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The Relationship between Nutrition Literacy and Nutrition Knowledge with the Incidence of Stunting: A Scoping Review

Hubungan Literasi Gizi dan Pengetahuan Gizi terhadap Kejadian Stunting: A Scoping Review

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ABSTRACT

Background: *Globally, the incidence of stunting in children under five has declined over the past few decades. However, there are regional and in-country disparities. In Indonesia, the prevalence of stunting increased from 25.7% to 30.8% between 2013 and 2018. This upward trend is associated with negative consequences such as reduced academic potential, increased risk of noncommunicable diseases, increased healthcare costs, and reduced productivity. Maternal nutrition literacy is a contributing factor to stunting. Therefore, strengthening maternal nutrition literacy can help reduce stunting.*
Objectives: *This study aims to examine the relationship between maternal nutrition literacy and maternal nutrition knowledge with the incidence of stunting in children under five.*
Methods*: The literature search was conducted using databases, namely PubMed, Scopus, and ScienceDirect, and followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) and Population, Intervention, Comparison, Outcome, and Study Design (PICOS) frameworks.*
Discussion: *Only 13 out of 630 articles were eligible. Among them, four articles showed a significant correlation between nutrition knowledge and literacy with the incidence of stunting in lower-middle-income countries. In upper-middle-income countries, seven articles showed a significant correlation between nutrition literacy and knowledge with the incidence of stunting.*
Conclusions: *There is a significant relationship between nutrition literacy and nutritional knowledge with the incidence of stunting. Nutrition literacy and knowledge can be related to infant and young child feeding, selection and preparation of nutritional and healthy foods, child growth and development, stunting prevention, access to health services, food security, and traditional food nutrition knowledge.*

INTRODUCTION

Stunting is a chronic malnutrition characterized by reduced growth rate in terms of height[1]. Despite a decline in the prevalence of stunting in children under five over the past few decades, it remains a significant nutrition problem in Indonesia and worldwide. In 2019, an estimated 21.3% (144 million) of children under five were stunted, with prevalence ranging from 34.5% in Eastern Africa to 4.5% in East Asia[2]. Between 2013 and 2018, the prevalence of stunting increased from 25.7% to 30.8%[1]. This underscores the need for systematic and sustainable prevention measures to mitigate the negative consequences of stunting, including reduced academic potential, increased risk of non-communicable diseases, increased healthcare costs, and reduced productivity[3].

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Stunting is a complex issue caused by multiple factors, including low socioeconomic status, poor maternal health and nutritional status, inadequate infant and young child feeding (IYCF) practices, and micronutrient deficiencies[4]. Maternal nutrition literacy, such as maternal parenting and family diet, is a contributing factor to stunting in children under five. Nutrition literacy is defined as the ability of an individual to access, process, and understand nutritional information, as well as their capacity to make informed decisions about nutrition[5]. Maternal nutrition literacy, on the other hand, is the ability of mothers to understand nutrition concepts and apply nutrition principles in various aspects of life, particularly in ensuring a balanced diet for all age groups, especially for vulnerable groups. Maternal nutrition literacy has been shown to have an impact on the mechanisms for managing child nutrition[6].

Nutritional literacy can be assessed using a questionnaire that covers functional, interactive, and critical domains. The functional domain assessed the ability to obtain and understand nutritional information. The interactive domain assesses the ability to communicate interpersonally with dietitians and the willingness to seek out and apply nutritional information. The critical domain assesses the more complex ability to critically evaluate nutritional information[6]. Maternal knowledge and skills related to nutrition and health can be improved through parent education programs. Strengthening maternal nutrition knowledge is crucial to reducing the incidence of stunting[7,8]. However, there is limited information available on the influence of maternal nutrition literacy and maternal nutrition knowledge on the incidence of stunting in children under five[1].

Based on the background provided, this study aims to investigate the relationship between maternal nutrition literacy and maternal nutrition knowledge with the incidence of stunting in children aged 0-59 months in lower-middle-income and upper-middle-income countries. This study was based on articles published in relevant journals. It is important to note that there are regional disparities in stunting reduction in some countries[2]. Social and cultural contexts can also influence the incidence of stunting[9]. Lower-middle-income and upper-middle-income countries were selected to observe demographic and income patterns similar to Indonesia. Although Indonesia is classified as an upper-middle-income country, it shares similar demographics and socio-cultural characteristics with lower-middle-income countries. This study will contribute to providing an overview of nutrition literacy and the nutrition knowledge needed to support stunting reduction that can be applied in the context of Indonesia.

METHODS

Study Design

This study employed a scoping review, which is an appropriate method to determine the scope of literature on a particular topic and to provide an overview of the available studies. Scoping reviews are useful for examining inconclusive evidence on a particular topic[10,11]. This study examines the relationship between maternal nutrition literacy and maternal nutrition knowledge with the incidence of stunting in children under five in low-middle-income countries (LMICs) and upper-middle-income countries (UMICs). This scoping review was conducted according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA). The review process included identification of research questions; identification and selection of relevant studies; mapping of data; and compiling, synthesizing, and reporting of the results. Articles that met the criteria underwent further analysis in accordance with the research questions. The results were then presented and explained, and conclusions were drawn.

Search Strategy

A systematic search for national and international studies was conducted in November 2022 using PubMed, Scopus, and Science Direct databases. The search was limited to articles published between 1981 and 2023 due to the limited scope of topics in the last decade. The initial search strategy used several keywords related to the research topic, namely (maternal or mother) and nutrition and (literacy or knowledge) and (stunt* or height for age or HAZ or z*score). The database search used an asterisk (*) to identify word variations. In addition, article searches were conducted using manual methods.

Data Selection

A literature search strategy is essential for accessing relevant literature and data when writing a scoping review. It is recommended to formulate research questions to make the process of searching for studies more efficient. The research questions can be based on the Population, Intervention, Comparison, Outcomes, and Study Design (PICOS) framework. Using the PICOS method ensures that the articles found are consistent according to the predetermined criteria. In this study, the population consisted of mothers with children aged 0-59 months residing in LMICs and UMICs. The intervention was nutrition literacy or nutrition knowledge, and the comparison group received standard intervention. The outcomes were stunting, defined as a z-score of less than -2 SD. Finally, the study designs were experimental, such as randomized controlled trials, and observational studies.

Articles obtained during the initial search stage were analyzed to determine if they met the predetermined inclusion criteria, namely articles discussing nutrition literacy or nutrition knowledge among mothers with children aged 0-59 months in LMICs and UMICs with a z-score of the incidence of stunting being less than -2 SD. In addition, the articles must be written in English or Indonesian and published between 1981 and 2023 with study designs in the form of experimental or observational studies. Meanwhile, the exclusion criteria included articles that were not available in full text, articles that were published in SINTA 4 and 5 or proceedings, and review articles.

Data selection was conducted in three stages. First, the results were extracted from the databases and uploaded to the Rayyan application for screening by FCW. The uploaded results were checked for duplication.

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Second, the abstract titles were screened by FCW and UK. Any discrepancies in the reviewers' responses during the abstract title screening stage were resolved through discussion until consensus was reached. Any conflicts that could not be resolved were referred to the third reviewer (LA). Third, the full texts were screened until an agreement was reached between the three reviewers. The literature search process is outlined in Figure 1.

Data Extraction

Data on author, year, country, study design, population, number of participants, interventions, instruments, and outcomes were extracted from the agreed articles. Subsequently, the study design and results were analyzed with the help of the Mendeley application.

DISCUSSION

Screening Results

A search was conducted for 630 articles from three databases based on the PICOS framework on the relationship between nutrition literacy and nutrition knowledge with the incidence of stunting. After eliminating duplicate articles, 523 articles remained. Articles with irrelevant titles and abstracts were excluded, resulting in 23 articles. After reviewing the full text of the 23 articles that met the criteria, nine articles were selected. In addition, four articles were obtained from manual searching. Finally, 13 articles met the criteria and were eligible to be used as references.

Characteristics of the Studies

The results of the literature review based on the PICOS framework related to the relationship of nutritional literacy and nutritional knowledge to the incidence of stunting obtained search results of 630 articles from 3 databases. Then, duplicate articles were eliminated to 523 articles, and articles were excluded based on irrelevant titles and abstracts so that the results were 23. Of the 23 articles selected based on full text, nine articles were obtained that met the criteria. Then, as many as four articles were obtained from other methods, namely manual searches. The final results obtained are 13 articles that meet the criteria and are eligible to be used as references.

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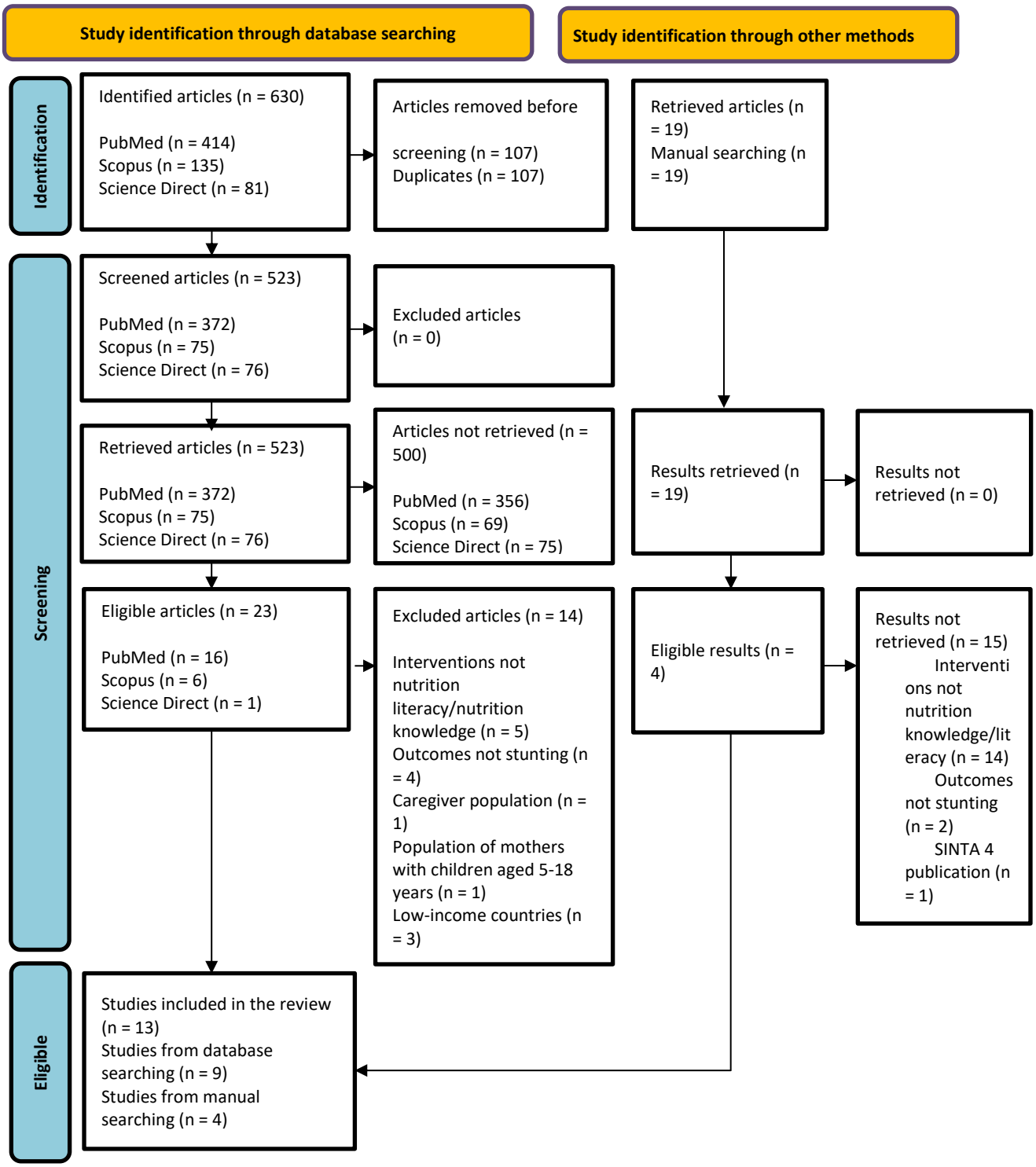

Figure 1. Database search process based on the PRISMA framework

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Table 1. Extraction results of studies in low-middle-income countries (LMICs)

No	Author, Year	Country	Study Design	Population	Number of Participants	Intervention/Exposure	Instrument	Outcome
	Nutrition Literacy							
1	Maheri et al. 2022[12]	Iran	*Cross-sectional*	Mothers aged 18-50 years with children under five	368	Maternal nutrition literacy	The study used the Persian version of the Evaluation Instrument for Nutrition Literacy in Adults (EINLA) which was translated by Hemati et al. in Iran and were measured for validity and reliability. The instrument consists of 35 topic items with five dimensions, namely general nutrition information (10 items), reading comprehension and interpretation (6 items), food groups (10 items), portion size determination (3 items), and reading food labels and the ability to perform simple calculations (6 items).	There was a significant relationship between the level of maternal nutrition literacy and the incidence of stunting in children. Mothers who had stunted children tended to have lower nutrition literacy scores compared to those who had non-stunted children. Stunted (mean ± SD) Yes = 23.03 ± 5.13 (p = 0.001) Not stunted = 26.11 ± 4.47
	Nutrition Knowledge							
2	Yeganeh et al. 2018[13]	Iran	*Cross-sectional*	Mothers with children aged 1-2 years	400	Maternal knowledge of food security	The questionnaire covers three areas of food security (availability, access, and utilization), including	Mothers who did not have sufficient knowledge about food security led to a 4.87 times higher incidence of stunting (p = 0.001, OR = 4.87).

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						national and international studies. The knowledge questionnaire consists of 20 questions with a Likert scale. To be categorized as having the desired knowledge, the assessment criteria required a score of ≥70%. A score of <70% was categorized as having insufficient knowledge.	
3	Bukari et al., 2020[14]	Ghana	*Cross-sectional*	Mothers aged 17-50 years with children aged 0-18 months selected from four health facilities	340 pairs of mothers and children	Maternal knowledge of child growth monitoring	Adapted questionnaire with the following scoring: a correct answer received a score of 1 (maximum score), while an incorrect answer received a score of 0 (minimum score). Mothers who scored between 0 and 4 were categorized as having poor knowledge, while mothers who scored between 5 and 8 were categorized as having good knowledge.	No correlation was found between maternal of knowledge of child growth monitoring and the incidence of stunting (p = 0.781).
4	Forh et al. 2022[15]	Ghana	*Cross-sectional*	Mothers/caregivers with children aged 6-59 months	226	Maternal nutrition knowledge	The structured questionnaire was adapted from FAO with ten questions related to	No significant relationship was found between maternal nutrition knowledge and child stunting (p = 0.744).

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							breastfeeding practices, colostrum, complementary feeding, and the function of selected foods. Mothers who scored between 0 and 4 were categorized as having low level of knowledge, between 5 and 7 as having moderate level of knowledge, and between 8 and 10 as having high level of knowledge.	
5	Jesmin et al. 2011[16]	Dhaka, Bangladesh	*Cross-sectional*	Mothers with children aged 0-59 months	380	Maternal nutrition knowledge	The instrument was calculated based on mothers' responses to health and nutrition-related questions in the questionnaire (Cronbach's α = 0.81). Maternal knowledge scores were categorized into three categories: low (3-6), medium (7-11), and high (12-16).	Increased maternal nutrition knowledge significantly reduced the risk of stunting (p = 0.036).
6	Saaka et al., 2014[17]	North Ghanaa	*Cross-sectional*	Mothers with children aged 0-36 months	991	Maternal knowledge of childcare practices	The Maternal Childcare Nutritional Knowledge Questionnaire (CNKQ) was used. The questions asked in the questionnaire included	In the Analysis of Covariance (ANCOVA), the mean height-for-age z-score (HAZ) was 0.44 after adjusting for child age, child sex, mother's education level, and household wealth index. The HAZ

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		knowledge on the appropriate age to introduce semi-solid foods into the child's diet, the importance of giving colostrum to the child, and the provision of fluids, semi-solid foods, and ORS during diarrhea.	was significantly higher among children born to mothers with higher level of nutrition knowledge (p = 0.03, CI: [0.03-0.85]) compared to children born to mothers with lower level of nutrition knowledge.

Notes:
CI: Confidence Interval
HAZ: Height-for-age-z-score
CNKQ Scoring: A score 1 was given for each correct answer, with a maximum score of 5. Mothers who scored below the sample mean score were classified as having low level of maternal nutrition knowledge, and mothers who scored at least the sample mean score were classified as having a high level of maternal nutrition knowledge (score 0 = HAZ ≥-2, score 1 = HAZ < -2 SD)

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Table 2. Extraction results table of articles in Upper-middle-income countries (UMICs)

No	Author, Year	Country	Study Design	Population	Number of Participants	Intervention/Exposure	Instrument	Outcome
	Nutrition Literacy							
1	Sirajuddin et al. 2021[18]	Makassar, Indonesia	*Randomized controlled trial*	Mothers with children aged 0-6 months	85 Intervention (n = 43) Control (n = 42)	The intervention group received the MNL intervention for three months, while the comparison group received a standard/natural intervention for three months. The interventions included primary immunization, child development monitoring, and vitamin A supplementation.	N/A	The intervention group experienced a 9.3% decrease in stunting status due to MNL (p = 0.046), while the control experienced a 2.4% decrease (p = 0.317).
	Nutrition Knowledge							
2	Masilela et. al., 2023[19]	South Africa	*Cross-sectional*	Mothers with children under two years	400	Maternal nutrition knowledge	The study used an adapted instrument consisting of five question items related to colostrum, continued breastfeeding, prevention and treatment of diarrhea with oral rehydration solution, immunization, and family planning. Answers were either "yes" or "no". Correct,	The multivariate analysis showed a significant correlation between maternal nutrition knowledge and stunting (AOR = 1.92, 95% CI: [1.12-3.29]).

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							incorrect, or "do not know" answers were categorized into excellent (80-100), good (60-79), moderate (40-59), and fair (0-39).	
3	Aprilina et al. 2021[20]	Banyumas, Indonesia	*Case-control*	Mothers with children aged 0-24 months	68	Maternal nutrition knowledge	A 23-question questionnaire with tested validity and reliability.	A relationship was found between maternal nutrition knowledge and the prevalence of stunting. Respondents with a poor level of nutrition knowledge had a 0.246 time higher risk of stunting compared to respondents with a good level of nutrition knowledge.
4	Mutiarasari et al. 2021[21]	Palu, Central Sulawesi, Indonesia	*Case-control*	Mothers who with children from 13 health centers	560	Knowledge about stunting	N/A	Knowledge significantly influenced the incidence of stunting with a coefficient of determination of 0.458 (p = 0.026). Respondents with insufficient knowledge contributed to the incidence of stunting by 1.581 times higher compared to respondents with sufficient knowledge.
5	Yunitasari et al. 2021[22]	Madura, Indonesia	*Cross-sectional*	Mothers with children aged 6-24 months who lived with their children and could read and write	109	Maternal knowledge of stunting	The researchers developed a 15-question instrument about definitions, causes, symptoms, impacts, and prevention of stunting. The answers were categorized into good (76-100%), fair (56-75%), and poor (≤55%).	Maternal knowledge was significantly correlated with stunting prevention (p = 0.007) although the strength of correlation was low. In addition, insufficient knowledge was significantly associated with lower rates of stunting prevention.

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							The Cronbach's alpha value of the instrument was 0.917.	
6	Simanjuntak et al. 2019[23]	Central Bengkulu Regency, Indonesia	*Cross-sectional*	Mothers with children aged 12-59 months	115	Maternal nutrition knowledge of traditional foods	The instrument for traditional food knowledge consisted of 15 questions on the definition, benefits, serving habits, and role of traditional foods for toddlers. The knowledge was categorized as low (below 60%), medium (60% - 80%), and high (above 80%) based on the number of correct answers.	Maternal nutrition knowledge was associated with the HAZ index (p = 0.031). Mothers with higher levels of nutrition knowledge had children in the normal category. Low level of maternal nutrition knowledge of traditional foods contributed to the incidence of stunting in 63.64% of children under five.
7	Mauludyani 2022[24]	West Java, Indonesia	*Cross-sectional*	Mothers with children under five in rural and urban areas	300	Maternal knowledge of infant and young child feeding and balanced diet	The instrument consisted of 20 true or false statements, and then the answers were coded to calculate the nutrition knowledge score for each statement by multiplying the number of correct answers by five.	Mothers of non-stunted children in urban areas had significantly higher nutrition knowledge than mothers of stunted and non-stunted children in rural areas.

Notes:
AOR: Adjusted Odd Ratio
CI: Confidece Interval
HAZ: Height-for-age-z-score
MNL: Maternal Nutrition Literacy
N/A: Not Available

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MNL Intervention: Intervention in the form of providing literacy through five items of educational classes (understanding the basic principles of breastfeeding and complementary feeding), namely simulation classes (understanding breastfeeding and complementary feeding practices), home visits two times per month (a total of 15 visits) (supporting new habits in breastfeeding and complementary feeding practices), monitoring child growth, and hand sanitation.

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The Relationship between Maternal Nutrition Literacy and the Incidence of Stunting

Out of the 13 studies, two studies examined the effect of nutrition literacy on the incidence of stunting. The two studies were conducted in LMIC and UMIC, namely Iran and Indonesia, respectively[12,17]. The results of these two studies showed a significant positive relationship between maternal nutrition literacy and the incidence of child stunting with p-values of 0.001 and 0.046, respectively.

The study conducted in Iran used the Evaluation Instrument of Nutrition Literacy on Adults (EINLA) and found that the average nutrition literacy score of mothers with stunted children was lower than that of mothers with non-stunted children[12]. In contrast, the study conducted in Indonesia showed that maternal nutritional literacy had a significant impact on stunting status in the intervention group (p = 0.046), resulting in a 9.3% reduction in stunting, while the control group only decreased by 2.4% (p = 0.317). The intervention group received the Maternal Nutritional Literacy (MNL) intervention that consisted of three months of literacy education classes and simulations of breastfeeding and complementary feeding, as well as two monthly home visits (15 visits), child growth monitoring, and hand sanitation. The comparison group received a standard three-month intervention of primary immunization, developmental monitoring, and vitamin A supplementation[18]. These findings suggest the importance of providing nutrition literacy to mothers, particularly those with low levels of nutrition literacy, as well as to mothers of children aged 0-12 months, mothers of children with a history of illness, mothers of children who consume formula milk, and mothers of children who have not yet started complementary feeding. This can help improve the nutritional status and anthropometric indicators of children and ultimately prevent stunting[12,18].

The Relationship of Maternal Nutrition Knowledge and the Incidence of Stunting

This scoping review identified 11 studies that examined the relationship between maternal nutrition knowledge and the incidence of stunting. Out of the 11 studies, nine studies reported a correlation between maternal nutrition knowledge and the incidence of stunting[13, 16, 17, 19, 20,21, 22, 23,24]. Meanwhile, two studies found no correlation between maternal nutrition knowledge and the incidence of stunting[14, 15]. The studies showed a significant positive correlation between maternal nutrition knowledge and the risk of child stunting. Specifically, lower maternal nutrition knowledge is associated with higher risk of child stunting. The instruments used to assess maternal nutrition knowledge varied depending on the topic under investigation. The nutrition knowledge observed was related to a variety of topics, including food security, growth monitoring, childcare practices, nutritional value of traditional foods, nutrition knowledge on stunting, infant and young child feeding, and balanced diet.

Yeganeh et al. (2018) found a significant relationship between maternal nutrition knowledge and the incidence of stunting. Mothers who lacked sufficient knowledge about food security had a 4.87 times higher incidence of stunting (p = 0.001, OR = 4.87). The study used three indicators of food security, namely availability, access, and utilization[14]. The study is consistent with a study conducted in Central Bengkulu Regency, Indonesia, which found that maternal nutrition knowledge was associated with the HAZ index (p = 0.031). Mothers with higher levels of nutrition knowledge had children in the normal height category. In addition, low maternal nutrition knowledge about traditional foods led to a stunting incidence of 63.64% in children under five[23]. Traditional food sources can be used to improve family nutrition. Micronutrients such as iron, vitamin A, and vitamin C are primarily found in traditional foods. On the other hand, optimizing local foods ensures that they are easily accessible and relatively affordable[23].

A multivariate analysis conducted by Masilela et al. (2023) found a significant correlation between stunting and maternal nutrition knowledge (AOR = 1.92, 95% CI: [1.12-3.29])[19]. These findings are similar to the study conducted by Saaka et al. (2014) which found that after adjustment for child age, child sex, mother's education level, and household wealth index, the mean HAZ was 0.44 significantly higher for children born to mothers with higher nutrition knowledge (p = 0.03, CI: [0.03-9.85]) than for children born to mothers with lower nutrition knowledge[17]. The findings of the study differ from those of Forh et al. (2022), who found no significant relationship between maternal nutrition knowledge and child stunting (p = 0.744)[15]. All three studies examined maternal knowledge of childcare practices, including the appropriate age to introduce semi-solid foods into a child's diet, the importance of providing colostrum, and the provision of fluids, semi-solid foods, and oral rehydration solutions (ORS) during diarrhea. It is important for mothers to have nutrition knowledge to properly feed their children and promote their development and growth. This includes understanding food choices, feeding practices, and seeking healthcare services to achieve normal child nutrition. Efforts should be made to provide appropriate nutrition knowledge according to the child's growth phase from 0-2 years and continue from infancy to school age.

A study conducted by Mutiarasari et al. (2021) in Palu, Central Sulawesi, Indonesia found a significant correlation between knowledge and the incidence of stunting with a coefficient of determination of 0.458 (p = 0.026). Mothers with insufficient nutrition knowledge were 1.581 times more likely to have stunted children compared to those with sufficient knowledge[21]. The study is consistent with a study conducted by Yunitasari et al. (2021) in Madura, Indonesia which assessed mothers' understanding of stunting, including its definition, causes, signs, symptoms, impacts, and prevention. The findings of study showed a significant correlation (p = 0.007) between nutrition knowledge and stunting prevention. Insufficient nutrition knowledge was significantly associated with lower rates of stunting prevention[22].

Furthermore, a study conducted by Bukari et al. (2020) in Ghana found no association between the level of maternal knowledge of growth monitoring and the incidence of stunting (p = 0.781)[14]. This finding contrasts

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with a study conducted by Jesmin et al. (2011) in Dhaka, Bangladesh which found that increasing maternal nutrition knowledge significantly reduced the risk of stunting ($p = 0.036$)[16]. Meanwhile, research conducted in Banyumas Indonesia by Aprilina et al. (2021) found a correlation between the level of maternal nutrition knowledge and the prevalence of stunting. Mothers with poor nutrition knowledge had a 0.246 times higher risk of having stunted children compared to those with good nutrition knowledge[20].

A study conducted by Anna Vipta et al. (2022) in West Java, Indonesia found that mothers of non-stunted children in urban areas had significantly higher nutrition knowledge than those of stunted and non-stunted children in rural areas ($p < 0.05$)[24]. This suggests that mothers in rural areas may have limited access to health information than those in urban areas[25].

Recommendation

Improving nutrition literacy and nutrition knowledge among mothers can be achieved through various components or sectors. Based on the studies identified in this scoping review, it is recommended to improve access to nutrition literacy for mothers with children aged 0-2 years, especially before the child starts consuming solid foods. Nutrition literacy topics that can be covered include infant and child feeding practices, selection and preparation of nutritious foods, child growth and development, stunting prevention, healthcare service monitoring, food security, and traditional food knowledge[12, 19,20,21,22,23,24]. Nutrition education topics can be tailored to meet the needs and conditions of the mothers[24]. Nutrition education can also be provided to mothers with children who are not stunted as a prevention measure[18]. Health education on family planning services and nutrition education targeted at adolescent girls can prevent teenage pregnancy and stunting[15]. Nutrition education can be provided in health centers, integrated health service posts, pediatric clinics, rural and urban areas by cadres of integrated health service posts and by community midwives, academics, government, and private partners[15, 16, 24]. The Ministry of Health or the Health Office should provide comprehensive health facilities with appropriate, relevant, and professional resources[15].

Maternal nutrition literacy and maternal nutrition knowledge have been found to have a significant relationship with the incidence of stunting. It is necessary to increase access to nutrition information, particularly for mothers with children aged 0-2 years, especially in rural areas. This study has limitations. It focuses on nutrition literacy and nutrition knowledge, and does not examine maternal attitudes or behaviors. Further research is necessary to link the knowledge, attitudes, and behaviors of mothers of stunted and non-stunted children. The strength of this study lies in its consideration of research on maternal nutrition knowledge and the incidence of stunting in both lower middle-income countries (LMICs) and upper middle-income countries (UMICs). In addition, reviews on nutrition literacy, nutrition knowledge, and the incidence of stunting have not been widely conducted.

CONCLUSION

Four of the articles (66.67%) show a significant relationship between nutrition knowledge and literacy with the incidence of stunting in lower-middle-income countries. Similarly, all seven articles (100%) showed a significant relationship between nutrition literacy and knowledge with the incidence of stunting in upper-middle-income countries. The average nutrition literacy score of mothers with stunted children was lower than that of mothers with non-stunted children. Mother with low levels of nutrition knowledge has been found to be more likely to have stunted children. However, two other studies have found no significant relationship between maternal nutrition knowledge and child stunting. To address this issue, it is important to improving maternal nutrition literacy and knowledge through various components or sectors. Nutrition literacy topics that can be covered include to infant and child feeding practices, selection and preparation of nutritious foods, child growth and development, stunting prevention, health service monitoring, food security, and traditional food knowledge.

This scoping review can serve as a reference for further literature review or research. Policy makers can use it to develop nutrition education programs aimed at improving maternal nutrition literacy, which can support the efforts to prevent and reduce the incidence of stunting in Indonesia.

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