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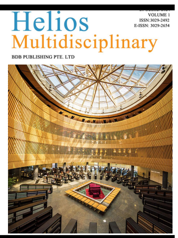

A Systematic Review and Meta-Analysis of Multilevel Analysis of Risk Factors for Stunting Among Under Five-Year-Old Children in Indonesia

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ABSTRACT

The causes of stunting, according to the WHO Conceptual Framework, are divided into child factors, household, and family factors, and community and social factors. Databases were systematically reviewed from 2015 until 2021 in Google Scholar, PubMed, and ScienceDirect. The selection of eligible studies was conducted according to PRISMA. A meta-analysis of studies was performed to analyze the association between multilevel risk factors stunting(child, household, family, community and social) and stunting. Of 26.492 articles, 16 articles were included to review. The results of the meta-analysis show that there are various risk factors for stunting in children under five years in Indonesia, such as the individual level (child factor), male sex OR:1.21 (95% CI 1.12-1.31), birth length <48 cm OR:14.88 (95% CI 7.68-28.87), low birth weight <2.500 gr OR:2.43 (95% CI 1.68-3.51), history of infectious diseases OR:2.83 (95% CI 1.61-5.00), not exclusive breastfeeding OR: 2.39 (95% CI 0.72-7.93), household and family level: maternal height < 150 OR:1.86 (95% CI 1.26-2.77), maternal age < 20 OR: 5.17 (95% CI 3.01-8.09), bad sanitation OR:1.28 (95% CI 1.00-1.63), low father and mother education OR:1.58 (95% CI 1.14-2.18), unavailability of food OR:3.29 (95% CI 1.35-8.02), family size > 5 OR:1.41 (95% CI 1.09-1.82) and, community level and social factors, rural area (living outside Java-Bali) OR:1.41 (95% CI 1.09-1.82), wealth quantile 1 OR:1.39 (95% CI 1.23-1.56). The findings of the meta-analysis show that reducing stunting requires integrated health promotion, prevention, and intervention using a multi-sectoral strategy involving health professionals, families, the government, and the community.

1. Introduction

As a result of persistent starvation during the first 1000 days of life, when children's growth cannot be altered, stunting or being short is a hidden catastrophe (Trihono, 2015). Stunting in children is a serious issue since it raises the risk of morbidity and mortality, obesity, and non-communicable diseases in later life, as well as the likelihood that people would be short adults with delayed cognitive development and lower levels of productivity and income. (UNICEF / WHO / World Bank Group, 2020)[1]

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Indonesia is rated 108th out of 132 nations with a prevalence of stunting according to the Global Nutrition Report 2016. Second place went to Indonesia, where the majority of Southeast Asia's highest rate of stunting after Cambodia (Rocha et al., 2016). Indonesia is one of 17 nations that are categorized as having a double burden of nutrition, including both excess and undernutrition (IFPRI, 2015)

According to the 2018 Basic Health Research data, there are around 7 million stunted children under the age of five, or 30.8% of all children.; this is far from the target that the Indonesian government wants of 14% in 2024. The stunting prevalence of Aceh Province ranks first at 37,9%, followed by West Sulawesi Province in second place with 37.1% and East Nusa Tenggara Province in third with 35.9%, while Jakarta Province in the last place out of 34 provinces with only 16.2% (Kemenkes RI, 2018).

Based on the theory of H.L. Blum that public health is influenced by four factors, namely (a) the environment such as economic, social, political, and cultural; (b) behaviour (lifestyle); (c) health services, and (d) heredity or genetics (Blum, 1974).

According to the WHO conceptual framework for stunting (2013), the factors that affect stunting are those at the individual level, the family level, the community level, and the level of the household (for example, food security, child care, clean water and sanitation, lack of essential health services, and maternal education). (Hagos et al., 2017). In this literature search, the author selects literature that uses the WHO child stunting framework(Stewart CP, Iannotti L, Dewey KG, 2013) to assess risk factors for stunting at multilevels.

Based on the foregoing context, this literature review seeks to identify the risk variables for stunting using a multilevel analysis based on the WHO concept framework. Given that factors that affect stunting can be found on many different levels, including those that affect families, communities, and individuals.

2. Methods

This study uses a systematic review method to describe the risk factors for the PRISMA (Preferred Reporting Item for Systematic Review and Meta-Analysis) statement stunting using the WHO concept framework in multilevel analysis. PICOS: The population in this review article is CHILDREN under five years old, the intervention a risk factors suspected of causing stunting according to the WHO concept framework, Comparison: toddlers not stunting or without comparison (*cross sectional*), Outcome: stunting toddler, and study design: cross-sectional and case-control.

In this systematic review, the inclusion criteria used are as follows:

a. This research should be related to the risk factors for stunting in children under five with a multilevel analysis using the WHO concept framework in Indonesia,
b. The full text of the study must be available in English and Indonesian
c. Articles used from 2015 to 2021.
d. Articles are available in full text and open access.
e. Performed analysis test until multivariate

This literature is reviewed based on the search for relevant health databases, namely PubMed, Scientific Direct and Google Scholar, using the keywords "Stunting AND maternal AND child AND household AND community AND risk factors OR determinants AND Indonesia". Data selection and analysis through literature search with filter articles for 2015-2021 and full text obtained 26,492 PubMed (9,251), google scholar (9,980), scientific direct (7,261). A total of 20,737 irrelevant articles, potentially relevant ones, were screened based on inclusion and exclusion criteria; there were 5,739 not suitable. Sixteen papers were tested for eligibility by reading systematically. The objectives, methods, and results of all 16 articles were summarized to identify multiple risk factors for stunting the WHO concept framework in the multilevel analysis described in the 16 articles. For an illustration of the data selection process is described (Figure 1)

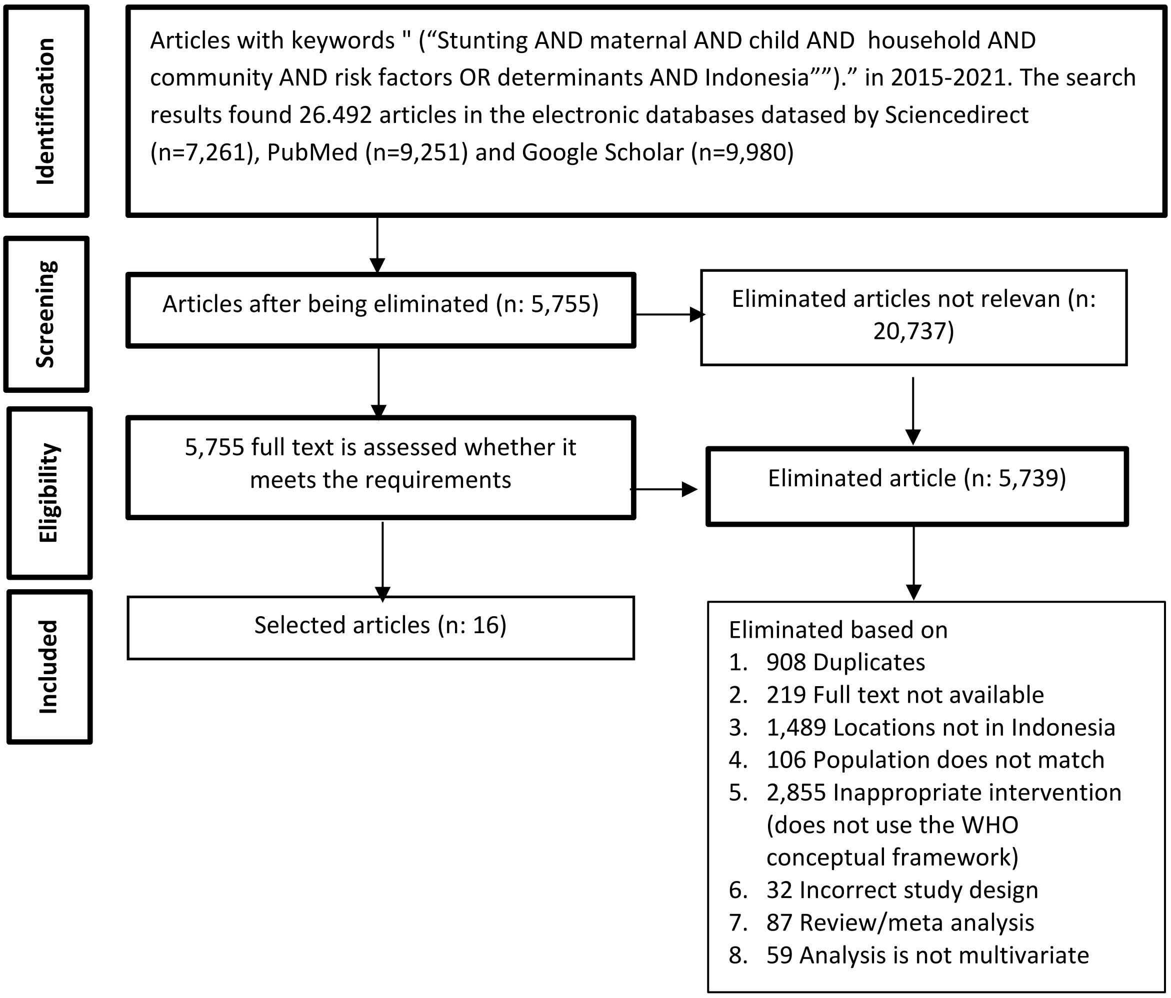

Figure 1. Literaure search and screening flowchart

Data analysis

RevMan 5.3 was used to examine the data for this research meta-analysis test. The odds ratio (OR) with a 95% confidence interval (CI) was used to assess the strength of the association between risk variables and stunting. If I2 was greater than 50%, a random effects model was employed in the study; otherwise, a fixed effect model was utilized. The Z test was used to estimate the overall impact (OR), and P 0.05 was considered significant. The Chi2 estimator, the test for heterogeneity, and the I2 statistic were used to estimate the level of heterogeneity. Heterogeneity in the Q test was defined as P0.05 and an I2 value greater than 50%.

Results

In electronic databases (Sciencedirect, Pubmed Research Gate, and Google Scholar), 26.492 journal articles were discovered during the search for relevant literature. Following the selection of the search results into 16 journal articles in accordance with the standards established in(Table 1), the meta analysis's findings about the risk variables for stunting in Indonesia are shown in (Table 2).

Table 1. Study characteristics

Author	Population	∑ stunted children	∑normal height children	Independen Variabel	Design
Kusumawati, 2015 (Kusumawati et al., 2015)	100 children aged 6-36 months	50 stunted children	50 normal height children	birth weight, birth length, breastfeeding, infectious disease, health services and immunizations, gender, age, mother's knowledge, parenting style for children, father's and mothers height, mom's job, family income, number of family members, food availability, environment sanitation Stunted children	Case Control
Ni'mah Khoirun, 2015 (Ni`mah Khoirun & Nadhiroh, 2015)	68 children aged 12-59 months	34 stunted children	34 normal height children.	birth weight, birth length, breastfeeding, family income, father's and mother education, mother's knowledge, number of family members	Case Control
Rukmana, 2016 (Rukmana et al., 2016)	360 children aged 6-24 months	67 stunted children	293 normal height children	Gender, birth weight, birth length, ras, father's and mother education, father's and mother job, family income	Cross Sectional

Rachmi CN, 2016 (Rachmi CN, Agho KE, Li M, 2016)	Wave 1 : 938 Wave 2 : 913 Wave 3 : 939 Wave 4 : 1.311 (Children aged 2-4,9 years)	Wave 1 : 477 Wave 2 : 444 Wave 3 : 421 Wave 4 : 481	Wave 1 : 461 Wave 2 : 469 Wave 3 : 518 Wave 4 : 830	Age, sex, birth weight, breastfeeding, age of weaning, age starting complementary food, child weight and height, mothers age, fathers age, parents marital status, mothers BMI, fathers BMI, mothers height, fathers height, ever had check up during pregnancy, mothers education, fathers education, households wealth index, housing area and region	Cross Sectional

Torlesse, 2016 (Torlesse et al., 2016)	1.366 children age 0-23 months	389 stunted children	977 normal height children	Gender, children age, maternal education, maternal job, family income, maternal age pregnancy, maternal MUAC, birth weight, birth length, exclusive breastfeeding, infection history	Cross Sectional
Aryastami, 2017 (Aryastami et al., 2017)	3.024 children aged 12-23 months	1.222 stunted children	1.802 normal height children	Child's gender, LBW status, Had neonatal illness, Food intake history, Exposure to health program/service, Economic status, , Infants characteristic	Cross Sectional
Palino, 2017 (Palino & masjid, 2017)	, and	65 stunted children	65 normal height children	Children's age, sex, birth weight, mothers height, birth distance, parity, households wealth index, mothers education, fathers education	Case Control
Badriyah, 2018 (Badriyah & Syafiq, 2017)	9,688 children under the age of two years	3.229 stunted children	6.459 normal height children	Age, gender, birth weight, early initiation, breastfeeding, exclusive breastfeeding, diarrhoea, tall mother, mothers level of education, employment status of mother, socioeconomic status, number of family members, water source, physical quality of water, distance to source of contamination, distance to water source, toilet facilities, sewage management, waste management, handwashing,	Cross Sectiona l

				open defecation,	
Rakhmahayu, 2019 (Rakhmahayu et al., 2019)	200 children aged 6-24 months	57 stunted children	143 normal height children	Age, gender, parental occupation, place of residence, maternal MUAC, maternal education, paternal education, family income, allotment of family food, birth weight, and breastfeeding practices (exclusive and complementary)	Cross Sectiona l
Manggala, 2018 (Manggala et al., 2018)	166 children age 24-59 months	37 stunted children	129 normal height children	Maternal height, MUAC, maternal age, parity, gestational age, child sex, birth order, birth weight, birth length, exclusive breastfeeding, immunization status, housing location, and paternal and maternal education	Cross Sectiona l
Indriani, 2018 (Indriani et al., 2018)	225 children under five years	75 stunted children	150 normal height children	Maternal height, birth length, family size, posyandu activeness	Case Control

Sajalia, 2018 (Sajalia et al., 2018)	186 children under five years	62 stunted children	124 normal height children	Gender, age of the children, maternal education, employment status, family income, maternal age at pregnancy, maternal MUAC, birthweight, length, only-breastfeeding status, history of infections, and posyandu activity	Case Control
Titaley, 2019 (Titaley et al., 2019)	24,657 children under five years	8.309 stunted children	16.348 normal height children	Region, place of residence, number of children under five in the household, number of people in the household, household wealth index, mother's education level, father's education level, mother's employment level, father's employment level, maternal age at childbirth, number of ANC visits, number of iron/folic acid supplements used during pregnancy, sex of the baby, ever breastfed, diarrhoea in the last two weeks, child's age, weight at birth, and pregnancy stage at birth.	Cross Sectional

Sugiyanto, 2019 (Sugiyanto et al., 2019)	225 children aged 5-59 months	72 stunted children	153 normal height children	Children age, gender, nutritional status, exclusive breasfeeding, history of infectious disease, birth weight, birth length, maternal education, maternal height, income, basic sanitation/environment, family members, children under five birth, basic sanitation, village status	Case control
Wicaksono, 2020 (Wicaksono & Harsanti, 2020)	76,165 children aged under 5 years	27.927 stunted children	48.238 normal height children	Sex of children, vaccination status, slum dwelling, father's education, maternal education, household wealth, numbers of household member, type of residence, long GDP per capita, poverty rate, ratio of profesional health	Cross Sectiona l
Mulyaningsih, 2021(Mulyani ngsih et al., 2021)	8.045 children	4.044 stunted children	4.001 normal height children	Unhealthy snacking, gender, birth weight, diarrhea, mothers education, mothers stature, consumption quartile,regional, access to clean water, access to sanitation, access to hygiene, nutrition specific intervention	Cross Sectiona l

No	Risk factor stunting	Heterogenitas			Florest Plot		*Funnel Plot*
		(I^2)	*Fixed effect*	*Random Effect*	P value	aOR (95% CI)	
1.	Sex	75%	-	√	0,00001	1.21 (1.12-1.31)	bias
2.	Birth length	0%	√	-	0,00001	14.88 (7.68-28.87)	bias
3.	Low Birth Weight	87%	-	√	0,00001	2.43 (1.68-3.51)	bias
4.	Infectious Disease	92%	-	√	0,00003	2.83 (1.61-5.00)	bias
5.	children who did not get exclusive breastfeeding	72%	-	√	0,15	2.39 (0.72-7.93)	bias
6.	Maternal Height	92%	-	√	0,002	1.86 (1.26-2.77)	bias
7.	Maternal age at pregnancy	0%	√	-	0,00001	5.17 (3.01-	bias
8.	Slum dwelling/ environment sanitation	78%	-	√	0,05	1.28 (1.00-1.63)	bias
9.	Father and maternal educated	62%	-	√	0,006	1.58 (1.14-2.18)	bias
10.	Food availability	0%	√	-	0,009	3.29 (1.35-8.02)	bias
11.	Family Size	96%	-	√	0,001	1.41 (1.09-1.82)	bias
12.	Living outside Java-Bali and rural area	95%	-	√	0,06	1.37 (0.99-1.91)	bias
13	Family income or wealth quintile	36%	√	-	0,00001	1.39 (1.23-1.56)	bias

Table 2. Meta analysis test results risk factor of stunting in Indonesia

3. Discussion

Child level (individual)

Male toddlers are more likely to experience stunting than female toddlers; male children are more likely to experience stunting. According to the findings, the combined effect of the high heterogeneity and random effect models is equal to OR 1.21 (95% CI: 1.21-1.31). It can be inferred that male children are 1.21 times more likely than female children to experience stunting. According to statistics, there is a strong correlation between male sex and stunting (p=0.00001). Low birth weight kids are more likely to be underweight and stay underweight throughout early childhood because men are more physically active and produce more energy that should be channeled to improve growth. Due to maternal causes, who were already malnourished before pregnancy, (Aryastami et al., 2017; Badriyah & Syafiq, 2017; Mulyaningsih et al., 2021; Titaley et al., 2019; Wicaksono & Harsanti, 2020). Additionally, it is consistent with studies on stunting predictors for children under three years old that were done in Vietnam and Nigeria. Baby boys' gender is one of the key predictors for stunting. (Akombi et al., 2017; Hanieh et al., 2019).

Stunting risk is increased when birth length is less than 48 cm. The results show that the cumulative effect is equal to OR 14.88 (95% CI: 7.68-28.87) and that the heterogeneity between studies is modest. It can be inferred that babies born shorter than 48 cm have a 14.88 times higher risk of stunting than babies born taller than 48 cm. It can be demonstrated statistically that stunting and birth length 48 cm are significantly related (p=0.00001). It is caused by internal variables like genetics, which have a significant role, as well as additional internal factors including gender, family, ethnicity, and race. One of the factors affecting a child's growth and development is their body length at birth. Stunting is three times more likely to occur if the birth length is shorter. (Indriani et al., 2018; Manggala et al., 2018)

Because a baby's weight increases with age starting at 12 months until the kid reaches the age of 2, low birth weight (LBW), which is 2.500gr, will also increase the risk of stunting. According to the findings, the total effect of the high heterogeneity and random effect models is equal to OR 2.43 (95% CI: 1.68-3.51). It can be concluded that, in comparison to LBW > 2.500gr, LBW 2.500gr has a 2.43 times higher risk of stunting. It is statistically demonstrated that stunting and low birth weight are significantly correlated (p=0.00001). If supplementary feeding is not age-appropriate and exclusive breastfeeding is not practiced, problems with a child's growth and development will arise. (Aryastami et al., 2017; Badriyah & Syafiq, 2017; Manggala et al., 2018; Ni`mah Khoirun & Nadhiroh, 2015; Palino & masjid, 2017; Rachmi CN, Agho KE, Li M, 2016; Rakhmahayu et al., 2019; Rukmana et al., 2016; Sajalia et al., 2018; Titaley et al., 2019). Research conducted outside Indonesia, including Zambia, India and Rwanda, also found that low birth weight (LBW) increased the risk of stunting in toddlers (Víctor M. Aguayo et al., 2016; Hasegawa et al., 2017; Nshimyiryo et al., 2019)

The likelihood of stunting is increased among children who have experienced infectious infections like pneumonia or diarrhea within the previous six months. The combined effect produced by the high heterogeneity and random effect models in the research is equal to OR 2.83 (95% CI: 1.61-5.00). It can be inferred that children with an infectious disease history are 2.83 times more likely to experience stunting than children without such a history. According to statistics, there is a strong link between a child's history of infectious diseases and stunting (p=0.00003), as when a child has diarrhea, they will lose fluids and experience problems with their appetite and absorption. These nutritional issues make children under five more susceptible to infectious diseases. (Aryastami et al., 2017; Kusumawati et al., 2015; Mulyaningsih et al., 2021; Sajalia et al., 2018; Sugiyanto et al., 2019). Similar research was done in Madagascar, where it was discovered that toddlers with a history of infectious disorders (diarrhea) had a three times higher risk of stunting. (Rabaoarisoa et al., 2017)

If a child is not exclusively breastfed for six months, their risk of stunting increases. (Badriyah & Syafiq, 2017; Manggala et al., 2018; Ni`mah Khoirun & Nadhiroh, 2015; Rakhmahayu et al., 2019; Sugiyanto et al., 2019). The cumulative effect produced by the high heterogeneity and random effect model of research is equal to OR: 2.39 (95% CI 0.72-7.93). According to this interpretation, a youngster who does not receive exclusive breastfeeding is 2.39 times more likely to suffer from stunting than a female child. Statistics indicate that there is no correlation between non-exclusive breastfeeding and stunting (p=0.15), although breastfeeding offers a number of other benefits, such as increasing children's resilience to disease and ear infections, reducing the frequency of diarrhea, alleviating chronic constipation, etc. Due to the significant impact that exclusive breastfeeding has on children's nutritional status, the WHO advises implementing an intervention to increase breastfeeding for the first six months as one of the steps to achieve the WHO Global Nutrition Targets 2025 regarding the reduction of stunting in children under the age of five. (WHO, 2014)

Household and family Level

According to this study, children with mothers who are shorter than 150 cm tend to have greater stunting rates. The overall effect produced by the high heterogeneity in study variation and random effect model is OR: 1.86 (95% CI: 1.26-2.77). It can be inferred that mothers who are shorter than 150 cm have a 1.86 times higher risk of stunting than mothers who are taller than 150 cm. Given that hereditary variables play a key role in the occurrence of stunting, it is statistically demonstrated that there is a substantial association between mother height of less than 150 cm and stunting (p=0.002). (Badriyah & Syafiq, 2017; Indriani et al., 2018; Manggala et al., 2018; Mulyaningsih et al., 2021; Palino & masjid, 2017; Rachmi CN, Agho KE, Li M, 2016; Sugiyanto et al., 2019; Titaley et al., 2019). India-based research indicates that children born to moms with heights below 145 cm have a twofold increased risk of stunting. (Víctor M. Aguayo et al., 2016).

Stunting will also rise if the mother was between 20 and 35 years old at the time of conception. According to the findings, heterogeneity in study variation virtually never occurs, and a fixed effect model yields a combined effect with an OR of 5.17 (95% CI: 3.01-8.09). It can be inferred that mothers who are 20 or older throughout their pregnancies have a 5.71 times higher risk of stunting than mothers who are between the ages of 20 and 35. According to statistics, there is a strong correlation between stunting and the mother's age during pregnancy, specifically between 20 and 35 years old (p=0.00001). Because pregnant women under the age of 20 do not have the same knowledge or expertise in child nutrition as pregnant women over the age of 35, the likelihood of complications after childbirth will have an impact on nutritional intake during pregnancy. (Manggala et al., 2018; Sajalia et al., 2018). Research conducted in Cebu, a too young pregnancy increases the risk of stunting by 1.51(Maravilla et al., 2020). A study conducted in Iran where the age above 35 years during pregnancy has a chance of giving birth to stunting children 2.74 times.

This study demonstrates that children who reside in slum areas with poor sanitation have a higher risk of stunting because of numerous exposures that can impair a child's ability to absorb nutrients. (Kusumawati et al., 2015; Mulyaningsih et al., 2021; Sugiyanto et al., 2019; Torlesse et al., 2016; Wicaksono & Harsanti, 2020). The overall effect produced by the high heterogeneity in study variation and random effect model is OR: 1.28 (95% CI 1.00-1.63). It can be inferred that male children are 1.28 times more likely to suffer from stunting than children who live in slums and have poor sanitation. According to statistical evidence, children who live in slums and have poor sanitation are more likely to have stunting (p=0.005). According to the findings of a study carried out in India, stunting is 88% more likely to occur in children from households without access to proper sanitation. (V. M. Aguayo et al., 2016)

Because high maternal education will affect parenting in terms of providing food and healthcare services, parental education can have an impact on the prevalence of stunting. The combined effect produced by the random effect model and the intermediate heterogeneous variation in the research is equal to OR: 1.58 (95% CI: 1.14-2.18). It can be concluded that children with low parental education are 1.58 times more likely to experience stunting than children with middle-high parental education. According to statistics, there is a strong correlation between stunting and low parental education (p=0.006). A tall father's guidance will improve food security, and it's possible to earn more money or have a higher household wealth index. increase the ability of households to acquire and buy healthy food, medical care, sanitation services, and clean water. (Manggala et al., 2018; Ni`mah Khoirun & Nadhiroh, 2015; Rachmi CN, Agho KE, Li M, 2016; Rakhmahayu et al., 2019; Rukmana et al., 2016; Sugiyanto et al., 2019; Wicaksono & Harsanti, 2020)

Compared to healthy family food, there is a higher chance of creating stunted children when family food is scarce. According to the findings, heterogeneity in study variation virtually never occurs, and a fixed effect model yields a combined effect with an OR of 3.29 (95% CI: 1.35–8.02). According to this, children who do not have access to family meals are 3.29 times more likely to experience stunting than children who do. According to statistics, there is a strong correlation between the scarcity of household food (p=0.009). The scarcity of food poses a threat to household consumption of a variety of wholesome, nutritionally sound, and safe foods. In the end, it will have an effect on how severe the neighborhood's nutritional issues are, including toddler stunting. (Kusumawati et al., 2015; Rakhmahayu et al., 2019)

Stunting has the potential to occur more frequently in households with three or more children under the age of five and a family size of more than five. The cumulative effect produced by the high heterogeneity and random effect models in the research is equal to OR: 1.41 (95% CI: 1.09–1.82). It can be inferred that a family with more than five members has a 1.41-times higher risk of stunting than a household with fewer than five members. It can be demonstrated statistically that there is a substantial association between having more than five family members and stunting (p=0.001). Having a large family can result in inadequate food distribution, poor health, and less than ideal nutritional condition. The availability of resources, breastfeeding practices, and supplemental feeding are not ideal. Children from big families typically receive poorer nourishment, parental attention, and access to sufficient healthcare, and big families also tend to spend more money on their requirements. The availability of wholesome food will be hampered by competition.. (Indriani et al., 2018; Titaley et al., 2019; Wicaksono & Harsanti, 2020)

Community and social level

Children lives outside the Java-Bali and rural areas have a higher probability of experiencing stunting when compared to children under five who live in the Java-Bali and urban areas. The results that the variation between research is high heterogeneous and random effect model produces combined effect equal to OR: 1.41 (95% CI 1.09-1.82). It can be interpreted that Children lives outside the Java-Bali and rural areas have 1.41 times greater risk of stunting compared to children who live in the Java-Bali and urban areas. Statistically it can be proven that there isn't a significant relationship between Children lives outside the Java-Bali and rural areas with stunting (p=0.06). It is based on the lower socioeconomic conditions of people outside the Java-Bali and rural areas, including limited resources and facilities, such as health workers and health care services. Limited family restrooms are also factors why areas outside Java-Bali are more likely to experience stunting, especially in rural areas (Rachmi CN, Agho KE, Li M, 2016; Sugiyanto et al., 2019; Titaley et al., 2019; Wicaksono & Harsanti, 2020).

Low wealth quantile is considered to significantly impact the likelihood of children being thin and short (Aryastami et al., 2017; Badriyah & Syafiq, 2017; Ni`mah Khoirun & Nadhiroh, 2015;

Rakhmahayu et al., 2019; Sugiyanto et al., 2019; Torlesse et al., 2016). The results that the variation between research is low heterogeneous and fixed effect model produces combined effect equal to OR: 1.39 (95% CI 1.23-1.56). It can be interpreted that Low wealth quantile have 1.39 times greater risk of stunting compared to middle-high wealth quantile. Statistically it can be proven that there is a significant relationship between low wealth quantile with stunting (p=<0.00001). Families in good financial standing will have better access to public services like education, health care, and transportation, according to Bishwakarma (2011). Children's nutritional status may be impacted. Additionally, the family's purchasing power will rise, improving their access to food. (Bishwakarma & Vanneman, n.d.)

4. Conclusions and suggestions

Estimated risk effect size stunting in Indonesia from the meta-analysis were male sex OR: 1.21 (95% CI 1.12-1.31), birth length <48 cm OR: 14.88 (95% CI 7.68-28.87), low birth weight <2.500 gr OR: 2.43 (95% CI 1.68-3.51), history of infectious diseases OR: 2.83 (95% CI 1.61-5.00), not getting exclusive breastfeeding OR: 2.39 (95% CI 0.72-7.93), household and family level: maternal height < 150 OR: 1.86 (95% CI 1.26-2.77), maternal age < 20 OR: 5.17 (95% CI 3.01-8.09), bad sanitation OR: 1.28 (95% CI 1.00-1.63), low father and mother education OR: 1.58 (95% CI 1.14-2.18), unavailability of food OR: 3.29 (95% CI 1.35-8.02), family size > 5 OR: 1.41 (95% CI 1.09-1.82) and, community level and social factors, rural area (living outside Java-Bali) OR: 1.41 (95% CI 1.09-1.82), wealth quantile 1 OR: 1.39 (95% CI 1.23-1.56). The review results indicate that there is a need for integrated health promotion, prevention and intervention using a multi-sectoral approach involving health experts, families, government and the community to reduce stunting in Indonesia.

5. Ethical considerations

Ethical issues (Including information consent, plagiarism, data falsification, double publication) was fully observed by the authors.

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