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Social, Economic, and Behavioural Factors Associated with Overweight among Women of Reproductive Age Attending Gihundwe District Hospital, Rwanda

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ABSTRACT

Background: Overweight and obesity are growing public health concerns globally, particularly among women of reproductive age. In 2016, approximately 39% of adults worldwide were overweight, and 13% were obese. In Sub-Saharan Africa, overweight prevalence increased from 28.4% in 2000 to 41.7% in 2016. In Rwanda, the prevalence of overweight and obesity among women aged 15 to 49 years reached 26% in 2019 to 2020. This study assessed the social, economic, and behavioural factors associated with overweight among women of reproductive age attending Gihundwe District Hospital in Western Rwanda.

Methods: An analytical cross-sectional study was conducted between January and March 2025 among 198 women aged 15–49 years attending Gihundwe District Hospital. Participants were consecutively recruited from outpatient and antenatal care clinics. Data was collected using structured questionnaires and anthropometric measurements. Body Mass Index (BMI) was calculated using World Health Organization criteria, and overweight was defined as BMI ≥25 kg/m^2. Pregnant women were excluded to avoid bias related to pregnancy-related weight gain. Quantitative data were analysed using SPSS version 30. Descriptive statistics, chi-square tests, and multivariable logistic regression analyses were performed to identify factors associated with overweight. Statistical significance was set at $P<.05$.

Results: The prevalence of overweight among participants was 26.8% (53/198). Bivariate analysis revealed significant association between overweight and sedentary lifestyle ($P=.023$), monthly income ($P=.0016$), employment status ($P=.031$), and food affordability ($P=.028$). In multivariable logistic regression analysis, sedentary lifestyle, higher monthly income, formal employment, and food affordability remained significant independent predictors of overweight.

Conclusion: Overweight among women of reproductive age attending Gihundwe District Hospital was significantly associated with socioeconomic and behavioural lifestyle factors, particularly sedentary lifestyle, higher income, formal employment, and food affordability. Community-based interventions promoting physical activity and healthy dietary practices are recommended to reduce overweight and related non-communicable diseases among women in Rwanda.

BACKGROUND

Overweight and obesity are major global public health challenges contributing significantly to the burden of non-communicable diseases (NCDs), such as hypertension, diabetes mellitus, cardiovascular diseases, and pregnancy-related complications. According to the World Health Organization (WHO), approximately 39% of adults worldwide were overweight, and 13% were obese in 2016.[1] The prevalence of overweight and obesity has continued to increase in both developed and developing countries due to rapid urbanisation, changing dietary patterns, and reduced physical activity. [4]

Sub-Saharan Africa has experienced a rapid nutritional transition over the past two decades. The prevalence of overweight among adults increased from 28.4% in 2000 to 41.7% in 2016.[4] Increased consumption of processed foods, sedentary lifestyles, and socioeconomic transitions have contributed significantly to this growing burden. In Rwanda, the Rwanda Demographic and Health Survey (RDHS) 2019 to 2020 reported that 26% of women aged 15 to 49 years were either overweight or obese. [2]

In many African settings, including Rwanda, sociocultural perceptions often associate larger body size with beauty, prosperity, and social status. At the same time, increased urbanisation and economic growth have contributed to lifestyle changes characterised by low physical activity, increased consumption of high-calorie diets, and sedentary occupations. These changes have accelerated the prevalence of overweight among women of reproductive age.[4]

Overweight during reproductive years is associated with numerous adverse maternal and child health outcomes, including gestational diabetes, hypertensive

disorders during pregnancy, caesarean section delivery, and an increased risk of non-communicable diseases later in life. Despite the growing burden of overweight and obesity, limited evidence exists regarding the socioeconomic and behavioural determinants of overweight among women in rural and semi-urban areas of Rwanda, particularly in the Western Province.[7]

This study therefore assessed the social, economic, and behavioural lifestyle factors associated with overweight among women of reproductive age attending Gihundwe District Hospital in Rwanda.

METHODS

Study Design and Study Area

An analytical cross-sectional study was conducted between January and March 2025 at Gihundwe District Hospital, located in Rusizi District, Western Province, Rwanda.

Study Population

The study targeted women of reproductive age (15–49 years) attending outpatient and antenatal care (ANC) services at Gihundwe District Hospital during the study period.

Inclusion and Exclusion Criteria

Women aged 15 to 49 years who consented to participate were included in the study. Pregnant women and those with chronic illnesses known to influence body weight, such as cancer, HIV/AIDS, and thyroid disorders, were excluded from the study.

Sample Size Determination

The sample size was calculated using Fisher et al. (1998) formula for estimating a single population proportion:
$n = (Z\alpha/2)^2\, p(1-p)/d^2$

Where:

Z = 1.96 at 95% confidence level

p = 26% prevalence of overweight among women aged 15–49 years in Rwanda according to RDHS 2019 to 2020

d = 5% margin of error

The calculated sample size was 296 participants. Since the estimated target population was below 10,000, a finite population correction (FPC) factor was applied using an estimated population of 600 women of reproductive age attending outpatient and antenatal care services during the study period.

$nf = n / [1 + (n/N)]$

$nf = 296 / [1 + (296/600)] = 198$

Therefore, the final sample size was 198 participants.

Sampling Technique

A consecutive sampling technique was employed. Eligible participants attending outpatient and antenatal care clinics were recruited consecutively until the desired sample size of 198 participants was achieved.

Data Collection Tools and Procedures

Data were collected using a structured questionnaire adapted from validated public health studies that assessed overweight and obesity determinants among women in Sub-Saharan Africa. The questionnaire captured information on sociodemographic characteristics, dietary practices, physical activity, sedentary behaviour, alcohol consumption, income level, employment status, and food affordability.

The questionnaire was pretested among 20 women attending a neighbouring health facility to assess clarity, relevance, and completeness. Necessary modifications were made before the actual data collection. Data collectors received training on the study procedures, questionnaire administration, and anthropometric measurement techniques

Anthropometric measurements were obtained using standardized WHO procedures. Weight was measured with participants wearing light clothing and no shoes using a calibrated digital SECA scale. Height was measured without shoes using a portable stadiometer. The weighing scale was calibrated daily before data collection.

Body Mass Index (BMI) was calculated by dividing weight in kilograms by height in meters squared (kg/m^2).

Operational Definitions

Overweight

Participants with a BMI of ≥25 kg/m^2 were classified as overweight according to WHO classification criteria.

Sedentary Lifestyle

A sedentary life style was defined as spending six or more hours per day sitting or engaging in low-energy activities such as prolonged television viewing, office work, or inactive leisure activities.

Food Affordability

Food affordability referred to the respondents' self-reported ability to consistently purchase adequate food for household consumption.

Reliable Food Access

Reliable food access was defined as consistent physical and economic access to sufficient, safe, and nutritious food required to meet dietary needs for an active and healthy life.

Data Analysis

Data was entered into Microsoft Excel, cleaned for completeness and consistency, and consequently exported to SPSS version 30 for analysis. Descriptive statistics, including frequencies and percentages, were generated. Chi-square tests were performed to determine associations between overweight and independent variables.

Variables with p-values less than 0.05 at bivariate analysis were included in multivariable logistic regression analysis to determine independent predictors of overweight. Crude Odds Ratios (COR), Adjusted Odds Ratios (AOR), 95% Confidence Intervals (CI), and *p*-values were reported. Statistical significance was set at $p<.05$.

The fitness of the final logistic regression model was assessed using the Hosmer–Lemeshow goodness-of-fit test. Multicollinearity among independent variables was assessed before model fitting.

Ethical Considerations

Ethical clearance was obtained from the Mount Kenya University Rwanda Institutional Review Board (IRB No: MKUR/PH/025-2025). Permission to conduct the study was obtained from Gihundwe District Hospital administration.

Written informed consent was obtained from all participants before data collection. For participants below 18 years of age, assents were obtained alongside consent from parents or guardians. Participants were informed about the purpose of the study, confidentiality of the information collected, and their right to withdraw at any time without penalty.

RESULTS

Sociodemographic Characteristics of Participants

A total of 198 women of reproductive age participated in the study. The largest age group was 36 to 45 years, comprising 26.3% of respondents, followed by those aged 26 to 35 years (25.3%). Married participants constituted 44.9% of the respondents. Regarding educational attainment, most participants had primary education (38.4%), while 25.8% had attained higher education. In terms of occupation, 24.2% were formally employed, and 21.2% were self-employed. (Table 1)

TABLE 1: Sociodemographic Characteristics of Respondents

Variable	Frequency	Percent
Age group		
15–25 years	49	24.7
26–35 years	50	25.3
36–45 years	52	26.3
46–49 years	47	23.7
Marital status		
Single	51	25.8
Married	89	44.9
Divorced	19	9.6
Widowed	39	19.7
Level of education		
No formal education	19	9.6
Primary	76	38.4
Secondary	52	26.3
Higher education	51	25.8
Occupation		
Unemployed	37	18.7
Self-employed	42	21.2
Employed	48	24.2
Student	39	19.7
Other	32	16.2

Prevalence of Overweight

The prevalence of overweight among women of reproductive age attending Gihundwe District Hospital was 26.8% (53/198).

Factors Associated with Overweight

Bivariate analysis demonstrated statistically significant associations between overweight and sedentary lifestyle (p=.023), monthly income (p=.016), employment status (p=.031), and food affordability (p=.028).

Women reporting a sedentary lifestyle accounted for 71.7% of overweight participants compared with 28.3% among those who were physically active. Conversely, only 45.5% of women without overweight reported sedentary lifestyles. Overweight was also more prevalent among women earning more than 100,000 RWF per month, with 35.8% and 37.7% of overweight participants reporting monthly incomes of 100,000–200,000 RWF and >200,000 RWF, respectively. In addition, 47.2% of overweight women were formally employed compared with 24.1% of women who were not overweight. Women who reported being able to afford food constituted 69.8% of overweight participants compared with 48.3% among non-overweight participants. These findings indicate that socioeconomic and behavioural factors were significantly associated with overweight among women of reproductive age (Table 2).

Multivariable Logistic Regression Analysis

Multivariable logistic regression analysis identified sedentary lifestyle, higher monthly income, formal employment, and food affordability as independent predictors of overweight. Women reporting sedentary lifestyles were 2.4 times more likely to be overweight than physically active women (AOR = 2.4; 95% CI: 1.2–4.8; p = .015). Similarly, women earning more than 100,000 RWF per month had more than twice the odds of being overweight compared with lower-income earners (AOR = 2.1; 95% CI: 1.1–4.2; p = .022). Formal employment was associated with increased odds of overweight (AOR = 1.9; 95% CI: 1.0–3.8; p = .037), while women reporting food affordability were 1.8 times more likely to be overweight than those experiencing food affordability challenges (AOR = 1.8; 95% CI: 1.0–3.5; p = .041) (Table 3).

TABLE 2: Sociocultural, Socioeconomic, and Behavioural Factors Associated with Overweight

Characteristic	Total n (%)	Overweight n (%)	Not Overweight n (%)	*p-value* (χ^2)
Sedentary lifestyle				.023
Yes	104 (52.5)	38 (71.7)	66 (45.5)	
No	94 (47.5)	15 (28.3)	79 (54.5)	
Monthly income (RWF)				.016
<50,000	43 (21.7)	6 (11.3)	37 (25.5)	
50,000–100,000	47 (23.7)	8 (15.1)	39 (26.9)	
100,000–200,000	54 (27.3)	19 (35.8)	35 (24.1)	
>200,000	54 (27.3)	20 (37.7)	34 (23.4)	
Employment status				.031
Employed	60 (30.3)	25 (47.2)	35 (24.1)	
Unemployed	43 (21.7)	7 (13.2)	36 (24.8)	
Casual employment	49 (24.7)	11 (20.8)	38 (26.2)	
Others	46 (23.2)	10 (18.8)	36 (24.8)	
Food affordability				.028
No	91 (46.0)	16 (30.2)	75 (51.7)	
Yes	107 (54.0)	37 (69.8)	70 (48.3)	

TABLE 3: Multivariable Logistic Regression Analysis of Factors Associated with Overweight

Variable	AOR	95% CI	*p-value*
Sedentary lifestyle	2.4	1.2–4.8	.015
Income >100,000 RWF	2.1	1.1–4.2	.022
Formal employment	1.9	1.0–3.8	.037
Food affordability	1.8	1.0–3.5	.041

DISCUSSION

This study assessed the social, economic, and behavioural factors associated with overweight among women of reproductive age attending Gihundwe District Hospital in Rwanda. The prevalence of overweight was 26.8%, consistent with national estimates reported in the Rwanda Demographic and Health Survey 2019-2020. This finding suggests that overweight remains an important public health concern among women of reproductive age in Rwanda.

The study found that a sedentary lifestyle was significantly associated with overweight. Women who reported spending prolonged periods in sedentary activities were more likely to be overweight than physically active participants. These findings are consistent with studies conducted in South Africa and Ghana, which reported that physical inactivity significantly increases the risk of overweight and obesity among women.[5] Reduced energy expenditure associated with sedentary behaviour may contribute to positive energy balance and subsequently weight gain.

The study further demonstrated that women with higher monthly incomes were more likely to be overweight compared to lower-income earners. This finding reflects the ongoing nutrition transition occurring in Rwanda and other Sub-Saharan African countries, where economic growth is associated with increased access to processed and energy-dense foods. Furthermore, women with higher income may also adopt more sedentary lifestyles due to office-based occupations and reduced physical labour. [8]

Employment status emerged as another significant determinant of overweight. Formally employed women had higher odds of being overweight compared to unemployed participants. This association may be explained by the sedentary nature of many formal occupations, prolonged sitting during working hours, reduced time for physical activity, and increased purchasing power that facilitate access to processed foods.

Food affordability was also significantly associated with overweight. Women who reported being able to consistently afford food were more likely to be overweight than those experiencing food affordability challenges. This finding suggests that greater economic access to food may contribute to higher caloric intake and increased consumption of unhealthy foods, particularly in environments where nutrition education and healthy dietary choices are limited. [6]

Overall, these findings highlight the influence of socioeconomic development, urbanisation, and lifestyle

changes on the increasing burden of overweight among women in Rwanda. Public health interventions should therefore focus on promoting healthy dietary practices, physical activity, and awareness regarding obesity-related health risks.

Limitations

This study had several limitations. First, the cross-sectional study design limited causal inference between identified factors and overweight status. Second, Self-reported information on lifestyle behaviours may have introduced recall and social desirability bias. Third, since the study was hospital-based, the findings may not be generalisable to all women in Rwanda. Finally, although multivariable analysis was performed, residual confounding from unmeasured variables may have influenced the observed associations.

CONCLUSION

The prevalence of overweight among women of reproductive age attending Gihundwe District Hospital was high and comparable to national estimates. Sedentary lifestyle, higher monthly income, formal employment, and food affordability were identified as significant independent predictors of overweight. These findings reflect the ongoing nutrition and lifestyle transition occurring in Rwanda and emphasise the need for targeted public health interventions. Strategies promoting regular physical activity, healthy dietary practices, and obesity prevention awareness should be strengthened to reduce the burden of overweight and its associated non-communicable diseases among women of reproductive age.

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