



Maternal knowledge on nutritional-focused nurturing care and associated factors among women with stunted children aged 6-23 months in Yogyakarta, Indonesia: A cross-sectional study

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Abstract

Background: Childhood stunting poses serious long-term risks to cognitive development, education, and adult productivity. While research has explored stunting's causes and effects, there is a lack of focus on maternal knowledge of nutrition-focused nurturing care for stunted children. This gap limits the ability to design effective interventions that target improved caregiving practices.

Objective: This study aimed to assess maternal knowledge of nutrition-focused nurturing care and explore associated factors, including child gender, maternal age, education, income, and prior exposure to nurturing care information, among mothers of stunted children aged 6-23 months in Indonesia.

Methods: A cross-sectional study was conducted with 73 mothers in Kulon Progo, Yogyakarta. Data were collected from February to March 2024 using a validated self-assessment questionnaire covering four domains: responsive caregiving, early learning opportunities, safety and security, and supportive caregiver well-being. Statistical analyses, including t-tests and one-way ANOVA, were performed.

Results: Overall maternal knowledge of nurturing care was high, with a mean score of 25.15 (SD = 4.72). Factors significantly associated with higher knowledge included having male children ($p = 0.017$), being aged 30-34 years ($p = 0.035$), possessing higher education levels ($p = 0.002$), and prior exposure to nurturing care information ($p < 0.001$). Family income significantly influenced knowledge in the domain of early learning opportunities ($p = 0.006$), though not in other areas.

Conclusion: Maternal knowledge of nutrition-focused nurturing care was influenced by child gender, maternal age, education, income, and prior exposure to nurturing care information. These findings emphasize the importance of focused educational interventions in nursing practice to enhance maternal knowledge. Addressing these factors can help align nursing strategies better to support the healthy growth and development of children.

Keywords

Indonesia; child development; cross-sectional studies; health knowledge; stunting

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Background

Childhood malnutrition, including stunting, is a leading cause of disease and death in children under five (Danaei et al., 2016; Vaivada et al., 2020). Stunting significantly contributes to child mortality and the global disease burden (Anjela et al., 2018; Montenegro et al., 2022). Its effects extend beyond childhood, affecting cognitive development, educational achievement, adult earnings, and productivity and increasing

the risk of chronic nutrition-related diseases in adulthood (Atalell et al., 2023). Despite extensive research on the causes of stunting, there has been insufficient focus on the role of maternal knowledge, particularly in the domain of nutritional nurturing (Akseer et al., 2020; Faridah et al., 2024; Rakotomanana et al., 2020).

In response to the global challenge of childhood development, 193 United Nations member states committed to the Sustainable Development Goals (SDGs) in 2015,

including SDG 4.2, which emphasizes early childhood development (ECD) for children under five as crucial for human capital growth (Nilsson et al., 2016). However, SDG 4.2 is not categorized as a health-related goal by WHO, leading to gaps that some advocates exploit to downplay the role of health interventions in early detection and support for at-risk children (Lozano et al., 2018; Nilsson et al., 2016; Shawar & Shiffman, 2017). Global data highlights the need to prioritize ECD within the Nurturing Care Framework, addressing fragmented governance and ensuring effective collaboration with WHO to meet the SDGs and improve outcomes for children worldwide (Clark et al., 2020; UNICEF, 2021; World Health Organization, 2018).

Maternal nutritional nurturing knowledge refers to a mother's understanding of key practices necessary for promoting healthy growth and development in children (Ahun et al., 2023; Black et al., 2020). This knowledge includes several domains, including responsive caregiving, early learning opportunities, safety and security, and supportive caregiver well-being (UNICEF, 2021; World Health Organization, 2018). These domains are critical components of the Nurturing Care Framework, which emphasizes creating environments that support optimal child development through health, nutrition, and responsive care (UNICEF, 2017; World Health Organization, 2018). Studies have shown that mothers with higher knowledge in these areas are more likely to engage in effective caregiving practices that can prevent stunting and promote better health outcomes (Britto et al., 2018; dos Santos et al., 2023).

Stunting in children is a complex issue influenced by various factors related to maternal practices and household environments. Maternal factors such as education level and knowledge about nurturing care are crucial in determining the incidence of stunting in children (Permatasari et al., 2024). Studies have consistently shown a strong association between maternal education level and child stunting, with maternal education being a significant predictor of child stunting (Sarwar et al., 2024). Additionally, household size, family income, and exposure to nurturing care information are linked to stunting (Yaya et al., 2022).

Moreover, the number of children in a household, maternal education level, family income, and exposure to information about nurturing care are all identified as risk factors associated with stunting (Amaha & Woldeamanuel, 2021). Maternal education is highlighted as a robust predictor of child stunting, with some studies demonstrating a statistically significant interaction between maternal schooling and household wealth on childhood stunting (Dwomoh et al., 2023). Low household wealth, residing in rural areas, low maternal educational attainment, and belonging to marginalized social groups have been associated with an increased prevalence and risk of stunting (Rao et al., 2023).

Previous studies emphasize the vulnerability of children aged 6-23 months to malnutrition due to their rapid growth and exposure to infectious diseases (Gebremaryam et al., 2022; Tadele et al., 2022). Additionally, research has highlighted the prevalence and correlates of stunting among children aged 6-23 months, indicating that they are particularly prone to stunting during this critical period (Anin et al., 2020). Focusing on this age group is essential because it represents a crucial

window for growth and development (Akhmadi et al., 2021; Haryanti et al., 2023; Kurniasih et al., 2023).

In the Indonesian context, there is a significant lack of research specifically focused on maternal knowledge regarding nutritional-focused nurturing care, particularly in relation to stunted children. The majority of existing studies tend to explore maternal knowledge in broader aspects of nurturing care rather than emphasizing the nutritional dimension (Faridah et al., 2024; Rahmawati et al., 2023; Sumiati & Kusumayati, 2023). For instance, a study conducted in Banjar District identified a link between maternal knowledge and attitudes towards the first 1000 days of life and stunting prevalence, underscoring the role of maternal knowledge in stunting prevention but without a sole focus on nutrition (Subratha et al., 2024). Another study examined the relationship between maternal caregiving abilities and energy-protein adequacy among children with stunting, concluding that improved maternal caregiving abilities were associated with better nutritional outcomes for children. However, the study did not exclusively focus on nutrition-centered nurturing care (Mar'Ah Has et al., 2024).

By specifically studying mothers of stunted children aged 6-23 months, this study aimed to assess maternal knowledge of nutrition-focused nurturing care and explore associated factors, including child gender, maternal age, education, income, and prior exposure to nurturing care information, among mothers of stunted children aged 6-23 months in Indonesia. This focus allows for a more targeted analysis of the factors that contribute to stunting, enabling the development of more effective interventions tailored to the needs of this vulnerable population. The findings from this study will help bridge the gap in existing research and contribute to more precise public health strategies aimed at reducing stunting and improving child health outcomes in Indonesia.

Methods

Study Design

This study utilized a cross-sectional design with participants completing self-assessment questionnaires. Reporting followed the "STrengthening the Reporting of OBServational studies in Epidemiology" (STROBE) guidelines (Von Elm et al., 2007).

Samples/Participants

The study focused on mothers with children aged 6-23 months diagnosed with stunting residing in the areas served by Kalibawang and Samigaluh Community Health Centers. Specifically, this included the sub-districts of Banjarharjo, Banjaroya, Banjararum, and Banjarasri under Kalibawang and Purwoharjo, Sidoharjo, Gerbosari, and Ngargosari under Samigaluh. Participants were selected using consecutive sampling. Inclusion criteria were mothers of stunted children aged 6-23 months who provided informed consent. Exclusion criteria ruled out caregivers other than mothers (e.g., grandparents, fathers) and children with congenital diseases.

The researchers chose Kulon Progo District based on 2021 and 2022 Indonesian Nutritional Status Survey (*Survey Status Gizi Indonesia/SSGI*) data showing an increase in stunting among children in Kulon Progo, Yogyakarta. The

study focused on Kalibawang and Samigaluh Community Health Centers, both of which still had high levels of stunting among children, according to the 2022 SSGI data. The researchers received recommendations from both health centers. The study area in Kalibawang Community Health Center covered four villages: Banjarharjo, Banjaroya, Banjarasri, and Banjararum. Similarly, the Samigaluh Community Health Center area covered four villages: Purwoharjo, Sidoharjo, Gerbosari, and Ngargosari.

In the first phase, the researchers collaborated with health center personnel and cadres to collect secondary data on the weight and height of children in February 2024, identifying 160 eligible participants from Kalibawang and Samigaluh. The researcher then invited these respondents through the cadres and contacted them directly via WhatsApp, SMS, and phone calls. Following this, a second phase of data collection involved directly screening the children's anthropometric measurements, including weight and height, to classify their nutritional status according to the inclusion and exclusion criteria. After this direct screening process, 43 mothers from Kalibawang and 30 from Samigaluh met the study's criteria, resulting in a final sample size of 73 participants.

Instruments

This study utilized two main instruments. The first was designed to collect demographic data for both children and mothers. For the children, information gathered included age and gender, while for the mothers, data collected covered age, number of children, education level, family income, and exposure to nurturing care information.

The second instrument assessed nurturing care knowledge and originally consisted of 48 items, adapted from [Hendriyani et al. \(2020\)](#), with permission from the original author. Both content and construct validity tests were conducted to ensure the instrument effectively measured the intended construct. Content validity was evaluated by experts using Aiken's V coefficient, resulting in the refinement of the questionnaire to 44 items. Subsequently, construct validity testing was performed using Pearson's product-moment correlation on a sample of 132 mothers, which identified five items with *r*-values below the critical *r*-table value. These invalid items were removed, leaving 39 valid items.

These 39 items are distributed across four domains: responsive caregiving (13 items), opportunities for early learning (7 items), safety and security (13 items), and supportive caregiver well-being (6 items). The questionnaire uses a Guttman scale, where answers are scored as either correct (1) or incorrect (0). The total score reflects the mother's level of knowledge on nurturing care, with higher scores indicating greater knowledge. The Cronbach's alpha reliability score for the final version of the nurturing care knowledge questionnaire was 0.736, demonstrating good reliability.

Data Collection

After securing permission from local authorities and obtaining ethical clearance from the university's ethical committee, data collection took place from February to March 2024. The data were gathered through an online questionnaire administered via Google Forms. Prior to the main data collection, a pilot test was conducted with a small group of participants similar to the

study population to assess the readability and usability of the questionnaire, aiming to identify and mitigate any potential bias in the responses. During the pilot test, the completion of the questionnaire was monitored by the researchers, allowing participants to ask questions and receive clarifications if needed, ensuring that the final version was clear and easily understood.

Data Analysis

Demographic variables, including mothers' knowledge, age, gender, number of children, education level, family income, and exposure to information about nurturing care, were summarized using percentages, means, minimum-maximum ranges, and standard deviations. As the sample size was less than 100, a Shapiro-Wilk normality test was run, which indicated no evidence of non-normality in the data set ($p = 0.477$). Therefore, group comparisons were made using independent-sample *t*-tests and ANOVA. Statistical significance was defined as *p*-values <0.05 (two-sided).

Ethical Considerations

This study received approval from the Medical and Health Research Ethics Committee (MHREC) of the Faculty of Medicine, Public Health and Nursing, Universitas Gadjah Mada on November 27th, 2023 (Approval No. KE/FK/1853/2023). It is noteworthy that the study adhered to the rigorous ethical guidelines outlined by the institutional research committee and was conducted in full compliance with the ethical standards set forth in the 1964 Helsinki Declaration, including its subsequent amendments and equivalent guidelines. These measures were implemented to ensure the protection of the rights, safety, and well-being of all participants involved in the research. The approval and adherence to these ethical standards highlight the commitment of the researchers to uphold the highest levels of ethical integrity throughout the study.

Results

Characteristics of the Participants

The demographic characteristics of both children and their mothers were assessed and are summarized in [Table 1](#). Among the children, 61.6% were male and 38.4% were female, with ages ranging from 7 to 23 months and an average age of 16.52 months (SD = 4.74). The mothers had an average age of 30.24 years, ranging from 20 to 44. Most mothers fell into the age groups of 20-29 years (43.8%) and 30-34 years (37.0%). Regarding education, 74.0% of the mothers had higher education, while 26.0% had primary education. A majority of families (61.6%) reported incomes below the regional minimum wage, and 72.6% of mothers had more than one child.

Additionally, nearly half of the mothers (49.3%) had prior exposure to information about nurturing care. It is important to note that this prior exposure from a larger study focused on the effectiveness of nurturing care education. The mothers who had this exposure were participants in the nurturing care education component of the larger study, which aimed to enhance maternal knowledge and practices related to child development and care.

Table 1 Description of participants' characteristics (N = 73)

Variable		f	%	Mean (SD) Min-Max
Children				
Gender	Male	45	61.6	
	Female	28	38.4	
Age (month)	7-12	20	27.4	M = 16.52 (SD = 4.74) Min-Max = 7-23
	13-17	18	24.7	
	18-23	35	47.9	
Mother				
Age (year)	20-29 years	37	43.8	M = 30.24 (SD = 5.23) Min-Max = 20-44
	30-34 years	27	37	
	≥35 years	14	19.2	
Education level	Primary Education	19	26	
	Higher education	54	74	
Family income	<RMW	45	61.6	
	≥RMW	28	38.4	
Number of children	1	20	27.4	
	>1	53	72.6	
Previous exposure to nurturing care information	Yes	36	49.3	
	No	37	50.7	

Note: RMW= Regional minimum wage per month; "Primary Education" refers to the completion of elementary and junior high school (up to Grade 9); "Higher Education" refers to senior high school and higher (including vocational, diploma, and university degrees)

Level of Nurturing Care Knowledge and Its Domains

Table 2 summarizes the mean, standard deviation, minimum-maximum range, and levels of nurturing care knowledge and its domains among the participants. The nurturing care knowledge score had a mean of 25.15 (SD = 4.72) and ranged from 13 to 35, indicating a high level of knowledge overall. Domain-specific scores were as follows: responsive

caregiving (mean = 8.12, SD = 2.01, range = 2-12), opportunities for early learning (mean = 4.87, SD = 1.37, range = 2-7), safety and security (mean = 7.63, SD = 2.40, range = 1-12), and supportive caregiver well-being (mean = 4.52, SD = 1.08, range = 1-6). All domain scores also indicated high levels of knowledge among the participants.

Table 2 Level of nurturing care knowledge and its domain of the participants (N = 73)

	Mean	SD	Min-Max	Level
Nurturing care knowledge (Total score)	25.15	4.72	13-35	High
<i>Domains:</i>				
Responsive caregiving	8.12	2.01	2-12	High
Opportunities for early learning	4.87	1.37	2-7	High
Safety and security	7.63	2.4	1-12	High
Supportive caregiver well-being	4.52	1.08	1-6	High

Factors Associated with Nurturing Care Knowledge

Table 3 details the nurturing care knowledge and its related domains among various participant demographics. The table demonstrates how children's gender significantly influences nurturing care knowledge scores (p = 0.017), with males (26.17 ± 4.60) scoring higher than females (23.50 ± 4.50). In the specific domains of nurturing care, significant differences are observed in opportunities for early learning (males: 5.13 ± 1.34, females: 4.46 ± 1.34, p = 0.042) and safety & security (males: 8.08 ± 2.24, females: 6.89 ± 2.51, p = 0.038). However, no significant gender differences were noted in responsive caregiving and supportive caregiver well-being domains.

Further analysis based on the age of mothers reveals significant variability in nurturing care knowledge scores across different age groups. Mothers aged 20-29 scored 24.78, those aged 30-34 scored 26.07, and mothers aged 35 years and above scored 25.90. Significant differences are also present in the safety & security domain among these groups (p = 0.035), indicating variability in knowledge and application based on maternal age. However, responsive caregiving and

opportunities for early learning showed no significant differences across maternal age groups.

Education level markedly affects nurturing care knowledge, with mothers having higher education levels scoring significantly higher (26.31 ± 4.12) than those with primary education (21.84 ± 4.83, p < 0.001). This trend extends to the domains of responsive caregiving (p = 0.006), opportunities for early learning (p = 0.013), and safety & security (p = 0.007), underscoring the impact of educational attainment on nurturing care practices.

Income levels analyzed show no significant differences in overall nurturing care knowledge based on family income above or below the regional minimum wage (RMW). However, the domain of opportunities for early learning has significant differences (higher income: 5.42 ± 1.10, lower income: 4.53 ± 1.42, p = 0.006), suggesting that economic factors may influence specific aspects of nurturing care.

Lastly, previous exposure to nurturing care information profoundly impacts all measured domains. Mothers with prior exposure scored significantly higher in overall nurturing care knowledge (27.55 ± 3.63 vs. 22.81 ± 4.50, p < 0.001) and had

higher scores across all domains, including responsive caregiving, opportunities for early learning, safety & security, and supportive caregiver well-being. These findings highlight

the beneficial effects of prior knowledge and exposure to nurturing care concepts on maternal caregiving practices.

Table 3 Differences in nurturing care knowledge and its domains based on sociodemographic factors

Variable	Nurturing care knowledge (Total score)	<i>p</i>	Responsive caregiving	<i>p</i>	Opportunities for early learning	<i>p</i>	Safety and security	<i>p</i>	Supportive caregiver well-being	<i>p</i>
	Mean ± SD		Mean ± SD		Mean ± SD		Mean ± SD		Mean ±SD	
Children's gender^a		0.017*		0.173		0.042*		0.038*		0.57
Male	26.17 ± 4.60		8.37 ± 2.12		5.13 ± 1.34		8.08 ± 2.24		4.57 ± 1.05	
Female	23.50 ± 4.50		7.71 ± 1.78		4.46 ± 1.34		6.89 ± 2.51		4.42 ± 2.13	
Children's age (month)^b		0.417		0.444		0.752		0.413		0.12
7-12	26.80 ± 3.56		8.45 ± 1.50		4.90 ± 1.48		8.80 ± 1.23		4.65 ± 1.03	
13-17	23.44 ± 5.51		7.05 ± 2.48		5.00 ± 1.08		7.05 ± 2.66		4.33 ± 1.32	
18-23	25.08 ± 4.66		8.48 ± 1.85		4.80 ± 1.47		7.25 ± 2.59		4.54 ± 0.98	
Mother's age (year)^b		0.09		0.032*		0.881		0.035*		0.663
20-29 years	24.78 ± 3.84		7.78 ± 2.05		4.78 ± 1.12		7.84 ± 1.72		4.37 ± 0.90	
30-34 years	26.07 ± 4.66		8.40 ± 1.90		5.03 ± 1.67		7.77 ± 2.51		4.85 ± 0.90	
≥35 years	25.90 ± 6.45		8.63 ± 2.13		4.90 ± 1.31		7.81 ± 3.39		4.21 ± 1.57	
Education level^a		<0.001*		0.006*		0.013*		0.007*		0.148
Primary Education	21.84 ± 4.83		7.05 ± 2.67		4.21 ± 1.13		6.36 ± 2.52		4.21 ± 1.27	
Higher education	26.31 ± 4.12		8.50 ± 1.58		5.11 ± 1.38		8.07 ± 2.22		4.62 ± 0.99	
Family income^a		0.144		0.511		0.006*		0.596		0.593
<RMW	24.51 ± 4.96		8.00 ± 2.12		4.53 ± 1.42		7.51 ± 2.67		4.46 ± 1.16	
>RMW	26.17 ± 4.19		8.32 ± 1.84		5.42 ± 1.10		7.82 ± 1.92		4.60 ± 0.95	
Number of children^a		0.581		0.75		0.009*		0.56		0.888
1	24.65 ± 4.64		8.00 ± 1.89		4.20 ± 1.60		7.90 ± 2.46		4.55 ± 1.05	
>1	25.33 ± 4.77		8.16 ± 2.07		5.13 ± 1.19		7.52 ± 2.39		4.50 ± 1.10	
Previous exposure to nurturing care information^a		<0.001*		<0.001*		0.013*		0.002*		0.014*
Yes	27.55 ± 3.63		8.94 ± 1.60		5.27 ± 1.36		8.50 ± 1.99		4.83 ± 0.94	
No	22.81 ± 4.50		7.32 ± 2.06		4.48 ± 1.28		6.78 ± 2.49		4.21 ± 1.13	

Note: ^aIndependent t-test was performed, ^bOne-way ANOVA test was conducted, *Significant at *p*<0.05

Discussion

This study aimed to assess maternal knowledge of nutritional-focused nurturing care and its associated factors among mothers of stunted children aged 6-23 months in Indonesia. The findings revealed a high level of nurturing care knowledge among these mothers, with notable variations influenced by several factors. Firstly, mothers with male children scored higher in nurturing care knowledge compared to those with female children, particularly in opportunities for early learning and safety and security domains. Secondly, mothers aged 30-34 had the highest nurturing care knowledge scores, with significant differences observed in the safety and security and supportive caregiver well-being domains. Thirdly, higher maternal education levels were strongly associated with increased nurturing care knowledge scores, with significant differences also noted in responsive caregiving, early learning opportunities, and supportive caregiver well-being domains. Fourthly, family income influenced scores only in the opportunities for early learning domain. Lastly, mothers with prior exposure to nurturing care information demonstrated

significantly higher overall nurturing care knowledge, including specific domains such as responsive caregiving, early learning opportunities, safety and security, and supportive caregiver well-being.

The study found that mothers of male children had higher nurturing care knowledge, particularly in the domains of early learning opportunities and safety and security. This gender-based difference is noteworthy and requires further exploration to understand its implications and underlying causes (Endendijk et al., 2016). This gender-based difference is significant and can be understood in the context of traditional gender norms, which often assign specific roles to boys and girls (Chung et al., 2021). In many cultures, boys are usually perceived as future breadwinners or heads of families, leading to a preference for male children and differential treatment within the family (Mensah, 2023). This preference can manifest in the form of more resources, attention, and opportunities for boys, influencing how mothers approach their caregiving practices.

These traditional gender norms impact not only the way children are socialized but also the expectations placed on

them and the opportunities they are provided based on their gender (Igbolo & Ejue, 2016). For example, boys might be encouraged to be more active and autonomous, which aligns with societal expectations of masculinity, while girls may be expected to be more passive or nurturing, in line with traditional notions of femininity (Averett, 2016). This can lead mothers to focus more on ensuring that their male children have access to early learning opportunities and are kept safe, reflecting higher knowledge and engagement in these areas.

The study also emphasized that maternal age significantly influences nurturing care knowledge, with mothers aged 30-34 years achieving the highest scores, particularly in the safety and security and supportive caregiver well-being domains. This finding aligns with previous research suggesting that older mothers typically possess more comprehensive nurturing care knowledge compared to younger mothers (Bornstein et al., 2022). As mothers age, their parenting practices tend to evolve, as noted by Kim et al. (2010), who found that maternal age is positively associated with changes in harsh parenting during the first three years of a child's life. This suggests that as mothers grow older, their nurturing care knowledge and behaviors may become more refined.

Moreover, Deng et al. (2023) indicate that advanced maternal age can have long-term health implications for children, such as higher blood pressure at 18 years old, underscoring the importance of considering maternal age when evaluating its impact on children's health and well-being. Additionally, research by Ahmad et al. (2022) found an average maternal age of 33 years, highlighting how maternal age varies across populations and can influence caregiving experiences, particularly for small for gestational age infants.

The safety and security domain focuses on creating a safe physical and emotional environment for children. Older mothers tend to be better at recognizing and mitigating risks, likely due to more established routines, better access to information, and a more cautious approach to parenting (Nomaguchi & Milkie, 2020). Older mothers often score higher in the supportive caregiver well-being domain because they have developed stronger coping mechanisms and stress management strategies (Kapoor et al., 2021).

Furthermore, the findings of this study align with previous research, demonstrating that household economic status and maternal education are significant factors influencing child malnutrition and overall child development. Laksono et al. (2022) highlighted that a family's economic status, maternal and paternal education, and maternal health practices directly impact child malnutrition. Similarly, Vikram and Vanneman (2020) found that maternal educational attainment, socioeconomic status, and family size are critical determinants of a child's nutritional status.

This study specifically found that family income significantly influences nurturing care practices, particularly in the domain of early learning opportunities. This supports the research by Black et al. (2017), which emphasizes the role of maternal nurturing care in mitigating the adverse effects of low socioeconomic status on early brain development. In resource-constrained settings, where family income may limit access to early learning resources, nurturing care becomes even more essential in protecting children's development. Britto et al. (2017) also stress the importance of providing support to parents, caregivers, and families to help children

reach their developmental potential, especially when financial resources are limited.

Allel et al. (2021) further discuss how income levels impact various aspects of early childhood development, including the quality of nurturing care. Higher family income is associated with better-nurturing care environments, which are crucial for a child's growth and development. Investing in early childhood programs, as highlighted by dos Santos et al. (2023), is vital for supporting low-income families in creating nurturing environments that promote optimal child development. Such investments can help address disparities in nurturing care practices influenced by income, ensuring that all children have access to the resources and support they need for healthy development.

Mothers with prior exposure to nurturing care information had significantly higher levels of overall nurturing care knowledge. This finding aligns with research by Bridges (2015), which examined how developmental experiences and maternal background shape subsequent caregiving practices. Exposure to nurturing care information can come from various sources, such as formal education programs, community health workshops, healthcare professionals, and media campaigns (Brown et al., 2022). For instance, educational interventions like parenting classes or community-based programs have been shown to significantly improve maternal knowledge and practices related to child-rearing (Ahun et al., 2023). Additionally, Porter and Hsu (2003) found that women who had successful experiences with caregiving tasks before becoming mothers felt more confident in their nurturing abilities, suggesting that hands-on exposure, possibly through caring for younger siblings or relatives, can also play a role. Such experiences help mothers develop practical skills and increase their confidence, which in turn enhances their ability to implement effective nurturing care practices.

Moreover, exposure to information through healthcare visits, where mothers receive guidance on child health and development from professionals, can be particularly influential. Hackett et al. (2015) highlighted the relationship between maternal self-efficacy and the ability to create a nurturing environment, suggesting that the confidence gained from exposure to reliable caregiving information can lead to better outcomes for children. Furthermore, media campaigns and public health initiatives aimed at educating parents about responsive caregiving and early childhood development can also contribute to increased maternal knowledge. Mackness et al. (2021) emphasized that responsive caregiving, which involves activities that stimulate play and communication, is a key component of effective nurturing care. Prior exposure to this type of information, whether through formal education or community outreach, reinforces the importance of these practices and helps mothers adopt behaviors that support their child's development.

Study Limitations

While efforts were made to control for confounding variables, this study has limitations that should be acknowledged. The sample size was relatively small, which may limit the generalizability of the findings to a broader population. Other factors influencing maternal knowledge and caregiving practices, such as cultural beliefs or access to healthcare resources, were not comprehensively explored.

Implications for Nursing Practice

This study's findings have significant implications for maternal and child healthcare, particularly in addressing stunting. Nurses play a critical role in educating mothers about nurturing care practices, including nutrition, early learning, responsive caregiving, safety, and security. However, factors such as disparities in maternal education, family income, and access to information still hinder effective nutritional nurturing knowledge. To address these gaps, nurses can develop tailored educational programs focusing on communities with lower education and income levels, providing practical and accessible information on child nutrition and care. Regular healthcare visits should also be used as opportunities to update and support mothers' caregiving practices. By targeting these barriers, nursing interventions can empower mothers to make informed decisions, ultimately contributing to the reduction of stunting and the improvement of child health outcomes. Integrating these strategies into nursing practice is essential for promoting optimal early childhood development.

Conclusion

This study highlights the importance of maternal knowledge in nutritional-focused nurturing care, revealing that various factors, such as child gender, maternal education, age, and exposure to nurturing care information, significantly influence this knowledge among mothers of stunted children aged 6-23 months in Indonesia. While the study highlights that maternal knowledge is particularly strong in cognitive aspects, it does not fully address how this knowledge translates into actual parenting behaviors. The findings suggest that while maternal knowledge is generally high, particularly in domains like early learning opportunities, safety, and caregiver well-being, further research is needed to explore how this knowledge impacts day-to-day parenting practices. Given the already strong levels of knowledge observed, the focus should shift from general health education to understanding and supporting the application of this knowledge in real-world parenting behaviors. This approach could provide deeper insights into improving child health and development outcomes.

Declaration of Conflicting Interest

The authors affirm that there were no financial or commercial conflicts of interest throughout this study and state that they have no competing interests with the funders.

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All authors contributed equally in this study in substantial contributions to the conception or design of the work, analysis or interpretation of data for the work, drafting of the work, and final approval of the version to be published.

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Data Availability

The datasets generated during and analyzed during the current study are available from the corresponding author upon reasonable request.

Declaration of Use of AI in Scientific Writing

There is nothing to disclose.

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