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Research Article

Relationship between Educational Level and Incidence of Obesity among Adults in Abeokuta, Ogun State, Nigeria

AS Adekoya[1,2,3]*, CI Ojo[3], OA Mafimidiwo[3,4] and FO Oyeleke[5]

[1]SAM Obesity Consult, Nigeria

[2]Marie Curie Academy, Abeokuta, Nigeria

[3]Federal Cooperative College, Ibadan, Nigeria

[4]Department of Human Nutrition, University of Ibadan, Nigeria

[5]Department of Human Nutrition and Dietetics, Kwara State College of Health Technology, Offa, Nigeria

***Corresponding Author:** AS Adekoya, SAM Obesity Consult, Nigeria.

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Abstract

This study examined the relationship between educational level and the incidence of obesity among adults in Abeokuta, Ogun State, Nigeria. A total of 240 respondents were selected from two different localities i.e. rural and urban, with their ages ranging from 20 years and 64 years. The educational level details were obtained based on the personal information given. The prevalence of obesity was determined using the Body Mass Index cut-off (≥ 30 kg/m^2) to estimate those obese. The data were analyzed using descriptive and correlative parameters to demonstrate the influence of educational level and its resultant effect on income level and incidence of obesity across the sampled population. The results showed the highest level of among the rural males of lower educational status. Adjustments were made to establish relationship between educational attainments and BMI graphically. Conclusively, the study affirmed that educational level determines the income level and obesity mostly among the urban population. Findings of this nature can further provide functional insights into some socioeconomic developments that can help to overcome obesity epidemic.

Keywords: Educational Level; BMI; Adults; Trends

Introduction

There is increasing trends in obesity as countries emerge from poverty, especially in urban areas [1]. To characterize the impact of weight stigma on obese people as disadvantaged, education as a domain in which people with obesity are disadvantaged [3]. In workplaces, negativity can be seen in some teaching staff attitudes and expectations [4]. Even teachers' perceptions of the academic ability of overweight children at school may be low performance, not minding the objective measurement of the children's performance in reading and maths [29,30]. Changes in educational levels, composition of diets and activity patterns are considered the crucial contributory factors that explain the rise in the incidence of obesity globally. Educational level in rural and urban areas has considerable association with increase in income and occupational patterns. Obesity has been an important social health issue in contemporary society; where the people living in urban areas consume diets distinctively different from those of their rural counterparts.

Taras and Potts-Datema was among the first researchers to determine the relationship between obesity and student performance at school [30].

In 2009, 29 published studies determined that there was an overall weak association between obesity and educational attainment in children and young people [32,41], which became weaker as variables such as family socio-economic status and other measures of deprivation were considered.

Educational achievement was considered better than obesity itself. Of which further reviews showed similar outcome, thus con-

cluding an "uncertain association" based on strength of evidence, study quality and moderation by other variables [33,41]. Those studies that restricted their findings to longitudinal found no evidence of an association in preadolescents or across most areas of academic achievement in adolescents [34].

There was some indication of poorer maths scores in young adolescent girls with obesity, with exception within a raft of non-differences. Some reviews also focused on school-based achievement and the intentional exclusion of students in tertiary or university education.

Knowing that tertiary education refers to post-school study at college and university, which leads to degree and vocational qualifications. Much focus has always been on higher level qualification such as diploma, bachelor's, master's, doctorate's, and professorial's degrees.

OECD (Organization for Economic Co-operation and Development) reported that some three quarters of young people in Australia, 55% of those in the US, and nearly half of young people in the UK are expected to graduate from tertiary education before the age of 30 [35,41] and the more women graduate than men. Also, that people from disadvantaged backgrounds are less likely to be in tertiary education. The families become responsible for the continued education i.e. tuition fees and living costs e.g. England [36]. Since higher education is a bridge to employment for some people across the world, attainment of a tertiary degree can make someone to be 10% more likely to be employed and earn over 50% more than adults who is yet to attain more than secondary education level [35,41].

For a large majority of individuals, overweight and obesity results from excess energy consumption, usually determined by income; and/or inadequate physical activity, as result of sedentarism [1,12,42].

A shift towards the higher fat and higher refined carbohydrate (western diet) with a more sedentary lifestyle is the serious problem worldwide, and would continue to increase as long as there is improving educational level with resultant rising income and increased westernization [22,26,42]. Generally, bodyweight is shaped by a combination of genetic, metabolic, behavioral, environmental, socio-cultural and socioeconomic factors.

This study focused on the level of education as having causal effect on the increasing incidence of obesity and overweight, considering variables such as Body Mass Index (BMI) and income.

Materials and Methods

The materials used include a questionnaire that collected data on the educational levels of 240 respondents, which comprised of 120 males and 120 females that spreads across two localities i.e. rural and urban areas [17]. The educational level was classified as:- Primary School = I, Secondary/High School = II, Technical = III, Vocational = IV, Polytechnic/College of Education = V, University graduate = VI, Postgraduate = VII; which were grouped as LOW = (I-IV) and HIGH = (V-VII); and also as lower than High School, High School graduate, and higher than High school for analysis purposes; and related with annual incomes which were classified as Low Income (#30,000 - #110,000) = I; Medium Income (#120,000 - #200,000= II; High Income (#210,000 and above) = III; and also grouped as Low Income (I) and High Income (II-III) for analysis purposes [10,21,25]. The Body Mass Index (BMI kg/m^2) was determined using the anthropometry data which involves the height in centimeter and weight in kilogram according to World Health Organization classification [2,14,16,20,27].

Results

The results were based on some units of analysis which reflect individual data of which adjustments were made during analysis; as can be seen in table 1. It showed the frequency of obesity in relation to the educational level and its effects on income; of which the variables were sub-classified and classified into low and high. 50% of the rural males had low educational level and 48.7% of the urban females also of low educational level were found to be obese. 50%, 53.9% and 51.3% of the rural females of high income level, urban males of high income level and urban females of high income level were also found to be obese respectively.

Figure 1 showed the same adjustments made on educational level in its relationship with the BMI kg/m^2, which revealed the mean values of BMI kg/m^2 of all the respondents across the localities were based on the educational attainments. The rural females of > high school has 33.48 ± 3.44; the rural males of high school graduates has 30.14 ± 3.30; and the rural males of > high school has 31.92 ± 4.22. All these showed levels above the cutoff point that is associated with the risks of being overweight and obese.

% Obese (≥ 30 kg/m^2)				
Sub-Population	**Low Education (I-IV)**	**High Education (V-VII)**	**Low Income (I)**	**High Income (II-III)**
Rural Males n = 60	50.0	0.0	0.0	33.3
Rural Females n = 60	0.0	33.3	25.0	50.0
Urban Males n = 60	42.3	12.6	18.3	53.9
Urban Females n = 60	48.7	38.7	35.0	51.3

Table 1: Frequency of obesity according to BMI (kg/m^2) IOTF on educational level of the adults across the localities and genders.

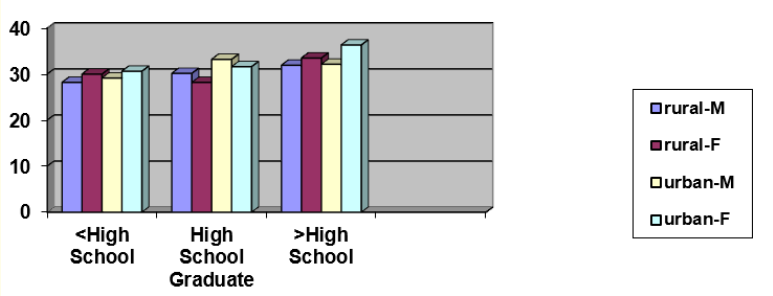

Figure 1: The relationship between the educational levels and BMI (kg/m^2) IOTF of the adults across the localities and genders.

The urban males of high school graduates and > high school had mean values of 33.19 ± 4.13 and 32.13 ± 2.01 respectively; which compared with the urban females of < high school with mean values of 30.60 ± 5.17, the urban females of high school graduates with mean value of 31.61 ± 4.79 and the urban females of > high school with mean value of 36.32 ± 3.89.

Discussion

Some researches indicate obesity status during school years is a significant risk factor for academic performance. Overweight and obesity have also been linked to cognitive dysfunction across adulthood [6,11].

Dr. Charles Hillman [3,13] from the Department of Kinesiology and Community Health at the University of Illinois articulated that there is relationship between energy consumption, storage and expenditure, and its effect on cognition which has a lot to do with educational attainments.

Sargent and Blanchflower [5,11] found that teen obesity is associated with a significantly lower educational level (along with lower income) continuing into adulthood. A large increase in BMI from early to late midlife was associated with poorer performance on tests of executive control function [7,18,19]. The findings from this study also conformed with their studies, in which higher percentage of obesity were observed among the lower educational level rural males and urban females.

Inequality in educational attainment is similar in Australia but with additional factors to be recognized. By age 15, people from low income families are 2.5 years behind high income families in educational achievement [38]. Living in a remote area (vs. metropolitan) is associated with a 2 year gap in maths and literacy, and being an indigenous young Australian, is a 2.5 year gap behind a white young Australian citizens or a young immigrants. University attainment once in study is less impacted by socio-economic factors and educational qualifications; they just determine the access into the university. Young people from disadvantaged backgrounds are under-absorbed into the university in countries such as England due to high tuition fees [39]. In 2017, 14% of 18 year olds from the most disadvantaged areas entered university education, as compared to 53% of those from the most advantaged areas [40].

Obese teenage girls are 50% more likely to repeat a grade than healthy counterparts; and obese boys drop out of school more than twice as often as healthy peers [4,11,24], which can also be related to this study where the urban female subjects that were high school drop outs were having the highest mean value of BMI.

In prioritizing future research, university completion is a very blunt measure of academic achievement. All students who graduate or terminate their course prior to graduation do so with detailed records of academic achievement. Opportunity exists for a much more nuanced understanding of the relationship between obesity and tertiary academic achievement, if primary care health data on weight (collected pre-university/college or at registration) is linked to academic transcripts. There is also indication that obesity affects motivation and ability to enrol for courses, the quality of assessed and examined work while at university/college, progression across the years of study, and course completion. Also, qualitative research with stakeholders, students (young or old) and staff should be conducted [32,34], so as to listen to the important experiences of university students with obesity, past and present. To understand the mechanisms that underpin any educational disadvantage in relation to obesity better, there is need to access the "casual observation" in 1960s that obesity was less prevalent among the prestige American colleges than public high schools [37]. von Hippel and Lynch reviewed that the prevalence of obesity has increased dramatically since 1960s, where young people having access to tertiary education had a different experience from those in the primary and secondary school cohorts.

A study by Cournot., *et al*. [8,11] employed a prospective design over a 5 year period to assess the relationship between BMI and Cognition of 32 - 62 year-old men and women in a workforce; the result showed higher BMI with poorer cognitive performance after adjusting for (age, sex, education) [15].

Extensive literatures also supported the causation processes, that relates attainment of a university/college educational qualification to lower prevalence of obesity later in life (in high income countries at least) [28,42].

This also occurred in this finding as the high school graduates and those above high school were the ones constituting the work force majorly; and they were having the highest BMI, which can be attributed to increased income but nothing has been done in the area of their cognitive assessment.

Although, increased physical activity improves cognitive health and function; and this can guarantee performance educationally [9,23]. In this study physical activity level of the subjects were assessed, which showed that some of them spent some time on some activities that expends energy and may have been contributing positively to their cognitive performances and their higher educational level and increased income. But higher intake of energy of western nature results in higher BMI.

Extensive assessment of this study which was majorly based on determinants of obesity further revealed that some associations existed between BMI kg/m^2 and income as a way of showing whether educational level can be attributed to the increment in income. The correlation just showed that income has a strong and direct association with BMI based on the correlative values [31,42].

The finding further showed that with higher level of income and energy intake, there was a tendency for increased odds ratios. The odds ratios were estimated in a common model for the rural and urban groups' BMIs, which when adjusted for the confounders the crude estimates of the urban low income and urban high energy intake levels changed. This can further be extended to determine some significant increase trends in odds ratios for BMIs and educational levels [42].

Conclusion

In view of all these hypothesis and facts from all the findings outlined from articles; continue exploration through interventions and researches, using current ideas, analyses and best practices can help in answering common problems associated with obesity; accompanied with learning from other approaches and proposals to overcome the epidemic.

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Author Contributions

Conceived and designed the experiments. Performed the experiments. Analyzed the data. Wrote the first draft. Contributed to the final paper. All authors approved the final version.

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