Conference Paper

# Low Birth Weight As the Predictors of Stunting in Children under Five Years in Teluknaga Sub District Province of Banten 2015

**Marti Rahayu Diah Kusumawati[1,2], Rina Marina[1,3], and Caroline Endah Wuryaningsih[4]**

[1]Postgraduate Student Faculty of Public Health, Universitas Indonesia, Depok, Indonesia
[2]Directorate of Health Promotion and Community Empowerment, Ministry of Health, Indonesia
[3]Centre for Public Health Effort, Ministry of Health, Indonesia
[4]Faculty of Public Health, Universitas Indonesia, Depok, Indonesia

## Abstract

Stunting in children under five years still becomes a health problem in Banten Province. This study aimed to analyze the determinants of stunting in children under five years in Teluknaga sub-district, Banten Province in 2015. Data were obtained from secondary data analysis using the primary survey data of Pos Keadilan Peduli Umat (PKPU) nutrition program in April 2015. The subsequent nutrient status assessment was performed using the calculation of longevity indicator by Age (PB/U) or Body Height by Age (TB/U) based on z-score according to WHO. Chi-square and multivariable logistic regression were used to analyze 290 children under five years old as the sample. The results showed that 70.7% of children were stunting. Bivariate analysis showed that birth weight of infants (p = 0.008), maternal employment status (p = 0.026), and average parents income (p = 0.012) have a significant relationship with the occurrence of stunting in infants. Birth weight of infants was the most dominant risk factor, among the variables. That is the children who were born with low birth weight was 3.12 times more likely to be stunted than those taken with normal weight after controlled by child sex, number of family members, education level of the father and mother, mother's working status and average parents income (OR= 3.12, 95% CI: 1.38–7.03). Health programs to overcome stunting can be done through education about the importance of consuming proper nutrition and routine health checks in pregnant women and children under five. Also, training is also given to all women of childbearing age so that in the future can better understand the importance of maintaining nutritional status in adolescence, before pregnancy until pregnancy to give birth to healthy babies.

**Keywords:** Low Birth Weight, Stunting, and Children.

Corresponding Author:
Marti Rahayu Diah Kusumawati
martirdk@yahoo.co.id

Received: 21 December 2018
Accepted: 23 January 2019
Published: 28 February 2019

Publishing services provided by Knowledge E



Selection and Peer-review under the responsibility of the 3rd IMOPH & the 1st YSSOPH Conference Committee.

## 1. Introduction

One of the indicators of health and welfare of the community is characterized by nutritional status in infants and children under five years which are vulnerable to various

malnutrition problems. Assessment of nutritional status is done through anthropometric measurements reflecting the nutritional state of infants and children under five years [1].

By 2016, WHO reports 155 million children under five years old are classified as stunting and about 45% of deaths in children under five years are associated with malnutrition. The is mostly the case in low-and-middle-income countries [2]. The prevalence of children under five years stunting becomes a public health problem if the incidence is 20% or more [3] Compared to some neighboring countries, the prevalence of under-five stunting in Indonesia (36%) is the highest compared to Burma (35%), Vietnam (23%), Malaysia (17%), Thailand (16%) and Singapore (4%) [4].

The problem of stunting in children under-five in Indonesia is still quite severe, Riskesdas 2013 showed 37.2 percent of a national stunting prevalence. This prevalence has increased compared to 2010 (35.6%) and 2007 (36.8%). The incidence of stunting consisted of 18.0 percent of a severely stunting and 19.2 percent of stunting [5]. [5].

Stunting is one of the less nutritional forms based on the longevity index by Age (PB/U) or High Body by Age (TB/U). A child under five years is said to be stunted if the Z-score score is less than -2.0 SD (Deviation Standard) [3]. The state of stunting is a description of chronic or recurrent nutritional deficiencies, usually related to socioeconomic and environmental conditions [1].

There are various factors related to the occurrence of stunting. These factors are include child sex [6], birth weight [7, 8] birth order [9], number of siblings [10], number of family members [6, 9, 11], father's working status [6], mother's working status [12], father's education level [13], maternal education level [14, 15] and average parents income [8]

Stunting affects long-term effects on cognitive development, learning ability, and productivity in adulthood [16]. Stunting also leads to a decrease in the immune system and increase the risk of infectious diseases. The tendency to suffer from non-communicable diseases such as diabetes, cardiovascular diseases, high blood pressure, heart failure, and obesity will be higher when the stunting child becomes an adult [17].

One of the national development priorities in the Medium-Term Development Plan (RPJMN) 2015 - 2019 is an effort to improve the community's nutritional status, including the decrease of stunting in children under five years prevalence to 28%. This effort is done through prevention and reducing direct disturbance (specific nutritional interventions) and attempts to prevent and minimize indirect disturbance (sensitive nutrition interventions) [18].

In the province of Banten, it's recorded 33 percent of children under five were stunting which consist 16.4 percent of severely stunting and 16.6 percent of stunting [19]. From those, 32.3 percent came from Tangerang District, and this is higher than the percentage of other districts in Banten Province such as Cilegon city (31.4%), Serang city (31.2%), Tangerang city (28.6 %), or South Tangerang City (28.9%). Teluknaga sub-district is one of the eight sub-districts with the largest area and the third with the highest number of births [20]. Based on the health profile of Tangerang district, Teluknaga sub-district has several problems such as high infant, and under-five mortality rate, low coverage of UCI, a small percentage of D/S, and high malnutrition cases found compared to other sub-districts. This study attempts to analyze the determinants of stunting in children under five years in Teluknaga sub-district, Banten Province in 2015.

## 2. Methods

This study is a secondary data analysis using the underlying survey data of *Pos Keadilan Peduli Umat (PKPU)* Human Initiative nutrition program in April 2015. The population of the research were 618 children under five living in Posyandu areas assisted by *PKPU* with children data (name, birth date, age, sex, weight, length/height, upper arm circumference, state at birth, birth attendant, birth weight, body length of birth, family order, number of sibling, number of family members, address, name of Posyandu) and parents data (father's name, mother's name, father's age, mother's age, father's working status, mother's working status, father's education level, mother's education level, and average parents income).

The inclusion criteria were respondents, 290 children, having complete data according to the research variable (child sex, birth weight, family order, number of sibling, number of family members, father's working status, mother's working status, father's education level, mother's education level, and average parent's income). The following nutritional status assessment was performed using the calculation of the indicator of Body Length by Age (PB/U) or Body Height by Age (TB/U) based on z-score according to WHO. Stunting defined as a height-for-age Z score of less than -2 deviation standard (3). The dependent variable expressed as a dichotomous determine the level of stunting and severe stunting in children under five years, that is, category 0 (not stunted (>-2 SD) and category 1 ((stunted (-3 SD - <-2 SD) or severely stunted (<-3 SD)). Analyses were performed using SPSS. The chi-squared test was used to test the significance of associations, and multivariable logistic regression was used to find the dominant risk factor that causes stunting in children under five years.

## 3. Results

The prevalence of stunting based on TB/U or PB/U in a total of 290 children were found to be 70.7% which consisted of stunting (33.8%) and severely stunting (36.9%), while the normal category was only 28.6% (table 1).

Table 1: Frequency Distribution of Respondents Based on Nutrition Status (TB/U or PB/U).

| Nutritional Status | n | (%) |
|---|---|---|
| Severely Stunted (<-3 SD) | 107 | 36.9 |
| Stunted (-3 SD to <-2 SD) | 98 | 33.8 |
| Normal (-2 SD to 2 SD) | 83 | 28.6 |
| Tall (>2 SD) | 2 | 0.7 |
| Total | 290 | 100 |

Table 2 presents the distribution of children under five by research characteristics. Approximately 80.3% of the children were born with low birth weight, and those are the first or the second child n the family (80.3 %). Boys (46.6%) and girls (53.4%) nearly equally represented in the sample. About 80,3% of children were the first or second child, and 80% of children didn't have or had one sibling. Children living only with small

family (3-4 people) were 69.3%. Almost all children (99%) have a working father to earn a living and mother's who did not work as many as 88.3% with 64.5% parents income below the average. Parents education level known as 51.7% and 62.4% were in the lower level for both fathers and mothers.

Table 2: Characteristics of Respondents.

| Variabel | n (290) | % |
|---|---|---|
| **Nutritional Status based on PB/U or TB/U** | | |
| Normal/tall | 8 | 29.3 |
| Stunted/ severely stunted | 205 | 70.7 |
| **Sex** | | |
| Boys | 135 | 46.6 |
| Girls | 155 | 53.4 |
| **Birth Weight** | | |
| Normal | 57 | 19.7 |
| Low Birth Weight | 233 | 80.3 |
| **Birth Order** | | |
| First – second child | 233 | 80.3 |
| Child number ≥3 | 57 | 19.7 |
| **Number of Siblings** | | |
| 0 - 1 person | 232 | 80.0 |
| ≥2 person | 58 | 20.0 |
| **Number of Family Members** | | |
| 3-4 person | 201 | 69.3 |
| ≥ Five-person | 89 | 30.7 |
| **Father's Working Status** | | |
| Working | 287 | 99.0 |
| Does not work | 3 | 1.0 |
| **Mother's Working Status** | | |
| Working | 34 | 11.7 |
| Does not work | 256 | 88.3 |
| **Education Level of The Father** | | |
| Higher Education | 140 | 48.3 |
| Low education | 150 | 51.7 |
| **Education Level of The Mother** | | |
| Higher Education | 109 | 37.6 |
| Low education | 181 | 62.4 |
| **Average Parents Income** | | |
| Above average | 103 | 35.5 |
| Below average | 187 | 64.5 |

The proportion of stunted children seemed to be associated with low birth weight (p=0.008), mother's working status (p=0.026) and average parents income (p=0.012).

Stunted children who were born with low birth weight are 49 children (86%), children whose mother who didn't work are 187 children (73%), and about 142 children (75.9%) than average parents income are below the average. Other variables didn't show a significant relationship with stunting (table 3).

Table 3: Bivariate Analysis for Risk Factors of Stunting.

| | Stunting | | | | | | |
|---|---|---|---|---|---|---|---|
| **Variabel** | **No** | | **Yes** | | **Total (n)** | **OR (95% CI)** | **p-value** |
| | **n** | **%** | **n** | **%** | | | |
| **Sex** | | | | | | | |
| Boys | 33 | 24.4 | 102 | 75.6 | 135 | 0.641 (0.383-1.073) | 0.117 |
| Girls | 52 | 33.5 | 103 | 66.5 | 155 | | |
| **Birth Weight** | | | | | | | |
| Normal | 77 | 33 | 156 | 67 | 233 | 3.023 (1.364-6.699) | 0.008* |
| Low Birth Weight | 8 | 14 | 49 | 86 | 57 | | |
| **Birth Order** | | | | | | | |
| First – second child | 68 | 29.2 | 165 | 70.8 | 233 | 0.970 (0.514-1.828) | 1.000 |
| Child number ≥ 3 | 17 | 29.8 | 40 | 70.2 | 57 | | |
| **Number of Siblings** | | | | | | | |
| 0 - 1 person | 70 | 30.2 | 162 | 69.8 | 232 | 1.239 (0.646-2.376) | 0.629 |
| ≥ 2 person | 15 | 25.9 | 43 | 74.1 | 58 | | |
| **Number of Family Members** | | | | | | | |
| 3-4 person | 52 | 25.9 | 149 | 74.1 | 201 | 0.592 (0.347-1.010) | 0.073 |
| ≥ 5 person | 33 | 37.1 | 56 | 62.9 | 89 | | |
| **Father's Working Status** | | | | | | | |
| Working | 83 | 28.9 | 204 | 71.1 | 287 | 0.203 (0.018-2.274) | 0.206 |
| Does not work | 2 | 66.7 | 1 | 33.3 | 3 | | |
| **Mother's Working Status** | | | | | | | |
| Working | 16 | 47.1 | 18 | 52.9 | 34 | 2.409 (1.163-4.988) | 0.026* |
| Does not work | 69 | 27 | 187 | 73 | 256 | | |
| **Education Level of The Father** | | | | | | | |
| Higher Education | 49 | 35 | 91 | 65 | 140 | 1.705 (1.023-2.842) | 0.054 |
| Low education | 36 | 24 | 114 | 76 | 150 | | |
| **Education Level of The Mother** | | | | | | | |
| Higher Education | 38 | 34.9 | 71 | 65.1 | 109 | 1.526 (0.911-2.555) | 0.139 |
| Low education | 47 | 26 | 134 | 74 | 181 | | |
| **Average Parents Income** | | | | | | | |
| Above average | 40 | 38.8 | 63 | 61.2 | 103 | 2.004 (1.192-3.367) | 0.012* |
| Below average | 45 | 24.1 | 142 | 75.9 | 187 | | |

The multivariate analysis shows that infants born with LBW were 3.12 times more likely to be stunted (95% CI= 1.38-7.03) than those taken with a healthy weight. The means that children who were born with LBW have an opportunity to be stunting 3.12 times larger than children who were born with normal weight after controlled by child sex, some family members, education level of the father and mother, mother's working status and average parents income (table 4).

Table 4: Multivariate Regression Analysis of Risk Factors for Stunting.

| Variable | B | Wald | p-value | OR | 95% CI | |
|---|---|---|---|---|---|---|
| | | | | | Lower | Upper |
| Birth weight | 1.138 | 7.519 | 0.006 | 3.119 | 1.383 | 7.033 |
| Number of Family Members | -.455 | 2.543 | 0.111 | 0.635 | 0.363 | 1.110 |
| Education Level of The Father | 0.266 | 0.737 | 0.391 | 1.305 | 0.711 | 2.398 |
| Education Level of The Mother | 0.259 | 0.686 | 0.408 | 1.295 | 0.702 | 2.390 |
| Mother's Working Status | 0.621 | 2.342 | 0.126 | 1.860 | 0.840 | 4.119 |
| Average Parents Income | 0.419 | 1.898 | 0.168 | 1.521 | .838 | 2.763 |

## 4. Discussions

Children born with low birth weight (LBW) had a higher proportion to be stunted than those taken with a healthy weight (table 2). LBW remains a world problem, especially in developing countries. The was supported by Candra who said that LBW was a risk factor for stunting and growth failure in childhood. Babies born weighing less than average (< 2500 g) may still have standard body length at birth, but stunting will occur a few months later. Therefore, children born weighing less or children who were born with low weight should be aware of stunting [7]. A similar explanation has been given by Ramakrishnan, stating that children with LBW experienced growth failure during early childhood and into the adolescence period [21].

Our study showed that child's sex did not have a significant relationship with stunting. The results were consistent with previous research that analyzed data through a national survey in India stating that boys and girls are about equally likely to be stunted [22]. There may be a possible reason for this situation, such as no discrimination in parenting pattern between boys and girls [22]. The was in contrast to research conducted by Amin and Julia stating that boys were more stunting than girls because girls had faster growth spurt than boys [6].

Earlier study said that the effect of birth-order was significant to stunting because the children with high birth-order (later born) were more likely to fall in the composite index of anthropometric failure as stunting in urban and rural areas [9], but it is different from our findings that showed no significance between children birth-order and stunting. The meant that children under five years who were born as the first child, second or more had the same opportunities to be stunted.

Table 3 showed that the number of siblings is not significant with stunting. This result was different from research by Biswas and Bose in India, that found that children with ≥ three sibs had a significantly higher risk of being underweight than those with < 3 sibs [10].

Generally, families with many members will spend more to meet the needs of competition, or limitations in providing balanced, nutritious foods [6]. Khan's study showed that children from smaller households (less than and equal to 4 members) are less likely to fall into the composite index of anthropometric failure (stunting) in rural areas [9]. Growing families cause food for every child to be reduced and the distribution of food uneven, causing under-fives in the family to be malnourished (stunting) [11]. The results of this study show different values in which there is no significant relationship between the number of family members and stunting. The may be due to other, unexamined factors such as the utilization of the yard for the fulfillment of food needs.

The result of the bivariate analysis showed no significant relationship between the father's working status to stunting event. From the results of the study, noted that most of the respondent's parents are non-permanent workers, i.e., as laborers and this may affect the amount of incoming revenue. The results are consistent with previous research conducted by Amin that found no significant relationship between the work of the father to the stunting event [6].

Unlike the father's working status, non-working mothers were more likely to have stunted children than working mothers (table 3). The may be related to the level of education of mothers who are mostly relatively low-educated. Because they did not have a job and useful knowledge, feeding pattern in child became unsuitable. Other studies showed that children of currently working women significantly stunted than children of non-working women. The may be because most of the women involved in agriculture activities had less time to feed their children [12].

Like many other developing countries, education is an essential issue for Indonesia. In families with limited income, the culture in many Asian countries still influences parents to choose their boys over the girls to go to university because they will become the breadwinner for the family [13]. Our study showed that there was no significant relationship between the education level of father or mother and stunting. Lestari et al. presented similar findings., indicating that maternal education levels were not significantly related to stunting incidents in children [14]. Although statistically there was no significant relationship, based on the results of the study, the highest presentation still existed in low educated fathers and mothers. The indicates that the level of education of father and mother contribute indirectly to the nutritional status of children. A high level of education will enable a person including father and mother to absorb information, and take decisions to improve the nutritional status of children. More, Biswas and Bose said that maternal education and paternal education were the most influential factors for the emergence of stunting in children under five years [15].

Children from poor households are at a higher risk of being stunted than children from more affluent homes (table 3). The may be because low-income families spent less money on proper nutrition, making them more vulnerable to growth failure due to insufficient food. Aryastami et al. showed that poverty rates politically correlated with

the prevalence of stunting. Factors of income will indirectly affect the family's eating habits, mainly depending on the family's ability to buy the food the family needs. It can be interpreted that the prevalence of stunting is higher in low-income families than non-poor [8].

Birth weight is an important and reliable indicator that used as a general indicator to determine the health, nutrition and socio-economic status of developed and developing countries. Unbalanced birth weight can cause complications for both mother and baby [23]. This study showed that children who were born with LBW have an opportunity to be stunting 3,12 times larger than children who were born with normal weight after controlled by child sex, some family members, education level of the father and mother, mother's working status and average parents income. The results are consistent with previous research conducted by Aryastami, stating that the low birth weight was the most important and dominant risk factor related to stunting among children aged 12-23 months in Indonesia. LBW also had a significant relationship between a mother's nutritional status during pregnancy. Low birth weight is a predisposing factor to growth attainment after birth and to prevent growth faltering, required adequate and quality exclusive breastfeeding for six months [8].

Pregnant motherhood and pregnancy may affect the growth of the fetus conceived. The birth of LBW infants is higher in young mothers aged less than 20 years. The happens because, at that age, the reproductive organs are not mature yet and do not have a placenta transfer system as efficiently as adult women. In old age mothers, the condition of her body and health begins to decline, affecting the fetus and causing the birth of LBW. The age factor is not a significant factor in LBW birth, but LBW births appear to increase in women under 20 and over 35 [24].

Other factors that affect the occurrence of LBW are nutritional status before and during pregnancy, sociodemographic, maternal and antenatal examination [25]. Nutrition that is not good starts with the growth of the fetus in the womb will affect the entire life cycle. Inadequate pregnant women's food and underweight before pregnancy and weight gain during pregnancy are among the strongest predictors of labor with LBW [25].

The pattern of consumption of pregnant women is influenced by the design of family consumption, food distribution, and dietary restrictions. The abstinence in consuming certain types of food can be affected by the culture/belief factor found in the local community. Some patterns of food abstinence are only embraced by a group of people within a certain time. The results in a particular nutrient deficiency in a specific group of people during one stage of the cycle and this may be experienced by pregnant mothers [26].

Nutritional interventions such as dietary supplements during pregnancy in adolescents, women of childbearing age and during pregnancy helps reduce the occurrence of LBW [25]. Antenatal services aim to maintain the physical/mental health of mothers and infants by providing health education on nutrition and early detection of fetal abnormalities so if there are any abnormalities, it that can be quickly handled, especially the problem of fetal growth [23].

## 5. Conclusions

In this study, stunting in children under five years old in Teluknaga sub-district province of Banten is significantly associated with LBW, mother's working status and average parents income. Among the variables, LBW was the most dominant risk factor. Like other nutritional problems, stunting is not only related to health problems but also influenced by other conditions that indirectly affect health.

Therefore, efforts should be made since the beginning of the focus on the first 1000 days of life include providing education about the importance of proper nutrition and pregnancy examination through existing health facilities. Other efforts can be a health education for all women of childbearing age in the future to understand better the importance of maintaining nutritional status in adolescence, before pregnancy until pregnancy to give birth to healthy babies. Provision of skill to under-five mothers who did not work can also be made to utilize the natural resources possessed to improve the nutritional status of children as well as implementing clean and healthy life behavior. Integrated and sustainable interventions provide excellent opportunities to reduce stunting and enhance public health status.

## Acknowledgment

The authors are grateful to the PKPU Human Initiative which had permitted to use data as research material.

## References

[1] Aries M, Hardinsyah, Tuhiman H. Determinants of Underweight and Stunting on Children Aged 0 – 36 Month Based on Conditional Cash Transfer Family Program (CCTFP) 2007. J Nutr Food. 2012;7(1):19–26.

[2] World Health Organization. Malnutrition [Internet]. 2017 [cited 2017 Jul 28]. Available from: http://www.who.int/mediacentre/factsheets/malnutrition/en/

[3] World Health Organization. Physical Status: The Use and Interpretation of Anthropometry. Report of a WHO Expert Committee. WHO Technical Report Series; 854 [Internet]. Geneva: World Health Organization; 1995. Available from: http://apps.who.int/iris/bitstream/10665/37003/1/WHO_TRS_854.pdf

[4] Data and Information Center M of H of the R of I. Stunting Children Under Five Years Situation [Internet]. 2016. Available from: http://www.depkes.go.id/resources/download/pusdatin/infodatin/situasi-balita-pendek-2016.pdf

[5] Agency for Health Research and Development Ministry of the Health Republic of Indonesia. Basic Health Research 2013. 2013.

[6] Amin NA, Julia M. Sociodemographic and Height of Parents and Its Relationship with The Incidence of Stunting in Children Aged 6-23 Months. J Nutr Diet Indonesia. 2014;2(3):170–7.

[7] Candra A, Puruhita N, Susanto J. Risk Factors of Stunting among 1-2 Years Old Children in Semarang City. MEDIA Med Indones. 2011;45(3):206–12.

[8] Aryastami NK, Shankar A, Kusumawardani N, Besral B, Jahari AB. Low Birth Weight Was the Most Dominant Predictor Associated with Stunting Among Children Aged 12 – 23 Months in Indonesia. BMC Nutr. 2017;3(16):1–7.

[9] Khan REA, Raza MA. Determinants of Malnutrition in Indian Children: New Evidence from IDHS through CIAF. Qual Quant [Internet]. 2016;50:299–316. Available from: http://dx.doi.org/10.1007/s11135-014-0149-x

[10] Biswas S, Bose K. Effect of Number of Rooms and Sibs on Nutritional Status among Rural Bengalee Preschool Children from Eastern India. Coll Antropol. 2011;35(4):1017–22.

[11] Chaudhury RH. Determinants of Dietary Intake and Dietary Adequacy for Pre-School Children in Bangladesh. Bangladesh Inst Dev Stud. 2012;
[12] Pandey KK, Singh MP, Singh RD. A Study of Maternal Status, Household Structure and Children's Nutritional Status in India. Rom J Popul Stud Cluj-Napoca. 2016;X(1):77–90.
[13] Rachmi CN, Agho KE, Li M, Baur LA. Stunting, Underweight and Overweight in Children Aged 2. 0 – 4 . 9 Years in Indonesia: Prevalence Trends and Associated Risk Factors. PLoS One. 2016;11(5):1–18.
[14] Lestari W, Margawati A, Rahfiludin MZ. Stunting Risk Factors in Children Aged 6-24 Months in Penanggalan sub-district Subulussalam city of Aceh Province. J Nutr Indonesia. 2014;3(1):37–45.
[15] Biswas S, Bose K. Sex Differences in the Effect Of Birth Order and Parents Education Status on Stunting: A Study on Bengalee Preschool Children from Eastern India. HOMO-Journal Comp Hum Biol. 2010;61(4):271–6.
[16] Dewey KG, Begum K. Original Article Long-term consequences of stunting in early life. Matern Child Nutr. 2011;7(Suppl. 3):5–18.
[17] Bryce J, Coitinho D, Darnton-Hill I, Pelletier D, Pinstrup-Andersen P. Maternal and Child Undernutrition 4 Maternal and Child Undernutrition: Eff Active Action at National Level. Ser 510 www.thelancet.com [Internet]. 2008 [cited 2017 Aug 10];371(9). Available from: http://www.thelancet.com/pdfs/journals/lancet/PIIS0140-6736(07)61694-8.pdf
[18] Ministry of National Development Planning / National Development Planning Agency. National Medium Term Development Plan 2015-2019. 2015.
[19] Agency for Health Research and Development Ministry of the Health Republic of Indonesia. Riskesdas Dalam Angka Provinsi Banten 2013. 2013.
[20] Public Health Office of Tangerang District. Health Profile of Tangerang District 2014 [Internet]. 2015 [cited 2017 Jul 13]. Available from: http://dinkes.tangerangkab.go.id/wp-content/files/Profil_Kesehatan_Kabupaten_Tangerang_2015.pdf
[21] Ramakrishnan U. Nutrition and Low Birth Weight: From Research to Practice 1–5. 2004;(1):17–21.
[22] Mishra VK, Lahiri S, Luther NY. Child Nutrition in India. National Family Health Survey Subject Reports. 1999.
[23] Kusumawati E. A Systematic Review against Risk Factors on The Low- weight Birth Incidence in Indonesia. J Heal Sci Prev. 1(1):38–44.
[24] OECD/WHO. Health at a Glance: Asia/Pacific 2014. Measuring Progress Towards Universal Health Coverage [Internet]. OECD Publishing; 2014 [cited 2017 Aug 10]. (Health at a Glance: Asia/Pacific). Available from: http://www.oecd-ilibrary.org/social-issues-migration-health/health-at-a-glance-asia-pacific-2014_health_glance_ap-2014-en
[25] Ekayani NPK. Sociodemographic Factors, Maternal Medicals, Nutrition Status and Low Antenatal Examination Increasing Risk of Low Birth Weight in Mataram City - West Nusa Tenggara Province. Media Bina Ilm [Internet]. 2014 [cited 2017 Aug 12];8(4):24–32. Available from: http://lpsdimataram.com/phocadownload/Juli-2014/4-faktorsosiodemografimediasmaternalstatusgizi-putukarunia.pdf