IJSCIA

International Journal of Scientific Advances
ISSN: 2708-7972
Volume: 4 | Issue: 1 | Jan – Feb 2023 Available Online: www.ijscia.com
DOI: 10.51542/ijscia.v4i1.5

The Correlation Between Gestational Weight Gain with Children Nutritional Status Age 0 – 2 Years in Simomulyo Health Center Sukomanunggal Village Surabaya City

Ulfina Aliya Sulhana[1], Sri Umijati[2*], and Pungky Mulawardhana[3]

[1]Medical Program, Faculty of Medicine, Universitas Airlangga, Surabaya, Indonesia

[2]Department of Public Health and Preventive Medicine,
Faculty of Medicine, Universitas Airlangga, Surabaya, Indonesia

[3]Department of Obstetrics and Gynecology,
Faculty of Medicine, Universitas Airlangga, Surabaya, Indonesia

E-mail: ulfina.aliya.sulhana-2019@fk.unair.ac.id;
sri-u@fk.unair.ac.id; pungky- m@fk.unair.ac.id

*Corresponding author details: Sri Umijati; sri-u@fk.unair.ac.id

ABSTRACT

Background: The golden period of child growth begins in the womb where a rapid growth and development occurs. Throughout the pregnancy, there is a gestational weight gain so that the mother's nutritional intake can meet the needs of herself and her fetus. Low gestational weight gain can affect the next child's life. ***Methods:*** This study is an observational analytic study with a cross-sectional approach. Samples were taken by using a total sampling with a sample size of 57 mothers with children aged 0 - 2 years. The independent variable is the gestational weight gain and the dependent variable is the child's nutritional status. The data collection method was carried out by collecting secondary data through integrated health center's data and the Maternal and Child Health (MCH) book, then the results were analyzed by the chi square test. ***Results:*** Most gestational weight gain found in this study was in the adequate category according to IOM 2009 recommendations (45.61%). Most children's nutritional status was normal according to the WAZ, LAZ, and BMI Z-score index (78%). The chi square test showed no relationship between gestational weight gain and children's nutritional status ($p>0.05$) ***Conclusion:*** In this study, there was no relationship between the weight gain of pregnant women and the nutritional status of children aged 0-2 years based on the of WAZ, LAZ and BMI Z-score index.

Keywords: maternal health; gestational weight gain; nutritional status

INTRODUCTION

Children's nutritional status in the first 1000 days of life is determined by the mother's nutritional status before and during pregnancy and during breastfeeding. If the mother's nutritional status is lacking, it can cause malnutrition problems in children which will result in growth retardation, decreased immune system, and impaired intelligence [1]. Pregnant mothers experience physiological changes during pregnancy that require more nutrients to meet the needs of their body's metabolism and the nutritional needs of the fetus. Consequently, the mother's weight will increase during pregnancy. If the needs for the growth and development of the fetus in the womb can be met properly, then the baby may have enough birth weight that will allow the baby to grow and develop optimally, resulting in good nutritional status [2].

Based on the Riskesdas data in 2018, in Surabaya city, the percentage of underweight children under two years was 8.62% and severely underweight children was 3.97% based on the Weight-for-Age (WAZ). Then, the percentage of stunting children under two years was 17.67% and severe stunting was 8.78 based on the Length-for-Age (LAZ) [3].

Based on data from the Surabaya Health Office, the prevalence of children under 2 years with a WAZ index below the red line is 0.74% with the Simomulyo Health Center in the highest order (10.28%) [4]

The study conducted by Alfarisi et al. showed there is a significant relationship between the nutritional status of pregnant women and the incidence of stunting where pregnant women who experience CED (Chronic Energy Deficiency) during pregnancy are 2.2 times at risk of stunting in toddlers than pregnant women with normal upper arm circumference [5]. Meanwhile, the study conducted by Zaif et al. found no relationship between a history of maternal nutritional status during pregnancy based on upper arm circumference and third trimester weight gain with the nutritional status of children under five years on Weight-for-Age (WAZ), Height-for-Age (HAZ), and Weight-for-Height (WHZ) [6].

Based on the description above, the poor children nutritional status in Simomulyo Health Center is still high, the influence of gestational weight gain to children nutritional status, and contradictory in previous studies.

This research has an objective to find the correlation between gestational weight gain and the children nutritional status.

METHODS

This research was conducted from August 2021 to December 2022. This research is an analytic observational study with a cross-sectional approach. Samples were taken by total sampling with sample size of 57 mothers with children aged 0-2 years in the Sukomanunggal Village, Simomulyo Health Center, Surabaya. The independent variable is the gestational weight gain of the mother (less, enough, or more than the IOM Gestational Weight Gain Recommendation 2009). The dependent variable is the child's nutritional status calculated using the Z-score and adjusted to the WHO Child Growth Standards 2005. The data collection method was carried out by collecting secondary data through integrated health center data and Maternal and Child Health (MCH) books. The data was then analyzed using SPSS and the chi-square test.

RESULT

The sample of this study involved 57 samples of mothers with children age 0 – 2 years. The youngest mother was 20 years old and the oldest mother was 35 years old. In table 1, it is presented that most of the mother's education status is high school (63,2%). Furthermore, most of the mother's occupational status is unemployed (70,2%). Looking from the gestational weight gain perspective, most of the mother have had enough weight gain during pregnancy (45,6%). Nevertheless, the percentage of mother with less gestational weight gain is still high (40,4%).

TABLE 1: Sample Characteristic.

Characteristic	Frequency (n)	Percentage (%)
Mother's Education Status		
Primary School	4	7.0
Junior High School	9	15.8
High School	36	63.2
Diploma/graduate	8	14.0
Mother's Occupational Status		
Unemployed	40	70.2
Employed	17	29.8
Gestational Weight Gain		
Less	23	40.4
Enough	26	45.6
More	8	14.0

Table 2 shows that most of the children were in theage group 12 - 23 months old (56,1%). Most of the children sex is male (52,6%). Most of the children were born with normal birth weight (94,7%). The children nutritional status is mostly normal in all anthropometry index. The percentage of normal nutritional status is 80,6% based on WAZ, 86,0% based on LAZ, and 78,9% based on BMI Z-Score index.

As shown in table 3, based on the chi-square test, there was no correlation found between the gestational weight gain and children age 0 – 2 years nutritional status based on WAZ (p = 0,784), basedon LAZ (0,670), and based on BMI Z-Score index (0,255).

TABLE 2: Children Characteristic.

Characteristic	Frequency (n)	Percentage (%)
Children Age (Months)		
0 – 5	11	19,3
6 – 11	14	24,6
12 – 23	32	56,1
Children Sex		
Male	30	52,6
Female	27	47,4
Birth Weight		
Low	1	1,8
Normal	54	94,7
High	2	3,5
Nutritional Status based on WAZ		
Severely	1	1,8
Underweight	1	1,8
Normal	46	80,6
Overweight	9	15,8
Nutritional Status based on LAZ		
Severely stunting	3	5,2
Stunting	4	7,0
Normal	49	86,0
Tall	1	1,8
Nutritional Status based on BMI Z-Score index		
Severe wasting	1	1,8
Wasting	1	1,8
Normal	45	78,9
Risk of overweight	4	7,0
Overweight	2	3,5
Obesity	4	7,0

TABLE 3: Correlation Between Gestational Weight Gainwith Children Nutritional Status.

Correlation Between Gestational Weight Gain with Children Nutritional Status	Gestational Weight Gain						P value
	Less		Enough		More		
	n	%	n	%	n	%	
WAZ							
Severely underweight	0	0,0	1	3,8	0	0,0	0,784
Underweight	0	0,0	1	3,8	0	0,0	
Normal	19	82,6	21	80,8	6	75,0	
Overweight	4	17,4	3	75,0	2	25,0	
LAZ							
Severely stunting	2	8,7	1	3,8	0	0,0	0,670
Stunting	1	4,3	3	11,5	0	0,0	
Normal	20	87,0	21	80,8	8	100	
Tall	0	0,0	1	3,8	0	0,0	
BMI Z-Score Index							
Severe wasting	0	0,0	1	3,8	0	0,0	0,255
Wasting	0	0,0	0	0,0	1	12,5	
Normal	17	73,9	23	88,5	5	62,5	
Risk of overweight	3	13,0	0	0,0	1	12,5	
Overweight	1	4,3	1	3,8	0	0,0	
Obesity	2	8,7	1	3,8	1	12,5	

DISCUSSION

In this study, most of the children nutritional status is normal in all anthropometry index (WAZ, LAZ, BMI Z-Score index). The percentage for all indices is above 78%. Furthermore, most of the gestational weight gain of the mother is enough (45,61%).

In this study, mothers with higher levels of education (high school and diploma/graduate) have children with good and normal nutritional status based on all anthropometric. The mother's education level will influence the mindset and attitude of the mother in meeting the nutritional needs of her child and makes it easier for the mother to receive information about her child's nutritional fulfillment which affects the child's nutritional status [7].

In this study, unemployed mothers had children with good nutritional status based on all anthropometric indices with a percentage of more than 75%. Unemployed mothers have more time to monitor the growth and development of their children and pay attention to their children's nutritional needs, starting from choosing, determining and preparing food for their children. Meanwhile, working mothers have less time to pay attention to the growth and development of their children [8].

In this study, it was found that the most birth weight was normal (94.7%), in line with the nutritional status of most children. Babies born with low birth weight (LBW) have the opportunity to experience growth and development disorders in the next phase of life. This can result in children having below normal nutritional status. Infants with a history of LBW may experience disrupted growth and development, have lower body immunity, and are more often exposed to infectious diseases so they can have poor nutritional status. The effect of birth weight on the baby's nutritional status mainly occurs until the baby is 12 months [9].

The results of this study indicate that there is no correlation between the gestational weight gain and the nutritional status of children based on the WAZ, LAZ, BMI Z-Score index. The results of this study are in line with previous studies where no relationship was found between the gestational weight gain and the nutritional status of children based on the WAZ, LAZ [6]. However, other studies have shown otherwise where gestational weight gain correlates with the nutritional status of children based on the WAZ and LAZ [10], based on the LAZ [11], and based on the BMI Z-Score index [12].

Data collection for pregnant women's weight gain in this study used data in the MCH handbook. The large number of parents who did not bring or lost their MCH books had an impact on the small number of samples in this study, so that the data obtained was less varied. In addition, the limitations of this study are other factors that may affect the nutritional status of children 0-2 years who are not included in this study which are confounding factors. These factors include exclusive breastfeeding, complementary feeding, child immunization status, and improving child nutrition to return to normal growth patterns (catch-up growth).

CONCLUSION

In this study, the most common gestational weight gain in this study is within the range of the IOM 2009 (45.61%). Most of the nutritional status of children aged 0-2 years is normal based on the index WAZ, LAZ, and BMI Z-score index with a percentage above 78%. The result of this study shows that there is no correlation between gestational weight gain and the nutritional status of children aged 0-2 years based on WAZ, LAZ, and BMI Z-score index due to the lack of variety of the data and the amount of confounding variables. Future research is needed with larger sample and to be conducted to younger child age.

ACKNOWLEDGEMENT

The authors would like to thank Simomulyo Health Center for providing the data of this study. The authors would like to appreciate Faculty of Medicine, Airlangga University, for supporting the research to completion. This study is ethically approved by Surabaya City Health Department (072/38875/436.7.2/2021 and 072/34023/436.7/2022)

REFERENCES

[1] Wuryanti, S., Marsiati, H., Andayani, S.H., 2019. Edukasi Gizi Seimbang Anak Usia 0-2 Tahun pada Ibu-Ibu di Kelurahan Harapan Mulya, Kemayoran/Jakarta Pusat. Abdimas Talenta 4, pp. 9–12.

[2] Brown, J.E., Isaacs, J.S., Krinke, U.B., Lechtenberg, E., Murtaugh, M.A., Sharbaugh, C., Splett, P.L., Stang, J., Wooldridge, N.H., 2011. Nutrition Through the Life Cycle. Wadsworth, Belmont CA, pp. 104-111.

[3] Riskesdas, 2018. Laporan Provinsi Jawa Timur Riskesdas 2018. Kementrian Kesehatan Republik Indonesia.

[4] Dinkes Surabaya, 2019. Profil Kesehatan Kota Surabaya 2018.

[5] Alfarisi, R., Nurmalasari, Y., Nabilla, S., 2019. Status Gizi Ibu Hamil Dapat Menyebabkan Kejadian Stunting Pada Balita. Jurnal Kebidanan Malahayati 5, pp. 271–278.

[6] Zaif, R.M., Wijaya, M., Hilmanto, D., 2017. Hubungan antara Riwayat Status Gizi Ibu Masa Keha milan dengan Pertumbuhan Anak Balita di Kecamatan Soreang Kabupaten Bandung. Jurnal Sistem Kesehatan 2, pp. 156–163.

[7] Atmarita, Fallah., 2004. Analisis Situasi Gizi dan Kesehatan Masyarakat. Dalam Soekirman et al., editor. Widyakarya Nasional Pangan dan Gizi VIII "Ketahanan Pangan dan Gizi di Era Otonomi Daerah dan Globalisasi". Jakarta. LIPI.

[8] Sulistyorini, E. and Rahayu, T., 2017. Hubungan pekerjaan ibu balita terhadap status gizi balita di posyandu prima sejahtera Desa Pandean Kecamatan Ngemplak Kabupaten Boyolali Tahun 2009. Jurnal Kebidanan Indonesia, 1(2), pp 11-16.

[9] Septikasari, M., 2018. Status Gizi Anak dan Faktor yang Mempengaruhi. UNY Press, Yogyakarta.

[10] Deierlein, A. L., Siega-Riz, A. M., Adair, L. S., & Herring, A. H., 2011. Effects of pre-pregnancy body mass index and gestational weight gain on infant anthropometric outcomes. The Journal of pediatrics, 158(2), 221–226.

[11] Gondwe, Austrida et al. 2018. "Pre-Pregnancy Body Mass Index (BMI) and Maternal Gestational Weight Gain Are Positively Associated with Birth Outcomes in Rural Malawi." PLoS ONE 13(10): 1–15.

[12] Hinkle, Stefanie N. et al. 2012. "Excess Gestational Weight Gain Is Associated with Child Adiposity among Mothers with Normal and Overweight Prepregnancy Weight Status." Journal of Nutrition 142(10): 1851–58.