemplifies this dual challenge: while national data show that stunting remains prevalent, rapid urbanization and socioeconomic transition have increased exposure to ultra-processed food (UPFs) and reduced dietary diversity (6–8). Although undernutrition continues to predominate in many rural and peri-urban areas, where food insecurity and limited access to health services remain significant concerns, urban environments are increasingly characterised by dietary transitions, greater availability of energy-dense foods, and more sedentary lifestyles. Urban areas such as Jakarta are particularly vulnerable due to shifting household dynamics, longer parental working hours, and limited caregiver supervision, factors that collectively influence how and what children eat (9).

From a pediatric nursing perspective, feeding practices are modifiable behavioural targets that can be effectively addressed through nurse-led family-centered interventions. Pediatric nurses are uniquely positioned to promote responsive feeding through routine growth monitoring, home visits, and parental counselling (10,11). Their roles extend beyond curative care to health promotion-helping parents recognise hunger and satiety cues, reducing coercive feeding, and establishing structured mealtime routines (10). Such approaches align with the global nursing mandate for preventive and promotive health services aimed at addressing the double burden of malnutrition (3).

Despite growing recognition of the importance of responsive feeding, empirical evidence from urban Indonesian settings remains limited. Most existing studies have been conducted in rural or peri-urban communities and may not capture the complexity of modern urban lifestyles, food marketing, and family structure influencing feeding behavior (12,13). Moreover, while instruments such as the Child Feeding Questionnaire (CFQ) have been extensively used internationally, adaptation and psychometric validation in Indonesian populations remain scarce, limiting the reliability of behavioral assessments (12). Although several Indonesian studies have explored child nutritional status, few have examined parental feeding behaviours using a validated multidimensional instrument within densely urbanised metropolitan contexts. By employing the Indonesian-adapted Child Feeding Questionnaire and integrating behavioural feeding assessment with child health service engagement from a pediatric and community nursing perspective, the present study provides context-specific evidence addressing the dual burden of malnutrition in an urban Indonesian population.

Understanding how parental feeding practices interact with nutritional outcomes among urban preschoolers is critical for designing evidence-based, family-centered nursing programmes. As nurses play a pivotal role in growth monitoring, counseling, and community health promotion, integrating responsive feeding education into nursing practice can strengthen caregiver competence and prevent both undernutrition and overnutrition. Accordingly, this study investigates the association between parental feeding practices and nutritional status among preschool-aged children in an urban Indonesian context, providing evidence to inform nursing practice, community-based health programming, and policy development.

METHOD

This study employs a clear and systematic approach to ensure the reliability and validity of the findings. Below are the components of the methodology:

Research Type

This study employed a descriptive-analytic cross-sectional design conducted in several early childhood education centres (PAUD) located in West Jakarta, Indonesia. Data were collected from October 2024 to February 2025. The urban setting was selected to represent rapidly changing nutritional and caregiving environments typical of metropolitan Indonesia, where dietary transitions and family structures may influence child-feeding behaviour.

Population and Sample

The study population consisted of parents or primary caregivers of preschool children aged 3-6 years. A total of 255 participants were recruited using purposive sampling from seven registered early childhood education centers (PAUD) located in West Jakarta. Centers were selected in collaboration with local educational administrators based on accessibility, geographic coverage across several subdistricts, and willingness to participate in the study. Eligible caregivers of preschool children attending participating PAUD centers were invited through school communication channels during the data collection period. Participation was voluntary, and written informed consent was obtained prior to enrolment. The inclusion criteria were: (1) being the primary caregiver responsible for daily feeding, (2) having a child without congenital or chronic illness affecting growth, and (3) providing informed consent to participate. Given the exploratory nature of this cross-sectional study and the limited empirical evidence from urban Indonesian settings, the sample size of 255 participants was considered adequate to detect small-to-moderate behavioural associations. The achieved sample size was comparable to previous studies examining parental feeding practices and child nutritional outcomes in similar community-based populations.

Research Location

The study was conducted in PAUD located in West Jakarta.

Instrumentation or Tools

Parental feeding practices were assessed using the Indonesian-adapted Child Feeding Questionnaire (CFQ) (12), a Rasch-validated instrument consisting of 21 items across multiple feeding domains including perceived responsibility, monitoring, pressure to eat, restriction, and concern about child weight. Items were scored using a Likert-type scale, yielding a possible total score range of 21-63. Total feeding practice scores were calculated by summing individual item responses, with higher scores reflecting greater caregiver responsiveness during feeding interactions. Based on established Indonesian adaptation guidelines and distributional characteristics of the study sample, feeding practices were categorized into two groups: non-responsive feeding (<44) and responsive feeding (45-63). This categorization was aligned with responsive feeding concepts emphasizing caregiver sensitivity to children's hunger and satiety cues and was intended to facilitate clinically interpretable classification within community nursing contexts.

Nutritional status was classified using weight-for-height z-score (WHZ) based on WHO Child Growth Standards and the Ministry of Health anthropometric guidelines. Categories were defined as undernutrition (<-2 SD), normal (-2 SD to +1 SD), and overnutrition (> +1 SD) (14).

Sociodemographic variables included maternal age, education, employment status, household income, family structure, number of children, age of children, sex of children, chronic illness, growth and development screening and recent child illness.

Data Collection Procedures

Data were collected through structured face-to-face interviews with caregivers, followed by direct anthropometric assessments of children. Enumerators (nurses trained in pediatric measurement) received standardised training to ensure inter-observer reliability. Each interview lasted approximately 30–40 minutes and was conducted in a private setting at the child's school or home. Completed questionnaires were reviewed daily for completeness and accuracy.

Data Analysis

Quantitative data were analyzed using chi-square tests to examine associations between sociodemographic characteristics and feeding practices. Spearman's rank correlation was used to assess the relationship between feeding practices and nutritional status. Multivariable multinomial logistic regression analysis was subsequently performed to examine independent associations between feeding practices and nutritional status after adjustment for potential confounders, including maternal education, household income, recent illness, and participation in growth and development screening. Adjusted odds ratios (aORs) with 95% confidence intervals (CI) were reported.

Ethical Approval

Ethical approval was obtained from the Ethics Committee of Universitas Esa Unggul, Jakarta (Approval No.0923-12.041/DPKE-KEP/FINAL-EA/UEU/X/2024). Written informed consent was obtained from all participants prior to data collection.

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RESULTS

This study describes the characteristics of caregivers and preschool children, as well as the associations between sociodemographic factors, parental feeding practices, and child nutritional status. Results are presented according to the research objectives and summarised in Tables 1-3.

Table 1. Characteristics of respondents (n=255)

Variable	N	%
Maternal age	Mean ±SD = 32.8±5.9	
Maternal education		
• Low education	58	22.7
• High education	197	77.3
Maternal employment		
• Employed	85	33.3
• Unemployed	170	66.7
Household income		
• Below Jakarta minimum wage	123	48.2
• Equal to Jakarta minimum wage	71	27.8
• Above Jakarta minimum wage	61	23.9
Family structure		
• Nuclear family	178	69.8
• Extended family	73	28.6
• Single parent	4	1.6
Number of children		
• 1-2 children	190	74.5
• > 2 children	65	25.5
Child age	Mean ±SD = 4.5 ±0.8	
Child sex		
• Male	135	52.9
• Female	120	47.1
Recent illness (past 2 months)		
• Yes	105	41.2
• No	150	58.8
Chronic illness		
• Yes	5	2.0
• No	250	98.0
Growth and development screening		
• Yes	152	59.6
• No	103	40.4

Variable	N	%
Feeding practice		
• Responsive	143	56.1
• Non-responsive	112	43.9
Nutritional status		
• Undernourished	56	22.0
• Overnourished		
• Normal	31	12.2
	168	65.9

A total of 255 caregivers participated in this study. As shown in Table 1, the mean maternal age was 32.8±5.9 years, indicating that most caregivers were in early to middle adulthood. The majority of mothers had higher education (77.3%), and were unemployed (66.7%), reflecting a caregiving pattern where mothers act as primary feeding decision-makers at home. Nearly half of the households (48.2%) reported income below the Jakarta minimum wage, suggesting potential economic constraints that may affect food purchasing behaviours.

Most families were nuclear households (69.8%), and the majority had one to two children (74.5%). The mean age of children was 4.5±0.8 years, with slightly more boys (52.9%) than girls (47.1%). Recent illness within the previous two months was reported in 41.2% of children, while chronic illness was rare (2%). More than half (59.6%) had undergone routine growth and development screening.

Regarding feeding practice, 56.1% of caregivers demonstrated responsive feeding, while 43.9% practiced non-responsive feeding. Most children had normal nutritional status (65.9%), but undernutrition (22.0%) and overnutrition (12.2%) were still present, reflecting the dual burden of malnutrition in urban settings.

Table 2. Association between demographic characteristics and feeding practice

Variable	Feeding practice				*p-value*	Crude OR value (95%CI)
	Responsive		Non-responsive			
	N	%	N	%		
Maternal Education						
Low education	24	41.4	34	58.6	0.01	2.161 (1.192-3.920)
High education	119	60.4	78	39.6		
Maternal Employment						
Employed	54	63.5	31	36.5	0.09	0.631 (0.370-1.076)
Unemployed	89	52.4	81	47.6		
Household Income						
Below Jakarta minimum wage	58	47.2	65	52.8	0.003	-
Equal to Jakarta minimum wage	40	56.3	31	43.7		
Above Jakarta minimum wage	45	73.8	16	26.2		
Family Structure						
Nuclear family	96	53.9	82	46.1	0.478	-
Extended family	44	60.3	29	39.7		
Single parent	3	75	1	25		
Number of Children						
1-2 children	103	54.2	87	45.8	0.304	1.351 (0.760-2.403)
>2 children	40	61.5	25	38.5		

Variable	Feeding practice				*p-value*	Crude OR value (95%CI)
	Responsive		Non-responsive			
	N	%	N	%		
Child Sex						
Male	79	58.5	56	41.5	0.405	0.810 (0.493-1.330)
Female	64	53.3	56	46.7		
Recent illness (past 2 months)						
Yes	49	43.8	63	56.3	0.001	2.466 (1.483-4.101)
No	94	65.7	49	34.4		
Chronic Illness						
Yes	5	100	0	0	0.04	-
No	138	55.2	112	44.8		
Growth and Development Screening						
Yes	90	65.2	48	34.8	0.001	0.442 (0.266-0.732)
No	53	45.3	64	54.7		

Note: Crude odds ratios (ORs) were calculated using the following reference categories: high maternal education, unemployed mothers, household income below the Jakarta minimum wage, nuclear family structure, 1-2 children, female sex, absence of recent illness, absence of chronic illness, and growth and development screening.

As shown in Table 2, Chi-square analysis revealed significant associations between several sociodemographic variables and parental feeding practices. Maternal education was significantly related to feeding style (p = 0.01), with highly educated mothers being more likely to adopt responsive feeding (OR = 2.16;95% CI: 1.19-3.92). Household income was also significant (p = 0.003), showing that families with income above the Jakarta minimum wage had the highest proportion of responsive feeding.

In contrast, maternal employment status, family structure, number of children, and child sex were not significantly associated with feeding practices (p > 0.05). Health-related variables showed consistent trends: children with recent illness were more likely to experience non-responsive feeding (p = 0.001; OR = 2.47; 95% CI: 1.48-4.10), while participation in growth and development screening was associated with higher odds of responsive feeding (p = 0.001; OR = 0.44; 95% CI: 0.27-0.73). Although a significant association was observed for chronic illness (fisher's exact test p = 0.04), interpretation should be cautious due to the small number of cases (n=5).

Table 3. Correlation between feeding practice and nutritional status

Feeding practice	R	95% CI	P-value	Explained variance
	0.123	0.001-0.242	0.04	1.5%

Spearman's rank correlation analysis demonstrated a weak but statistically significant positive association between feeding practices and nutritional status (r = 0.123, 95% CI 0.001-0.242; p = 0.04). Feeding practices explained approximately 1.5% of the variability in nutritional status, indicating a modest effect size.

Table 4. Multivariable multinomial logistic regression analysis of factors associated with nutritional status among preschool children (n=255)

Variable	Undernutrition vs Normal aOR (95%CI)	P-value	Overnutrition vs Normal aOR (95%CI)	P-value
Feeding Practice				
Non-responsive feeding	0.93 (0.47-1.83)	0.832	1.67 (0.87-3.21)	0.123
Maternal education Low education	0.62 (0.27-1.45)	0.271	1.14 (0.46-2.83)	0.773

Household income >Jakarta Minimum Wage	1.91 (0.79-4.64)	0.153	0.84 (0.32-2.23)	0.733
Recent illness (past 2 months) Yes	3.16 (1.61-6.21)	0.001	1.22 (0.58-2.54)	0.594
Growth and Development screening Yes	0.36 (0.18-0.71)	0.003	0.40 (0.17-0.94)	0.035
Child age	-	-	1.77 (1.07-2.93)	0.026

Note: adjusted for maternal education, household income, recent illness, participation in growth and development screening, and child age. Reference categories were responsive feeding practice, high maternal education, household income below the Jakarta minimum wage, absence of recent illness, and absence of screening participation. Normal nutritional status served as the reference outcome category.

Multivariable multinomial logistic regression analysis in table 4 demonstrated that recent illness was independently associated with higher odds of undernutrition compared with normal nutritional status (aOR 3.16; 95% CI 1.61-6.21; p = 0.001). Participation in growth and development screening demonstrated a protective association with both undernutrition (aOR 0.36; 95% CI 0.18 – 0.71; p= 0.003) and overnutrition (aOR 0.40; 95% CI 0.17 – 0.94; p= 0.035). Feeding practice category was not independently associated with nutritional status after adjustment for covariates. The multinomial logistic regression model demonstrated adequate goodness-of-fit, with non-significant Pearson (p=0.764) and deviance (p=0.558) statistics, indicating appropriate model fit to the observed data.

DISCUSSION

The present study examined the association between parental feeding practices and the nutritional status of preschool children in a rapidly urbanising metropolitan setting. Overall, the findings suggest that responsive feeding practices were modestly associated with more favourable nutritional status among preschool children, whereas non-responsive feeding behaviours, characterised by coercive, restrictive, or inconsistent mealtime interactions were more frequently observed among children presenting with undernutrition or at risk for overnutrition. These observations are consistent with previous literature indicating that responsive feeding may facilitate children's appetite regulation and support healthier dietary patterns. Conversely, non-responsive feeding behaviours have been linked to disrupted hunger-satiety responsiveness and less adaptive eating patterns during early childhood (2,15,16). However, given the cross-sectional design, the directionality of this association cannot be determined. Feeding practices may also represent parental responses to pre-existing child nutritional status or recent illness rather than primary determinants of growth outcomes. This bidirectional relationship should therefore be considered when interpreting the findings.

The demographic patterning observed in this study provides important contextual insight into why certain families are more likely to adopt responsive or non-responsive feeding approaches. Higher maternal education and household income were positively associated with responsive feeding, which is consistent with evidence from other LMIC urban settings where socioeconomic advantages improve access to nutrition information, support healthier food purchasing, and facilitate structured family mealtimes (17–20). Conversely, caregivers whose children had recent illness were more likely to practice non-responsive feeding, a finding also reported in earlier studies showing that parental anxiety about appetite loss often results in increased pressure to eat or inconsistent feeding routines (10,21). These findings indicate that both structural factors (education, income) and situational factors (child health status) interact to shape caregiving behaviours and daily feeding dynamics.

The modest but statistically significant correlation between responsive feeding and nutritional status observed in this study reinforces the idea that mealtime interactions represent a behavioural pathway within the complex etiology of child malnutrition. Although the magnitude of association was small, the pattern reflects broader nutritional transitions occurring across Southeast Asia, where undernutrition increasingly coexists with rising overweight among preschoolers. Rapid urbanization may amplify this dual burden: metropolitan environments such as Jakarta expose children to pervasive marketing of ultra-processed foods, limited caregiver time, and less opportunity for structured family meals. Comparable observations have been reported in studies from Mexico, India,

and the Philippines and other urbanising settings (22–24). Where urban lifestyle and work patterns influence feeding practices and dietary quality (16,17).

The correlation observed in the present study therefore contributes to region-specific evidence suggesting that the behavioural dimensions of feeding may operate within complex socio-environmental contexts, particularly in large metropolitan areas compared with smaller urban or peri-urban settings (2,25). However, emerging evidence has reported inconsistent or null associations between parental feeding practices and child anthropometric outcomes. A recent longitudinal study demonstrated no significant relationship between feeding practices and subsequent changes in children's body composition, indicating that certain feeding behaviours may represent parental responses to child weight status rather than direct determinants of growth (26). Similarly, cohort findings suggest that early feeding practices do not consistently predict anthropometric outcomes once broader dietary intake patterns, socioeconomic conditions, and environmental exposures are considered (27).

These discrepancies underscore the multifactorial nature of child malnutrition, in which socioeconomic vulnerability, infection burden, dietary quality, and caregiving behaviours interact dynamically rather than operate in isolation. Multivariable analysis provided additional insight into these complex relationships. After adjustment for sociodemographic and health-related factors, feeding practice category was no longer independently associated with nutritional status. This attenuation suggests that observed bivariate associations may partly reflect confounding influences rather than direct behavioural effects. In contrast, recent illness emerged as a strong risk factor for undernutrition, while participation in growth and development screening demonstrated a protective association against both undernutrition and overnutrition. These findings highlight the importance of child health status and engagement with preventive services in shaping nutritional outcomes within urban community settings. The attenuation of association following adjustment further indicates that feeding behaviours operate within broader socioeconomic and child health contexts rather than functioning as isolated determinants of growth outcomes. Moreover, the dichotomization of feeding practice scores in the present study may have reduced variability across CFQ domains; however, this approach was selected to enhance interpretability within community-based nursing and public health applications. Further research employing continuous or subscale level modeling may provide more granular insight into domain-specific effects.

From a pediatric nursing and community nursing perspective, these findings hold practical importance. The association between caregiver responsiveness and child nutritional status underscores the critical role of nurses in promoting responsive feeding through routine growth monitoring, parental counselling, and home-based education (28). Research shows that creating responsive feeding environments requires training healthcare providers and restructuring service delivery (29). Interventions integrated into child-health and nutrition services have demonstrated improvements in caregiver practices in LMICs (30) and emphasise the role of healthcare providers in guiding parents to recognise hunger and satiety cues (31). Nurse-led, family-centered interventions that teach parents to avoid coercive feeding and establish regular mealtime routines can strengthen caregiver competence and improve children's dietary self-regulation (32).

Methodologically, this study also highlights a measurement gap. Although tools such as the Child Feeding Questionnaire (CFQ) are widely used internationally, there is a lack of validation and systematic use in Indonesian metropolitan populations. This limitation constrains the ability to compare findings across cultural contexts and hampers the development of locally adapted, evidence-based interventions. Strengthening the cultural and psychometric relevance of such tools within Indonesian nursing research would support more accurate assessments and more targeted educational interventions.

Taken together, the results underscore the urgent need to integrate responsive feeding strategies into urban child nutrition and nursing education programs. As the double burden of malnutrition escalates in Indonesia, interventions that enhance caregiver responsiveness, build positive mealtime environments, and reduce reliance on ultra-processed foods have significant potential to improve child nutritional outcomes. Evidence from recent international programs also suggests that incorporating responsive feeding guidance into early childhood and community health services can yield measurable improvements in growth and dietary regulation within relatively short timeframes (33). These findings reinforce the importance of nurse-led, behaviour-oriented education as a cornerstone of sustainable child nutrition promotion.

While the study provides valuable insights, several limitations must be acknowledged. The cross-sectional design precludes causal inference, and potential confounders such as food insecurity, parental stress, and home food availability were not assessed. Moreover, the modest correlation strength suggests that nutritional status is shaped by multiple interacting ecological factors beyond feeding behaviours alone. Future studies should employ longitudinal or mixed-method approaches to capture the dynamic interplay among caregiver practices, food environments, and child behaviour in rapidly urbanising contexts.

Despite these limitations, this research contributes context-specific evidence from an urban Indonesian setting, a population under-represented in global feeding behaviour literature. By demonstrating the relationship between parental feeding practices and nutritional outcomes, the findings provide valuable evidence base for family-centered nursing interventions and public health strategies aimed at addressing both undernutrition and the rising risk of overweight in preschool children.

CONCLUSION

This study concludes that parental feeding practices were weakly associated with nutritional status of preschool-aged children in urban Indonesia, suggesting a modest behavioural correlate within a multifactorial nutritional context. These findings indicate that caregiver responsiveness may represent a potentially modifiable component of family-centered child health promotion. Pediatric and community health nurses may consider incorporating responsive feeding guidance into routine child health services as part of broader strategies addressing socioeconomic and environmental determinants of child nutrition.

Based on these findings, it is recommended that responsive feeding be integrated into family-centered nutrition education and community health programmes to strengthen caregiver awareness and practice. Health professionals and early childhood educators should be empowered to provide guidance on responsive mealtime interaction and avoidance of coercive feeding patterns. Policy-level efforts that address the affordability of nutrient-dense foods, regulate marketing of ultra-processed products to children, and support flexible caregiving time are also essential. Future research should employ longitudinal approaches to explore how feeding behaviours evolve in urban settings and to evaluate the long-term effectiveness of responsive feeding interventions in reducing the double burden of malnutrition among Indonesian preschoolers. These findings may inform the development of culturally adapted health education modules aimed at strengthening family-centered nutrition education in urban community settings.

AUTHOR CONTRIBUTION STATEMENT

Conceived and designed the study by WS; K performed the data collection; EV and RAP analyzed and interpreted the data; WS contributed research materials, coordinated project administration, and wrote the manuscript. All authors read and approved the final version of the manuscript.

CONFLICT OF INTEREST

The authors declare no conflict of interest. The funding sponsors had no role in the design of the study; in the collection, analyses, or interpretation of data; in the writing of the manuscript; and in the decision to publish the results.

DECLARATION OF GENERATIVE AI AND AI-ASSISTED TECHNOLOGIES IN THE WRITING PROCESS

During the preparation of this manuscript, the authors used generative AI tools, specifically ChatGPT (OpenAI), to assist in language refinement, improve clarity, and enchance the overall readability and structure of the text. The use of AI tools was limited to editorial purposes and did not involve content generation related to data analysis, interpretation of findings, or authorship contributions. All intelectual content, critical interpretation, and final approval of the manuscript remain the sole responsibility of the authors. The authors affirm adheherence to ethically authorship practices and confirm that the use of AI tools does not compromise the originality or integrity of the research presented.

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