BIBLIOMETRIC VISUALIZATION OF STUNTING RISK FACTORS AND RATIONALITY OF STUNTING REDUCTION TARGETS IN INDONESIA

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Abstract. The prevalence of stunting in Indonesia has been decreasing every year, but it has not yet reached the global target standard. This study aimed to determine the risk factors for stunting and assess the rationality of stunting reduction targets in Indonesia through a bibliometric analysis. We utilized VOSviewer for the bibliometric analysis. The articles were extracted from the Scopus database on 23 April 2022 using the following keywords: "risk factor" OR "determinant" OR "prevention" OR "prediction" AND "stunting". A total of 81 articles published in Indonesian and English language between 2013 and 2022 were identified. VOSviewer revealed that there were 16 keywords that often appeared in selected articles and play a crucial role in understanding and addressing the factors influencing the prevention and risks associated with stunting in Indonesia. The prevention of stunting involves 11 keywords including agriculture, dietary, food diversity, clean living behavior, vitamin D, exclusive breastfeeding, parenting, nutritional status, policy, public health, and sanitation. Conversely, there are 5 keywords identified as risk factors for stunting; these included child demographic, length at birth, urban residence, underweight, and anemia. This study concludes that there has been limited exploration and publication of public health policies aimed at enhancing family food security as an intervention to prevent stunting. These policies can be implemented at the family level to mitigate the risk of stunting.

Keywords: bibliometric, co-occurrence analysis, Indonesia, stunting, VOSviewer

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INTRODUCTION

As an archipelagic country with a fairly dense population in the Asian region, Indonesia has the fifth highest prevalence of stunting (height is lower than -2 standard deviations) in the world (de Onis and Branca, 2016; Beal *et al*, 2018). The incidence of stunting in Indonesia has decreased from 30.80% in 2018 to 24.4% in 2021 (Indonesia Ministry of Health, 2021). However, the National Medium-Term Development Plan developed by the Government of Indonesia targets a reduction in stunting of up to 14% by 2024 (Satriawan, 2018). Based on Indonesia's experience, the average annual reduction rate for stunting is 3% (Indonesia Ministry of Health, 2021); therefore, substantial efforts are still required to meet the national target in 2024. The prevalence of stunting at 24.4% is still considered chronic by the World Health Organization (WHO) because it remains above 20% (WHO, 2018).

The strategy for accelerating stunting reduction in Indonesia has been regulated since 2013 through Presidential Regulation No. 42 of 2013 (Republic of Indonesia, 2013), which concerns the national movement for the acceleration of nutrition improvement. This strategy has resulted in the development of six manuals, three training modules, three technical manuals, and one cadre pocketbook (Satriawan, 2018). Furthermore, Presidential Regulation No. 72 of 2021 has been promulgated to further accelerate

stunting reduction efforts in Indonesia (Republic of Indonesia, 2021). As of 2021, the responsibility for accelerating stunting reduction lies with the National Population and Family Planning Agency.

Interventions for childhood stunting can be delayed due to brain development disorders that hinder cognitive abilities and impact the quality of life in later years (Hijrawati *et al*, 2021). The medium and long-term consequences of child stunting include increased morbidity and mortality, a higher risk of infection, and non-communicable diseases. It also leads to an increased susceptibility to infectious diseases, particularly fat accumulation in the mid-body region, reduced fat oxidation, lower energy expenditure, insulin resistance, and a higher risk of developing conditions such as diabetes, hypertension, and dyslipidemia. Additionally, it can result in decreased work capacity and unfavorable maternal reproductive outcomes later in life (De Sanctis *et al*, 2021).

Numerous studies on the risk factors and determinants of stunting prevention have been conducted in Indonesia (Ramli *et al*, 2009; Torlesse *et al*, 2016; Mutiarasari *et al*, 2021; Podungge *et al*, 2021; Wicaksono *et al*, 2021; Abri *et al*, 2022; Widyaningsih *et al*, 2022). Most of systematic review of the determinants of stunting in Indonesian children was conducted conventionally. However, bibliometric studies focusing on risk factors and prevention in Indonesia have been limited. Bibliometric studies offer the advantage of visually summarizing previous publications, helping to identify the novelty of the study and saving time in data analysis. This is particularly important in assessing the need for future evidence, especially considering the goal of reducing stunting by 14% in Indonesia by 2024.

The main objective of this study was to analyze bibliometric visualizations of various publications related to risk factors and the prevention of stunting in Indonesia. Some specific objectives of this study included: 1) analyzing bibliometric visualization clusters related

to risk factors and stunting prevention in Indonesia; 2) analyzing overlay visualizations to identify areas of future research needed in relation to risk factors and stunting prevention in Indonesia; 3) establishing the framework for understanding risk factors and prevention of stunting across various dimensions; and 4) identifying the rationale for preventing and reducing stunting based on the findings of previous studies. It is hoped that the results of this study will inform and prioritize efforts to accelerate stunting reduction in Indonesia.

MATERIALS AND METHODS

This research was a part of the literature review by conducting a bibliometric visualization analysis. The analysis aimed to further analyze scientific publications in reputable databases qualitatively and quantitatively. This study provided information about the authors and institutions contributing to research on risk factors and preventive factors for stunting in Indonesia. The application used for bibliometric analysis in this study was VOSviewer (https://www.vosviewer.com/download). This software helped to make a technical and methodological mapping from previously published studies on stunting in Indonesia. The articles chosen for further analyzed were limited to studies conducted in Indonesia, as per the inclusion criteria. It was important to assess the validity of the Indonesian Government's goal of reducing stunting.

The visually map of previous studies were displayed by the keywords. These keywords were explored by depicting past keyword trends, highlighting the risk factors or stunting prevention that have been extensively studied in Indonesia's previous research studies. These keywords were grouped into clusters that may be related. Based on this visualization, some keywords might be relevant but have received

limited attention, suggesting potential areas for future research that could contribute valuable information to the Government of Indonesia in achieving its stunting reduction target by 2024.

The publication search source was taken from the Scopus database on 23 April 2022. The retrieved data were collected within one day to avoid potential deviation due to daily updates. This study focused on risk factors or prevention factors for family members, especially children affected by stunting. The words used in the search source were "risk factor" OR "determinant" OR "prevention" OR "prediction" AND "stunting". The data file was downloaded in Comma Separated Value (CSV) file format.

RESULTS

Based on Fig 1, a total of 2,663 documents were extracted. Further screening is carried out by filtering the search time span for only the last 10 years, namely 2013-2022 manually. This study only explores studies originating from Indonesia by extracting data on the menu bar on Scopus page. The only selected articles were those published in either Indonesian or English language. Finally, a total of 81 articles were obtained for bibliometric analysis.

Fig 2 describes the keyword visualization by cluster. The co-word map was created with a threshold of 173 co-occurrence keywords in VOSviewer. To find the themes in the literature, the authors studied the terms of each cluster. We obtained 4 clusters with 16 selected keywords. Cluster 1 (red) had six keywords (agriculture, child demographic, diet, food diversity, underweight, and vitamin D), Cluster 2 (green) had two keywords (length at birth and exclusive breastfeeding), Cluster 3 (blue) had five keywords (parenting, anemia, nutritional status, policy, and

public health), and Cluster 4 (yellow) had three keywords (sanitation, urban residence, and clean living behavior).

Fig 3 shows the overlay visualization of the time trend of the most frequently used words in the selected articles from 2019 to 2021. The larger the font size and circles of the keyword, the more frequently it appears in the selected articles. The keywords "sanitation", "growth

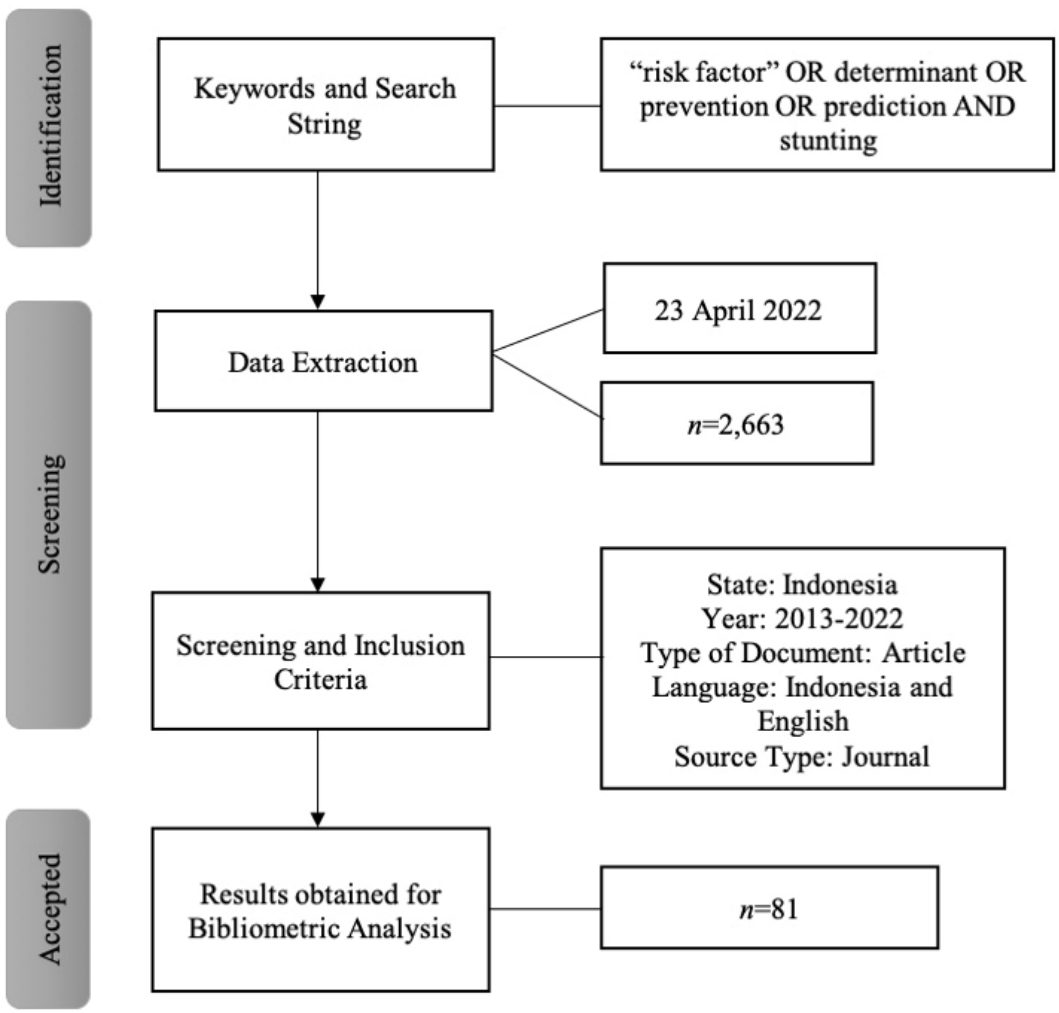

Fig 1 - Search strategy to find eligible articles

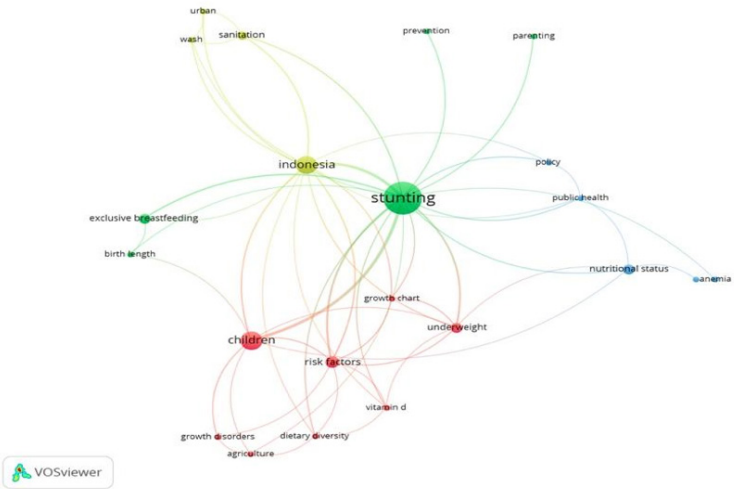

Fig 2 - Main clusters based on keyword co-occurrence analysis

Note: Fig 2 above comprises 4 color clusters displaying 21 words. The red cluster displays 8 words including growth chart, underweight, children, risk factors, vitamin D, growth disorders, dietary diversity, and agriculture; the green cluster displays 3 words including stunting, exclusive breastfeeding, birth length; the blue cluster displays 6 words including prevention, parenting, policy, public health, nutritional status, anemia; and the yellow cluster displays 4 words including Indonesia, wash, sanitation, and urban.

These words are then further selected to become keywords in preventing or addressing risk factors of stunting. In the red cluster, the words growth chart, risk factors, growth disorders are dropped due to curative treatment for stunting, discussed words in this study, growth disorders effects of stunting, respectively. Meanwhile, the words dietary diversity is separated into 2 words: diet and food diversity to make deep analysis. Hence, the selected keywords in the red cluster are underweight, children then clarified as child demographic, dietary, diversity, and agriculture.

In the green cluster, the word stunting is removed because it's the disease discussed in this study. Thus, the selected words in the green cluster are exclusive breastfeeding, birth length (clarified later as length at birth).

In the blue cluster, the word prevention is eliminated from the keywords as it's the title of the word sought in this study. The selected keywords in the blue cluster are parenting, policy, public health, nutritional status, anemia.

In the yellow cluster, the word Indonesia is eliminated from the keywords as it's an inclusion criterion in this study. The selected words in the yellow cluster are sanitation, urban, and wash (clarified later as clean living behavior).

Finally, there are 16 keywords analyzed further in all color clusters: agriculture, child demographic, diet, food diversity, underweight, vitamin D, length at birth, exclusive breastfeeding, parenting, anemia, hemoglobin, nutritional status, policy, public health, sanitation, urban residence, clean living behavior.

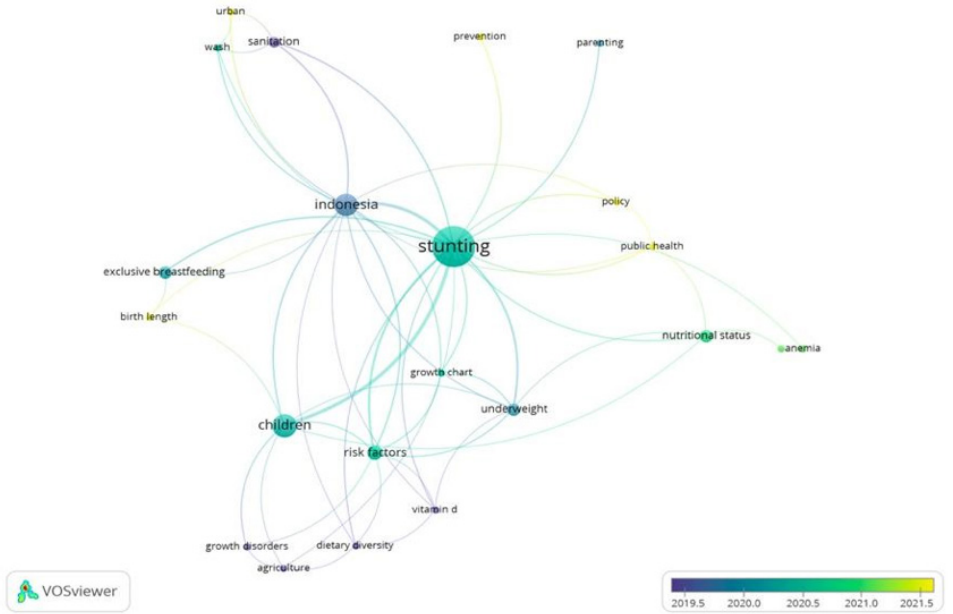

Fig 3 - Overlay visualization of average publication year

disorders", "agriculture", and "vitamin D" have blue-purple circles, indicating that this term frequently appears in articles published in 2019. Meanwhile the keywords "prevention", "policy", and "public health" are more commonly found in articles published in 2021.

Table 1 describes detailed explanation of keywords. There are 11 keywords that involves the prevention of stunting; they are agriculture, dietary, food diversity, clean living behavior, vitamin D, exclusive breastfeeding, parenting, nutritional status, policy, public health, and sanitation. Conversely, there are five keywords identified as risk factors for stunting; they are child demographic, length at birth, urban residence, underweight, and anemia.

Frequently, included articles mention the term "children", or "child demographic", a keyword associated with the family sociodemographic,

Table 1

Keyword details based on eligible study publications on risk factors and prevention of stunting in Indonesia

No.	Cluster	Keyword	Category	Description
1	Red (Cluster related nutrition consumption)	Agriculture	Prevention factor	Agricultural intervention includes domestic food adequacy and security to meet national food needs (Mahmudiono *et al*, 2018; French *et al*, 2021).
		Child demographic	Risk factor	Child demographic includes the sociodemographic characteristics of the child and the family's socioeconomic conditions, the education and occupation of the parents (Ramli *et al*, 2009; Huriah *et al*, 2021; Sartika *et al*, 2021; Abri *et al*, 2022; Widyaningsih *et al*, 2022).
		Diet	Prevention factor	Diet is related to the ability and willingness of the family to fulfil a healthy diet in the family (Gunardi *et al*, 2017; Nurhayati *et al*, 2020; Hartotok *et al*, 2021; Susiloretni *et al*, 2021).
		Food diversity	Prevention factor	Food diversity includes a diversified diet that pays attention to the fulfilment of nutritional content in food (Mahmudiono *et al*, 2018; Diana *et al*, 2021; Hafid *et al*, 2021; Sirajuddin *et al*, 2021).
		Underweight	Risk factor	Underweight includes the incidence and prevalence of underweight and information literacy and technological literacy about body mass index (Flynn *et al*, 2020; Jahan *et al*, 2021; Hijrawati *et al*, 2021; Abri *et al*, 2022).
		Vitamin D	Prevention factor	Vitamin D plays a role in facilitating calcium absorption, supporting bone development, and enhancing immune function in both pregnant women and fetuses or babies (Berawi *et al*, 2019; Fuada *et al*, 2020; Nurhayati *et al*, 2020; Hafid *et al*, 2021).

Table 1 (cont)

No.	Cluster	Keyword	Category	Description
2	Green (Cluster related to parenting)	Length at birth	Risk factor	A length at birth, especially less than 48 centimeters, serves as a predictor of linear growth status and stunting in the first two years of life following a maternal nutrition intervention (Huriah *et al*, 2021; Jahan *et al*, 2021; Sartika *et al*, 2021; Hijrawati *et al*, 2021).
		Exclusive breastfeeding	Prevention factor	Early initiation of breastfeeding ensures that the baby receives adequate nutritional intake, prevent from malnutrition, and immunological protection (Hartotok *et al*, 2021; Podungge *et al*, 2021; Sari *et al*, 2021).
3	Blue (Cluster related to policy and health services)	Anemia	Risk factor	Anemia in mothers, especially those who have experienced it from a young age or during pregnancy, increases the risk of their children being stunted. Therefore, the consumption of iron supplements, particularly blood-added tablets, by pregnant women is crucial for preventing anemia (Agustina *et al*, 2021; Djuardi *et al*, 2021; Flora *et al*, 2022).
		Nutrition status	Prevention factor	Nutritional status includes the condition of meeting the nutritional needs of the family, including the nutritional needs of the mother during pregnancy as well as the nutritional adequacy of the child (Mahmudiono *et al*, 2018; Hafid *et al*, 2021; Jahan *et al*, 2021; Sartika *et al*, 2021; Sirajuddin *et al*, 2021).
		Policy	Prevention factor	The policy referred to by this keyword is the government's social, economic, and political policies to accelerate stunting reduction, including providing social assistance (rice and nutritious food) and other social security ownership (Hartotok *et al*, 2021; Mutiarasari *et al*, 2021; Indra and Khoirunurrofik, 2022; Widyaningsih *et al*, 2022).

Table 1 (cont)

No.	Cluster	Keyword	Category	Description
		Public health	Prevention factor	Public health encompasses preventive measures such as ensuring pregnant women to access primary healthcare facilities, educating them on various nutritional issues, and discouraging smoking behavior within families to prevent stunting (Mahmudiono *et al*, 2018; Tampake *et al*, 2021; Absori *et al*, 2022).
		Parenting	Prevention factor	Parenting, whether undertaken by mothers, fathers, siblings, or other family members involved in childcare, is crucial for preventing stunting and ensuring prompt responses to a child's illness (Syam *et al*, 2020; Podungge *et al*, 2021; Sartika *et al*, 2021; Susiloretni *et al*, 2021).
4	Yellow (Cluster related to environment condition)	Sanitation	Prevention factor	Sanitation is related to maintaining environmental health by realizing clean water, a clean home environment, and latrines (Torlesse *et al*, 2016; Fadjriah *et al*, 2021; Hendraswari *et al*, 2021; Wulandari *et al*, 2022).
		Urban area	Risk factor	Residing in urban areas can pose several risk factors for stunting in children, including socio-economic disparities, food insecurity, limited access to nutritious food compared to rural areas, and parents being busy working, potentially leading to suboptimal parenting patterns for children (Otsuka *et al*, 2019; French *et al*, 2021; Hendraswari *et al*, 2021).
		Clean living behavior	Prevention factor	Clean living behavior is the behavior related to the awareness of being able to prevent body from disease infection (Djuardi *et al*, 2021; Hendraswari *et al*, 2021; Mulyaningsih *et al*, 2021).

particularly the occupation of the parents (Ramli *et al*, 2009; Huriah *et al*, 2021; Sartika *et al*, 2021; Abri *et al*, 2022; Widyaningsih *et al*, 2022). This condition is closely related to the family's economic ability to meet nutritional consumption, whether in terms of food nutrient diversity, underweight prevention, and sufficient micronutrient intake of vitamin D for pregnant women (Mahmudiono *et al*, 2018; Diana *et al*, 2021; Hafid *et al*, 2021; Sirajuddin *et al*, 2021; Flynn *et al*, 2020; Jahan *et al*, 2021; Hijrawati *et al*, 2021; Abri *et al*, 2022; Berawi *et al*, 2019; Fuada *et al*, 2020; Nurhayati *et al*, 2020; Hafid *et al*, 2021). Agriculture is also an important keyword as a national food security to meet the family's nutritional needs (Mahmudiono *et al*, 2018; French *et al*, 2021).

The other keywords that extensively discussed in selected articles are sanitation and clean and healthy living behaviors (Torlesse *et al*, 2016; Fadjriah *et al*, 2021; Hendraswari *et al*, 2021; Wulandari *et al*, 2022; Djuardi *et al*, 2021; Mulyaningsih *et al*, 2021). Meanwhile, the most discussed keywords are a policy of health care services and public health program for reducing stunting in Indonesia (Hartotok *et al*, 2021; Mutiarasari *et al*, 2021; Indra and Khoirunurrofik, 2022; Widyaningsih *et al*, 2022; Mahmudiono *et al*, 2018; Tampake *et al*, 2021; Absori *et al*, 2022).

Based on the selected keywords, the Government of Indonesia has strategies to achieve the stunting reduction target (Table 2). Agricultural issue is the subject of Law Number 18 of 2012 which is one of the country's high-level policies (Republic of Indonesia, 2012b). This law emphasizes the utilization of consumption to make human resources healthy and productive. Other keywords such as food diversity, underweight reduction target, and stunting reduction target are included in the National Medium-Term Development Plan policy (Republic of Indonesia, 2020; Republic of Indonesia, 2021). On the other hand, diet, anemia, nutritional status, sanitation, and clean and healthy living behaviors

Table 2

Rationality of decreasing the national stunting target based on keywords

No.	Keyword	Existing policy strategy	Strengthening effort
1.	Agriculture	Indonesia Law No. 18 of 2012 concerning food demands the availability, affordability, and utilization of consumption to make human resources healthy and productive (Republic of Indonesia, 2012b).	• Adequate food (healthy food) for the family • Digitization and improvement of stunting prevention literacy in families • Increase local government's commitment to local food resilience. • Increased blood-added tablets in the adolescent phase • Improved access to social assistance • Policy monitoring, research and innovation
2.	Child demographic	The Ministry of Health has developed guidelines for the prevention and management of malnutrition in toddlers in 2019 and guidelines for nutrition services during the COVID-19 period (Indonesia Ministry of Health, 2020).	
3.	Diet	The policy of the Ministry of Education and Culture to introduce healthy food consumption starts from early kindergarten education (Indonesia Ministry of Education and Culture, 2019).	
4.	Food diversity	National Mid-Term Development Plan policies encourage local governments to increase local food capacity (Republic of Indonesia, 2020).	
5.	Underweight	National Mid-Term Development Plan policies targets reducing child nutrition problems (Republic of Indonesia, 2020).	
6.	Vitamin D	Presidential Regulation No. 72 of 2021 hints at the addition of Foodstuffs as a fortification effort (Republic of Indonesia, 2021).	
7.	Length at birth	Ministry of Health's policy to increase the capacity of *Posyandu* (Integrated Service Post) cadres to record baby development (Indonesia Ministry of Health, 2023).	
8.	Exclusive breastfeeding	Ministry of Health policy to encourage exclusive breastfeeding for at least six months (Republic of Indonesia, 2012a).	

Table 2 (cont)

No.	Keyword	Existing policy strategy	Strengthening effort
9.	Parenting	The role of National Population and Family Planning Agency in improving the health quality of families and toddlers (Republic of Indonesia, 2012a)	
10.	Anemia	Ministry of Health's policy regarding the provision of blood-added tablets for pregnant women to prevent anemia (Indonesia Ministry of Health, 2014).	
11.	Nutrition status	Ministry of Social policies related to social assistance programs for necessities and nutritious food to families (Indonesia Ministry of Social Affairs, 2019).	
12.	Policy	Presidential Regulation No. 72 Year 2021 concerning the acceleration of stunting reduction and village fund policy for handling stunting (Republic of Indonesia, 2021)	
13.	Public health	Presidential Regulation No. 72 Year 2021 concerning the acceleration of stunting reduction and village fund policy for handling stunting (Republic of Indonesia, 2021)	
14.	Sanitation	The policy of the Minister of Public Works and Public Housing is to improve access to clean water and sanitation (Republic of Indonesia, 2020)	
15.	Urban residence	The policy of the Minister of Public Works and Public Housing to increase access to clean water facilities, both in urban and rural areas (Republic of Indonesia, 2020).	
16.	Clean living behavior	The role of the health department is to carry out surveillance of clean-living behavior in the family (Indonesia Ministry of Health, 2011)	

COVID-19: corona virus disease 2019

are keywords that is regulated by the strategy under Ministerial-level regulations due to requiring technical efforts for resolution (Indonesia Ministry of Health, 2011; Indonesia Ministry of Social Affairs, 2019; Indonesia Ministry of Health, 2023). Various crucial efforts to strengthen the stunting reduction policy strategy include government commitment, policy monitoring, and innovation to accelerate stunting reduction in Indonesia.

DISCUSSION

This research finds agriculture has a crucial role for food systems in providing adequate nutrition in population, especially for families. Preventing stunting through adequate nutrition and proper food for families can indeed help mitigate the risk of stunting in Indonesia. This aligns with Goudet *et al* (2019) who explained that family sufficient nutrition could prevent stunting in infants and young children, especially in rural areas of low- to middle-income countries. The dietary requirements needed by families to prevent stunting include animal protein sources such as eggs, fish, and meat (Darapheak *et al*, 2013). However, not all families in Indonesia provide enough animal protein to their families each day.

Low-income families in Indonesia do not meet their dietary protein needs and spend more on family expenses to purchase cigarettes (Djutaharta *et al*, 2022). Father's attitude that prioritizes buying cigarettes compared to the family nutritional needs is in line with Kanjilal *et al* (2010) study which explains that chronic child malnutrition nationwide is caused by the role of household socioeconomic status and family health risk behaviors such as smoking. Parental smoking behavior indeed leads to child stunting through two ways (Bella *et al*, 2022). The first is the

exposure of children to second-hand smoke from smoking parents, which directly affects their growth and development. The second is the impact of smoking behavior in terms of the cost of purchasing cigarettes, leading parents to reduce the funds allocated for nutritious food, healthcare expenses, and education. Strengthening efforts to reduce stunting should focus on the family level by increasing awareness and consciousness within families regarding risky behaviors, including smoking behavior (Sartika *et al*, 2021; Susiloretni *et al*, 2021). Normalizing non-smoking behavior within families is crucial, ensuring that children are protected from stunting.

The other keyword based on publications on the risk factors and prevention of stunting in Indonesia is birth length. Stunting can occur due to the prevalence of low birth length and low birth weight, that usually happens due to a lack of literacy in information technology related to stunting prevention and a lack of monitoring and measuring child growth. Research by Putri *et al* (2021) also explained that low birth weight and low birth length increase the risk of stunting in children under 60 months of age. The Presidential Regulation No. 72 Year 2021 strengthens the implementation of the National Strategy for Accelerating Stunting Reduction 2018-2024, which aims to reduce the prevalence of stunting, improve the quality of family life preparation, ensure adequate nutrition intake, improve parenting patterns, enhance access and quality of healthcare services (Republic of Indonesia, 2021). Interventions for families to prevent malnutrition can be prioritized so that Indonesia can achieve a 14% reduction in stunting by 2024.

A balanced diet is a key factor in promoting overall health. Diet involves reducing food portions and replacing them with healthier, nutritious, and high-quality food portions. This is in line with Bloem (2013) who explained that preventing stunting required a nutritious diet,

as an individual need around 40 different nutrients in varying amounts to grow, develop, and stay healthy. Meeting these requirements necessitates consuming a diverse range of foods and various vegetables. Vitamin D is also a keyword in agriculture, as seen in the adequacy of vitamin intake for pregnant women and infants (Bloem, 2013). This aligns with the sustainable development goals (SDGs) target, which states that addressing nutritional issues is in line with the SDG 2, which is to end hunger, achieve food security, improve nutrition, and promote sustainable agriculture. This target aims to eradicate hunger and ensure access to safe, nutritious, and sufficient food for all, especially the poor and vulnerable, including infants (Diana *et al*, 2021).

The key findings from more recent studies on the risk factors and prevention of stunting include public health policies and healthcare services. Public health related to stunting prevention involves access to health facilities, community health centers (*Posyandu*), behaviors related to preventing other nutritional problems such as wasting and obesity, and family smoking prevention behaviors. The local government in Indonesia should mandated its citizens to focus on providing exclusive breastfeeding to their babies regularly and enriching complementary foods. Other efforts are to reduce stunting include the provision of vitamin A, deworming, and vitamin tabula powder to mothers with infants aged 6-23 months twice a year. These stunting reduction efforts have been undertaken in Indonesia as well to achieve a reduction in stunting rates, but they still need to be more intensified.

The term "urban" in this study emerges as a relatively new keyword in the context of researching risk factors and the prevention of stunting in Indonesia. Urban conditions are indeed associated with an unclean environment, such as improper waste disposal, and the possibility of infections as one of the risks of stunting in children. Inadequate

sanitation facilities significantly affect the likelihood of stunting (Irianti *et al*, 2019). Urban areas have easier access to clean water, adequate healthcare facilities, and more social assistance, making it more possible to prevent stunting compared to rural areas. However, urban areas are also associated with working parents who have less time for childcare and less effective child monitoring in relation to stunting. Parenting practices are also related to mothers, fathers, brothers, and other family members who play a role in childcare to prevent stunting and promptly respond when a child get sick. This issue needs to be addressed in urban areas. Public health policies regarding parenting practices, patterns, and clean water sanitation in urban areas can be a focus for the Indonesian government in accelerating efforts to combat stunting.

The strengths of this study lie in its ability to examine the determinants of stunting and government programs as efforts to accelerate the reduction of stunting. The limitations of this research are based on a restricted set of keywords and may potentially be constrained by the database used to gather articles. Secondly, although this study utilized VOSviewer software, subjective assessments by the authors could still introduce errors. Further research would be improved by using expanding the keywords and accessing broader databases. Additionally, comparing the results of the analysis using different bibliometric analysis software (such as BibExcel and HistCite) would be beneficial.

In conclusion, studies related to family food security have been published for a long time, followed by findings on risk factors in children such as birth length and low birth weight according to cases in Indonesia. However, in recent study publications, less-explored intervention efforts, such as public health policies targeting food security, can be applied to families and efforts to prevent the risk of stunting. Accelerating the reduction of stunting in the future also requires intervention in healthy

family behaviors and the avoidance of smoking habits. These policies are also crucial interventions for urban areas to prevent stunting. Accelerating the reduction of stunting also can be achieved through multi-sectoral collaboration, including specific interventions and sensitive interventions conducted in a convergent, holistic, integrated, high-quality manner, and it begin with a family-centered approach.

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CONFLICT OF INTEREST DISCLOSURE

Authors confirm that there is no conflict interest.

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