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Predictors of Overweight and Obesity Among Women in Ghana

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Abstract: The global prevalence of overweight and obesity has more than doubled between 1980 and 2008. Using the 2008 Ghana Demographic and Health Survey data, this study explored the association between biological, behavioural and socio-cultural factors and overweight and obesity among women in Ghana. The bivariate descriptive analysis and the binary logistic regression estimation technique were used to analyse the data. From the results, it was observed that there were significant associations between some of the factors and overweight and obesity. For instance, age was found to have a positive significant association with overweight and obesity for all categories while having four or more children was significant but negatively associated with overweight and obesity. The introduction of socio-cultural factors in the model did not affect the direction of association between age and overweight and obesity even though the strength of association reduced. Amongst the socio-cultural factors introduced in the model, all categories of education and wealth status had a positive significant association with overweight and obesity. The introduction of behavioural factors in the model did not change the nature of predictors of overweight and obesity. Alcohol consumption, contraceptive use and exposure to television were positively associated with overweight and obesity. The results underscore the relevance of biological, socio-cultural and behavioural factors in the planning and implementation of intervention strategies to address overweight and obesity among women in Ghana.

Keywords: Behavioural, Biological, Obesity, Overweight, Predictors, Socio-cultural, Women.

INTRODUCTION

Obesity is the accumulation of total body fat. It is clinically defined as having a body mass index (BMI) of over 30kg/m2 [1]. In spite of warnings from the World Health Organization (WHO) of an escalating epidemic of obesity, worldwide prevalence of obesity has more than doubled between 1980 and 2008 [2] to become a worldwide public health issue [3-5]. Recent figures indicate that more than 400 million adults worldwide are obese out of which over 115 million (constituting 29%) are found in developing countries [5, 6]. Over 2.8 million obese people die worldwide each year, with an estimated 35.8 million of global Disability Adjusted Life Years (DALYs) caused by overweight or obesity [7].

Individuals who are overweight or obese are more likely to be diagnosed with type 2 diabetes, hypertension, osteoarthritis, some cancers, gall bladder disease among others [1, 2, 8, 9]. Growing knowledge has shown that overweight and obesity do not discriminate between geographical locations, socio-economic levels, sex and age [10]. The conditions are known to be associated with food and eating habits, ethnicity, physical activity and marriage [11, 12].

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The increasing prevalence of overweight and obesity in developing countries is attributable to rapid urbanization with associated acculturation plagued with changes in diet and physical activity patterns [13]. Developing countries are therefore confronted with fighting morbidity at two fronts, that is, under nutrition and over nutrition. Nutritional stunting early in life is confirmed to be associated with obesity in later years [14]. Women however are more likely (14%) to be obese than men (10%) in developing countries [15]. The effect of globalization coupled with speedy economic transition in Ghana has resulted in high intake of foods that are saturated with fats and salts [16]. According to the authors increase in income level results in risky lifestyles which may lead to overweight and obesity. Also, it has been observed that Ghana is currently going through nutrition and economic transitions culminating in high prevalence of overweight and obesity, and related non-communicable diseases [17].

There are studies which examined the trends, patterns, distributions and determinants of overweight and obesity in Ghana. For instance, obesity was found to be more prevalent in the urban rather than rural areas and in the southern rather than the northern sector of the country [5]. On regional basis, the conditions are common in the Greater Accra. Among the various ethnic groups of Ghana, overweight and obesity are more common among the Ga/Dangmes. People with high level of education and the employed working class are more likely to be overweight or obese [8]. The current paper

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explored the association between biological, socio-cultural and behavioural factors and overweight and obesity among women in Ghana.

THEORETICAL CONTEXT

A number of models have been used to explore the factors that affect and the intervention strategies for dealing with overweight and obesity. These models include the theory of energy balance, which is an application of thermodynamics to the human body [18]. It states that when more calories are taken than are refined by the human body on daily basis, the surplus calories are converted to fats that are stored in the body. In effect, weight is gained when calories taken are much higher than can be burnt off from the body. The energy balance in determining body weight in individuals involves inter-individual variations in energy intake, basal metabolic rate, spontaneous physical activity, the relative rates of carbohydrate-to-fat oxidation and the degree of insulin sensitivity [19]. Even though contested by some authors [20], the energy balance model has been used variously to develop intervention models for reducing overweight and obesity [21].

Behavioural change theories have also been used [22, 23]. The behavioural change theories were developed at a period when the dominant conceptual models that regulated the development of health interventions were the cognitive behaviour models, which have their origin in psychological theory [23]. They are used to understand or propel behaviour changes among populations in order to reduce overweight and obesity [24]. The most widely used behavioural change models include the Health Belief Model [25], Theory of Reasoned Action [26], Social Cognitive Theory [27], Protection Motivation Theory [28], Trans-theoretical Model [29], and the Subjective Expected Utility Theory [30]. All these theories are concerned with how people make behavioural choices with the expectation that the choices they make will produce expected results [23]. In that sense, factors or variables that are believed to influence value/expectancy judgments include such factors as perceived rewards of current behavior, self-efficacy, normative beliefs, motivation, and the perceived consequences of not changing behavior [31]. Most of the behavioural change theories (except the Social Cognitive Theory and the Trans-Theoretical Models) expound the abilities of the individual to make personal decisions and change his/her behaviour to achieve a quality health status. The Social Cognitive and the Trans-Theoretical Models are broader and include factors that are external to the individual and are rather in his environment.

Related to the behavioural change models are the social ecological theories which have their origin in the Ecological Systems Theory of Brofenbrenner [32]. The social ecological theories have been used to explore the influence of environment on weight status, physical activity and eating behaviours [33]. Researchers of this model purported that rise in obesity is due to changes in the physical, social and economic environments. The situation in the environment makes it increasingly harder for individuals to do vigorous activities and eat health promoting foods that they require. The environment is thus the sum of influences that surroundings, opportunities or conditions of life have in promoting obesity in individuals or in populations [34]. In an obesogenic environment, the food market, national policies on food and agriculture, media, urban design, education and transport among others work together to restrain healthy eating and perhaps physical activity among populations [35].

The Social Ecological Perspectives see the Behavioral Change Model as inadequate in the sense that human behaviour is difficult to change, particularly in an environment that does not support change. This explains why individual programmes are difficult to sustain [28]. It is argued that, to increase physical activity and healthy eating, health promotion activities should not only focus on behaviour choices of people but also on the factors which influence those choices [33]. These factors have to do with several spheres of influences including public policy, institutional/organizational, community, interpersonal as well as individual levels of influence [23]. Susceptibility of individuals to the influences of the environment is affected by genetic and other biological factors such as sex, age and hormonal activities over which the individuals have little or no control [36].

Considering the various theories, it is realized that individual health behaviours and genetic profiles are not the only factors for understanding the epidemic of overweight and obesity. There are other broader influences on health status including socio-cultural and environmental influences that contribute to overweight and obesity among populations [37]. In spite of the fact that these theories did not specifically define the extent to which various factors contribute to the development of overweight and obesity, understanding them could enhance the comprehension of social and environmental trends that maximize opportunities for weight gain and minimize healthy lifestyle options that create "obesogenic" macro and micro environments [35].

Based on these theories, this study has grouped the predictors of overweight and obesity into three namely: behavioural, socio-cultural and biological. The behavioural factors include alcohol, fruit and vegetable consumption, vigorous physical activity and contraceptive use. The socio-cultural factors include wealth status, employment status, place of residence, marital status, education and religion. The biological factors are age and number of children.

DATA AND METHODS

The data used are from the 2008 Ghana Demographic and Health Survey (GDHS-08). The 2008 GDHS was designed as follow-on to the 1988, 1993, 1998 and 2003 surveys. GDHS-08 is a large nationally representative dataset collected by the Ghana Statistical Service and Macro and it forms part of the Global Demographic and Health Surveys (DHS) programme. The GDHS-08 utilized a two-staged stratified sample design, the first of which involved selecting primary sampling units (PSU) or clusters using systematic sampling with probability proportional to size. This was based on an updated master sampling frame constructed from the 2000 Population and Housing Census. The second stage involved the systematic sampling of the households listed in each cluster.

In half of the households selected for the survey, all eligible women aged 15-49 and all eligible men aged 15-59

were targeted for interview with the Women's and Men's questionnaires, respectively. A total of 4,916 women and 4,568 men from 6,141 households were interviewed over a three-month period, from early September to late November 2008. This analysis is based on 4125 women aged 15-49 with complete information for the purpose of this study.

The dependent variable for the study was derived from data collected on the Body Mass Index (BMI) of women who were interviewed. The BMI of each respondent was defined as her weight in kilograms divided by the square of her height in meters (W/H^2). The data had two implied decimal place which had to be divided by 100 to produce the BMI estimates. Using the DHS cut off of BMI of 25.0 or above to indicate overweight or obesity, a binary outcome was generated for overweight and obesity. Women with BMI of 25.0 or above were considered as overweight or obese and coded 1, whiles those below the BMI of 25.0 were considered as not overweight or obese and coded 0. All cases with missing information for the purpose of this study were excluded from the analysis.

The independent variables used in the study were grouped into three: behavioural, socio-cultural, and biological factors. Behavioural factors included alcohol consumption, number of days of fruit consumption per week, number of days of vegetables eaten per week, engaging in vigorous physical activity, contraceptive use and exposure to mass media (print, radio and television). Socio-cultural factors included education, marital status, wealth status, employment, residence, religion and ethnicity, whiles age and number of children born to a woman were the biological factors considered.

Complex survey designs like the one used in DHS surveys need to be accounted for in data analysis in order to obtain unbiased point estimates and accurate confidence intervals [38]. The statistical software STATA version 11.0 was therefore used for all analyses because it has a feature for estimating accurate standard errors where the sample has been drawn using clusters, stratification and unequal weights [39]. All the analyses for this paper were therefore weighted using DHS sample weights (see http://www.measure-dhs.com/Data/).

In order to clearly examine the nature and strength of the association between the various behavioural, socio-cultural and biological factors and overweight and obesity, it was necessary to control for confounding correlates of overweight and obesity using multivariate analyses. As a result, binary logistic regression was used in the analysis since the dependent variable (overweight or obesity) was constructed to be a binary outcome. A sequential approach was adopted, and three models were run to determine the predictors of overweight and obesity. Adjusted Wald's statistics were used to measure statistical significance.

RESULTS

The proportions of women overweight and obese by various characteristics are presented in Table **1**. The results of the Pearson's chi-squared tests indicate that all the characteristics considered were significantly associated with overweight or obesity, except vegetable consumption. Vigorous activity and exposure to print media were significantly associated with overweight or obesity at $p < 0.05$, while the remaining characteristics were significant at $p < 0.001$.

Thirty percent of the sampled women were overweight or obese. However, the proportions of women who were overweight or obese varied by biological, socio-cultural and behavioural characteristics. Though the pattern is not so clear, overweight and obesity appeared to be positively associated with age ranging from 14% for women aged 15-24 to 43% for those aged 35-44. Women who had given birth to four to six children were more (38%) associated with overweight and obesity. Overweight and obesity also seemed to increase with education, with about half of women with higher education being overweight or obese compared with about 22% of women without education. In terms of marital status, a greater proportion of overweight or obese women were either widowed or divorced or separated (42%). Again the proportion of women who were overweight or obese increased as wealth status improved (46% among richest women).

Overweight and obesity were also common with employed women (34%) and living in urban areas (40%). On the basis of religion, overweight and obesity appeared to be more associated with being Christian (32% for "other" Christians and 28% for Catholics). Even though the Ga/Dangme constitutes the smallest ethnic of the women sampled, they had the highest (49%) overweight and obesity levels compared to the other ethnic groups.

The results further indicate that about 40% of women who consumed alcohol were overweight or obese, whiles about a third of women who consumed fruits or vegetables in a week were overweight or obese. The use of contraceptives was associated with overweight or obesity although the proportions did not differ much by the methods. About a third of the women who had been exposed to print media or radio or television were overweight or obese.

The results of three binary logistic models run to determine the predictors of overweight and obesity in women in Ghana are presented in Table **2**. The unadjusted associations between biological factors such as age and number of children born to a woman are shown in model 1. Age was found to have a positive significant association with overweight and obesity for all categories, whiles having 4 or more children was significant but negatively associated with overweight and obesity. To control for socio-cultural correlates of overweight and obesity, education, marital status, wealth status, employment, residence, religion and ethnicity were introduced in model 2. Though the introduction of socio-cultural factors in model two did not affect the direction of association between age and overweight and obesity in model 2, the strength of association reduced. Number of children born which was inversely associated with overweight and obesity became positive in model 2, with all categories being statistically significant.

Amongst the socio-cultural factors introduced in model 2, all categories of education and wealth status had a positive significant association with overweight or obesity. A positive significant association was also found between being employed and overweight and obesity, while a negative

Table 1. Proportion of Women Overweight and Obese by Various Characteristics (Weighted)

Characteristics	Number of Women	%	X^2
All	4125	30.0	
Age			287.49***
15-24	1601	13.7	
25-34	1167	36.5	
35-44	969	43.9	
44+	388	40.9	
No. of children			117.38***
None	1478	18.6	
1 to 3	1602	36.1	
4 to 6	884	37.5	
7+	161	29.1	
Educational level			90.28***
No education	820	21.9	
Primary	845	30.1	
Secondary	2306	31.2	
Higher	154	49.7	
Marital status			134.64***
Never married	1446	17.7	
Married/cohabiting	2260	35.4	
Widowed/divorced/separated	419	41.5	
Wealth status			410.21***
Poorest	609	12.3	
Poor	745	15.4	
Middle	830	23.3	
Richer	973	40.9	
Richest	968	46.3	
Employment status			103.21***
No	1031	16.5	
Yes	3094	34.2	
Place of residence			229.87***
Urban	2036	39.9	
Rural	2089	20.1	
Religion			41.35***
Catholic	519	27.6	
Other Christians	2735	31.8	
Muslim	583	26.8	
Traditional	161	21.3	

Table 1. contd…

Characteristics	Number of Women	%	X^2
Other	127	20.9	
Ethnicity			93.64***
Akan	2152	32.2	
Ga/Dangme	296	39.3	
Ewe	515	31.0	
Mole-Dagbani	623	20.4	
Other	539	24.7	
Alcohol consumption			20.79***
No	3381	27.6	
Yes	744	39.7	
No. of days of fruit per week			28.45***
None	383	24.0	
1 to 3	1733	30.3	
4 to 7	2009	30.5	
No. of days of veg per week			1.45
None	131	27.6	
1 to 3	2026	30.4	
4 to 7	1968	29.3	
Vigorous activity			5.35*
No	2172	31.2	
Yes	1953	28.2	
Contraceptive use			61.73***
None	3237	26.8	
Modern method	614	41.1	
Traditional method	274	40.6	
Exposure to print media			6.23*
No	3120	29.2	
Yes	1005	31.7	
Exposure to radio			37.41***
No	596	20.8	
Yes	3529	31.3	
Exposure to television			133.95***
No	1469	20.5	
Yes	2656	35.1	
BMI groupings	*N*	*%*	
Underweight	361	8.7	
Healthy weight	2535	61.5	

Table 1. contd…

Characteristics	Number of Women	%	X^2
Overweight	845	20.5	
Obese	384	9.3	

*p < 0.05, ***p < 001; WHO standard BMI groupings – underweight, BMI < 18.5; normal weight, BMI 18.5-24.9; overweight, BMI 25.0-29.9; obese, BMI > 30.0

Table 2. Results of Logistic Regression on Overweight and Obesity

	Model 1 (N=4125)		Model 2 (N=4125)		Model 3(N=4125)	
Characteristics	**OR**	**P-value**	**OR**	**P-value**	**OR**	**P-value**
Biological factors						
Age						
15-24 (Ref)						
25-34	3.75***	0.000	2.52***	0.000	2.48***	0.000
35-44	5.76***	0.000	3.51***	0.000	3.55***	0.000
45+	5.50***	0.000	3.03***	0.000	3.10***	0.000
No. of children						
None (Ref)						
1 to 3	0.99	0.966	1.54**	0.005	1.48*	0.011
4 to 6	0.65**	0.002	1.73**	0.003	1.64**	0.009
7+	0.46***	0.000	1.72*	0.035	1.70*	0.041
Socio-cultural factors						
Educational level						
No education (Ref)						
Primary	Na	Na	1.50**	0.002	1.43**	0.007
Secondary	Na	Na	1.38*	0.012	1.32*	0.037
Higher	Na	Na	1.88**	0.005	1.80*	0.014
Marital status						
Never married (Ref)						
Married/cohabiting	Na	Na	1.03	0.835	1.02	0.916
Widowed/divorced/separated	Na	Na	1.26	0.231	1.29	0.189
Wealth status						
Poorest (Ref)						
Poor	Na	Na	1.44*	0.028	1.36	0.064
Middle	Na	Na	2.17***	0.000	1.99***	0.000
Richer	Na	Na	5.09***	0.000	4.43***	0.000
Richest	Na	Na	6.75***	0.000	5.61***	0.000
Employment status						
No (Ref)						
Yes	Na	Na	1.53***	0.000	1.45**	0.002
Place of residence						

Table 2. contd…

	Model 1 (N=4125)		Model 2 (N=4125)		Model 3(N=4125)	
Characteristics	**OR**	**P-value**	**OR**	**P-value**	**OR**	**P-value**
Urban (Ref)						
Rural	Na	Na	0.73**	0.005	0.73**	0.005
Religion						
Catholic (Ref)						
Other Christians	Na	Na	0.95	0.706	0.96	0.764
Muslim	Na	Na	1.06	0.714	1.17	0.335
Traditional	Na	Na	0.99	0.972	0.90	0.678
Other	Na	Na	0.94	0.801	0.92	0.760
Ethnicity						
Akan (Ref)						
Ga/Dangme	Na	Na	1.27	0.126	1.18	0.301
Ewe	Na	Na	1.34*	0.013	1.27*	0.048
Mole-Dagbani	Na	Na	0.76	0.071	0.74*	0.047
Other	Na	Na	1.00	0.982	0.99	0.995
Behavioural factors						
Alcohol consumption						
No (Ref)						
Yes	Na	Na	Na	Na	1.37**	0.002
No. of days of fruit per week						
None (Ref)						
1 to 3	Na	Na	Na	Na	1.17	0.271
4 to 7	Na	Na	Na	Na	1.18	0.262
No. of days of veg per week						
None (Ref)						
1 to 3	Na	Na	Na	Na	1.09	0.705
4 to 7	Na	Na	Na	Na	1.16	0.545
Vigorous activity						
No (Ref)						
Yes	Na	Na	Na	Na	1.06	0.497
Contraceptive use						
None (Ref)						
Modern method	Na	Na	Na	Na	1.33**	0.008
Traditional method	Na	Na	Na	Na	1.52**	0.006
Exposure to print media						
No (Ref)						
Yes	Na	Na	Na	Na	0.89	0.352

Table 2. contd…

	Model 1 (N=4125)		Model 2 (N=4125)		Model 3(N=4125)	
Characteristics	**OR**	**P-value**	**OR**	**P-value**	**OR**	**P-value**
Exposure to radio						
No (Ref)						
Yes	Na	Na	Na	Na	0.96	0.757
Exposure to television						
No (Ref)						
Yes	Na	Na	Na	Na	1.32**	0.009
Pseudo R	0.0690		0.1796		0.1866	
Wald chi	294.0(6)		633.2(25)		653.2(36)	
Prob >chi	0.000		0.000		0.000	

OR = Odds ratio; Ref = Reference category; Na = Not applicable; *p < 0.05, **P < 0.01, ***p < 001

significant association emerged between rural residence and overweight and obesity. In terms of ethnicity, a positive significant association emerged between Ewes and overweight and obesity, while a significant inverse association was found for the Mole-Dagbani group. The introduction of behavioural factors in model 3 did not change the nature of predictors of overweight and obesity in the previous model. Of the factors introduced in model 3, alcohol consumption, contraceptive use and exposure to television were positively associated with overweight and obesity.

DISCUSSION

Women within the 35-44 age group had the highest odds (3.55, p=0.000) of being overweight or obese. This could be attributed to the number of children a person has had, which is related to their risk of overweight or obesity [40]. For biological reasons, age could have an effect on the probability of being overweight. Specifically, women may gain weight as they approach middle age, but then begin to lose weight as they enter old age, resulting in an inverted U-shape relation between weight and age [41]. It can again be argued that many women within the age group 35-44 live sedentary lifestyle or they may have independent children which decrease physical activity with its attendant effect of increasing overweight or obesity [42].

The study also revealed that overweight or obesity increased with parity. Women who had given birth to seven or more children had higher probabilities of being overweight or obese, followed by those with four to six children and those with one to three children, compared to women with no children. Biologically, childbearing is associated with higher body weight among women [43]. A woman's risk of overweight or obesity increases by 7% per child [44]. During pregnancy, women gain weight so that their babies get proper nourishment and develop normally. After giving birth, some women find it hard to lose the weight gained. This may lead to overweight or obesity [6].

Overweight or obesity did not seem to discriminate in terms of level of education. However, the highest probabilities of overweight or obesity were among women with higher education. Compared with those without education, women with higher education were about two times (1.80, p=0.014) more likely to be overweight or obese. If education affects activity and eating behavior, we might expect an inverse rather than a direct relationship [45]. This finding is consistent with a report that, in Ghana people with tertiary education are presented with the highest levels of obesity [46]. It again compares with the results of a study in which subjects with tertiary education had the highest prevalence of obesity compared with less literate and illiterate subjects [8]. However, this contradicts the findings of other studies which revealed that overweight/obesity was substantially higher among the non-educated women than their educated counterparts [47, 48].

The odds of overweight and obesity in women also appeared to increase with increasing wealth status. The odds (5.6, p=0.000) of women in the richest wealth category were more than five times higher than those in the poorest category. Following this was those in the richer category, with more than four times significantly higher odds (4.43, p=0.000) compared with those in the poorest category. Similarly, employed women had higher odds (1.45, p=0.002) of being overweight or obese compared to their unemployed counterparts. Several theories have been postulated on the possible relationships between income and weight, which are positive, negative or inverted U-shaped [41, 46, 49]. Demand for food that raises weight could increase with increase in income. Continued growth in weight, however, would depend on whether income growth encourages weight control or not. Whereas obesity in industrialized countries is more prevalent within the lower socio-economic class, studies in Africa and Ghana have demonstrated by contrast a strong positive relationship between obesity and high socio-economic status [47, 50, 51]. In developed countries, the wealthy people are able to afford nutritious food; they are under greater social pressure to remain slim, and have more opportunities along with greater prospects for physical fitness [52]. However, in a country like Ghana where the rich are expected to put on weight as a proof of their success and prestige, chubbiness in successful individuals is expected [46].

Women living in rural areas were significantly less (0.73, p=0.005) likely to be overweight or obese, compared with those living in urban settings. On ethnic grounds, some variations in obesity were also observed. While the Mole-Dagbani had significantly lower odds (0.74, p=0.047) of being overweight or obese, the Ewes had significantly higher odds (1.27, p=0.048) of being so. Urbanization and socioeconomic transformation come with increased access to energy-dense foods and less strenuous jobs resulting in many people having a positive energy balance and hence becoming overweight or obese [53, 54]. In spite of rampant poverty in urban areas, access to cheap foods with a high content of fat and sugar among the urban poor is easier than among the rural population, leading to overweight and obesity [55, 56].

The effects of ethnicity are also quite significant for overweight and obesity, with Ewes having significantly higher odds of being so. This contrasts the findings of earlier studies which revealed that Ga/Dangmes, Asantes and Fantes were significantly more likely to be obese compared to their Ewe counterparts [8, 41]. Compared to other ethnic groups, the Mole-Dagbani had significantly lower odds of being obese.

The association between alcohol consumption and overweight or obesity is such that women who consume alcohol were about 1.4 (p=0.000) times more likely to be overweight or obese than those who did not consume alcohol. This is consistent with the findings of an earlier study in Ghana [11]. The results show higher probabilities of overweight or obesity among women who used contraceptive methods, irrespective of whether such methods were modern or traditional. That notwithstanding, the highest probabilities (1.52, p=0.006) were observed among women who used traditional methods of contraception, compared to those who used no method or modern methods.

Out of the media variables considered, only television exposure was more significantly associated with overweight and obesity. The rest were insignificant and less associated with obesity. The odds of women who were exposed to television being overweight or obese were about 1.3 times (p=0.009) more than those who were not exposed.

CONCLUSION

The study explored the association between biological, socio-cultural and behavioural factors and overweight and obesity among women in Ghana. Age and number of children born to women were significantly associated with overweight and obesity after controlling for socio-cultural and behavioural correlates. The introduction of the socio-cultural and behavioural factors did not affect the direction of association between age and overweight and obesity although the strength of association reduced. However, the number of children born which was inversely associated with overweight and obesity became positive with all categories being statistically significant. Amongst the socio-cultural factors, all categories of education and wealth status had a positive significant association with overweight or obesity. A positive significant association was also found between being employed and overweight and obesity, while a negative significant association emerged between rural residence and overweight and obesity. In terms of ethnicity, a positive significant association emerged between Ewes and overweight and obesity, while a significant inverse association was found for the Mole-Dagbani group. Of the behavioural factors, alcohol consumption, contraceptive use and exposure to television were positively associated with overweight and obesity. Intervention strategies targeting obesity among women in Ghana should consider the critical biological, behavioural and socio-cultural factors.

CONFLICT OF INTEREST

The authors confirm that this article content has no conflicts of interest.

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