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Link between method of delivery and childhood overweight or obesity

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Abstract. This study aimed to determine the relationship between the method of delivery and the incidence of overweight or obesity during childhood. This study was conducted on June 2012 to March 2013 in four selected elementary schools in Iligan City, Philippines wherein 96 overweight to obese children between 5-8 years old were selected as respondents through purposive sampling technique. A descriptive-correlational research design was used. To gather the pertinent data and information, a researcher-made questionnaire was employed. The data gathered were then tabulated and analyzed using frequency and percentage distribution, Chi-square test and Spearman correlation coefficient. It was found out that there is no sufficient evidence to harbor a significant relationship between the method of delivery and the incidence of childhood overweight or obesity among the respondents. Thus, other factors should be explored to relate to overweight or obesity in childhood.

Key words: normal vaginal delivery, cesarean section, childhood overweight, childhood obesity.

Introduction

Overweight and obesity are defined as abnormal or excessive fat accumulation that may impair health. A Body Mass Index (BMI) greater than or equal to 25 is overweight and a BMI greater than or equal to 30 is obesity (World Health organization, 2013). Childhood obesity has both immediate and long-term effects on health and well-being. Obese youth are more likely to have risk factors for cardiovascular disease, such as high cholesterol or high blood pressure. Obesity also predisposes to bone and joint problems, sleep apnea, and social and psychological problems such as stigmatization and poor self-esteem. Children and adolescents who are obese are likely to be obese as adults and are therefore more at risk for adult health problems such as heart disease, type 2 diabetes, stroke, several types of cancer, and osteoarthritis (Centers for Disease Control and Prevention, 2013). A number of factors have been identified that can lead to obesity in children such as genetics, physical activity and diet among others. Method of delivery has also been explored to possibly cause childhood obesity. According to Huh, et.al. (2012), children delivered by cesarean section have higher Body Mass Index and skinfold thickness measurements by the age of three. It was presumed that this finding is related to the composition of gut bacteria acquired at birth between the two delivery methods. They stressed previous study result that children born by c-section have more Firmicutes bacteria and less Bacteroides bacteria in their bowels. These bacteria make up the gut flora. In another research they also found out that obese people have higher levels of Firmicutes bacteria. It is speculated that gut bacteria are significant in the development of obesity by increasing energy extracted from the diet, and

by stimulating cells to boost insulin resistance, inflammation, and fat deposits (BMJ-British Medical Journal 2012).

Likewise, Blustein, et. al (2013) did a longitudinal birth cohort study, following subjects up to 15 years of age to assess associations of cesarean section with body mass from birth through adolescence. It was found out that cesarean delivery is associated with increased body mass in childhood and adolescence. The link between C-section births and obesity was especially strong in children born to overweight mothers.

Materials and Methods

Research design

This study used a descriptive-correlational research design to describe and determine the relationship between variables. The first variable in this study is the independent variable which is the method of delivery which is either normal vaginal delivery or cesarean section. The second variable is the dependent variable which is the incidence of childhood overweight or obesity. An intervening variable which is the demographic characteristics of the respondents was also considered to possibly affect the dependent variable.

Population and sample.

The target population of this study were the 96 children either overweight or obese between 5-8 years old in four selected elementary schools in Iligan City, Philippines selected through purposive sampling technique.

Instrument.

The instrument used in this study was a researcher-made questionnaire with two parts: (1) the respondents' method of delivery; and (2) the demographic characteristics of the respondents (age, sex, ordinal position in the family and number of overweight or obese members in the family).

Procedure.

The researchers asked permission from the respective principals of the four elementary schools for the conduct of the study. The possible overweight and obese children were selected, each of them was assessed of his/her weight and height, then Body Mass Index (BMI) was computed (kg/m2) and classified. Then, a request letter to participate and the researcher-made questionnaire were sent to the parents/guardians of the children whose BMI indicated overweight and obese. The filled-out questionnaires were then collected and results were tallied and interpreted using the selected statistical tools.

Data analysis

This study employed frequency and percentage distribution to describe the variables. Chi-Square Method of Association was used to determine relationship between the independent variable (method of delivery) and the dependent variable (incidence of childhood overweight or obesity). The same method was used to find a relationship between the intervening variable (demographic characteristics) and the dependent variable. To measure the strength of association between two ranked variables, the Spearman correlation coefficient was employed which is a nonparametric version of the Pearson correlation.

Results and Discussion

Research question 1: What is the method of delivery of the respondents?

Table 1 shows that majority of the respondents or 71 % were born normally or via normal spontaneous vaginal delivery (NSVD) while only 29 % were born via Cesarean Section (CS). This means that most of the overweight and obese children surveyed were born via NSVD.

Table 1. Method of Delivery of the Respondents (N=96)

Responses	No. Of Responses (%)	
Normal Vaginal	68	(71.0)
Cesarean Section	28	(29.0)

Research question 2: What is the demographic characteristics of the respondents as to age, sex, ordinal position in the family and number of overweight or obese family members?

Table 2. Demographic characteristics of respondents (N=96)

Response	No. Of responses (%)	
Age in years		
5	7	(7.3)
6	22	(22.9)
7	35	(36.5)
8	32	(33.3)
Mean=6.5		
Sex		
Male	55	(57.3)
Female	41	(42.7)
Ordinal Position in the Family		

1st born child	45	(47.0)
2nd born child	25	(26.0)
3rd born child	14	(14.5)
4th born child	7	(7.3)
5th born child	2	(2.1)
6th born child	1	(1.0)
7th born child	2	(2.1)
Number of Overweight or Obese Family Members		
1	48	(50.0)
2	23	(24.0)
3	15	(15.6)
4	7	(7.3)
5	3	(3.1)

Table 2 shows that majority or 36.5 % of the overweight and obese respondents are 7 years old followed by 8 year-old respondents of 33.3 %. The mean age is 6.5 years old with a standard deviation of 1.29. Meanwhile, more than half or 57 % of the respondents are males and 43 % are females. This finding agrees with Ogden, et. al. (2006) indicating the significant increased prevalence of overweight and obesity among male children and adolescents. Moreover, majority of the respondents or 48 % are eldest in the family followed by second-born children of 26 %. It implies that first-born children are more susceptible to overweight or obesity. While the largest number of respondents or 50% have one overweight or obese member in the family.

Research question 3: Is there a significant relationship between the method of delivery and the incidence of childhood overweight or obesity?

Ho_1 : There is no significant relationship between the method of delivery and the incidence of childhood overweight or obesity.

Table 3. Test of relationship between the method of delivery and the incidence of childhood overweight or obesity

	Pearson Chi-square p-value	Remark	Conclusion
Method of delivery vs Incidence of childhood overweight/obesity	0.354	Not significant	Null hypothesis not rejected

To determine if there is a relationship between method of delivery and the incidence of childhood overweight or obesity, the chi-square test for independence was executed. The chi-square p-value is 0.354. Since the p-value is not less than 0.05 level of significance, then the null hypothesis is not rejected. Hence, there is no sufficient evidence to show that there is a relationship between method of delivery and incidence of childhood overweight or obesity among the respondents. This finding contradicts with the finding of Blustein et.al (2013) and Huh et. al. (2012), that showed a relationship between method of delivery and the incidence of childhood obesity and that delivery by caesarean section increases the risk of obesity in children.

Research question 4: Is there a significant relationship between the respondents' demographic characteristics (age, sex, ordinal position in the family and number of overweight or obese family members) and the incidence of childhood overweight or obesity?

Ho_2: There is no significant relationship between the respondents' demographic characteristics (age, sex, ordinal position in the family and number of overweight or obese family members) and the incidence of childhood overweight or obesity.

To measure the relationship between the respondents' demographic characteristics (age, ordinal position in the family and number of overweight/obese family members) and the incidence of childhood overweight or obesity, Spearman Correlation Coefficient was utilized. The correlation coefficients are very small and are closer to 0. Hence, there is a very weak or ignorable relationship between the said demographic characteristics and the incidence of overweight or obesity. Likewise, all the p-values are not less than 0.05 level of significance, thus, the null hypothesis of no relationship is not rejected. Hence, there is no enough evidence to prove that the respondents' demographic characteristics (age, ordinal position in the family and number of overweight/obese family members) contribute to the incidence of overweight or obesity. In determining the relationship between sex and incidence of overweight or obesity, the Pearson Chi-square test for independence (for 2x2 contingency table) was executed. Since the p-value is not less than 0.05 level of significance then the null hypothesis is not rejected. Hence, there is no proof to show that

there is a relationship between sex and incidence of overweight or obesity. Therefore, the demographic characteristics do not influence the incidence of childhood overweight or obesity among the respondents.

Conclusion

This study found out that method of delivery and demographic characteristics (age, sex, ordinal position, number of overweight or obese family members) do not affect the incidence of overweight or obesity among the respondents. As a result of this study, it is recommended that future researchers use a larger number of respondents participating, and use random sampling technique instead of purposive sampling so that biases will be less likely to occur; include other control factors that may associate to overweight or obesity such as diet, physical activity, and lifestyle; and consider other variables like breastfeeding or bottle-feeding to relate to the incidence of overweight or obesity during childhood.

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