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THE PREVALENCE AND RISK FACTORS OF STUNTING CHILDREN UNDER 5 YEARS OLD: A SYSTEMATIC REVIEW

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Abstract. Stunting is one of the global issues that occur in children under 5 years old, especially children under 5 years old and come from countries with low income. Understanding the risk factors for stunding can help in determining a more comprehensive treatment strategy. The aim of this systematic review is to determine the prevalence and risk factors/determines of stunting. in children under 5 years old. The literatures come from Pubmed and Ebsco search engines. The keywords used are stunting, prevalence, risk factors, and determinants. Articles are limited to only publications/publications from 2014-2019; in English, stunting in the age group of children taken 5 years is the result of primary research. Of the 79 articles obtained from literature searches, 36 articles were relevant to the systematic purpose of this review. The highest prevalence is in countries in the African (29-64.5% for stunting and 16.1-26.8% for severely stunting) and in Asia (17.8-55.7% for stunting and 6.2-15.9% for severely stunting). The basic causes include Geo-Political-Social-Environment Factors, Economic and Parental. Underlying causes include: Household environment, hygiene practice and maternal factor. Immediate causes include: diseases, feeding and child factors. Overcoming poverty is the key to overcoming stunting and for this a comprehensive, cross-sectoral handling strategy is requires multi-level and multi-sector cooperation and efforts from the global community, state governments and social communities and families to synergize stunting prevention and management.

Keywords: Stunting, children under five years old, prevalence, risk factors.

1. INTRODUCTION

Stunting is one of the global problems that occur in children. Estimated 154.8 million (22.9%) children under 5 globally in 2016 suffered stunting [1]. According to WHO, stunting is the growth and development experienced by children from malnutrition, recurrent infections, and inadequate psychosocial stimulation [2]. Stunting is measured by the height-for-age z-score (HAZ) expresses a child's height in terms of the number of standard deviations (SDs) above or below the median height of healthy children in the same age group or in a reference group. stunted if children have HAZ <−2 SD from the median as short for their age, and severely stunted if children have HAZ <−3 SD from the median group [3].

World Health Assembly (2012) set a target of 16% prevalence rate for stunting by reducing 40% of the number of children aged 5 years stunting by 2025 [4]. This target was then adopted as a target in the Sustainable Development Goal for 2030 on the second goal number 2, namely: By 2030, the end of forms of malnutrition, including Achieving, by 2025 age and address the nutritional needs of adolescent girls, pregnant and lactating women and older persons [5].

Stunting can have an impact on health aspects, children's development and economic aspects both at the family and state level. Based on the conceptual framework on Childhood Stunting, Context, Cause and Consequences from WHO states that stunting has short and long-term consequences. In the short term, stunting can have an impact on health (increased pain and death), have an impact on children's development (cognitive, motoric and language development); and have an economic impact (increasing health costs). The long-term impact of stunting also has an impact on health (a decrease in the child's posture as an adult, increased obesity and associated comorbidity and a decrease in reproductive health), an impact on children's development (a decrease in children's learning performance and a decrease in learning abilities so they cannot reach potential); and has an impact on economic aspects (decreasing work ability and decreasing work productivity) [6].

Children with stunting can experience developing flower retardation due to lack of nutrition, reduced endurance, repeated infections that make children vulnerable to various diseases. Stunting also has an impact on children's mental development which makes it difficult for children to concentrate so that their abilities are reduced and learning achievement is lacking. This will also have an impact on the economic aspects of the family and the state in terms of financing. Stunting events can continue to occur between generations, especially if the mother has a short posture where the pelvis is narrow and tends to cause children with low birth weight. Impaired growth in the child from the womb and after birth can cause children to grow small as adults. [7]. Therefore, understanding the situation (prevalence) and the factors that cause stunting are very important. Based on the back circumference, this literature review was made with the aim to determine the prevalence and risk factors / determines of stunting. It is hoped that the results of this review can become the basis for the strategy to prevent and treat stunting.

2. METHODS

This systematic review was conducted to investigate the prevalence and risk factors of stunting under 5 years old. Searching for literature is done through search engines/databased: Ebsco / Chinal and PubMed. Criteria for articles are limited to only English-language articles published in 2014 - 2019-time brackets, the results of primary research, the research area in the age group of children taken 5 years, articles must have abstracts and full-text papers. Articles will be excluded (exclusion criteria) if they do not use WHO standards in determining stunting status of children and if stunting coincides with certain other chronic conditions/diseases such as anemia, congestive heart failure. The article search process uses the PRISMA method [8] (Figure 1).

A total of 36 articles were selected for review. Descriptive analysis was carried out to get an overview of where this research was conducted, the type of research and statistical analysis used, population and research samples and specifically to get an idea of the prevalence of stunting and whatever factors determine stunting. All studies use the World Health Organization (WHO) Child Growth Standards (2016) in determining stunting status. The height of the age z-score expresses a child height in terms of standard deviations (SDs) above or below the median height of healthy children in the same age group or in a reference group. Children with a measurement of <SD2 from the median were considered as short for their age (stunted), while children with measurement of <−3 SD from the median group were considered to be severely stunted [3]. The prevalence of stunting is categorized based on the cut-off values for the WHO public health significance

for stunting: <20%: Low prevalence 20-29%: Medium prevalence 30-39%: High prevalence ≥ 40%: Very high prevalence [7]. It is expected that the results of this systematic literature review can contribute to the development of strategy programs for prevention and prevention of stunting.

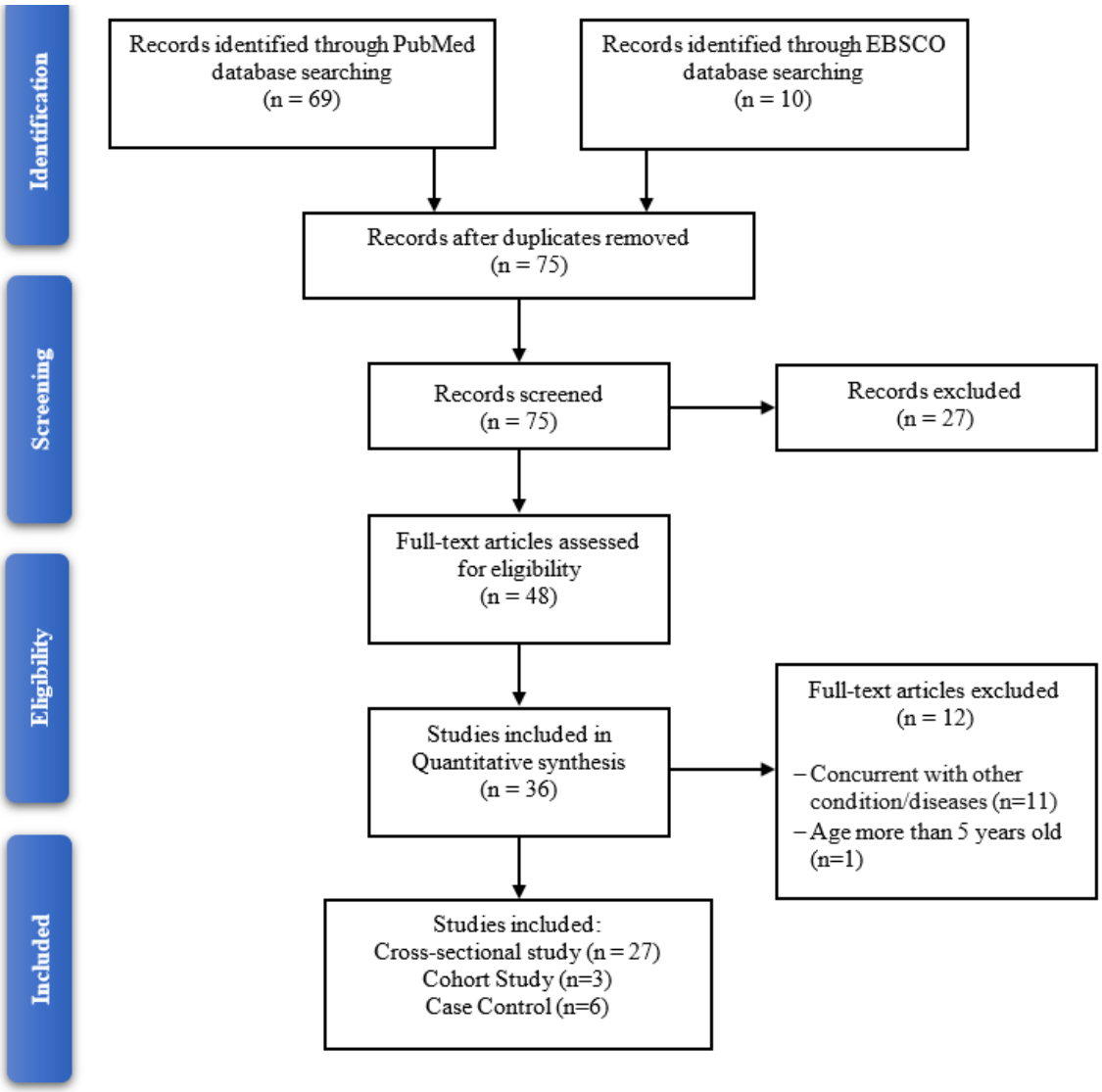

Figure 1: PRISMA diagram of literature review process

3. RESULTS AND DISCUSSION

This systematic review is intended to invest- gate the prevalence and risk factors/determines the occurrence of stunting in children under 5 years.

Continent	Country/is	Prevalence	References
Asia	China	S:17.8-27	10, 15

		SS:13.2	
	Indonesia	S: 28.4 SS: 6.7	24
	India	S: 22.7-55.7 S: 7.4	15,20
	Vietnam	S: 22.2	41
	Bangladesh	S:18-48	35, 30,22,18
	Nepal	S: 26.3-40.6 SS: 10.2-15.9	29
	Palestine	19.6	32
Africa	Rwanda-2	31.6-38	23,45
	Ethiopia-7	S:41.7-64.5 MS:37.7 SS:21.3-26.8	33,19,39,27,40,28,37
	Tanzania-3	S:41.6-45.7 SS:14.4-16.1	21,12,36
	Uganda-1	Not mention	33
	Madagascar	40-52.8	25
	Central African Republic (CAR)	64.25	44
	Burundi	S:53 SS:20.9	26
	Ghana	16.1	43
	Democratic Republic of Congo (DRC)	S:42.7 MS:20.2 SS: 22.5	11
	Mozambique	Not mention	14
	Nigeria	S: 29 SS:16.4	13
	Somalia	S:31	16
Multi-countries	Bangladesh, Brazil, India, Nepal, Peru, South Africa, and Tanzania	43---74	42
	Ethiopia, Kenya, Uganda	29.1-39.7	31
	low- and middle- income countries	8.4-44.4	34

Figure 2: Summary of Stunting Prevalence according the continent and country/is

From the 36 studies, the highest prevalence of stunting under 5 years old (Figure 2) was in countries in Africa such as Ethiopia, Central African Republic (CAR), Madagascar, Burundi, Tanzania, Democratic Republic of Congo (DRC), Rwanda, Somalia, Nigeria, Ghana with the prevalence of 29-64.5% for stunting and 16.1-26.8% for severe stunting. The prevalence in Asian countries such as India, Bangladesh, Nepal, Indonesia, China, Vietnam and Palestine ranges from 17.8-55.7% for stunting and 6.2-15.9% for severe stunting. Studies on multi country based on income obtained stunting prevalence of 8.4% for countries with high income and 44.4% for countries with Low Income. Based on the prevalence range it can be seen that the prevalence of stunting in Africa is classified as high to very high prevalence for stunting and classified as low to medium prevalence for severely stunting. The prevalence of Asian tendering varies from low to very high prevalence for stunting and is classified as low prevalence for severely stunting.

The results showed that the highest prevalence of stunting under 5 years old in the countries in the African continent was classified as high to very high prevalence for stunting and low to medium prevalence for severely stunting. While the countries in Asia tend to vary from low to very high prevalence for stunting and are classified as low prevalence for severely stunting. When viewed from such a level of income, it can be seen that countries in Africa are included in the group of countries with low income. This is in line with the results of previous studies which stated that the prevalence of undernutrition including stunting was highest in countries with low income compared to countries with middle income [9,10].

Stunting risk factors (Figure 3) are divided into 3 main causes categories, namely: Basic Causes, Underlying causes and Immediate causes. Basic causes including Geo-Political-Social-Environment Factors, Economic factors and Parental Factor. Underlying cause including: Household environment factor, hygiene practice factor and maternal factor. Immediate causes including: diseases factors, feeding factor and child factors.

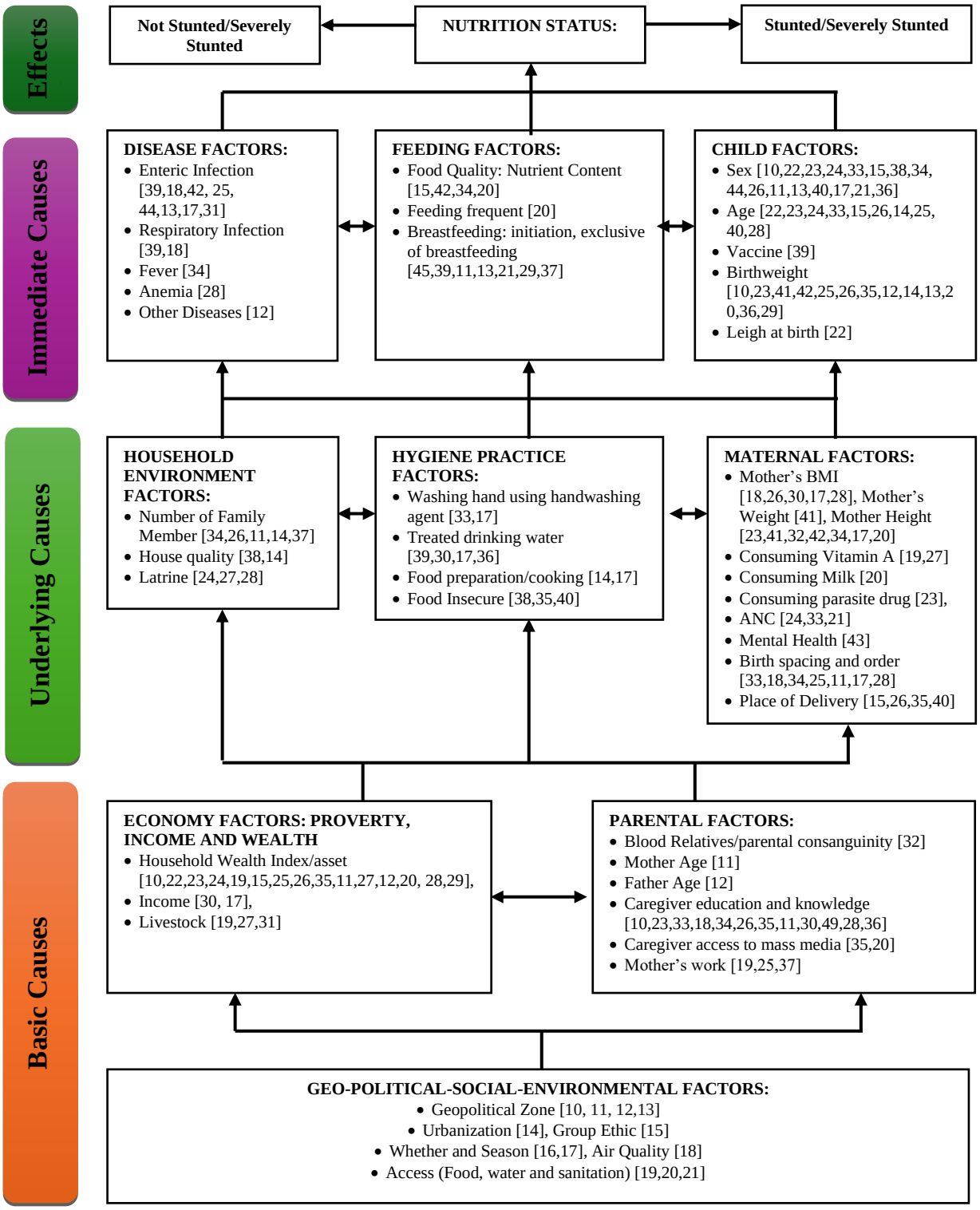

Figure 3: Framework of Causes of Stunting under 5 years old modified from UNICEF/WHO Framework

3.1 Basic Causes

Basic causes including: Geo-Political-Social-Environment Factors, Economic factors and Parental Factor. In terms of Geo-Political-Social-Environment Factors, this result of a review of the literature found that the geopolitical area in which children live is one of the

factors suspected of causing stunting [13]. This is related to the dominance of the characteristics of the area: urban / rural areas; certain ethnicity, religion and culture; and agriculture that affect the pattern of habits of local people in their respective regions. Accordingly, other studies also state that children from rural areas are more at risk for stunting compared to children in the urban area [14,15]. Aside that, weather and season conditions are also risk factors for stunting [16,17]. Children born in the rainy season have protection for stunting. This is related to the availability of water and food sources from agriculture. Drought conditions make plants unable to grow. The unavailability of food and water causes disrupted nutrition and family sanitation. This increases the child's risk of developing various diseases and stunting. Air and water pollution are risk factors for stunting [18,19,20,21].

In terms of Economic factors, this result of a review of the literature found that the risks of stunting include: Poverty status, low income and poorest Index Wealth. In this review literature, children who live in families with poor economic status are at greater risk of stunting compared to children from families who have middle or higher economic status. [10,22,23,24,19,15,25,26,35,11,27,17,20,28,29,30]. This is related to the family's ability to obtain food (family purchasing power) due to the inability of the family to buy food which has an impact on children's nutritional insufficiency. Moreover, poor families are also closely related to a lack of education, health-related knowledge and even limited access to health services, which all increase the risk of children becoming stunting. [19,27,31].

In relation to Parental Fact, the results of this literature review find that there is a kinship with parents is one of the risk factors that inhibits the development of stunting [32]. This is related to genetic factors that allow children suffering from genital diseases such as autosomal recessive disease, congenital anomalies and stunting and infant mortality. Besides that, the age of the mother during pregnancy and childbirth has a risk of stunting. [11]. This can be related to the readiness of the reproductive organs of the mother to be able to receive and undergo the pregnancy process. The father's age is also a risk factor for stunting in children. Dad young age increases the risk of children suffering from stunting [12]. This is related to the father's ability to protect his family especially in providing sufficient funds and food availability in the family. In addition, the level of education/knowledge of parents (father and mother) is a risk factor for stunting in children. [10,23,33,18,34,26, 35,11,30,40,28,36]

3.2 Underlying Causes

Underlying cause including: Household environment factor, hygiene practice factor and maternal factor. In term of Household environment factor: Number of Family Member, House quality and availability of Latrine are factor are factor associated with stunting among children. Children who live in families with a large number of members are at increased risk of stunting in children compared to children who are in small families [40,26,11,14,37]. This is related to the ability of the family to meet nutritional needs in the family. Home quality is also a risk factor for stunting. Children who live in homes with poor quality, including homes with inadequate floors, have a risk of stunting in children. [38,14]. This is related to sanitation from the home environment. Home sanitation that is not clean, allows children to be easily attacked by diseases such as intestinal worms that can interfere with children's nutrition.

In terms of hygiene practice factors, the habit of washing children 's hands and the use of hand washing soap also have a risk of stunting in children. Children who usually do not wash their hands using soap before eating and after defecating have a higher risk of stunting [33,17]. children who do not wash their hands and do not use soap when they eat and after defecation will have a number of germs that cause disease that can easily enter to contaminate children and cause disease. In terms of Maternal Factors, Mothers with less weight (weight <43 kg) [41]; short height (160) [23,41,32,42,34,17,20]; and with less BMI (<18.5 kg / m2) [18,26,30,17,28] are a predictor of stunting in children. This is related to the nutritional status of the mother to support child growth both in the womb and after the child is born. BMI is an indicator of maternal nutritional status. Mothers who do not receive vitamin A supplements after childbirth are at risk for stunting [19,27]. Mothers who consume foods containing protein such as milk and other dairy products during pregnancy and participated in Antenatal care (ANC) activities have protection against stunting [20].

3.1 Immediate Causes

Immediate causes including: diseases factors, feeding factor and child factors. In terms of Disease Factors, Children's health status is very influential and a predictor of stunting [28]. Children affected by diseases, such as malaria, pneumonia and other infectious diseases are more at risk for stunting. This is caused by an imperfect body defense system. This then makes the child very easy to become weak and lose weight. This condition worsens the nutritional status of children and inhibits growth so that children can become stunting. Children who have enteric infection are more at risk for stunting [39,18,42, 25, 44,13,17,31].

In terms of Feeding Factors, the quality and quantity of children's food intake is one of the predictor factors for stunting. Children who do not get the Minimum Diet Diversity (MMD) tend to experience stunting [15]. The inadequate nutrition (protein and other nutrients) needed by the child results in a child's growth disorder and causes stunting. Breastfeeding is one of the predictor factors for stunting. Children who are breastfed after one hour after giving birth and mothers who squeeze their first milk are more at risk for stunting compared with children who receive ASI less than 1 hour after giving birth [39,11]. This is related to the quality of the colostrum given. Colostrum contains nutrients (Vitamin A, antibodies and other protective factors) far higher than other milk. Exclusive breastfeeding for more than 12 months is actually a protective factor for stunting [45,21,13,29,37].

In terms of Child Factors, Child sex is also a predictor of stunting. A male type of male family has a higher risk of stunting compared to girls [10,22,23,24,33,15,38,34, 44,26,11,13,40,17,21,36]. This is related to metabolic needs (biologically) in boys greater than girls, so they need more nutritional intake. The age of the child is also a predictor of stunting. Increasing age of children will increase the risk of stunting [22,23,24,33,15,26,14,25, 40,28]. This is closely related to increasing nutritional needs as we age. In terms of vaccination, children who did not receive the vaccine were more at risk for stunting compared to those who received the vaccine [39]. Vaccines are efforts made to improve the child's immune system so that they don't get sick. if the child does not get the right vaccination, it will make the child susceptible to various diseases that can interfere with the child's growth and of course the risk of stunting. Children born with low birth weight are one of the main predictors of the

practice of stunting [10,23,41,42,25,26,35,12,14,13,20,36,29]. This is closely related to the child's ability to grow.

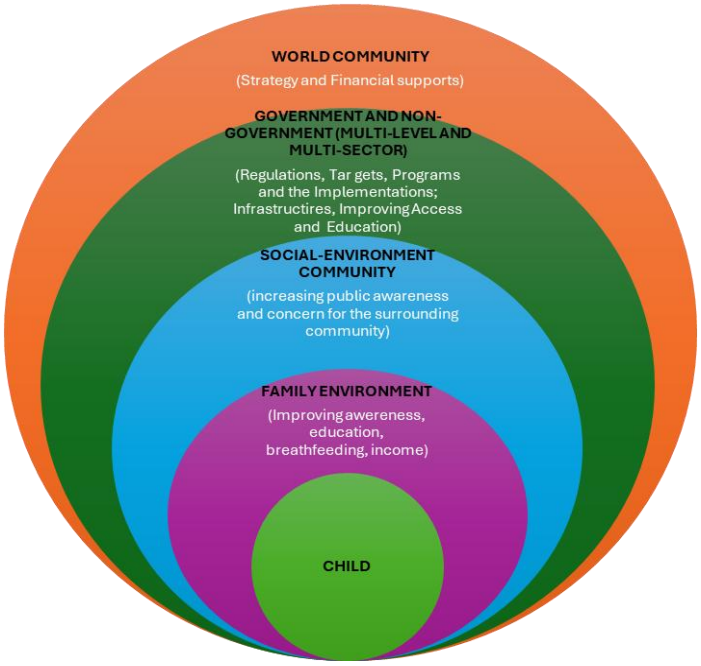

Figure 4: Multi /Level-Sector Strategies needed to Prevent and Handle Stunting Children under 5 years old

By knowing and understanding the prevalence and risk factors for stunting in children under 5 years of age, it can be concluded that the incidence of stunting is the result of a variety of complex problems at the government, community, family and even mother and child levels. Poverty eradication is the key to handling stunting. Therefore, in handling it requires a cross-sectoral strategy, synergy of various parties and global community participation in its handling (Figure 4). Globally good society in the form of world organizations in various sectors is expected to help countries with a relatively high prevalence of stunting in terms of understanding the existing conditions/problems, compiling management strategies, assisting in planning and implementation and also assisting in financial and facilities/infrastructure/personnel in the implementation of stunting prevention and prevention programs. At the level of state government, political will is needed from the state to resolve stunting problems in their country. This must reflect the regulations, policies and programs that are compiled comprehensively to prevent and overcome stunting. In its implementation, the government certainly needs the help of various parties and levels of government and non-government.

At the social level of the surrounding community, awareness and leadership of families who have stunting problems also need to be awakened. It is hoped that the surrounding community can help each other both in terms of sharing knowledge, facilities and access to food, water and hygiene, even in financial terms. At the family level, there is certainly a need for awareness and proactivity from the family to assess the condition of the family, plan for the future number of families, seek fulfillment of family needs,

proactively find useful sources of information, and utilize existing public facilities to meet family and child needs.

4. CONCLUSIONS

From the results of the literature review of 36 results of previous studies related to the prevalence and risk factors for stunting children under 5 years old, it can be concluded that the highest prevalence of stunting is in countries with high to very high African categories. This is closely related to developing countries with relatively small state revenues. In this literature review, it is also concluded that there are 3 major categories of stunting factors, namely: Basic Causes, Underlying causes and Immediate causes. Basic causes including Geo-Political-Social-Environment Factors, Economic factors and Parental Factor. Underlying causes including: Household environment factor, hygiene practice factor and maternal factor. Immediate causes including: diseases factors, feeding factor and child factors. Poverty is the core problem of stunting. Therefore, it requires multi-level and multi-sector cooperation and efforts from the global community, state governments and social communities and families to synergize stunting prevention and management.

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