BMC Digital Health

RESEARCH

Open Access

Influence of internet and media use on overweight and obesity among women of reproductive age in Nigeria: evidence from the demographic and health survey

Adeleye Abiodun Adeomi[1*]

Abstract

Background There is a rise in the prevalence of overweight/obesity globally, including in Nigeria. While some attempts have been made to understand the determinants, there is a dearth of data on the influence of contemporary issues such as internet and media use on overweight/obesity in Nigeria. The study therefore aimed to investigate the influence of internet and media use on overweight/obesity among women of reproductive age in Nigeria.

A population based cross-sectional study among 13,174 non-pregnant women (15 – 49 years) of reproductive age who were selected using cluster sampling technique. Data were obtained from the Nigeria Demographic and Health Survey, 2018. The outcome variable was overweight/obesity which was defined using the body mass index (BMI) and the BMI-for-age reference values among adults (20 – 49 years) and adolescents (15 – 19 years) respectively. The main explanatory variables were the frequency of use of internet, television and radio, defined as women who used these at least once a week. Other possible confounders such as age, education, work status, marital status, number of children ever born, number of household members, wealth index, region and residence, were adjusted for. After a descriptive analysis of all variables, tests of associations were done at bivariate (using Pearson Chi squared test) and multivariate level using logistic regression analysis.

Results The mean age of the respondents was 29.5 (standard deviation: 9.7) years. The combined prevalence of overweight and obesity was 28.5%, and the proportions with high usage of internet, radio and television were 12.8%, 31.0% and 34.6% respectively. In the final model that adjusted for all explanatory variables, internet (high vs low use; OR: 1.61; 95% CI: 1.26 to 2.08) and television (high vs low use; OR: 1.27; 95% CI: 1.08 to 1.48) had a statistically significant positive association with overweight/obesity.

Conclusion Internet and television use had statistically significant positive associations with overweight/obesity even after adjusting for possible confounding variables. While internet and television use have a lot of advantages and should not be regulated, interventions should be designed to address the risk of overweight/obesity associated with screen-based sedentary behavior.

Keywords Overweight, Obesity, Women of reproductive age, Internet, Media, Television, Radio, Nigeria

*Correspondence:
Adeleye Abiodun Adeomi
adeleyeadeomi@gmail.com

Introduction

The prevalence of obesity is increasing in all regions of the world, including low- and middle-income countries (LMIC). According to the World Health Organization (WHO), more than 3 out of 10 people in the World were overweight in 2022, with nearly a billion of them having obesity [1]. Even in countries like Nigeria were high rates of poverty and undernutrition are reported [2, 3], the prevalence of obesity is increasing among males and females in all age groups, but especially among adult females [4, 5]. A recent systematic review and meta-analysis on the prevalence of overweight and obesity in Nigeria reported a combined prevalence rate of 42.1% for males and females and 51.3% for females only [6].

A challenge with the rising prevalence of obesity is the non-communicable diseases (NCDs) associated with them. The prevalence rates for NCDs including cardiometabolic diseases and cancers were low in most sub-Saharan African (SSA) countries including Nigeria, but recent findings show the prevalence rates are rising [7]. In 2019, Africa's disability-adjusted life years (DALYs) loss due to NCDs was 167 million, compared to 164 million for infectious diseases [8]. The implication of this is that there is increased pressure on the health systems and economies of these countries who have to additionally deal with the high burden of under-nutrition [9]. The consequences of these are grave considering the already poor health systems and meager resources in most SSA countries.

The most cost-effective and pragmatic approach for LMICs including Nigeria to address the rising burden of obesity and NCDs will be prevention. However, prevention can only be possible when the determinants and drivers of the rising prevalence are known, and effective interventions are designed to address them. While some attempts have been made to understand the determinants of obesity in SSA and Nigeria [4, 5], these efforts have neglected the topical issue of internet and media use and its possible influence on obesity. A systematic review and meta-analysis on the relationship between internet use and overweight/obesity, not only found a statistically significant positive association, but also reported a significant linear dose–response between internet use and the odds for overweight/obesity [10]. Similarly, media use has been associated with increasing odds for overweight/obesity [11, 12].

However, only little data exists for the influence of internet and media use on overweight/obesity in Nigeria. The only study that provided some data worked on media and not internet use [12], and the study used 2008 to 2013 data, which is now about a decade old and may not reflect current realities. Even after a diligent search, no nationally representative data could be found in Nigeria on the association between internet use and overweight/obesity. This study therefore aimed to investigate the influence of internet and media use on overweight/obesity among women of reproductive age in Nigeria.

Methods

This population-based cross-sectional study was carried out in Nigeria, a West African country which is the most populous black nation in the world with a current estimate of 228 million inhabitants. Nigeria has 36 states with her capital in the Federal Capital Territory, Abuja. The states are grouped into 6 geo-political zones or regions namely; south south, south east, south west, north central, north east and north west. The states are further divided into local government areas (LGAs), within which are enumeration areas (EAs) used in this study as the primary sampling units.

Data from Nigeria Demographic and Health Survey (NDHS) of 2018 was used [13], which till data is still the most current such survey for Nigeria. The study population were women of reproductive age (15 – 49 years) from the selected communities in all regions and states in Nigeria. All pregnant women, those whose anthropometric measurements were not taken and those with missing height and/or weight measurements were excluded from the present study, hence 13,174 women were included in this study. Respondents were selected using cluster sampling technique; at the first stage, 1,400 communities (enumeration areas) were randomly selected from all regions and states in Nigeria, after which a mapping and listing of the households in the selected communities was done. From the lists of households in each community, 20 – 30 households were randomly selected from where all the women who met the inclusion criteria were included in the study [13].

The body mass index for all respondents was calculated by dividing their weights in Kg by their height in metre-squared (m^2). Afterwards, obesity was defined for female adolescents (15 – 19 years) using the BMI-for-age reference values of the World Health Organization [14]. Overweight and obesity were defined as those with Z-scores > 1 to 2, and > 2 respectively. For older women (20 – 49 years), those with BMI 25 – 29.99 and ≥ 30 were defined as overweight and obesity respectively. Overweight and obesity were combined for data analysis because both are indicators of overnutrition with attendant health risk, and are often combined in research when over-nutrition is the outcome of interest [10].

Internet use was defined in this study using the variable on the frequency of internet use in the NDHS measured as not at all, less than once a month, at least once a week and almost every day. Those who never used the internet at all and those who used it less than

once a month were categorized as low internet users, while those who used it at least once a week or almost every day, as high users. This is because only 2.09% and 4.22% used the internet less than a month and once a week respectively. The frequency of usage of radio and television was used as measures of media use in this study, and they were originally measured as not at all, less than once a week and at least once a week. Those who used them at least once a week were classified as high users, and others low users to ensure consistency of reporting with internet use.

Possible confounding factors were adjusted for as contained in the NDHS [13]. The confounders were included based on the findings from previous studies, including the systematic review and meta-analysis [10–12]. These factors include age (15 – 19, 20 – 24, 25 – 29, 30 – 34, 35 – 39, 40 – 44, 45 – 49 years), education (nil, primary, secondary and higher), work status in the 12 months preceding data collection (worked, did not work), number of children ever born (nil, 1 – 2, 3 – 4, 5+), marital status (single, currently in a union or formerly in a union), number of usual household members i.e. excluding visitors (<6, 6 – 10, >10), household wealth index (poorest, poorer, middle, richer, richest), region (north central, north east, north west, south east, south south, south west) and residence (rural, urban). Age was categorized into groups for univariate and bivariate analysis, but used as a continuous variable for the multivariable logistics regression analysis.

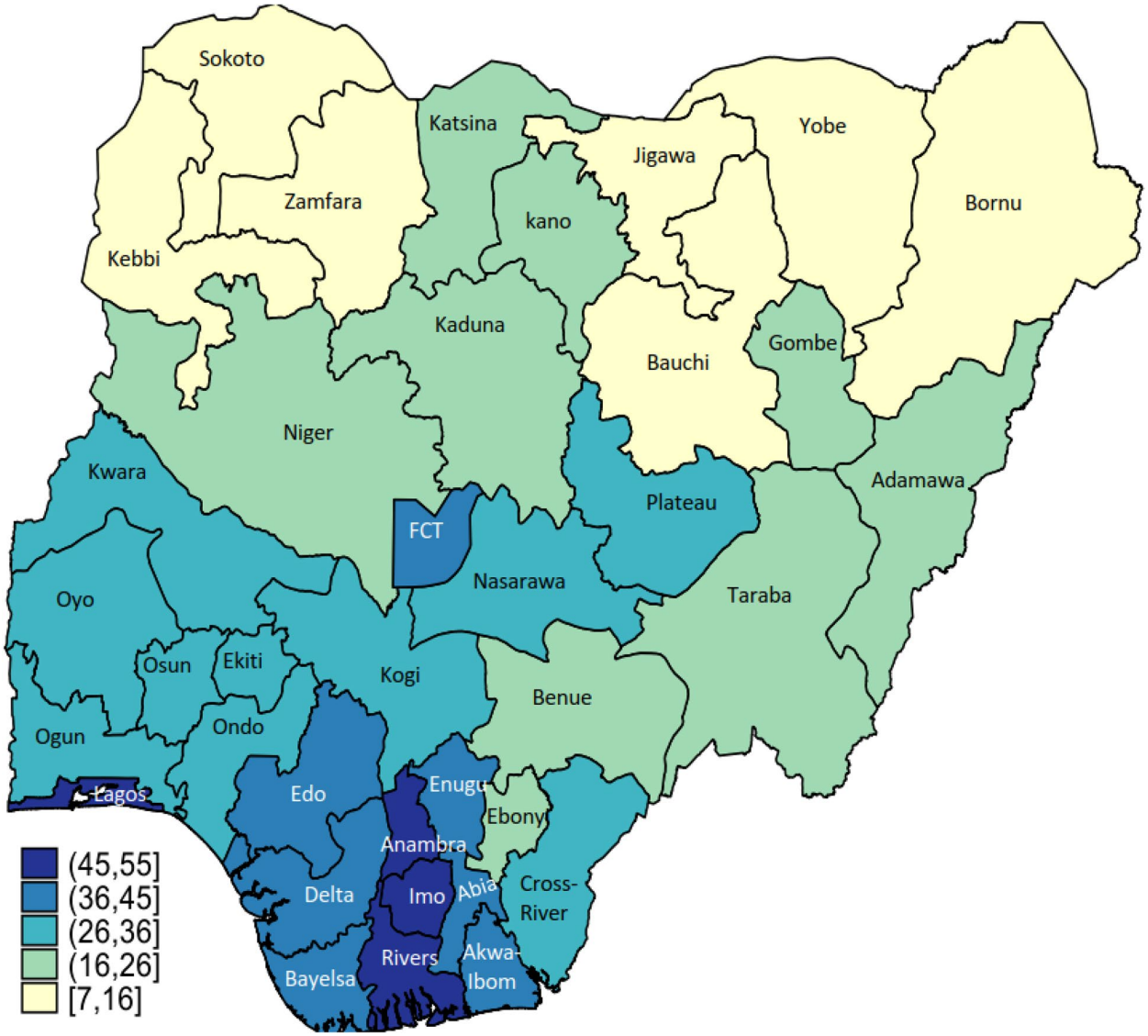

Fig. 1 Distribution of Overweight/Obesity among non-pregnant women of reproductive age (15 – 49 years) in the 36 States and the Federal Capital Territory of Nigerian. (Copy-right for this figure is owned by the author)

Table 1 Descriptive analysis of all variables ($N = 13,174$)

Variables	Frequency	Percentage
Outcome variable		
Obesity status		
Not obese	9423	71.52
Obese	3751	28.48
Main explanatory variables		
Internet use		
Low	11489	87.21
High	1685	12.79
Radio use		
Low	9096	69.05
High	4078	30.95
Television use		
Low	8623	65.45
High	4551	34.55
Age groups in years		
15 – 19	2557	19.41
20 – 24	1966	14.93
25 – 29	2223	16.87
30 – 34	2018	15.32
35 – 39	1916	14.54
40 – 44	1263	9.59
45 – 49	1231	9.35
Education		
Nil	4192	31.82
Primary	2032	15.42
Secondary	5534	42.01
Higher	1416	10.75
Religion		
Christianity	6459	49.03
Islam	6638	50.39
Others	77	0.59
Work status		
Otherwise	3988	30.27
Worked	9186	69.73
Marital status		
Never in union	3295	25.01
Currently in union	9137	69.35
Formerly in union	742	5.63
Number of children ever born		
Nil	3446	26.16
1 – 2	3018	22.91
3 – 4	2677	20.32
5+	4033	30.61
Usual household members ($n = 13,010$)		
< 6	5868	45.10
6 – 10	5392	41.44
> 10	1750	13.45
Wealth index		
Poorest	2043	15.51
Poorer	2426	18.41
Middle	2650	20.12
Richer	2946	22.36
Richest	3109	23.59
Residence		
Urban	6239	47.36
Rural	6935	52.64
Region		
North central	1878	14.25
North east	1953	14.83
North west	3388	25.71
South east	1685	12.79
South south	1690	12.83
South west	2580	19.58

Analysis was done using STATA version 17, and statistical significance was set at $p < 0.05$. Descriptive analysis of all variables was first carried out, and then the description of the explanatory variables across categories of overweight/obesity status using Pearson chi-squared test. The influence of media and internet use on overweight/obesity were investigated using adjusted odds ratios and 95% confidence intervals generated using multivariable logistics regression analysis. The adequacy of the adjusted logistic regression model was determined using the Hosmer–Lemeshow goodness-of-fit test, and a p-value of 0.5069 shows a good fit. The values of the variance inflation factor (VIF) for all categorical variables ranged from 1.2 to 2.1, showing minimal collinearity between the variables. Weighing was applied at all levels of the analysis as appropriate for the recode file in the NDHS [13]. Different weighting variables have been calculated for individuals and household variables in the NDHS data, and the variable applicable to the unit of analysis is used. This study used the women recode file, hence the applicable weighting variable (labelled "v005") was used. The stratifications according to age groups (younger (15–29 years) and older (30–49 years)) showed no statistically significant difference in the p-values for interaction generated using Wald test for the use of internet (0.3432), radio (0.2985) and television (0.0823).

Results

The mean age of the respondents was 29.5 ± 9.7 years, and the combined prevalence of overweight and obesity in this study was 28.5%. Figure 1 shows the sub-national distribution of overweight/obesity among women of reproductive age in Nigeria. The proportions with high usage of internet, radio and television were 12.8%, 31.0%

Table 2 Distribution of explanatory variables across categories of obesity status using Pearson Chi-Squared test

Explanatory variables	N	Not Obese ($n=9423$)		Obese ($n=3751$)		*P*-value
		%	95% CI	%	95% CI	
Internet use						
Low	11,490	74.1	72.9, 75.2	25.9	24.8, 27.1	< 0.001
High	1,685	54.2	50.7, 57.7	45.8	42.3, 49.3	
Radio use						
Low	4,078	64.6	62.6, 66.6	35.4	33.4, 37.4	< 0.001
High	13,174	71.5	70.4, 72.6	28.5	27.4, 29.6	
Television use			09			
Low	8,623	78	76.8, 79.2	22	20.8, 23.2	< 0.001
High	4,551	59.3	57.3, 61.2	40.7	38.8, 42.7	
Age groups						
15–19	2,557	89.5	87.8, 90.9	10.5	9.1, 12.2	< 0.001
20–24	1,966	83.9	81.8, 85.8	16.1	14.2, 18.2	
25–29	2,223	72.3	69.9, 74.7	27.7	25.3, 30.1	
30–34	2,018	64.9	62.0, 67.8	35.1	32.2, 38.0	
35–39	1,916	58.2	55.2, 61.1	41.8	8.9, 44.8	
40–44	1,263	60.9	57.6, 64.2	39.1	35.8, 42.4	
45–49	1,231	55.5	52.0, 58.9	44.5	41.1, 48.0	
Education						
Nil	4,193	84	82.5, 85.4	16	14.6, 17.5	< 0.001
Primary	2,032	68.6	65.9, 71.2	31.4	28.8, 34.1	
Secondary	5,534	68.5	66.9, 70.1	31.5	29.9, 33.1	
Higher	1,416	50.6	47.1, 54.0	49.4	46.0, 52.9	
Work status						
Otherwise	3,988	81.5	79.8, 83.1	18.5	16.9, 20.2	< 0.001
Worked	9,186	67.2	65.8, 68.5	32.8	31.5, 34.2	
Marital status						
Never in union	3,295	82.6	80.9, 84.1	17.4	15.9, 19.1	
Currently un union	9,136	68.3	66.8, 69.7	31.7	30.3, 33.2	
Formerly in union	742	62.5	58.6, 66.3	37.5	33.7, 41.4	
Number of children ever born						
No child	3,446	83.3	81.6, 84.8	16.7	15.2, 18.4	< 0.001
1–2 children	3,018	69.3	66.9, 71.6	30.7	28.4, 33.1	
3–4 children	2,678	65	62.6, 67.3	35	32.7, 37.4	
5+	4,033	67.5	65.6, 69.3	32.5	30.7, 34.4	
Usual household members						
< 6	5,868	67.9	66.3, 69.5	32.1	30.5, 33.7	< 0.001
6 – 10	5,392	73	71.4, 74.5	27	25.5, 28.6	
> 10	1,750	79.4	76.8, 81.8	20.6	18.2, 23.2	
Wealth index						
Poorest	2,043	91.4	89.8, 92.8	8.6	7.2, 10.2]	< 0.001
Poorer	2,426	83	81.1, 84.7	17	15.3, 18.9	
Middle	2,650	76.4	74.5, 78.3	23.6	21.7, 25.5	
Richer	2,946	63.7	61.0, 66.2	36.3	33.8, 39.0	
Richest	3,108	52.8	49.9, 55.6	47.2	44.4, 50.1	
Region						
North Central	1,878	73.8	71.6, 76.0	26.2	24.0, 28.4	< 0.001
North East	1,953	84.6	82.6, 86.5	15.4	13.5, 17.4	

Table 2 (continued)

Explanatory variables	N	Not Obese (*n* = 9423)		Obese (*n* = 3751)		*P*-value
		%	95% CI	%	95% CI	
North West	3,388	83.4	81.4, 85.2	16.6	14.8, 18.6	
South East	1,685	59.4	56.4, 62.3	40.6	37.7, 43.6	
South South	1,690	56.9	53.9, 59.9	43.1	40.1, 46.1	
South West	2,580	61.8	59.0, 64.5	38.2	35.5, 41.0	
Residence						
Urban	6,240	63.2	61.4, 64.9	36.8	35.1, 38.6	< 0.001
Rural	6,935	79.1	77.8, 80.3	20.9	19.7, 22.2	

and 34.6% respectively. The descriptive analysis of other explanatory variables is shown in Table 1.

At the bivariate level, media and internet use, with all other explanatory variables had statistically significant associations ($p < 0.01$) with overweight/obesity (Table 2). Similarly, all explanatory variables had statistically significant associations with overweight/obesity in the unadjusted model of the logistic regression (Table 3). In the adjusted model, internet (high vs low use; OR: 1.41; 95% CI: 1.16 to 1.72) and television (high vs low use; OR: 1.26; 95% CI: 1.11 to 1.44) use remained significantly associated with overweight/obesity, such that high users had 41% and 26% higher odds for overweight/obesity compared to low users respectively.

Other explanatory variables that retained their statistically significant associations with overweight/obesity even after controlling for confounding factors were age (OR: 1.06; 95% CI: 1.05 to 1.07), education (higher vs nil; OR: 1.54; 95% CI: 1.24 to 1.91), marital status (currently in union vs single; OR: 1.41; 95% CI: 1.08 to 1.84) and wealth index (richest vs poorest; OR: 5.35; 95% CI: 4.05 to 7.06). For the regions, north east (vs north central; OR: 0.76; 95% CI: 0.62 to 0.93) and north west (vs north central; OR: 0.78; 95% CI: 0.65 to 0.93) had inverse association, while south east (vs north central; OR: 1.23; 95% CI: 1.03 to 1.47) and south south (vs north central; OR: 1.44; 95% CI: 1.21 to 1.72) had positive associations.

Discussion

The present study found that almost one-third of women were overweight/obese, and those who were high internet and television users had increased odds of being overweight/obese compared with women who were low users, although the effect was larger among internet users.

This study found that about 3 out 10 women of reproductive age in Nigeria were overweight/obese, which is similar to the global average as reported by WHO [1]. It is also similar to the findings of nationally representative surveys in Nigeria which report a prevalence ranging from 22 to 42% [4–6], depending on the year of the survey. This prevalence rate of obesity should be a point of concern to stakeholders and policy makers for a number of reasons. Firstly, this is a 30% increase from what was reported 10 years earlier by the same NDHS (i.e., 2008 to 2018) [5]. Secondly, in the same period, the population of stunted under-five children increased from 9.3 million to 14.5 million in Nigeria (i.e., 2008 to 2019) [15, 16] hence creating a double burden of nutritional disorders in a relatively poor country with already weak health systems. Finally, this is occurring in women of reproductive age, where obesity has been found to have negative consequences on child birth/survival and maternal mortality [17, 18].

Internet use has become very popular and is becoming more accessible to increasing number of people globally, even in LMIC [10, 19]. It is therefore important to track its potential effects on health indicators, including overweight/obesity. In this study, high internet users were found to have 61% higher odds for overweight/obesity compared to low users, and this was statistically significant even after adjusting for possible confounders. This is similar to what was found in the first systematic review and meta-Analysis on the influence of internet use on overweight/obesity that compared evidences from cross-sectional studies [10]. The present study is the first to corroborate this finding in Nigeria, and probably in West Africa especially with a Nationally representative data. The relationship between internet use and overweight/obesity may be due to the inactivity or sedentariness, and the increased probability of snacking that is usually associated with internet use. Another issue that may be important is the probability of increased exposure to internet-based food advertisement, mostly of processed drinks and foods [19, 20].

Television use similarly had a statistically significant positive association with overweight/obesity such that high users had nearly 30% higher odds for overweight/

Table 3 Associations of media and internet use with maternal obesity after adjusting for confounding factors using logistic regression analysis

	Unadjusted model			Adjusted model		
	OR	95% CI		OR	95% CI	
Internet use						
Low (R)						
High	2.41	2.05	2.84	1.41	1.16	1.72
Radio use						
Low (R)						
High	1.61	1.46	1.78	0.98	0.87	1.11
Television use						
Low (R)						
High	2.43	2.19	2.71	1.26	1.11	1.44
Age	1.06	1.06	1.07	1.06	1.05	1.07
Education						
Nil (R)						
Primary	2.41	2.08	2.78	1.31	1.11	1.55
Secondary	2.42	2.10	2.78	1.41	1.17	1.71
Higher	5.13	4.29	6.14	1.54	1.24	1.91
Work status						
Didn't work (R)						
Worked	2.15	1.91	2.42	1.08	0.94	1.23
Marital status						
Never in union (R)						
Currently in a union	2.20	1.95	2.48	1.41	1.08	1.84
Formerly in a union	2.84	2.35	3.43	1.23	0.90	1.69
Number of children ever born						
No child (R)						
1–2 children	2.20	1.89	2.57	1.29	0.99	1.68
3–4 children	2.68	2.33	3.08	1.27	0.95	1.71
5+	2.40	2.09	2.75	1.33	0.96	1.85
Usual household members						
< 6 (R)						
6–10	0.78	0.71	0.87	0.95	0.84	1.09
> 10	0.55	0.47	0.65	0.96	0.78	1.17
Wealth index						
Poorest (R)						
Poorer	2.19	1.73	2.77	1.93	1.51	2.48
Middle	3.28	2.66	4.06	2.45	1.94	3.11
Richer	6.09	4.88	7.59	3.92	3.02	5.10
Richest	9.55	7.64	11.93	5.35	4.05	7.06
Region						
North Central (R)						
North East	0.51	0.42	0.62	0.76	0.62	0.93
North West	0.56	0.47	0.67	0.78	0.65	0.93
South East	1.93	1.63	2.29	1.23	1.03	1.47
South South	2.14	1.81	2.52	1.44	1.21	1.72
South West	1.75	1.48	2.05	0.86	0.71	1.03
Residence						
Urban (R)						
Rural	0.45	0.41	0.50	0.91	0.81	1.03

R reference variable, *OR* odds ratio, *CI* confidence interval

obesity compared to low users. This also corroborates earlier findings on media and overweight/obesity in different contexts [11, 12]. The mechanism for this increased risk may be similar to that of internet use, which may include the sedentary lifestyle and inactivity it promotes, increased tendency for snacking while watching television and possibility to consume more unhealthy drinks and foods adverts [19, 20]. Contrary to the findings of a past study in Nigeria [12], radio use had no statistically significant association with overweight/obesity. This may be because the present study controlled for a wider range of possible confounders at individual, household and community levels. Additionally, the use of the radio may not necessarily involve inactivity, increased snacking and the visual sensation from food and drink advertisements like internet and television usage [19, 20].

The present study has a number of strengths. Firstly, it provides de novo nationally representative data on the influence of internet use on overweight/obesity among women of reproductive health in Nigeria. Secondly, it provides the most updated nationally representative data on media use and overweight/obesity. Thirdly, this study adjusted for a wide range of possible confounders at individual, household and community levels, hence increasing the validity of the findings.

This study is not without some limitations. Firstly, it used the 2018 NDHS which, though is the most recent NDHS data, is not so recent especially considering the possible socio-economic effect of the COVID pandemic that could not be reflected in this study. The NDHS survey used the cluster sampling with meticulous weighted analysis to reduce bias, however this could not be completely ruled out. Also, the internet use in this study did not give more details of actual length, forms and purposes of use which would have given more understanding on the contexts. While it could be argued that these are observational or cross-sectional evidence that cannot establish actual causality, yet they provide valid data that should provoke interest from policy makers and other stakeholders in Nigeria. Other potential sources of bias which could not be totally ruled out are recall and social-desirability bias.

Conclusion

The overall prevalence of overweight/obesity was 28.5%. Internet and television use had statistically significant positive associations with overweight/obesity even after adjusting for possible confounders at individual, household and community levels. While internet and television use have a lot of advantages and should not be regulated, interventions should be designed to address the risk of overweight/obesity associated with screen-based sedentary behaviour.

Abbreviations

BMI	Body mass index
CI	Confidence interval
DALY	Disability-adjusted life years
EA	Enumeration Area
LGA	Local Government Areas
LMIC	Low-and middle-income countries
NCD	Non-Communicable disease
NDHS	Nigeria Demographic and Health Survey
OR	Odds ratio
PSU	Primary Sampling Unit
SD	Standard Deviation
SSA	Sub-Saharan Africa
WHO	World Health Organization

Acknowledgements

The author appreciates the respondents used for the study, the team of researchers involved in the NDHS 2018 and USAID and ICF Macro for sponsoring the survey and making the data readily available.

Author's contributions

All aspects of the research were undertaken by AAA.

Funding

This research was funded by the author.

Data availability

The datasets used and/or analyzed during the current study are freely available at the demographic and health survey (DHS) website (https://dhsprogram.com/).

Declarations

Ethics approval and consent to participate

Ethical approval was obtained by the Ethics Committee of the ICF Macro at Calverton in the USA in conjunction with the National Ethics Committee of the Federal Ministry of Health in Nigeria (ethics approval number: NHREC/01/01/2007). The principles of respect for participants, informed consent, favourable risk-benefit ratio and fair subject selection were followed in accordance with the Declaration of Helsinki and the Nuremberg code. Written informed consent was obtained from respondents who were 18 years+, and parents of those < 18 years, while assent was obtained from respondents less than 18 years.

Consent for publication

Not applicable.

Competing interests

The authors declare no competing interests.

Author details

[1]Department of Community Health, Obafemi Awolowo University, Ile-Ife, Osun State, Nigeria.

Received: 25 May 2024 Accepted: 21 March 2025
Published online: 20 May 2025

References

1. World Health Organization. Malnutrition. 2022. https://www.who.int/news-room/fact-sheets/detail/malnutrition.
2. Nogales R, Oldiges C. Multidimensional poverty and conflict events in Nigeria over time. Int Polit Sci Rev. 2024;45:53–80.
3. United Nations Children's Fund (UNICEF). For Every Child, Vaccination. In: State world Child. 2023. https://www.unicef.org/media/108161/file/SOWC-2023-full-report-English.pdf. Accessed 25 Jul 2023.
4. Neupane S, Prakash KC, Doku DT. Overweight and obesity among women: analysis of demographic and health survey data from 32 Sub-Saharan African countries. BMC Public Health. 2016;16:1–9.

5. Tagbo S, Abebe D, Oguoma V. Overweight and obesity among non-pregnant women of reproductive age in Nigeria: findings from the 2008–2018 Nigerian demographic and health survey. Public Health. 2021;198:348–57.
6. Chukwuonye II, Ohagwu KA, Ogah OS, et al. Prevalence of overweight and obesity in Nigeria: systematic review and meta-analysis of population-based studies. PLOS Glob Public Heal. 2022;2: e0000515.
7. Dare AJ, Olatoke SA, Okereke CE, Abdulkareem FB, Adeyeye A, Badejo O, Kingham TP, Brennan MF. The African research group for oncology: a decade fostering colorectal cancer research in Nigeria. 2023. https://doi.org/10.1002/jso.27444.
8. Gouda HN, Charlson F, Sorsdahl K, et al. Articles burden of non-communicable diseases in sub-Saharan Africa, 1990–2017: results from the global burden of disease study. Lancet Glob Heal. 2017;7:e1375–87.
9. Adeomi A, Fatusi A, Klipstein-Grobusch K. Double burden of malnutrition among school-aged children and adolescents: evidence from a community-based cross-sectional survey in two Nigerian States. AAS Open Res. 2021;4:38.
10. Aghasi M, Matinfar A, Golzarand M, Salari-Moghaddam A, Ebrahimpour-Koujan S. Internet use in relation to overweight and obesity: a systematic review and meta-analysis of cross-sectional studies. Adv Nutr. 2020;11:349–56.
11. Ahammed B, Ahammed B, Haque R, Rahman SM, Keramat SA, Mahbub A, Ferdausi F, Alam K. Frequency of watching television, owning a mobile phone and risk of being overweight/obese among reproductive-aged women in low- and lower-middle-income countries: A pooled analysis from Demographic and Health Survey data. J Biosoc Sci. 2022;55(3):509–22.
12. Ghose B, Yaya S. Media use and excess body weight among women in Nigeria: a cross-sectional study. BMJ Open. 2018;8:1–8.
13. National Population Commission (NPC) Nigeria and ICF. Nigeria demographic and health survey 2018. NPC and ICF, Abuja and Rockville: NPC and ICF; 2019.
14. de Onis M, Onyango AW, Borghi E, Siyam A, Siekmann J. Development of a WHO growth reference for school-aged children and adolescents. Bull World Health Organ. 2007;85:660–7.
15. United Nations Children's Fund (UNICEF). The state of the world's children 2019: children, food and nutrition-growing well in a changing world. Unicef; 2019. https://www.unicef.org/media/106506/file/TheStateoftheWorld'sChildren2019.pdf.
16. United Nations Children's Fund (UNICEF). The State of the World Children; Child Survival. J Trop Pediatr. 2008. https://doi.org/10.1093/tropej/fmr064.
17. Elizondo-montemayor L, Hernández-escobar C, Lara- E. Gynecologic and obstetric consequences of obesity in adolescent girls. J Pediatr Adolesc Gynecol. 2016. https://doi.org/10.1016/j.jpag.2016.02.007.
18. Galliano D, Bellver J. Female obesity: short- and long-term consequences on the offspring. Gynecol Endocrinol. 2013;29:626–31.
19. Zheng Y, Wei D, Li J, Zhu T, Ning H. Internet use and its impact on individual physical health. IEEE Access. 2016;4:5135–42.
20. Matusitz J, McCormick J. Sedentarism: the effects of internet use on human obesity in the United States. Soc Work Public Heal. 2012;27:250–69.

Publisher's Note