

Maternal Knowledge of Nutrition and Physical Activities as Determinants of Body Weights of Nigerian School Pupils

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Abstract

The study investigated the influence of maternal knowledge of nutrition and physical activities on body mass index of Nigerian school pupils. Three hundred school pupils participated in this study. A structured questionnaire was used to assess the maternal's knowledge of nutrition and physical activities. Body height and body-weight were measured with a stadiometer and a bathroom weighing scale, respectively. BMI was calculated using the formula weight (kg)/height (m²). Pearson-product moment coefficient of correlation and independent-sample t-test were used to test the hypotheses. Statistical significance was accepted for a p-value of <0.05. The results showed that the maternal knowledge of nutrition is a proportionate and a significant ($p < 0.05$) correlate of children's BMI. Besides, a proportionate but an insignificant ($p > 0.05$) relationship exists between the maternal knowledge of physical activities and children's BMI. Also, an insignificant difference ($p > 0.05$) exists between the maternal knowledge of nutrition and physical activities, and children's bodyweights across gender characteristics. Thus, the maternal knowledge of nutrition can determine children's bodyweights. The maternal knowledge of physical activities is not a good determinant of children's bodyweights. The maternal knowledge of nutrition and physical activities cannot alter the body weight of boys and girls differently.

Keywords: Knowledge of nutrition; Knowledge of physical activities; Body mass index; Grade-schoolers

Introduction

Nutrition plays a key role in human health and well-being, starting from conception to the later stages of childhood and geriatrics. However, the knowledge of the type, time and quantity of nutritional intake to ensure energy balance remains a great challenge especially among mothers. This is because food occupies the first position in the hierarchy of human needs, ignorance of many basic facts relating to food and nutrition is still widespread in the society. It has been confirmed that well-nourished infants, children and adolescents grow, develop and learn better compared to their mal-nourished counterparts [1]. The quality of children's diets can have consequences for physical growth, cognitive development, and health. The problems of both over and under-consumption can increase children's risk for diet related diseases later in life. One particularly worrisome trend is the increase in childhood overweight or obesity. Maternal knowledge of nutrition can enable her to choose the right diet for her children which will help them maintain a healthy weight. Children are generally not aware of the health hazards of poor nutrition and undesirable weight. Therefore, mothers' nutritional knowledge and health concerns may influence children's eating patterns. It cannot be assumed, however, either that the mothers of malnourished children are necessarily ignorant or that all illiterate mothers whether their children are healthy or malnourished, are ignorant [2]. It is believed that, some of the knowledge in nutrition of mothers and their knowledge of child nutrition and child-care practices can be expected to have a significant bearing on their children's nutritional status and weight. Meanwhile, some studies have observed a positive relationship between childhood malnutrition, maternal knowledge and beliefs regarding nutrition [3-5].

Anthropometric measures such as bodyweight constitute the new vital signs of the 21st century that warrant being assessment priorities if the tide of overweight or obesity is to be turned [6]. A child is overweight if his/her bodyweight is more than 20% higher than the

ideal bodyweight for a boy or girl of his/her age and height. Childhood overweight is said to be one of the most serious public health challenges of the 21st century and has become a global epidemic, one of the leading causes of morbidity and mortality in both developed and developing countries [7]. Besides physiological and genetic properties as well as nutrition, regular physical activity is considered an important component of good health and prevention of childhood undesirable weight [8]. Children with undesirable weights can enjoy a healthy weight through increasing physical activities. Physical activity has been shown to be associated with healthy weight status, bone and skeletal health, motor skill development, psychosocial health, cognitive development and aspects of cardio-metabolic health [9]. Concluded that, physical inactivity and sedentary behaviours, such as television viewing, are strongly related to obesity in Canadian children and adolescents [10]. In addition, submitted that children who report relatively low levels of physical activity are significantly more likely to be overweight or obese than more active children of similar age and gender [11]. It is to this end that this study was carried out to evaluate the maternal knowledge of nutrition and physical activity as determinants of body weights of Nigerian school pupils.

Method

This study is a correlational survey design. The population for this

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study included primary school pupils between the biological ages of 7 to 11 years from five primary schools in the 2018/2019 academic session in Oyo State, Nigeria. A total of 150 males and 150 female's primary school pupils participated in this study. They were recruited using proportionate random sampling technique. However, participants with any physical disability were excluded from the study.

A structured questionnaire was used to assess the maternal's knowledge of nutrition and physical activities. All questions were scored on a scale from 1 to 4; with 4 representing the highest level of knowledge possible. That is, Highly Knowledgeable (HK) =4, Knowledgeable (K) =3, Not Knowledgeable (NK) =2 and Highly Not Knowledgeable (NHK) =1. The questionnaire was validated by three experts, one from measurement and evaluation and the other was an expert in home economics education, while the third was also an expert in human kinetics and sports science in University of Benin, Benin City. Also, the instrument was administered to twenty (20) mothers and their children's BMI were calculated. The field work results were collected by calculating BMI of the children by the ratio of weight to height square [weight (kg)/height (m²)] of each child. Then, Cronbach Alpha was used to determine the reliability and the reliability coefficient of the instrument was 0.77.

The standing heights of the participants were measured using Shorrboard Stadiometer (Model:ICA 420, USA, 2018) in centimeters. Also, the calibrated electronic auto-zeroing bathroom weighing scale (Escali USTT200, Amazon, 2018) was used to measure the bodyweights of the participants. Then, BMI was calculated using the formula: weight (kg)/height (m²). Thereafter, the children were categorized into different classes of BMI based on the recommendation of Centers for Diseases Control and Prevention, which is age and sex-specific for children and teens from two years old through 20 years [12].

The study received ethical approval from the Research Ethics Committee of the University of Benin, Nigeria to conduct this study and the participants were then recruited consecutively. An informed consent form was issued to each of the respondents and then the objectives of the study were explained to them. The measurement of the pupil's heights and body weights as well as the administration of the questionnaire were done with the help of two trained research assistants. These assistants helped in the administration of the questionnaire and also in recording of the illiterate mother's answers on the questionnaires. The mother's questionnaire was taken to them in their houses with the help of the assistant researchers with the researcher. The questionnaire forms were retrieved immediately after being completed to avoid misplacement and the rate of retrieval was 100%. Aggregate scores were compiled as total points possible. The scores from those questions that address each specific area of the maternal knowledge (nutrition and physical activities) were then averaged together, for a final score within

each area measured. However, the field testing involved measurements of the standing heights and bodyweights of the pupils were carried out at their schools.

The anthropometric profile of the pupils was analyzed using frequency counts and percentages. The relationship of maternal knowledge of nutrition and physical activities with children's BMI was analyzed using the Pearson product moment coefficient of correlation, and then differences in children's bodyweights across gender categories were analyzed using the independent sample t-test. Statistical significance was accepted for a p value of <0.05. All the analyses were performed using the Statistical Package for the Social Sciences (SPSS) version 22.0.

Results

The results are presented in Tables 1 and 2. (Table 1)

From the Table 1, the percentage bodyweight categories of the Nigerian school children for underweight, desirable, overweight and obesity are 5.0%, 25.3%, 55.7% and 14.0% respectively. Moreover, majority of the children were found to be overweight (55.7%) based on their age and sex, while those that were underweight have the lowest percentage (5.0%). It was also observed from the Table 1 that an insignificant difference ($p > 0.05$) exists between maternal knowledge of nutrition and children's bodyweights. This implies that the influence of maternal knowledge of nutrition on bodyweights of Nigerian school children is the same across gender characteristics. The Table equally showed that an insignificant difference ($p > 0.05$) exists between maternal knowledge of physical activities and children's bodyweights across gender characteristics. This is an indication that the influence of maternal knowledge of physical activities on bodyweights of Nigerian school children is the same across gender characteristics. (Table 2)

Table 2 showed that maternal knowledge of nutrition is a proportionate ($r = 0.131$) and significant ($p < 0.05$) correlate of children's BMI. This is an indication that maternal knowledge of nutrition is a predictor of bodyweights of Nigerian school children. It was also observed from the Table that a proportionate ($r = 0.070$) but insignificant ($p > 0.05$) relationship exists between maternal knowledge of physical activities and children's BMI. This implies that maternal knowledge of physical activities does not have the ability to determine the bodyweights of Nigerian school children.

Discussion

Maternal nutritional knowledge was found in this study to have a significant influence on bodyweights of children. Related studies showed that maternal nutritional knowledge was significantly influenced children's bodyweights [3,4,13]. Similarly, the results on the effect of mothers' nutritional knowledge and attitudes on

Table 1: Descriptive statistics and independent sample t-test for maternal educational qualification and children's bodyweights.

	Bodyweight Categories	Frequency	Percent	Valid Percent	Cumulative Percent	
	Underweight	15	4.9	5.0	5.0	
	Desirable	76	25.0	25.3	30.3	
	Overweight	167	54.9	55.7	86.0	
	Obesity	42	13.8	14.0	100.0	
		F	Sig	T	Df	Sig. (2-tailed)
MKN	Equal variances assumed	.004	.949	-1.318	298	.188
	Equal variances not assumed			-1.318	297.959	.188
MNPA	Equal variances assumed	2.841	.093	-1.167	298	.244
	Equal variances not assumed			-1.167	297.700	.244

MKN-maternal knowledge of nutrition, MNPA-maternal knowledge of physical activities

Table 2: Correlations of children's BMI with maternal knowledge of nutrition and physical activities.

	BW	MKN	MNPA	Gender	BMI
BW	1	.131*	.070	.041	1.000**
		.023	.227	.474	.000
MKN	.131*	1	.925**	.076	.131*
	.023		.000	.188	.023
MNPA	.070	.925**	1	.067	.070
	.227	.000		.244	.227
Gender	.041	.076	.067	1	.041
	.474	.188	.244		.474
BMI	1.000**	.131*	.070	.041	1
	.000	.023	.227	.474	

BW-bodyweights, MKN-maternal knowledge of nutrition, MNPA-maternal knowledge of physical activities, BMI-body mass index

Omani children's dietary intake showed that there was a positive relationship between children's dietary food intake scores with the mothers' nutritional knowledge scores [14]. They stated that nutritional knowledge influenced dietary intake, highlighting the fact that nutrition-related education and information for mothers can improve their offspring's bodyweights in Oman. The implication of this is that maternal nutritional knowledge is responsible for children's bodyweights. Therefore, maternal nutritional knowledge acts as a path way through which maternal education influences children's diets. In other words, maternal knowledge of nutrition is a determinant of an ideal bodyweights among school children. Moreover, processed, energy-dense, nutrient-poor foods and sugar-sweetened beverages, in increasing portion size, at affordable prices have replaced minimally processed fresh foods and water in many settings at school and family meals. The easy access to energy-dense foods and sugar-sweetened beverages and the tacit encouragement to "size-up" through commercial promotions might have contributed to the rising caloric intake among school children.

Maternal knowledge of physical activities was observed not to have substantial relationship with children's bodyweights in the present study. This is in disagreement with the studies of that indicated maternal knowledge of physical activities as a significant predictor of children's bodyweights [15,16]. Discrepant findings within studies might also be due to methodological nuances, such as the timing of measurements and statistical modeling and the like. However, the finding of this study is in agreement with the studies [17,18]. Infact, many children today are growing up in environments that encourage weight gain and obesity. Changes in food availability and type, and a decline in parental knowledge of physical activity for transport or play, could be responsible for energy imbalance among school children. Opportunities for physical activity, both in and out of school, have been reduced and more time is spent on screen-based and sedentary leisure activities. Nevertheless, the risk of undesirable weights can be passed from one generation to the next, as a result of behavioral and/or biological factors. Behavioral influences continue through generations as children inherit socioeconomic status, cultural norms and behaviors', and family eating and physical activity behaviors'. In addition, physical activity behaviors across the life-course can be heavily influenced by childhood experience through their parents especially the mothers. Creating safe, physical activity-friendly homes and communities, which enable, and encourage the use of active transport (walking, cycling and so on) and participation in an active lifestyle and physical activities will benefit both young and old individuals. Particular attention needs to be given to improving access to, and participation in, physical activity for children already affected by overweight and obesity (undesirable weights).

Also, the insignificant influence of maternal knowledge of nutrition and physical activities on children's bodyweights across gender characteristics suggests that gender cannot influence the maternal knowledge of nutrition and physical activities on children's bodyweights. The similarity in percentage of skeletal muscle mass development between boys and girls could be responsible for the equal impact of maternal knowledge of nutrition and physical activities on children's bodyweights of both gender and by implication this does not affect their anthropometrics differently. Equally, this could simply reflect the similarity in sexual dimorphism, due to the action of sex steroid hormones. However, the major limitation of this study was that the parental socioeconomic status of the pupils, which could determine some anthropometric measures, was not taken into consideration.

Conclusion

This study therefore concluded that the maternal knowledge of nutrition can determine children's bodyweights. Meanwhile, maternal knowledge of physical activities is not a good determinant of children's bodyweight. Also, the maternal knowledge of nutrition and physical activities cannot alter bodyweights of boys and girls differently. It is highly recommended that further studies be conducted to evaluate the influence of parental socioeconomic status on their children's bodyweights.

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