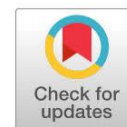


## Inbreeding marriage related to stunting in children aged 24-59 months



Ummi Kalsum, Krista Julita, Diah Restu Pertiwi

Public Health Faculty, Universitas Jambi, Jambi, Indonesia, [ummi2103@unja.ac.id](mailto:ummi2103@unja.ac.id)  
Public Health Faculty, Universitas Jambi, Jambi, Indonesia, [kristajulita1997@gmail.com](mailto:kristajulita1997@gmail.com)  
Public Health Faculty, Universitas Jambi, Jambi, Indonesia, [diahrestupertiwi24@gmail.com](mailto:diahrestupertiwi24@gmail.com)

### ARTICLE INFO

#### Article history:

Received: Sept 16<sup>th</sup>, 2019

Revised : Nop 14<sup>th</sup>, 2019

Accepted: Dec 16<sup>th</sup>, 2019

#### Keyword:

Inbreeding marriage  
Stunting  
Under-five children  
Nutritional status

### ABSTRACT

Stunting is a nutritional problem that often occurs in toddlers in Indonesia, as well as in Jambi. Kerinci is the highest incidence of stunting among regencies in Jambi. Inbreeding marriages are common in Kerinci Regency compared to other regencies. This study aimed to analyze the relationship of inbreeding marriage and other factors to the occurrence of stunting in Semurup Kerinci Regency, Jambi. This study was a cross-sectional design. Population studies were under-five children aged 24-59 months. The sampling technique was multistage random by the number of samples as much as 158 calculated by sample size determination in health studies from WHO. Primary data collection in March-April 2019. Research variables were inbreeding marriage, father's height, mother's height, father's education, mother's education, mother's knowledge, mother's job, family size and family socio-economic. Data collected by interviews and height measurements. Data analysis used Chi-square and Multiple Logistic Regression. The proportion of stunting was 57.6% and inbreeding marriage was 42.4%. There were a significant relationship between inbreeding marriage (Prevalence Ratio (PR) = 1.81; 95% CI = 1,38-2,37; P = 0,000); father's height (PR = 1.49; 95% CI = 1.09-2.04; P = 0.010) and mother's height (PR = 2.54; 95% CI = 1,78-3,62; P = 0,000) to the occurrence of stunting. The dominant factor was inbreeding marriage (PR= 3,45; 95% CI = 1,60-7,45; P = 0,002) after controlling by mother's height and mother's knowledge. The conclusion was inbreeding marriage of parent related to stunting in children.

This is an open-access article under the [CC-BY-SA](https://creativecommons.org/licenses/by-sa/4.0/) license.



### Corresponding Author:

Ummi Kalsum  
Public Health Faculty, Universitas Jambi, Jambi, Indonesia  
Lintas Sumatera Street, Mendalo Darat, Jambi, Indonesia 36122. Telp. 0741-583377. Fax. 0741-583111.  
Email : [ummi2103@unja.ac.id](mailto:ummi2103@unja.ac.id)

### INTRODUCTION

An under-five child is a group that is susceptible to malnutrition, one of which is stunting. Stunting is a condition of failure to thrive in infants due to chronic malnutrition so that the child is too short for his age. Malnutrition occurs since the baby is in the womb and the early period after the baby is born but the condition of stunting will be seen after the age of 2 years.<sup>1</sup> Stunting can increase the risk of obesity because people with short bodies lead to ideally low body weight so that a state of obesity and overweight continues for a long time will increase the risk of future degenerative diseases such as diabetes, heart diseases, blood vessels, cancer, stroke and disability in old age.<sup>2</sup> Stunting children is also more susceptible to infectious diseases, which indirectly also increases the risk of

death.<sup>3</sup> Due to these serious impacts, it is necessary to control and prevent the occurrence of stunting in children.

Based on genetic science and the results of the study showed that there was a very close relationship between inbreeding marriage and hereditary diseases. Inbreeding is a cross between two individuals who still have a kinship relationship that is a marriage between cousins with high potential to produce offspring biologically in a weak state both physically or mentally. Physical disorders resulting from inbreeding marriage include a short body (stunting), a disorder characterized by short stature due to medical or genetic disorders.<sup>4</sup>

The prevalence of stunting in Indonesia based on Basic Health Research (Riskesdas) in 2018 was 30.8%. This prevalence is categorized as a high level because higher than the target of WHO. Stunting is categorized low if the prevalence < 20%, moderate 20% - 29% and high 30% - 39% ≥ 40%. Based on data from the Nutrition Status Assessment (2015-2017) by the Jambi Provincial Health Office, Kerinci Regency is the regency with the highest prevalence of stunting with a prevalence in 2015 of 33.2%, in 2016 increase to 36.1% and in 2017 of 35.0%.<sup>5</sup> Adequate efforts are needed to reduce this number.

According to the Central Statistics Agency and the Ministry of Health, in the framework of accelerating the reduction of stunting, the government set 1000 priority villages of stunting interventions in 100 regencies and 34 provinces determined by looking at indicators of the number of stunting on children, stunting prevalence, and poverty levels so that a minimum elected one regency from all Provinces. In Jambi Province, the regency which is the priority in accelerating the reduction of stunting in 2018 is Kerinci Regency<sup>1</sup>, one of which is in the work area of the Semurup Public Health Center (PHC) with a stunting prevalence reaching 15%.<sup>6</sup>

The results of the previous study showed that many factors caused stunting in under-five children or infancy, including inbreeding marriage by parents, mother's height and mother's knowledge. It was found that out of 65% of people who have marriages with closed family (inbreeding) have different genetic diseases and are at risk of having an affected child.<sup>7</sup> Mothers with short bodies are ten times more likely to have stunted children.<sup>8</sup> Also, a factor influencing the occurrence of stunting is maternal knowledge, where mothers with low knowledge are twice as likely to have stunting children.<sup>9</sup> Research on the occurrence of stunting in the Kerinci Regency is still rarely done, mainly in examining inbreeding marriage that often conducted especially in the area of Semurup PHC and the other factors, even never done before.

Previous studies discussed a lot about the health effects of kinship and breeding between cousins (direct or cross-cousins), but from anthropological and social perspectives. The findings are still controversial, and only relate to congenital diseases such as birth defects or congenital anomalies, early hearing impairments, early vision impairments, mental retardation or learning disability & developmental delay or failure to thrive, inherited blood disorders, unexplained neonatal or infant death in offspring, epilepsy and undiagnosed severe condition.<sup>10</sup> This study links the incidence of stunting in toddlers in an area with a high incidence of stunting which often implements relative marriage as a custom that is still practiced until now, which has never been studied before.

The purpose of this study was to determine the relationship between inbreeding marriage and other factors to the occurrence of stunting in the Semurup PHC area, Kerinci Regency.

## **METHOD**

This study design was cross-sectional. Research sites in the working area of the Semurup PHC in Kerinci Regency. The data collection was carried out from March to April 2019. The study population was all children aged 24-59 months in the work area of the

Semurup PHC in Kerinci Regency. The minimum sample size is calculated using a formula "a different hypothesis of proportion test of two-tailed" from Lemeshow and Lwanga. The sampling technique uses cluster random sampling. Clusters were villages in the working area of Semurup PHC as many as 24 villages, randomly selected as many as 7 villages namely Pendung Hilir, Air Bersih, Pending Mudik, Air Tenang, Muara Semerah, Pendung Tengah and Koto Baru. All children in each selected cluster of villages that meet the inclusion criteria taken as research subjects, e.g. mothers of toddlers aged 24-59 months, toddlers still have both parents, living in the study area for at least 6 months and willing to be respondents as many as 158 toddlers.

The data were collected by interview using a structured questionnaire and height measurements using a microtoice measuring instrument with a precision of 0.1 cm. The main variable of this research was inbreeding marriage who was defined as marriage between two individuals (husband/wife) who have a kinship (blood relationship), namely marriage of cousins level 1, 2 and 3. The other factors under study were height of father (short if  $\leq 162$  cm and normal if  $> 162$  cm),<sup>11</sup> mother's height (short if  $\leq 150$  cm and normal if  $> 150$  cm),<sup>11</sup> father's education (low if maximum graduating from junior high school and high if graduating from senior high school or above), mother's education (low if maximum graduated junior high school and high if finished senior high school and above), mother's knowledge (bad if the score of knowledge  $< 75\%$  and high if the score  $\geq 75\%$ ),<sup>12</sup> mother's job (working/not working), family size (large if  $> 5$  household members in one family and small if  $\leq 5$  household members in one family) and socioeconomic level (low if  $<$  the Regional Minimum Salary (Rp. 2,400,000,00) and high if  $\geq$  the Regional Minimum Salary of Kerinci Regency according to Decree of the Regent of Kerinci number : 1345/KEP.BUP/DISNAKER/2019.<sup>13</sup> Dependent variable was nutritional status according to Z-score of Height/Age (HAZ) which was divided into two categories, stunting if the Z-score was  $< -2$  Standard Deviation (SD) and normal if the Z-score was  $-2$  SD up to  $+2$  SD.

Data collection was done by two enumerators who have been trained before collecting the data. The questionnaire developed was tested and carried out the validity and reliability first before use. Data analysis used Chi-square and Binary Logistic Regression at the 5% significance level. The ethical clearance was obtained from internal ethics commission of Universitas Jambi.

## RESULTS

The proportion of stunting in children aged 24-59 months in the area of the Semurup PHC in Kerinci Regency was 57.6%. Parents who carry out inbreeding marriage were 42.4%. The distribution of sibling (inbreeding) marriages according to three levels, marriage to cousins level I (from grandparents) by 13.9%, cousins level II (from great-grandchildren) by 14.6%, and level III cousins (from great-grandparents) by 13.9%. Most respondents have short-body fathers, a little more have short-body mothers, a good level of knowledge of mothers, most do not work and have low socioeconomic level, father and mother education was higher and most families were large that have more than five household members (Table 1).

**Table 1. Characteristics of under-five children**

Variable	Category	N	%
Stunting	Yes	91	57,6
	No	67	42,4
Inbreeding Marriage	Yes	67	42,4
	No	91	57,6
Father's Height	Short	95	60,1
	Normal	63	39,9

Variable	Category	N	%
Mother's Height	Short	85	53,8
	Normal	73	46,2
Mother's Knowledge	Bad	56	35,4
	Good	102	64,6
Mother's Job	Work	49	31,0
	Not	109	69,0
Family Socio-economic	Low	123	77,8
	High	35	22,2
Father's Education	Low	35	22,2
	High	123	77,8
Mother's Education	Low	44	27,8
	High	114	72,2
Family Size	Big	56	35,4
	Little	102	64,6

The result of the bivariate analysis, there was a relationship between inbreeding marriage by a parent and the occurrence of stunting in children. Parents who were married by a close family (inbreeding) increase the risk by 1.85 compared to those who do not do an inbreeding marriage. Father's height has related to the occurrence of stunting in children, where short fathers increased the risk of 1.68 to have stunting children compared to fathers of normal height. There was a relationship between the mother's height and the occurrence of stunting in children, a short mother having a risk of 3.30 more to have stunting children compared to mothers with normal height. No relationship was found between father's education, mother's education, mother's knowledge, mother's occupation, socioeconomic level and family size with the occurrence of stunting in children (Table 2).

**Table 2. Bivariate Analysis of independent variables to Stunting in under-five children**

Variable	Stunting				Total		PR (95% Confidence Interval)	p-value
	Yes		No		N	%		
	n	%	n	%				
<b>Inbreeding Marriage</b>								
Yes	52	77.6	15	22.4	67	100	1.81 (1.38-2.37)	0.000
No	39	42.9	52	57.1	91	100		
<b>Father's Height</b>								
Short	63	66.3	32	33.7	95	100	1.49 (1.09-2.04)	0.010
Normal	28	44.4	35	55.6	63	100		
<b>Mother's Height</b>								
Short	68	80.0	17	20.0	85	100	2.54 (1.78-3.62)	0.000
Normal	23	31.5	50	68.5	73	100		
<b>Mother's Knowledge</b>								
Bad	27	48.2	29	51.8	56	100	0.77 (0.56-1.05)	0.110
Good	64	62.7	38	37.3	102	100		

Variable	Stunting				Total		PR (95% Confidence Interval)	p-value
	Yes		No		N	%		
	n	%	n	%				
<b>Mother's Job</b>								
Work	30	61.2	19	38.8	49	100	1.09 (0.83-1.45)	0.656
Not Work	61	56.0	48	44.0	109	100		
<b>Family Socio-economic</b>								
Low	74	60.2	49	39.8	123	100	1.24 (0.86-1.79)	0.303
High	17	48.6	18	51.4	35	100		
<b>Father's Education</b>								
Low	23	65.7	12	34.3	35	100	1.19 (0.90-1.58)	0.364
High	68	55.3	55	44.7	123	100		
<b>Mother' Education</b>								
Low	29	65.9	15	34.1	44	100	1.21 (0.92-1.59)	0.257
High	62	54.4	52	45.6	114	100		
<b>Family Size</b>								
Big	30	53.6	26	46.4	56	100	0.90 (0.67-1.20)	0.555
Little	61	59.8	41	40.2	102	100		

The multivariate analysis shows the factors related to stunting in children were inbreeding marriages, maternal height, and level of maternal knowledge. The dominant factor was the inbreeding marriage where parents who do an inbreeding marriage increase the risk 3.45 more greater to have a stunting child than parents who do not have a family relationship marriage after being controlled by the mother's height and the level of mother's knowledge. A short mother increases the risk of occurrence of stunting compared to normal' height mothers, but low levels of mother's knowledge actually reduce the risk of stunting compared to mothers who had a high knowledge (Table 3).

**Table 3. The Final Model of inbreeding marriage and Stunting in under-five children**

Variables	B	S.E.	Wald	Sig.	Exp. (B)	95% CI
Inbreeding Marriage	1.24	0.39	9.92	0.002	3.45	1.60-7.45
Mother's Height	0.19	0.04	19.96	0.000	1.21	1.11-1.31
Mother's Knowledge	-0.58	0.40	2.09	0.148	0.56	0.26-1.23

## DISCUSSION

Stunting is a condition of failure to grow due to malnutrition in a long time (chronic) so that toddlers have a less height according to their age. Stunting children in the future will experience difficulties in achieving optimal physical and cognitive development, caused by many factors including inbreeding marriages, maternal height and maternal knowledge.<sup>14</sup> This has been proven empirically in this study.

The high prevalence of stunting in children of under-five in Kerinci Regency was also found in this study. The prevalence of stunting found in the Semurup Area, Kerinci Regency is higher than the prevalence in Indonesia in 2018 (30.8%). Based on the results of the Central Bureau of Statistics (BPS) and The National Team for Accelerating Poverty Reduction (TNP2K) of the Ministry of Health, Kerinci Regency has indeed been established as a priority area for the acceleration of stunting reduction in 2018, but the figure is still above the expectation of achieving a reduction in stunting prevalence in 2018 of 33.2%<sup>15</sup> and above the target of The 2019 RPJMN (National Medium Term

---

Development Plan) is about 28%.<sup>16</sup> Lower prevalence was found in children of under five in the working area of Wonosari I PHC, Duwet Village and Pulutan (2018) by Fitriahadi at 37.9%. In this village, the economic status and height of the mother were risk factors for stunting in infants aged 24-59 months.<sup>17</sup>

This study found that the final model (risk factors) for the occurrence of stunting were inbreeding marriage, maternal height, and maternal knowledge. The dominant factor of stunting in children aged 24-59 months was inbreeding marriage after being controlled by the mother's height and mother's knowledge. Parents who do married with their closed family have more at risk of having a stunting child than parents who do not marry their closed family. Parents who engage inbreeding marriage with short-bodied mothers will more likely increase the risk of having a stunting child, compared to parents who do not have an inbreeding marriage and have tall body height or normal body height.

This findings in line with the scientific literature on inbreeding marriage wherein concentrated on quite specific aspects of the effects of inbreeding with fertility and health.<sup>18</sup> In 2010 it was found in Pakistani society that practicing inbreeding marriages can cause congenital diseases, such as heart disease, thalassemia, and other disabilities in children include growth failure or a short body.<sup>7</sup> The results of a study conducted by Hamamy et al in 2011 found that there were health risks for cousin's marriage, as evidenced by the statement of health care providers and geneticists who assessed the overall negative effects of family marriages which could increase genetic risks to offspring. These researchers report higher levels of complex abnormalities in family marital offspring in the Bedouin Arab community in Southern Israel.<sup>7</sup> Similar research conducted by Raz and Atar in 2004 concerning health risks to communities in the Negev region in southern Israel, where the people there have a cultural custom to conduct marital relations. It was found that 89% of marriages were family and 65% had different genetic diseases and were at risk of having an affected child.<sup>20</sup> The affected child is usually accompanied by a height growth disorder that causes a short body (stunted).

Marriage is one of the basic needs of human life. People have a variety of choices in deciding what kind of marriage they want. People can do marriages with different regions, even countries, but it seems that there some communities still practice customary marriages. One of a customary marriage is still in demand by several populations in the world was a cousin's marriage or marriage with a closed family.<sup>7</sup> This is still mostly done in Kerinci Regency and has been entrenched since ancestors.

The results of this study have proven that the number of stunting in children aged 24-59 months that occur in Kerinci is related to inbreeding marriage of his parents. Further analysis shows that marriages of parents with second-level cousins are more at risk of causing stunting in their children than marriages of parents with first-level cousins (the data not shown).

Another factor that increases the risk of stunting is the height of the mother after being controlled by the marriage of relatives and knowledge of the mother. The mother's height as a hereditary factor of the mother influences the occurrence of stunting in children.<sup>7</sup> Short-acting genes in parents cause the possibility of having a stunning child.<sup>21</sup> The results of this study were in line with research conducted by Nasikhah and Margawati (2012) in East Semarang Regency, prove that mothers with relatively short height body had the greatest influence on the occurrence of stunting with an Odds Ratio of 10.31 after controlling by father's height, father's education, and income. So if the subject has these risk factors, the probability of having a stunting child reached about 99.08%.<sup>8</sup>

However, this study is not in line with Hanum's research in 2018 in the Maron PHC in Probolinggo Regency which found that there was no significant relationship between maternal height and the incidence of stunting in children aged 24-59 months. Researchers said that mothers who have nutritional problems will not necessarily have stunting children because stunting is influenced by many other factors.<sup>22</sup>

This study results found that maternal knowledge also contributes to the occurrence of stunting after being controlled by inbreeding marriage and mother's height. But we found a protective effect, where mothers with low knowledge have a low risk to have stunting children. The results of this study are different from studies conducted by Agustiningrum and Rokhanawati in the Wonosari I PHC, which found that there was a significant relationship between maternal knowledge and the incidence of stunting, wherein knowledge of mothers who were not good at risk had a stunting children of 1.9 times compared to mothers who have a good knowledge.<sup>9</sup> A similar result was found by Septamarini, et al (2018) in the working area of Bandarharjo PHC Semarang who found that there was a significant relationship between maternal knowledge and the incidence of stunting, that low-risk knowledge of mothers was 10.23 times having a stunting toddler compared to mothers with high knowledge. Mother's knowledge regarding how to improve feeding, give examples of healthy habits, actively feed, conditions for serving food, the environment needed to feed, how to respond responsibly when a child is sick, how to deal with refusal to eat, and when a child refuses to eat is urgently needed to prevent the occurrence of stunting.<sup>23</sup>

This study found the results are also different from the results of research conducted by Margawati and Astuti in the Bangetayu Village, Genuk District, Semarang, which found that the majority of the population is in middle to lower socioeconomic conditions, so that the education of mothers is at the lower middle level. The low level of education and not getting good health knowledge will certainly have an impact on the limited knowledge of mothers about nutritional health including stunting. The results of the Focus Group Discussion showed that they still had the wrong perception of stunting and ignorance about the incident. Misperception and low knowledge of the mother will certainly have an impact on maternal behavior, especially the health behavior and feeding behavior of children. The incidence of stunting in children is related to nutrient intake in children. The intake of nutrients consumed by toddlers daily depends on the mother so that the mother has an important role in changing the input of nutrients in toddlers.<sup>24</sup>

Mother's knowledge affects the ability to implement better such as the application of nutritional knowledge and appropriate child care patterns will prevent stunting, for example in the provision of nutritious food. However, this study found a different thing, precisely knowledgeable mothers would not reduce the risk of having a child stunting. In the Semurup Area, the characteristics of mothers found were mostly highly educated which were directly related to their level of knowledge. In this case, the hereditary factor that constitutes the majority in this population, namely frequent inbreeding marriage and most mothers of short postures have a more dominant role in causing stunting in children under five in this region.

In theory, the condition of stunting is caused directly by poor food intake and infectious diseases (health conditions). In this study infectious diseases were not explored but food intake can be assessed from socioeconomic levels indirectly. Although the socioeconomic level, in this case, has not been proven to be significantly related to the incidence of stunting in children of under five in this region, there was a tendency for families with low socioeconomic levels to have a greater risk of having stunting children than families with high socioeconomic status. Characteristics of respondents in this study were most families with low socioeconomic levels so that it will be directly related to the availability of food at the household level and cause toddlers becoming malnourished and stunted.

The results of this study indicate that if a person engages with his or her closed family and the mother's height is relatively short, it will increase the risk of having a stunting child, even though high maternal knowledge will confound the role. If someone marries a closed family and the mother also has a short body, it is expected to make efforts to improve nutrition by providing a good and diverse food intake to avoid the occurrence of stunting in children.

One of the government programs to handle stunting is to encourage the policy of "Food Nutritional Security" which is a policy that ensures access to nutritious food, especially in areas with high stunting cases and existing service programs (PHC, Integrated Health Post, Early Childhood Education Programs, Agency for the Improvement of Drinking Water Supply System, Family Hope Program, etc.) in provide support to pregnant women, nursing mothers and toddlers in the first thousand days of life. The results of this study also recommend an improvement in the nutritional status of adolescent girls to minimize the incidence of stunting in toddlers aged 24-59 months in the Semurup Area of Kerinci Regency as well as other areas with the same characteristics and problems by efforts on "specific nutrition intervention approaches" that have been set on national strategies to accelerate stunting reduction. Stunting management cannot only be carried out by the health sector alone but requires multisectoral action. Efforts with a specific nutrition intervention approach only contributed 30% in reducing stunting, while 70% was contributed by "sensitive nutrition interventions" that had to be carried out by sectors of the outside of health such as the economy, education, agriculture, family planning, and others.

## CONCLUSION

The proportion of stunting among children under-five in Semurup, Kerinci District was found to be relatively high, as much as the case for those who have marital with close family. Factors related to the stunting in children were inbreeding marriages, maternal height, and level of maternal knowledge. The dominant factors to the stunting in children were inbreeding marriages after being controlled by the mother's height and level of the mother's knowledge.

It is recommended to the community especially family to minimize the marital with close family (inbreeding marriage) and better efforts to improve knowledge nutrition among mothers or adolescent girls to reduce occurrence of stunting in children by promoting health and education about the short-term and long-term effects of malnutrition, especially stunting and also about a thousand days of life. Prevention occurrence of stunting in adolescent girls by improve mother's nutrition status, especially adolescent girls. Improvement of health services at PHC through revitalization and optimization of early detection activities by measuring the height of children under-five regularly every month at the Integrated Health Post. Further research is also needed to examine more deeply factors that influence to the occurrence of stunting that have not been studied in this study such as food intake, health conditions, parenting, food consumption habit, health services, sanitation and also the height of the third generation (grandmother), using better research design to refine the findings of this study.

## REFERENCES

1. Kemenkes R. Laporan Hasil Riset Kesehatan Dasar Tahun 2018. Jakarta: Badan Penelitian dan Pengembangan Kesehatan. 2018.
2. Aridiyah FO, Rohmawati N, Ririanty M. Faktor-faktor yang Mempengaruhi Kejadian Stunting pada Anak Balita di Wilayah Pedesaan dan Perkotaan. *e-Jurnal Pustaka Kesehat*. 2015;3(1):163–70.
3. Kusuma KE, Nuryanto. Faktor Risiko Kejadian Stunting pada Anak Usia 2-3 Tahun (Studi di Kecamatan Semarang Timur). *J Nutr Coll*. 2013;2(4):523–30.
4. Priadi A. *Biologi 3*. Jakarta : Yudhistira. 2010.
5. Jambi DKP. Profil Kesehatan Provinsi Jambi tahun 2017. Available from: <http://jurnal-stmik.muralinggau.ac.id/index.php/jutim/article/view/202>
6. Kerinci DKK. Profil Kesehatan Kabupaten Kerinci Tahun 2017. 2017;
7. Yusdiawati Y. Penyakit Bawaan: Kajian Resiko Kesehatan Pada Perkawinan Sepupu. *J Antropol Isu-Isu Sos Budaya*. 2017;19(2):89–99. <https://doi.org/10.25077/jaisb.v19.n2.p89-99.2017>



8. Nasikhah R, Margawati A. Prevalensi Risiko Kejadian Stunting Pada Balita Usia 24-36 Bulan di Kecamatan Semarang Timur. *J Nutr Coll.* 2012;1(1):176–84.
9. Agustiningrum T, Rokhanawati D. Hubungan Karakteristik Ibu Dengan Kejadian Stunting Pada Balita Usia 24-59 Bulan Di Wilayah Kerja Puskesmas Wonosari I. Univ 'Aisyiyah Yogyakarta. 2016;
10. Hamamy H. Consanguineous Marriage : Proconception Consultation in Primary Health Care Settings. *Springer-verlog,* 2012;19(2):185–192. <https://link.springer.com/article/10.1007/s12687-011-0072-y>
11. RISKESDAS. Riset Kesehatan Dasar; Badan Penelitian dan Pengembangan Kesehatan Kementerian Kesehatan RI Tahun 2010. *Lap Nas 2010.* 2013;1–446.
12. Arikunto. *Prosedur Penelitian Suatu Pendekatan Praktek.* PT. Rineka Cipta. 2016.
13. Statistik BP. *Statistik Indonesia 2019.* 2019. 1–782 p.
14. Kementerian Kesehatan RI. *Situasi Balita Pendek (Stunting) di Indonesia.* Kementeri Kesehatan RI. 2018;1.
15. Jahari AB. *Penurunan Masalah Balita Stunting.* 2018; Available from: [http://www.depkes.go.id/resources/download/info-terkini/materi\\_pra\\_rakerkesnas\\_2018/Pakar\\_Stunting.pdf](http://www.depkes.go.id/resources/download/info-terkini/materi_pra_rakerkesnas_2018/Pakar_Stunting.pdf)
16. Pritasari K. *Upaya Percepatan Penurunan Stunting: Evaluasi Pelaksanaan Tahun 2018 & Rencana Tindak Tahun 2019.* 2018;1–47.
17. Fitriahadi E. Hubungan tinggi badan ibu dengan kejadian stunting pada balita usia 24-59 bulan. *J Keperawatan dan Kebidanan Aisyiyah.* 2018;14(1):15–24. <https://doi.org/10.31101/jkk.545>
18. Bittles AH, Black ML. Consanguineous Marriage and Human Evolution. *Annu Rev Anthropol.* 2010;39(1):193–207. <https://doi.org/10.1146/annurev.anthro.012809.105051>
19. Shieh JTC, Bittles AH, Hudgins L. Consanguinity and the Risk of Congenital Heart Disease. *Am J Med Genet Part A.* 2012;158 A(5):1236–41. <https://doi.org/10.1002/ajmq.a.35272>
20. Raz AE, Atar M. Cousin marriage and premarital carrier matching in a Bedouin community in Israel: Attitudes, service development and educational intervention. *J Fam Plan Reprod Heal Care.* 2004;30(1):49–51. <https://doi.org/10.1783/147118904322701992>
21. Mamabolo RL, Alberts M, Steyn NP, Delemarre-van de Waal HA, Levitt NS. Prevalence and determinants of stunting and overweight in 3-year-old black South African children residing in the Central Region of Limpopo Province, South Africa. *Public Health Nutr.* 2005;8(5):501–8. <https://doi.org/10.1079/PHN2005786>
22. Hanum F, Khomsan A, Heryatno Y. Hubungan Asupan Gizi Dan Tinggi Badan Ibu Dengan Status Gizi Anak Balita. *J Gizi dan Pangan.* 2014;9(1):1–6. <https://doi.org/10.14710/jnc.v8i1.23808>
23. Septamarini RG, Widyastuti N, Purwanti R. Hubungan Pengetahuan Dan Sikap Responsive Feeding Dengan Kejadian Stunting Pada Baduta Usia 6-24 Bulan Di Wilayah Kerja Puskesmas Bandarharjo, Semarang. *J Nutr Coll.* 2019;8(1):9–20.
24. Margawati A, Astuti AM. Pengetahuan ibu, pola makan dan status gizi pada anak stunting usia 1-5 tahun di Kelurahan Bangetayu, Kecamatan Genuk, Semarang. *J Gizi Indones.* 2018;6(2):82–9. <https://doi.org/10.14710/jgi.6.2.82-89>