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Research

Overweight and obesity in women in Burkina Faso: Socio-cultural and behavioural factors

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Abstract

Overweight, obesity, and associated non-communicable diseases are global public health issues. Initially confined to developed nations, they are now spreading to least developed countries as a result of the globalisation of dietary attitudes and practices, which have greatly increased the consumption of ultra-processed and other obesogenic products. In developing countries, women are more likely to be overweight or obese than men. Burkina Faso is not an exception in this pattern. It is the reason why this analysis was initiated to highlight the socio-cultural and behavioural factors underlying this phenomenon among women. It aims at emphasizing the prominent characteristics of overweight/obese women to help formulate accurate actions and interventions. To this end, the data used come from the Burkina Faso 2021 Demographic and Health Survey, which covered a nationally representative sub-sample of 8,852 women aged 15-49 years, on whom anthropometric measurements (height and weight) were collected. The analyses revealed that overweight and obesity affect at least one in five women, and are linked predominantly to the possession of rapid means of transportation, practice of sedentary activities, having a high living standard, consumption of dietary diversity, having a high level of education, older age, frequent consumption of sweetened beverages, connected to internet, urban residence, membership in certain ethnicities and multi-parity. This highlights the multidimensional nature of overweight and obesity and the need for multi-faceted actions to control the current upward trend. Priority should be given to balanced diets low in ultra-processed foods, daily physical exercise, and their influencing parameters.

INTRODUCTION

Since 1997, human obesity has been recognised as a pandemic by the World Health Organization (2004). The prevalence of obesity is steadily increasing in developed countries and now also in emerging economies as living standards improve. Between 1980 and 2023, global obesity tripled (Dobbs et al., 2014). If current trends continue, almost half of the world's population will be overweight by 2030 (Dobbs et al., 2014). Obesity-related morbidity and mortality are steadily increasing worldwide, and it is estimated that 30% of deaths worldwide will be due to obesity-related diseases by 2030 (OMS et al., 2011). In 2020, 16% of the world population was living with obesity; 14% of men and 18% of women. In high-income countries (GNI per capita of US$13,205 or more), the prevalence is 29% in men and 28% in women. In low-income countries (GNI/capita of less than US$1,085), which include the majority of African countries, the prevalence is 5% for men and 14% for women. In sub-Saharan Africa specifically, the prevalence is 7% for men and 18% for women (World Obesity Federation, 2023).

In rural areas of Burkina Faso, during the lean period, 54.7% of households do not have enough food for the whole family (Sanou et al., 2018). The food diversity score then is 5.7±2.4, whereas in favourable periods it is 7.3±2.4 foods (Sanou et al., 2018). This is linked to rain-fed agriculture with little mechanisation, poor storage capacities, and inadequate conservation and processing infrastructure (MAHRAH, 2013). As a result, more and more food is imported to make up the shortfall. The consequence is a food price rise over the last ten years, continuing to restrict access to adequate food among lower income groups. Thus, it is mainly wealthy households that benefit from a diversified diet made up largely of imported products. However, this also exposes them to the high-calorie Western diet, including ultra-processed foods (KABRE et al., 2022; Scott et al., 2013).

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Thus, adult overweight and obesity are on the rise. Demographic and health surveys show that the prevalence of overweight and obesity among women of reproductive age, based on body mass index, increased from 5.2% in 1993 to 21.6% in 2021 (INSD & ICF, 2023; INSD & ICF International, 2012). The implications for the concerned population are manifold, including health, economic, social and psychological.

It is therefore important to take a closer look at this phenomenon, which is rising in Burkina Faso. Unfortunately, it is rarely subject of in-depth analysis, particularly in the case of women of reproductive age. To this end, the present study explores the socio-economic determinants of overweight in these women in Burkina Faso. It aims at emphasizing the prominent characteristics of overweight/obese women to help formulate appropriate and accurate actions and interventions.

METHODS

This analysis is based on data from the latest Burkina Faso Demographic and Health Survey (BFDHS-V), carried out by the National Institute of Statistics and Demography of Burkina Faso with the support of the USAID-funded DHS program. Fieldwork for this fifth survey done in Burkina Faso was conducted during the lean season of 2021, precisely between 30 July and 30 November 2021. The BFDHS-V sample was drawn from a two-stage stratified sample. The urban and rural parts of each 13 regions corresponded to a stratum, yielding a total of 26. In the first stage, 514 clusters were selected systematically, with a probability proportional to the number of households established in the last general population census conducted in 2019. After updating the list of households in each cluster, a random sample of 32 households per cluster was drawn in the Sahel region and 26 households per cluster in the 12 remaining regions. In these households, all women of reproductive age (15-49 year-olds) were eligible for the survey, resulting in 13,251 households and 17,659 women included. These final targets were obtained, with a coverage rate of at least 98%. In half of households, anthropometric measurements were conducted on women aged 15-49. This subsample, on which the present analyses are carried out, comprises 8,852 women of reproductive age. Data collection used smartphones managed by CAPI CSPro software. Completed information was systematically sent to a server dedicated to surveys. More detailed information can be found in the survey report (INSD & ICF, 2023).

One of the advantages of these data is that they provide information on many of the determinants included in the conceptual framework of obesity in developing countries identified by Scott et al. (2013), including the diversity of food consumed. In addition to anthropometrics on a consistent sample of women of reproductive age, relevant background characteristics (age, reproductive history, pregnancy status, health status) were collected. In addition, unlike previous DHS surveys, household food security was assessed using a relatively robust population-based instrument, the Food Insecurity Experience Scale, which includes assessments of food availability and quality. The use of this large range of specific variables is essential to respond as effectively as possible to the multidimensional nature of the adult obesity.

The independent variables from the BFDHS women's questionnaire used in the present study are based on the conceptual framework developed by Scott et al. (2013): proximal factors (energy expenditure, genetics and physical activity), intermediate factors (perceived overweight, occupation, social relationships and built environment) and distal factors (globalisation and urbanisation), as illustrated in Table 1. Some BFDHS data were re-coded to provide a standardised categorisation based on existing norms. These norms are constructed from a set of parameters through a multidimensional descriptive analysis of characteristics such as the household's non-monetary living standard (household wealth), based on the status of the dwelling, the quality of raw products used in house building, and the possession of certain durable goods (Filmer & Pritchett, 1998). In order to ensure the robustness of the results of explanatory analyses, certain variables were coded a posteriori to obtain a more consistent number of modalities, such as education level, for which the secondary and higher modalities are grouped together to form secondary and higher.

Table 1. Operational aspects of overweight/obesity factors

Proximate	Intermediary	Distal
Diversity of food	Occupation	Place of residence
Age	Religion	
Height	Marital status	
Number of children	Education	
Age at first birth	Ethnicity	
	Means of	
	Possession of	
	Food insecurity	
	Household wealth	
	Dietary diversity	
	Connection to internet	

The diversity of women's food consumption was captured by the number of food groups consumed, which reflects a key dimension of quality from the point of view of micronutrient adequacy. These are essentially 11 micronutrients: vitamin A, thiamine, riboflavin, niacin, vitamin B-6, folic acid, vitamin B-12, vitamin C, calcium, iron and zinc (FAO, 2021). The construction procedure involved recording whether or not 26 specific foods were consumed over a 24-hour recall period. They were then grouped into ten major standardised food groups, using the FAO (2021) framework: cereals, tubers, roots (1), protein crops (2), oilseeds (3), dairy products (4), meat, poultry, fish, offal (5), eggs (6), vitamin a rich vegetable (7), vitamin a rich fruit (8), other vegetables (8) and other fruits (10). The adequacy of food consumption was captured by the number of these groups consumed. This assumes that the more food groups a person lists, the more micronutrients they consumed (FAO, 2021).

The household food insecurity assessment used the Food Insecurity Experience Scale developed by FAO (Ballard et al., 2013). It is based on a series of eight questions that capture a household’s uncertainty about access to food, as well as its quantity and nutritional quality. They are arranged in order of increasing severity of the household's food security situation. Households are considered to be moderately food

insecure if they lack resources for a healthy diet, if they are uncertain about their ability to obtain food, or if they have skipped meals or occasionally run out of food. Severe food insecurity is attributed to those whose household is short of food or who have gone a day (or days) without eating. These household members are considered to be hungry.

The dependant variable is the overweight/obesity status. The categories are obtained from the dichotomisation of body mass index (BMI -- weight (kg)/height^2 (meters)). These two categories in the present study are "Too thin for height" (BMI<18.5 kg/m^2) grouped with "Normal status" (18.5 kg/m^2<=BMI<25 kg/m^2), and overweight or obesity (BMI>= 25 kg/m^2), using the WHO cut-points (Onis, 2006).

STATISTICAL ANALYSIS

In the present paper, significance of associations was tested using Pearson's chi-square for the cross-tabulation of two categorical variables, with Fischer's exact test used when a table cell contained fewer than 5 cases. Analysis of variance was used to cross-tabulate a quantitative variable with a categorical variable. Independent variables with a bivariate statistical test at a 20% significance threshold with the dependent variable were included in the multivariate modelling. As the dependent variable is dichotomous and unbiased (overweight/obesity or not), binary logistic regression was used for explanatory modelling. For diagnostic and precision modelling, the approaches summarised by Long & Freese (2001) were used. The R^2 of Nagelkerke indicates the proportion of variance in the dependent variable that is explained by all the variables included in the model. Rate of accurate classification shows the proportion of positive and negative cases (overweight/obesity) correctly predicted by the model. The Hosmer and Lemeshow Test was used to designate the degree of overlap between the probability curve predicted by the model and the logistic curve (Long & Freese, 2001). SPSS version 25 was used for descriptive analyses and Stata version 17 for multivariate analysis.

RESULTS

SAMPLE DESCRIPTION

Table 2 provides the background characteristics of the respondents, women of reproductive age (15-49 year-olds) in Burkina Faso. A fifth of the women are overweight or obese; about two fifths reported having consumed sugar-sweetened beverages in the 24 hours prior to the interviewer's visit; and about a tenth was moderately food insecure.

Table 2. Characteristics of 15-49 year-old women in Burkina Faso (N=8,852)

Variable	Modality	Percentage	95% CI	
Place of residence	Urban	32.9	30.9	34.9
	Rural	67.1	65.1	69.1
Possession of TV	No	62.9	60.5	65.4
	Yes	37.1	34.6	39.6
Means of transportation	No vehicle	5.2	4.3	6.3
	Car	5.2	4.1	6.6
	Motorcycle	64.2	62.3	66.1
	Bicycle	25.4	23.7	27.2
Occupation	No job	36.1	34	38.2
	Technical/Managerial	3.6	3.2	4.2
	Sales	19.4	18.1	20.9
	Agriculture	31.4	29.2	33.7
	Craftsman/Manual	9.5	8.6	10.4
Ethnicity	Bobo/Jula/Senufo	5.7	4.5	7.0
	Fulani/Tuareg	6.9	5.6	8.5
	Gurmantche	5.1	4.1	6.2
	Gurunsi	5.6	4.3	7.3
	Lobi/Dagara	3.2	2.5	4.0
	Mossi/Bissa	60.5	57.6	63.3
	Other	13.2	11.3	15.2
Household wealth[a]	Poor	35.1	32.8	37.5
	Middle	39.7	37.2	42.3
	Well-off	25.2	22.8	27.7
Education level attended	No education	59.2	57.3	61.1
	Primary	13.7	12.8	14.7
	Secondary+	27.1	25.5	28.8
Sweetened beverages consumed in past 24 hr[b]	No	61.5	59.8	63.3
	Yes	38.5	36.7	40.3
Age (year)	< 22	30.4	29.2	31.6
	22-35	42.8	41.4	44.2
	36-49	26.8	25.7	28.0
Age at first birth (year)	No child	27.0	25.8	28.2
	< 18	31.9	30.7	33.1
	19-20	18.4	17.4	19.5
	⩾21	22.7	21.7	23.8
Food insecurity status	No Food insecurity	69.7	67.7	71.7
	Moderate Food insecurity	11.8	10.5	13.1
	Severe Food insecurity	18.5	16.8	20.3
Height (cm)	<155	13.0	12.1	14.0
	155-165	57.1	55.7	58.4
	>165	29.9	28.6	31.3
Marital status	Not in union	27.1	25.7	28.5
	1st wife	10.6	9.8	11.4
	2nd wife+	16.2	15.1	17.5

Table 2. Continued

	Monogamous	46.1	44.5	47.7
Connection to internet	No	85.3	83.8	86.7
	Yes	14.7	13.3	16.2
Number of children	None	27.0	25.8	28.2
	1-2	25.6	24.5	26.8
	3-4	22.7	21.7	23.7
	⩾5	24.7	23.6	26
BMI	Too thin for height/Normal (BMI<25)	78.4	77.1	79.6
	Overweight/Obesity (BMI⩾25) kg/m²	21.6	20.4	22.9
Number of food groups	0	0.3	0.2	0.5
Consumed in past 24 hr	1	3.3	2.8	3.8
	2	21.0	19.5	22.6
	3	25.4	24.1	26.7
	4	22.0	20.8	23.2
	5	15.4	14.4	16.5
	6	8.2	7.4	9.0
	7	3.2	2.8	3.7
	8	1.0	0.8	1.3
	9	0.2	0.1	0.4
	10	0.0		

[a] *Household wealth: Non-monetary living standard based on durable goods and raw materials in dwelling house building*
[b] *Sweetened beverages encompass sodas, malt, sports/energy drinks, fruit juice or fruit-flavoured drinks consumed in past 24 hours*

DESCRIPTIVE ANALYSIS OF OVERWEIGHT/OBESITY

Possibly because the sample size is so large, all the bilateral associations are statistically significant (Table 3). The highest prevalence is shown by those connected to internet, those who were residing in urban area, those with a car in household, those who had a technical/managerial position or those who were members of well-off households. On the contrary, the lowest level is found in women of Gurmantche ethnic group. The prevalence increased with the number of food groups consumed in past 24 hours preceding interview, also with the number of offspring and women's age.

Table 3. Determinants of overweight/obesity in women of reproductive age in Burkina Faso

Variable	Modality	Prevalence of overweight/obesity	95% CI		P-Value
Place of residence	Urban	35.4	33.1	37.7	0.000
	Rural	14.9	13.6	16.3	
Possession of TV	No	15.6	14.3	17.0	0.000
	Yes	31.8	29.6	34.0	
Better means of	No vehicle	17.3	13.2	22.4	0.000
transportation	Bicycle	14.2	12.4	16.2	
	Motorcycle	23.2	21.8	24.7	
	Car	41.4	34.6	48.5	
Occupation	No employment	17.3	15.6	19.2	0.000
	Technical/Managerial	42.7	36.9	48.8	
	Sales	33.0	30.3	35.9	
	Agriculture	15.3	13.6	17.1	
	Craftsman/Manual	28.1	24.2	32.5	
Ethnicity	Bobo/Jula/Senufo	27.5	22.7	32.9	0.000
	Fulani/Tuareg	14.1	10.4	18.8	
	Gurmantche	5.3	3.3	8.6	
	Gurunsi	17.5	13.3	22.7	
	Lobi/Dagara	11.8	6.9	19.6	
	Mossi/Bissa	23.5	21.8	25.3	
Household wealth	Poor	10.4	9.2	11.8	0.000
	Middle	20.9	19.3	22.6	
	Well-off	38.4	35.5	41.5	
Education level attended	No education	19.3	17.8	20.8	0.000
	Primary	25.7	22.9	28.9	
	Secondary+	24.7	22.5	26.9	
Sweetened beverages	No	18.6	17.2	20.1	0.000
in past 24 Hr	Yes	26.5	24.7	28.2	
Age (year)	< 22	10.7	9.1	12.4	0.000
	22-35	23.7	22.0	25.4	
	⩾36	30.8	28.4	33.3	
Food insecurity status	No Food insecurity	23.0	21.5	24.4	0.002
	Moderate Food insecurity	18.8	16.0	21.9	
	Severe Food insecurity	18.5	16.1	21.2	
Height (cm)	<155	15.6	13.3	18.2	0.000
	155-165	21.5	20.1	23.0	

Table 3. Continued

	>165	24.4	22.3	26.7	
Marital status	Not in union	15.3	13.2	17.7	0.000
	1st wife	21.7	18.8	25.0	
	2nd wife+	20.6	18.1	23.3	
	Monogamous	25.7	24.0	27.4	
Connected to internet	No	18.9	17.7	20.1	0.000
	Yes	37.6	34.4	41.0	
Age at first birth (yr)	No child	13.3	11.3	15.6	0.0000
	< 19	24.2	22.2	26.2	
	19-20	22.7	20.5	25.1	
	⩾21	27.0	24.7	29.5	
Number of food groups	0	13.8	5.3	31.1	0.0000
consumed in past 24 hr	1	18.2	14.0	23.4	
	2	17.1	15.0	19.3	
	3	19.0	17.0	21.1	
	4	24.2	21.8	26.6	
	5	25.4	22.7	28.2	
	6	25.5	21.9	29.5	
	7	28.2	22.7	34.5	
	8	28.2	18.5	40.3	
	9	37.6	17.2	63.5	
	10	0.0			
Number of children	None	13.3	11.3	15.6	0.000
	1-2	22.2	20.2	24.4	
	3-4	27.1	24.7	29.6	
	⩾5	25.0	22.9	27.3	
	Total	21.6	20.4	22.9	

P-value is level of statistical significance based on chi-square/Fischer exact test. Using Somers' D statistics, Gamma statistics and Tau Kendall for cross-tabulation of ordinal and qualitative variables all resulted in p values < 0.000.

Table 4 presents the determinants of overweight/obesity in a binary logistic regression model. Many categories of the many variables proved to be statistically significantly associated with overweight. For example, urban women were 66.6% more likely to be overweight for their height and being connected to internet increased the risk by 33.8%. The type of means of transportation also differentiated the risks. Working in technical/managerial in particular increased the risk of being overweight/obese more than other occupations. All other ethnic groups had a much greater risk than the Gurmantche. Women with no education had the lowest risk of being overweight/obese, with primary and secondary education conferring similar risks. Age also seemed to increase the risk of being overweight. Diet diversity increased the risk of being overweight. The more varied the diet, the higher the risk of being overweight, but this was a very small increase. Each additional food group increased the risk by 4.2%. However, consuming a sugar-sweetened beverage the day before the survey increased the risk by 15.0%. Multi-parity increased risk incrementally with additional live birth.

Table 4. Determinants of overweight/obesity in women of reproductive age in Burkina Faso (binary logistic regression)

Variable/modality	aOR	P-Value	95% CI	
Place of residence				
Urban	1.666	0.000	1.410	1.967
Rural (Ref)	1.000			
Means of transport				
No vehicle	0.719	0.073	0.501	1.031
Bicycle	0.648	0.000	0.514	0.816
Motorcycle	0.559	0.000	0.424	0.736
Car (Ref)	1.000			
Occupation				
Technical/Managerial	1.187	0.243	0.890	1.582
Sales	1.381	0.000	1.182	1.614
Agriculture	1.042	0.622	0.886	1.225
Craftsman/Manual	1.089	0.403	0.892	1.330
No employment (Ref)	1.000			
Ethnicity				
Bobo/Jula/Senufo	3.945	0.000	2.408	6.463
Fulani/Tuareg	2.581	0.000	1.561	4.268
Gurunsi	2.836	0.000	1.701	4.726
Lobi/Dagara	2.004	0.016	1.136	3.538

Table 4. Continued

Mossi/Bissa	3.231	0.000	2.065	5.054
Other	4.225	0.000	2.654	6.726
Gurmantche (Ref)	1.000			
Household wealth				
Well-off	2.720	0.000	2.074	3.567
Middle	1.713	0.000	1.444	2.032
Poor (Ref)	1.000			
Education level attended				
Primary	1.360	0.000	1.145	1.616
Secondary+	1.249	0.014	1.046	1.492
No education (Ref)	1.000			
Sweeten beverages consumed in past 24h				
Yes	1.150	0.018	1.024	1.291
No (Ref)	1.000			
Age				
36 years	3.100	0.000	2.410	3.989
+22-35 years	2.088	0.000	1.704	2.558
< 22 years (Ref)	1.000			
Number of food groups consumed in past 24 Hr	1.042	0.032	1.004	1.082
Food Insecurity status				
Non-insecurity	0.869	0.082	0.742	1.018
Moderate insecurity	0.967	0.765	0.776	1.205
Severe insecurity (Ref)	1.000			
Height				
<155 cm	0.848	0.107	0.694	1.036
155-165 cm	1.014	0.829	0.896	1.147
165 cm+ (Ref)	1.000			
Marital Status				
1st wife	1.178	0.233	0.900	1.543
2nd wife+	1.355	0.015	1.060	1.732
Monogamous	1.504	0.000	1.226	1.846
Not in union (Ref)	1.000			
Age at first birth*				
< 18 years	1.470	0.002	1.150	1.877
19-20 years	1.198	0.171	0.925	1.552
21 years +	1.037	0.776	0.807	1.333
No child (Ref)	1.000			
Connected to internet				
Yes	1.338	0.002	1.115	1.607
No (Ref)	1.000			
Number of children*				
5 children +	1.358	0.004	1.104	1.670
3-4 children	1.304	0.002	1.099	1.547
1-2 children (Ref)	1.000			
Possession of TV				
No	0.939	0.426	0.805	1.096
Yes (Ref)	1.000			
Constant	0.013	0.000		
Rate of accurate classification (%)	80.3			
Hosmer & Lemeshow test	0.428			
R^2 of Nagelkerke	0.214			

*(Ref): Reference modality; aOR: Adjusted Odds Ratio; *Given the redundancy of modality "No child" in these two variables, it has been removed in the variable "Number of children"; CI: Confidence interval*

DISCUSSION

This study used nationally representative data to identify the determinants of overweight/obesity among women of reproductive age in Burkina Faso. The large sample size, the high response rate, and the diversity of the information collected made it possible to carry out a multivariate analysis including many factors that could explain overweight/obesity in Burkina Faso. Data were obtained from the 2021 DHS survey, the fifth one conducted in the country. This analysis illustrates the multidimensional nature of the determinants of women's overweight, with unfavourable characteristics such as living in an urban area, "favourable" ones such as being poor, and neutral ones such as the women's height.

In Burkina Faso, the prevalence of overweight and obesity is estimated at 21.6%, well below the 37% recorded

for the American subcontinent (World Obesity Federation, 2023), but close to that of neighbouring African countries. However, even in its sub-region, Burkina Faso has the lowest prevalence (Table 5). These differences often correlate with the level of wealth of countries (Pampel et al., 2012; World Obesity Federation, 2024). In poor countries, the populations least at risk of overweight often face food shortages, while their energy requirements are typically high due to arduous manual work. While markets of emerging countries often suffer from constraints in food availability, there is an invasion of cheap, energy-dense foods that are easily accessible (street vendors, fast-food restaurants, street food, and ultra-processed packaged foods), leading to calorie overconsumption. In addition, widespread access to new information and communication technologies encourages sedentary indoor lifestyles that reduce daily energy expenditure and lead to weight gain (Aghasi et al., 2020). In contrast, in industrially advanced countries, obesity has in recent times tended to stabilise or increase slowly, due to the positive influence of a high levels of awareness on health/nutrition issues, the possibility of acquiring higher quality food, greater allocation of free time for physical activity, and better access to health care, including the management of obesity problems (Pampel et al., 2012).

Table 5. Prevalence of overweight/obesity in Burkina Faso and neighbouring countries

Country	Prevalence (%)	Source
Burkina Faso	21.6	INSD & ICF, 2023
Benin	25.8	INSAE, 2019
Niger	27.0	*
Mali	28.0	INSTAT et al., 2019
Togo	30.5	MPDAT et al., 2015
Côte d'Ivoire	33.8	INS & ICF, 2023
Ghana	43.2	Ghana Statistical Service, 2024

**Estimation for 2021 based on prevalence obtained from the two most recent DHS surveys conducted in the country : 13.0% in 2006 and 17.8% in 2012 (INS et al., 2013).*

The possession of a car in the household doubles the risk of being overweight/obese compared to possession of only a bicycle. Frank et al. (2004) reported that for every hour spent driving per day, the risk of obesity increased by 6%, whereas an hour of walking reduced the risk by 4.8%. In Sydney, Australia, commuters who travelled more than 45 minutes per day between work and home were found to have twice the risk of obesity (Parise et al., 2021). Driving more than 120 minutes per day over 6 years increased the risk of obesity by 78% (Jacobson et al., 2011).

Compared with unemployed, agricultural or manual workers, women employed in technical, managerial or commercial occupations were at significantly higher risk of overweight/obesity. A similar result was found in Guatemala (Lee et al., 2010). This was also observed by Agyemang et al. (2021) in West Africa, where most women are satisfied with more sedentary occupations. Similarly, women farmers in Ghana were found to be 81.5% less likely to be obese than those in forceful works (Amugsi & Dimbuene, 2023). This was also the case in Malaysia (Khor & Sharif, 2003).

Women from well-off and middle-class households had a higher risk of obesity than women from poor households. This trend has been observed particularly in countries undergoing food transition with relatively stable economies (Garrett & Ruel, 2005). As the economy continues to improve, overweight/obesity gradually spreads from the wealthier to the poorer classes, while the wealthier classes gradually move towards stabilisation or decline in overweight/obesity. Leroy et al (2014) reached the same result based on an assessment of non-monetary living conditions. Similar findings have been documented for India (Barnett, 2011), Indonesia (Vaezghasemi et al., 2014), Ghana (Amugsi et al., 2023), and Guatemala (Bassett et al., 2014).

It appears that the number of food groups consumed in previous 24 hours by Burkinabe women is positively associated with an increased risk of overweight/obesity. In the Gnagna province of Burkina Faso, Savy (2006) found a significant correlation between dietary diversity and female BMI in rural areas. In urban areas, the association was less clear, even when different types of dietary diversity were tested. The author attributes this to a possible trade-off between quality for affluent women and quantity for poor women. In Brazil, diversity was also found to be associated with weight gain in the population (Bezerra & Sichieri, 2011). In an overview in low and middle income countries, Tzioumis et al. (2014) also found that the higher the tercile of dietary diversity, the higher the proportion of obese women. In contrast, Delisle (2008) found in Benin that dietary diversity had a protective effect against obesity in women. This could be explained by the greater use of traditional local foods, whose preparation, processing and conservation methods are based on practices that are more protective against obesity and no-communicable diseases (Sarkar et al., 2020).

The level of education attended was positively related to obesity. Increased education is usually accompanied by increased purchasing power and sometimes excessive diversification of food choices (Agyemang et al. (2021). Leroy et al. (2014) did find that education could mitigate the effect of higher income on the increase in obesity. Obesity increased among illiterate women and stabilised among more educated mothers. There may also be a cultural dimension women with high levels of education and professional status may tend to gain weight to assert their higher social status.

In our data, obesity increased with women's age. A similar finding was made in Argentinian women (Bassett et al., 2014). Consumption of sweetened beverages had a positive effect on overweight/obesity in women in our Burkina Faso data. This was also found in school-going adolescents (Hu et al., 2023). Ruanpeng et al. (2017) also found 59% more obesity in patients who consumed artificially sweetened soft drinks. An ecological analysis covering 75 countries and looking at soft drink consumption between 1997 and 2010 found that a 1% increase in consumption was associated with 4.8 more overweight adults per 100 inhabitants, 2.3 more obese adults per 100 inhabitants and 0.3 more diabetic adults per 100 inhabitants (Basu et al., 2013).

Urban women were at greater risk of overweight/obesity than their rural counterparts in our data (aOR=1.89). For the affluent in Africa, urbanisation is mainly associated with less energy-intensive jobs and more sedentary lifestyles.

Ethnicity had a significant effect on a woman's risk of obesity in Burkina Faso. The ethnic specificity of overweight/obesity was also observed in Benin, where women of the Fon ethnic group had a higher prevalence of obesity than women from other ethnic groups found in Comè (Dembele et al., 2018). This effect of ethnicity was also observed in Guatemala, where women of indigenous origin had a 51% higher risk of being overweight (Lee et al., 2012). These authors and Ramirez-Zea et al. (2014) point out that height is likely a factor in some countries, whereas it was not the case in our data. In the United States, there is also a significant difference in the prevalence of obesity between ethnic groups: whites (22.0%), Latinos (33.6%), African Americans (36.1%) and Asians (9.8%). Being overweight is also favoured culturally in some ethnic groups (Monárrez-Espino et al., 2004). In many African communities, being overweight is considered a sign of a woman's beauty and well-being. In Mauritania, weight gain is even part of the preparation for marriage, with young girls systematically force-fed, while those who were less fat had little chance of being asked to marry (Ouldzeidoune et al., 2013). As a result, women deliberately gain weight to meet these socio-cultural expectations (Agyemang et al., 2021). Apparent obesity is generally adopted to express wealth, the social status of the husband, well-being and fertility.

We found an increase in risk of obesity with increased parity. The childbearing years are a key period for weight gain in women, which can accelerate obesity (Luoto et al., 2011; Taghdir et al., 2020; Gunderson, 2009). We found a positive adjusted effect of internet access on overweight/obesity in Burkina Faso. This negative effect has been noticed in many other settings (Aghasi et al., 2020; Lin et al., 2024; Yıldız et al., 2024). In China, however, the opposite relationship was found. It led to less engagement in risky health behaviours, more participation in preventive health services, and more exercise. Also, internet diffusion increased income, suggesting an income channel through which the internet could affect body weight (Chen & Liu, 2022).

It should be pointed out that the 24-hour recall technique used in this study has certain limitations. It is based on memory and is therefore not free from recall bias. Furthermore, because of the short reference period, the information cannot be representative of the eating habits of individuals, but rather those of a community. A previous day that marked a festival or market day may introduce an individual bias into eating habits. In addition, it does not provide information on the quantity or portion of products consumed to assess excessive, sufficient or insufficient intakes of energy or micronutrients. Moreover, the cross-sectional nature of the data used means that only correlations can be established, not causalities. This is a secondary analysis. Some factors included in the conceptual framework of Scott et al. (2013), such as time spent watching television and genetics, could not be included in our modelling, as they were not included in the dataset used.

CONCLUSIONS

The rising levels of overweight and obesity in sub-Saharan Africa are likely to exacerbate the already significant burden of communicable and infectious diseases. In the case of Burkina Faso, place of residence, the only distal factor available in our dataset, appeared to be significant. This parameter impacts the intermediary factors including occupation, marital status, education, ethnicity, mean of transportation, possession of television, household wealth. These second category variables in turn influence the proximate ones: food diversity, number of children, age, age at first birth and consumption of sweeten beverages.

To compensate for the unintended energy gains from those factors leading to a sedentary lifestyle, increased intentional physical activity is essential, as seen in many industrialized country settings. The benefits of this can be seen in reduced blood pressure, increased high-density lipoprotein cholesterol levels, improved glycaemic control and reduced risk of some cancers, even without substantial weight loss (WHO, 2004). To this end, spaces and infrastructures for adult exercise should be expanded in urban areas. Sports activities within the civil service, which were practiced every Thursday during the revolutionary era in Burkina Faso, have gradually declined, and need to be reactivated.

Our results suggest that multiparity influences women's overweight/obesity status. The number of children, age at first birth and reproductive interval all influence the appropriateness of a woman's weight. In particular, a short birth interval does not allow a return to pre-pregnancy weight (Mazariegos et al., 2022). It should also be added that exclusive breastfeeding for up to 6 months and continued breastfeeding for up to 2 years and beyond are associated with lower weight retention (Organisation Panaméricaine de Santé, 2003). Early entry into reproductive life should also be avoided, especially as postpartum weight rebound is greater after childbirth at a young age, especially before the age of 21 (Patchen et al., 2017). Raising the age of first marriage should therefore be more strongly considered in order to reduce female obesity. As a useful first step, the revision of the current Personal and Family Code has raised the marriageable age in Burkina Faso to 18.

It has long been suggested that dietary diversification likely leads to better health. However, the type and nature of foods consumed are equally important. Therefore, obesity prevention education should be associated with a diet that is low in ultra-processed products. The focus should put on increasing the consumption of fruit and vegetables, whole grains and nuts, reducing the intake of free sugars, and limiting the amount of salt from all sources (WHO, 2004). The promotion of local products as part of the “Produce what you consume and consume what you produce” initiative could be beneficial if effectively adopted by the population.

There is also a need to curb the widespread belief that imported foods of Northern origin are of impeccable quality and nutritional value. These so-called luxury foods include soft drinks and generally contain an excess of meat, fried foods, fat, sugar, and other elements of ulta-processing. Vegetables, legumes and fruit, on the other hand, are seen as survival foods or foods for the poor. As “white people's food” becomes more widely available, the food transition is taking hold and obesity is being imported into sub-Saharan Africa (Renzaho, 2004). Taxation of such foods would be one way to protect people's health.

CONFLICT OF INTEREST

The author declares that he has no competing interest

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