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Maternal awareness of nutrition and physical activities as determinants of BMI in Nigerian School pupils

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Abstract

The study investigated the influence of maternal awareness of nutrition and physical activities on body mass index (BMI) of Nigerian school pupils. Three hundred school pupils participated in this study. A structured questionnaire was used to assess the maternal awareness of nutrition and physical activities. Body height and body-mass were measured with a stadiometer and a bathroom weighing scale, respectively. BMI was calculated using the formula weight (kg)/height (m²). Pearson coefficient of correlation and independent-sample t-test were used to test the hypotheses. Statistical significance was accepted for a p-value <0.05. The results showed that the maternal awareness of nutrition is a proportionate and a significant (p<0.05) correlate of children's BMI. On the other hand, there was no significant correlation between the maternal awareness for physical activities and children's BMI. Thus, we suggest that the maternal awareness of nutrition can determine children's BMI.

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. It has been confirmed that well-nourished infants, children and adolescents grow, develop and learn better compared to their mal-nourished counterparts (Youngson, 2004). The quality of children's diets can have implications for physical growth, cognitive development, and health (Pooja et al., 2016). According to Kaikkonen, Mikkilä and Raitakari (2014), the problem of both over and under-consumption of the right type of nutrients can be a predisposing factor for children's risk for dietary related diseases in their later years. One particularly worrisome trend is the increase in childhood overweight or obesity.

It is pertinent to state that maternal nutritional awareness can

enable her to choose the right diet for her children which will help them maintain a healthy body mass. Children are generally not aware of the health hazards of poor nutrition and weight gain. Therefore, mothers' nutritional awareness and health concerns can influence children's eating patterns (Yabancı, Kısac, & Karakus, 2013). Based on previous scientific evidence mothers nutritional awareness and their knowledge of child nutrition and child-care practices have a significant impact on their children's nutritional status and body mass. Meanwhile, some studies have observed a positive relationship between childhood malnutrition, maternal awareness and beliefs regarding nutrition (Al-Shookri, Al-Shukaily, Hassan, Al-Sheraji & Al-Tobi, 2011; Parul, Rita, Sunder & Tara, 2010; Wardle, Carnell & Cooke, 2005).

Anthropometric measures such as body mass constitute the new vital signs of the 21st century, that must be assessed, if the tide of overweight or obesity is to be upturned (Campbell & Crawford, 2001). According to Deurenberg, Yap and van Stav-

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eren (1998) body mass index (BMI) remains the simplest, safer and non-invasive way through which body fat percentage can be estimated, a person's health can be assessed as well as nutritional status. According to the World Health Organisation (2012), obesity has nearly doubled over the last three decades. Worldwide, the proportion of adults with a BMI of 25 kg/m² or greater increased between 1980 and 2013 from 28.8% to 36.9% in men, and from 29.8% to 38.0% in women. Prevalence has increased substantially in children and adolescents in developed countries; 23.8% of boys and 22.6% of girls were overweight or obese in 2013 (Ng et al., 2013). Interestingly, Childhood overweight is said to be one of the most serious public health challenges of the 21st century and has become a global epidemic. It is one of the leading causes of morbidity and mortality in both developed and developing countries (Kelishadi, 2007). Besides physiological and genetic properties as well as nutrition and regular physical activity is also considered an important component of good health and prevention of childhood obesity (Haskell, Lee & Pate, 2007). 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 (Carson, Hunter & Kuzik, 2015). Nelson, Li, Vuan and Lam (2002) concluded that, physical inactivity and sedentary behaviours, such as television viewing, are strongly related to obesity in Canadian children and adolescents. In addition, Chelen, Post, Roos and Lips (2000), reported that children with low levels of physical activity are significantly more likely to be overweight or obese than more active children of similar age and gender. Therefore, this study evaluates the maternal awareness of nutrition and physical activity as determinants of body weights of Nigerian school pupils.

Methods

The study received ethical approval from the Research Ethics Committee of the University of Benin, Nigeria. An informed consent form was issued to each of the respondents and then the objectives of the study were explained. The population for this study included primary school pupils between the age of 7 and 11 years from five primary schools in the 2018/2019 academic session in Oyo State, Nigeria. A total of 150 males and 150 females 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 awareness of nutrition and physical activities. All questions were scored on a scale from 1 to 4; with 4 representing the highest level of awareness possible. That is, Highly Aware (HA) =4, Aware (A) =3, Not Aware (NA) =2 and Highly Not Aware (HNA) =1. The questionnaire was validated by three experts in the certain matter

from the University of Benin, Benin City. The questionnaire was administered to twenty (20) mothers in order to test the reliability. 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 body mass 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 (2015), which is age and sex-specific for children and teens from two years old through 20 years. The measurement of the pupil's anthropometric characteristics, 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 questionnaire forms were retrieved immediately after being completed 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 awareness (nutrition and physical activities) were then averaged together, for a final score within each area measured.

The anthropometric profile of the pupils was analyzed using frequency counts and percentages. The relationship of maternal awareness of nutrition and physical activities and children's BMI was analyzed using the Pearson coefficient of correlation, and then differences in children's body mass 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

From the Table 1, the percentage body mass 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%). Table 1 revealed that an insignificant difference ($p > 0.05$) existed between maternal awareness of nutrition and children's body mass. Therefore implying that there was no influence of maternal awareness of nutrition on body mass of Nigerian school children for both boys and girls. Table 1 also revealed that there was an insignificant difference ($p > 0.05$) between maternal awareness of physical activities and children's body mass for both boys and girls. Table 2 showed that maternal knowledge of nutrition is a proportionate

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	0.004	0.949	-1.318	298	0.188
	Equal variances not assumed			-1.318	297.959	0.188
MNPA	Equal variances assumed	2.841	0.093	-1.167	298	0.244
	Equal variances not assumed			-1.167	297.700	0.244

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	0.131*	0.070	0.041	1.000**
		0.023	0.227	0.474	0.000
MKN	0.131*	1	0.925**	0.076	0.131*
	0.023		0.000	0.188	0.023
MNPA	0.070	0.925**	1	0.067	0.070
	0.227	0.000		0.244	0.227
Gender	0.041	0.076	0.067	1	0.041
	0.474	0.188	0.244		0.474
BMI	1.000**	0.131*	0.070	0.041	1
	0.000	0.023	0.227	0.474	

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

($r = 0.131$) and significant ($p < 0.05$) correlate of children's BMI. This might be an indication that maternal awareness of nutrition is a predictor of BMI of Nigerian school children. It was also observed from the Table 2 that there is no correlation ($r = 0.070$, $p > 0.05$), between maternal awareness of physical activities and children's BMI. This implies that maternal awareness of physical activities does not have the ability to predict the BMI in Nigerian school children.

Discussion

Maternal nutritional awareness was found in this study to have a significant influence on children's BMI. In this line, related studies showed that maternal nutritional awareness significantly influence children's body mass (Parul et al., 2010; Al-Shookri, Al-Shukaily et al., 2011; Baughcum, 2015). Similarly, the results of Ali, Layla, Fouad, Sadeq and Saif (2011) on the effect of mothers' nutritional awareness and attitudes on Omani children's dietary intake showed that there was a positive relationship between children's dietary food intake scores with the mothers' nutritional awareness scores. Previous evidence with support from our findings are indicating that nutrition-related education and information for mothers can improve their offspring's BMI. Maternal nutritional awareness acts as a pathway through which maternal education influences children's diets. In other words, maternal awareness of nutrition is a determinant of an ideal BMI among school children.

Maternal awareness for physical activities was observed not to have substantial relationship with children's BMI in the present study. This is in disagreement with the studies of Mulcherjee and Dhara (2014) and Coelho et al. (2012) that indicated maternal awareness of physical activities as a significant predictor of children's BMI. Discrepant findings within studies might be due to methodological nuances, such as the timing of measurements and statistical modeling. On the other hand, our results conform to the results of the studies of Tchicaya and Lorentz (2014) and Uthman and Aremu (2012).

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 awareness for physical activity, could be a reason for energy imbalance among school children. However, it has been observed that affinity for physical activity, both in and out of school, have been reduced and more time is spent on screen-based and sedentary leisure activities. Furthermore, this kind of behavior can be passed from one generation to the next, as children inherit socioeconomic status, cultural norms and behaviours, and family eating and physical activity behaviours. Moreover, physical activity behaviours across

the life-course can be heavily influenced by their parents especially the mothers. Thus, we therefore suggest that creating a 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.

Conclusion

This study therefore concluded that maternal awareness for nutrition may possibly determine children's BMI. It is therefore recommended that further studies are conducted to evaluate the influence of parental socioeconomic status on their children's BMI.

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