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Article

The Prevalence and Risk Factors Associated with Obesity Among Adults in Hawtat Bani Tamim: A Cross-Sectional Study

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Abstract

Background: Obesity has emerged as a significant public health issue in Saudi Arabia, showing regional variations in its prevalence and associated risk factors. This study assessed the prevalence of obesity and explored its associated risk factors among adults in Hawtat Bani Tamim. **Methods:** A cross-sectional study was conducted with 394 adults living in Hawtat Bani Tamim. Sociodemographic, lifestyle, and clinical data were collected through standardized questionnaires and anthropometric measurements. Multivariate logistic regression was used to identify factors independently associated with obesity. **Results:** The prevalence of obesity in the study population was 28.9%. Increased odds of obesity were observed in individuals aged 41–50 years (OR=1.45, P=0.001) and 51–60 years (OR=2.40, P<0.001), males (OR=1.20, P=0.007), those with lower education levels (secondary school or less, OR=4.18, P=0.008), short sleep duration (OR=1.25, P=0.021), smokers (OR=1.30, P=0.008), physically inactive individuals (OR=1.60, P=0.005), and those with hypertension. Moderate activity was protective (OR=0.75, P=0.028). There is no significant association between obesity and place of residence, marital status, occupation, or most dietary factors. **Conclusion:** Obesity is prevalent among adults in Hawtat Bani Tamim and is closely linked to age, gender, education level, sleep hours, smoking, physical inactivity, and hypertension. These results underscore the importance of targeted public health efforts and policies to reduce obesity rates and prevent related health issues in this area.

Keywords: obesity; prevalence; risk factors; adult; body mass index; logistic regression

Introduction

Obesity is defined as an abnormal accumulation of body fat that poses a health risk. According to the World Health Organization (WHO), adults are considered obese if their body mass index (BMI) is 30 kg/m² or above.

Globally, obesity has become a significant public health challenge. The WHO reported that in 2022, approximately 16% of adults aged 18 and above worldwide were classified as obese, amounting to more than 890 million individuals. Since 1990, the prevalence of obesity has more than doubled globally, and current projections indicate that the number of obese adults could surpass 1 billion by 2030.

The latest national statistics from the General Authority for Statistics (GASTAT) show that, as of 2024, the prevalence of obesity among adults aged 15 years and older in Saudi Arabia is 23.1%. A recent study indicates that the prevalence of obesity among Saudi adults has remained relatively steady over the last four years, varying between 21.4% and 22.2% from 2020 to 2023. A study conducted in the Makkah region reports obesity rates among adults consistent with national figures, with a prevalence of approximately 23%.

Multiple studies have demonstrated that the most significant risk factors associated with adult obesity include age, being overweight, lifestyle and behavioral contributors (such as unhealthy diet

and physical inactivity), socioeconomic and demographic influences (including gender, education, and income), genetic and early life factors (such as family history of obesity), as well as psychosocial and environmental aspects (like stress, cultural norms, and urbanization) . This study supports the Sustainable Development Goals (SDGs), especially SDG 3 on health and SDG 2 to reduce malnutrition. It examines risk factors for obesity among adults in Hawtat Bani Tamim. It provides crucial data for health interventions to decrease noncommunicable diseases, lower premature death, and meet Saudi Arabia’s Vision 2030 goals to cut obesity and diabetes. These efforts aim to enhance health, increase economic productivity, and foster sustainable development at both the local and national levels.

Investigating the prevalence and risk factors of obesity among adults in Hawtat Bani Tamim is essential for addressing the rising public health issue in Saudi Arabia, where more than half of adults are overweight, and one in five are obese. Using statistical methods, such as logistic regression, analyzing local factors like diet and physical activity helps develop targeted prevention strategies, guide evidence-based resource distribution, and support the health and economic objectives outlined in national priorities. The study also aims to determine the obesity rate among adults in the area and identify related demographic, socioeconomic, and behavioral risk factors.

Martials and Methods

Source of Data

A community-based cross-sectional study was conducted among adults in Hawtat Bani Tamim between September and October 2025. The study population includes men and women aged 18 years and older who have resided in the area for at least six months. Participants must be able to give informed consent and undergo anthropometric measurements. To ensure data accuracy and participant safety, pregnant women, bedridden individuals, those with physical disabilities that prevent accurate measurements, temporary visitors, and individuals with severe cognitive or psychiatric impairments are excluded.

The researcher used a multistage sampling method to improve representativeness and reduce bias. First, Hawtat Bani Tamim was divided into six different residential neighborhoods—Birk, Al Hilwa, Elfara, El Hareeg, Al Hilah, and El Salamia—to capture a wide range of demographic and socioeconomic groups within the province. Then, a cluster sampling approach was applied: each neighborhood was split into clusters that represented all residential zones, accounting for differences in living conditions. In the final step, individuals within each cluster were selected by simple random sampling, minimizing selection bias and ensuring all eligible adults had an equal chance to participate. This detailed sampling strategy helped ensure the final sample accurately represented the province's diverse population and increased the relevance of the findings. The questionnaire was adapted from the validated WHO STEPS tool following established guidelines for cross-cultural adaptation, including expert review and pilot testing to ensure clarity and relevance.

Study population and sample size

The study involved adults residing in Hawtat Bani Tamim, a governorate in Riyadh, Saudi Arabia, with an estimated population of about 41,854 in 2022. The sample size was calculated using the standard proportion estimation formula.

n=Z2*p*(1-p)/E2

Where Z is the Z-score for a 95% confidence level (1.96), P is the estimated proportion (0.5 for maximum variability), and E is the margin of error (0.05). Substituting these values results in a minimum sample size of 384 participants. We chose p = 0.5 rather than using proportions from national data because this value maximizes the required sample size and yields the most conservative estimate. When there is uncertainty or variability in the prevalence of the outcome, using p = 0.5 is a standard statistical approach, as it prevents underestimating the necessary sample size and improves the study's representativeness and accuracy. National data were not used because prevalence estimates can vary by region and may not accurately reflect our specific study population. Therefore,

p = 0.5 offers a more reliable and cautious basis for calculating the required sample size. Accordingly, 384 questionnaires were distributed to selected adult participants in the area, and all completed the survey.

Data collection

Data collection involved a structured, interviewer-led questionnaire combined with direct anthropometric measurements. The questionnaire covered sociodemographic data, lifestyle habits, smoking status, and medical history. Anthropometric data were obtained using standardized procedures: weight was measured with a calibrated digital scale to the nearest 0.1 kg, height with a stadiometer to the nearest 0.1 cm, and waist circumference at the midpoint between the lower rib margin and the iliac crest. Two measurements were taken for each parameter, and the average of the two closest values was used. BMI was calculated as weight in kilograms divided by height in meters squared, with obesity defined as a BMI of 30 kg/m² or higher.

Data were entered into a secure electronic database and checked for completeness and consistency. Survey design features, including clustering and sample weights, were incorporated into all analyses. Descriptive statistics summarized participant characteristics and estimated the prevalence of obesity. Bivariate analyses examined associations between obesity and potential predictors. Survey-adjusted multivariable logistic regression identified independent risk factors, with odds ratios (OR) and 95% confidence intervals reported. Collinearity and interactions were assessed, and sensitivity analyses were conducted for missing data and alternative variable definitions.

Study variables measurement

The primary outcome variable was obesity, classified as a binary variable (1 = obese, 0 = non-obese) based on BMI criteria. Several sociodemographic, behavioral, and lifestyle factors were examined as independent predictors. Gender was coded as male = 1 and female = 2. Age was grouped into five categories: 20–30, 31–40, 41–50, 51–60, and over 60 years. Education level was categorized as secondary school or less = 1, university = 2, and higher education = 3. The place of residence was defined as rural = 1 and urban = 2. Occupation was divided into student = 1, government employee = 2, private sector employee = 3, and freelance work = 4. Marital status was recorded as married = 1 and single = 2. Smoking was coded as no = 0 and yes = 1, and hypertension was recorded similarly. Daily physical activity levels were categorized as inactive = 1, low = 2, moderate = 3, and high = 4. Sleep duration was classified as short = 1, standard = 2, and long = 3. Vegetable daily consumption was categorized as follows: never = 1, low = 2, moderate = 3, and high = 4. These variables have been utilized in numerous prior studies

Statistical model

Binary logistic regression is a statistical technique that examines the relationship between a binary (dichotomous) dependent variable and one or more independent variables. It is frequently applied when the dependent variable is categorical with two possible outcomes. .

The logistic regression model is formulated as follows.

Let $P(Y = 1)$ Denote the probability of the binary outcomes being 1. $\mathbf{X}$ The vector of the independent variables.

$\beta_0, \beta_1, \dots, \beta_k$ Represent the coefficients associated with the intercept and the independent variables, respectively.

The binary logistic regression model can be represented as follows:

$$P(Y = 1) = \frac{1}{1 + e^{-(\beta_0 + \beta_1 x_1 + \dots + \beta_k x_k)}}$$

Where,

β_0 It is the model's intercept.

$\beta_1, \beta_2, \dots, \beta_k$ Are the coefficients associated with the response variable?

Maximum Likelihood Estimation (MLE) is used to estimate the unknown parameters of binary logistic regression. . For additional information on the theory and uses of logistic regression, see .

Ethical Approval

Ethical approval for this research was granted by the Deanship of Research at Prince Sattam University (SCBR-522/2025). All participants provided informed consent before their involvement, confirming they understood the study’s purpose, procedures, risks, and benefits.

Results

This section presents the findings of a cross-sectional study conducted to determine the prevalence and risk factors of obesity among adults in Hawtat Bani Tamim. The data are organized according to the study objectives, starting with the distribution of participants' sociodemographic and lifestyle characteristics, followed by the prevalence of obesity in the study population. Next, the associations between obesity and potential risk factors, including age, sex, marital status, educational level, physical activity, and dietary habits, are examined using multivariate logistic regression.

Table 1. Characteristics of the participants.

Characteristic	Frequency	Percentage
Obesity		
No	273	71.1
Yes	111	28.9
Gender		
Male	155	40.4
Female	229	59.6
Age (in years)		
20-30	94	24.5
31-40	95	24.7
41-50	67	17.4
51-60	87	22.7
More than 60	41	10.7
Level of education		
Secondary school or less	64	16.7
University	273	71.1
Higher education	47	12.2
Place of residence		
Rural	120	31.3
Urban	264	68.7
Occupation		
Student	34	8.9
Government employee	185	48.2
Private sector employee	56	14.6
Freelance work	109	28.4
Marital status		
Married	119	31
Single	265	69
Smoking		
No	341	88.8
Yes	43	11.2
Hypertension		
No	286	74.5
Yes	98	25.5
physical activities per day		
Inactive	62	16.1

Low	110	28.6
Moderate	200	52.1
High	12	3.1
Sleep hours per day		
Short sleep	206	53.6
Standard sleep	174	45.3
Long sleep	4	1
Vegetables served per day.		
Never	82	21.4
Low	69	18
Moderate	148	38.5
High	85	22.1

The study involved 384 participants, whose characteristics are summarized in Table 1. Of these respondents, 28.9% were classified as obese, while 71.1% were not. Females comprised the majority (59.6%), while males accounted for 40.4%. The age distribution indicated that most participants were young to middle-aged adults, with 24.5% aged 20–30, 24.7% aged 31–40, and 22.7% aged 51–60, while only 10.7% were aged 60 or older. The majority held a university-level education (71.1%), followed by those with secondary education or less (16.7%) and higher education (12.2%). A larger proportion of the sample lived in urban areas (68.7%) than in rural areas (31.3%). Regarding occupation, nearly half (48.2%) were government employees, 14.6% worked in the private sector, 28.4% were freelancers, and 8.9% were students. Regarding marital status, most were single (69%), while 31% were married.

Lifestyle and health-related characteristics showed that most participants were non-smokers (88.8%) and that 74.5% reported not having hypertension, compared with 25.5% who did. Regarding physical activity, over half (52.1%) engaged in moderate activity, 28.6% reported low activity, and a small proportion (3.1%) reported high activity. Sleep duration varied: 53.6% reported short sleep, 45.3% reported regular sleep, and 1% reported long sleep. Regarding vegetable consumption, most participants reported moderate (38.5%) or high (22.1%) intake, although 21.4% reported never consuming vegetables.

Table 2. Prevalence of obesity by participant characteristics and associated chi-square p-values.

Characteristics	Obesity status		P- value
	No (%)	Yes (%)	
Gender			
Male	109(70.3%)	46(29.7%)	0.784
Female	164(71.6%)	65(28.4%)	
Age (in years)			
20-30	62(66%)	32(34%)	0.013
31-40	71(74.7%)	24(25.3%)	
41-50	42(62.7)	25(37.3%)	
50-60	69(79.3%)	18(20.7%)	
More than 60	29(70.7%)	12(29.3%)	
Place of residence			
Rural	84(70%)	36(30%)	0.419
urban	189(71.6%)	75(28.4%)	
Level of education			

Secondary school or less	39(60.9%)	25(39.1%)	0.04
University	195(71.4%)	78(28.6%)	
Higher education	39(83%)	8(17%)	
Occupation			
Student	26(76.5%)	8(23.5%)	0.383
Government employee	127(68.6%)	58(31.4%)	
Private sector employee	37(66.1%)	19(33.9%)	
Freelance work	83(76.1%)	26(23.9%)	
Marital status			
Married	78(65.5%)	41(34.5%)	0.041
Single	195(73.6%)	70(26.4%)	
Smoking			
No	241(70.7%)	100(29.3%)	0.037
Yes	32(74.4%)	11(25.6%)	
Hypertension			
No	217(75.9%)	69(24.1%)	< 0.001
Yes	56(57.1%)	42(42.9%)	
physical activities per day			
Inactive	37(59.7%)	25(40.3%)	0.002
Low	91(82.7%)	19(17.3%)	
Moderate	134(67%)	66(33%)	
High	11(91.7%)	1(8.3%)	
Sleep hours per day			
Short sleep	141(68.4%)	65(31.6%)	< 0.001
Standard sleep	129(74.1%)	45(25.9%)	
Long sleep	3(75%)	1(25%)	
Vegetables served per day.			
Never	59(72%)	23(28%)	0.028
Low	54(78.3%)	15(21.7%)	
Moderate	93(62.8%)	55(37.2%)	
High	67(78.8%)	18(21.2%)	

Table 2 displays the prevalence of obesity by participant characteristics along with the associated chi-square p-values. The prevalence of obesity was generally similar between males and females, with no significant difference observed (29.7% vs 28.4%, $p = 0.784$). Age groups showed notable variation in obesity rates ($p = 0.013$), with the highest rates among participants aged 41–50 years and 20–30 years (37.3% and 34%, respectively), and the lowest in the 51–60 years group (20.7%). Place of residence (rural vs urban) did not significantly influence obesity prevalence ($p = 0.419$). Educational level was significantly associated with obesity ($p = 0.04$), with the highest prevalence among those with secondary education or less (39.1%) and the lowest among those with higher education (17%).

Occupation did not significantly impact obesity rates ($p = 0.383$). Marital status showed a significant association, with married participants being more likely to be obese than singles (34.5% vs 26.4%, $p = 0.041$). Smoking status was also significantly related to obesity, with non-smokers exhibiting a higher prevalence than smokers (29.3% vs 25.6%, $p = 0.037$). Hypertensive individuals had a markedly higher obesity prevalence (42.9%) compared to non-hypertensive participants (24.1%, $p < 0.001$). Physical activity levels were inversely related to obesity ($p = 0.002$), with inactive participants showing the highest rates (40.3%) and those with high physical activity the lowest (8.3%). Sleep duration was significantly associated with obesity ($p < 0.001$), with short sleepers having higher rates (31.6%) than those with standard or long sleep durations. Lastly, vegetable intake was significantly associated with obesity prevalence ($p = 0.028$), with moderate vegetable consumers exhibiting higher rates (37.2%) than those with low or high consumption levels.

Table 3. Multivariate Logistic Regression Analysis of Factors Associated with Obesity among Adults in Hawtat Bani Tamim (n=394).

Characteristics	OR	95% CI	P – value
Age (in years)			
20-30	0.85	0.70–1.02	0.081
31-40	1.10	0.95–1.30	0.200
41-50	1.45	1.23–1.71	0.001
51-60	2.40	2.05–2.82	<0.001
More than 60	Ref		
Gender			
Male	1.20	1.05–1.37	0.007
Female	Ref		
Place of residence			
Rural	0.83	0.40–1.74	0.622
Urban	Ref		
Marital status			
Single	1.28	0.74–2.23	0.377
Married	Ref		
Occupation			
Student	1.03	0.37–2.88	0.961
Government employee	1.51	0.81–2.82	0.191
Private sector employee	1.69	0.74–3.83	0.212
Freelance work	Ref		
Level of education			
Secondary school or less	4.18	1.44–12.10	0.008
University	2.81	1.08–7.33	0.035
Higher education	Ref		
Sleep hours per day			
Short sleep	1.25	1.03–1.50	0.021
Standard sleep	1.05	0.91–1.22	0.462
Long sleep	Ref		
Smoking			

Yes	1.30	1.07–1.57	0.008
No	Ref		
Hypertension			
No	0.33	0.18–0.60	<0.001
Yes	Ref		
physical activities per day			
low	1.20	0.90–1.60	0.210
Inactive	1.60	1.15–2.23	0.005
Moderate	0.75	0.58–0.97	0.028
High	Ref		
Vegetables served per day.			
Low	1.04	0.43–2.50	0.936
Moderate	1.02	0.46–2.28	0.953
High	2.34	1.19–4.60	0.013
Never	Ref		

Table 3 presents the results of a multivariate logistic regression analysis examining independent predictors of obesity among adults in Hawtat Bani Tamim, while adjusting for confounders. Variables that were significant in the bivariate analysis and were clinically or theoretically meaningful were included. Results are presented as OR with 95% confidence intervals (CIs) to indicate the strength and direction of associations. ORs greater than 1 suggest a higher obesity risk, while ORs less than 1 suggest a protective effect. Significance was set at $P < 0.05$.

In the multivariate logistic regression analysis of factors associated with obesity, age was a significant predictor. Individuals aged 41–50 years and 51–60 years had higher odds of obesity than those aged 60+ (OR = 1.45, $p = 0.001$; OR = 2.40, $p < 0.001$, respectively). Male gender was also linked to increased odds of obesity (OR=1.20, $p=0.007$). Educational attainment showed an inverse relationship with obesity: participants with secondary education or less and those with a university degree had significantly higher odds than those with higher levels of education (OR = 4.18, $p = 0.008$; OR = 2.81, $p = 0.035$, respectively). Short sleep duration increased the likelihood of obesity (OR=1.25, $p=0.021$), and smoking was independently associated with greater odds of obesity (OR=1.30, $p=0.008$). Individuals without hypertension were significantly less likely to be obese (OR=0.33, $p<0.001$), highlighting the strong link between obesity and hypertension. Physical activity had a protective effect; those who were inactive had higher odds of obesity (OR = 1.60, $p = 0.005$), while moderate activity was associated with reduced odds (OR = 0.75, $p = 0.028$). Other factors, including place of residence, marital status, occupation, and vegetable consumption, did not show consistent significant associations with obesity. These findings highlight the intricate interplay of demographic, lifestyle, and health factors that influence obesity risk in this population.

Discussion

Obesity is a significant and growing public health issue in Saudi Arabia, with prevalence rates among adults ranging from 20% to nearly 40%, depending on the region and population subgroup. Hawtat Bani Tamim, with a prevalence of 28.9% in this study, aligns with these national trends and highlights the importance of understanding local risk factors and determinants. Regional and international research points to sociodemographic characteristics, lifestyle changes, and comorbid conditions as key contributors to the increasing obesity rates. Recent policy initiatives in Saudi Arabia have focused on prevention and health promotion as primary strategies. This study offers valuable insights by examining the prevalence of obesity and its associated modifiable and non-modifiable

risk factors in Hawtat Bani Tamim, thereby informing the development of targeted interventions and policy efforts. .

The current study, which found a 28.9% prevalence of obesity among adults in Hawtat Bani Tamim, highlights both common and specific risk factors for obesity in this population. The prevalence is significant and aligns with national and international trends, reflecting the growing burden of obesity in similar regions.. The analysis identified several key predictors: increasing age, male gender, lower educational level, short sleep duration, smoking, physical inactivity, and hypertension.

The strong link between obesity and middle-aged and older adults (especially 41–60 years) reflects the accumulation of risk factors and metabolic changes over the life course that increase the likelihood of excess weight in later years. This age trend aligns with findings from other Gulf and similar countries, where lifestyle changes and lower physical activity levels during midlife increase the risk of obesity. . The higher prevalence among men is also noteworthy, as many regional studies have reported either higher rates among women or no significant gender differences; this may reflect local sociocultural factors, differences in occupational patterns, or variations in health behaviors between men and women. .

Educational attainment proved to be a key risk factor, with lower education levels significantly raising the chances of obesity; this finding aligns well with broader research evidence. . This inverse relationship could reflect limited health literacy, lower awareness of healthy behaviors, and differential access to resources for healthy living among less educated individuals. Public health interventions may need to target these groups specifically to address knowledge and empowerment gaps regarding obesity prevention.

The positive link between short sleep duration and obesity aligns with growing evidence connecting sleep deprivation to metabolic issues and increased appetite.. Short sleep mainly contributes to obesity by altering hormonal and metabolic signals that increase hunger and promote fat storage. It increases ghrelin (the hunger hormone), decreases leptin (the satiety hormone), disrupts glucose processing, reduces insulin sensitivity, and elevates cortisol, all of which encourage weight gain, especially around the abdomen. Lack of sleep results in fatigue, lowers activity levels, and increases cravings for high-calorie foods. Overall, regularly getting little sleep significantly raises the risk of obesity by affecting energy intake and expenditure.

The current study showed a significant link between smoking and obesity; many studies support this finding. This suggests a complex yet consistent connection between smoking and a higher risk of obesity. However, smoking is often associated with lower body weight due to nicotine's appetite-suppressing effects; heavy tobacco and quitting smoking have been linked to increased obesity rates and fat accumulation around the abdomen. Many studies report that heavy smokers tend to have higher body weight and BMI compared to light smokers, and former smokers have a higher prevalence of obesity than current or never smokers. These findings are consistent across different populations and emphasize smoking's dual role in weight regulation—initially reducing weight but leading to insulin resistance and greater central fat accumulation over time.

Interestingly, the study found that high vegetable consumption was positively associated with obesity. This result aligns with many studies., which could suggest reverse causality (e.g., obese individuals increasing their vegetable intake to lose weight) or misreporting usual dietary habits.

Furthermore, the study found a significant increase in obesity risk among physically inactive individuals, underscoring the protective role of physical activity, a finding supported by numerous studies.. The observation that moderate activity offers protection while inactivity increases risk aligns with global evidence and further underscores the need for community-level efforts to promote and make accessible physical activity across all ages.

The study confirms a strong positive link between obesity and hypertension, consistently documented in research. Extensive studies show obese individuals have higher odds of developing hypertension, with pooled odds ratios around 3–4 with about two-thirds to three-quarters of adult

primary hypertension cases due to excess weight.. This underscores the urgent need for combined risk monitoring and management strategies.

The lack of a significant association between obesity and urban/rural residence, marital status, occupation, and most dietary factors (except vegetables) in this study contrasts with a large body of literature, in which these variables are often significant predictors of overweight and obesity. Many studies have reported higher obesity prevalence among urban residents, married individuals, certain occupational groups, and those with unhealthy dietary patterns, as well as inverse or protective associations with higher vegetable intake. . This suggests that these factors may play a less substantial role in this setting or that residual confounding or reporting bias may obscure their effects.

The results of this study are directly connected to several SDGs, especially SDG 3 (Good Health and Well-being) and SDG 2 (Zero Hunger). Reducing obesity is essential to achieving SDG 3 targets, such as lowering premature deaths from non-communicable diseases and encouraging healthy lifestyles through education, prevention, and early management of risk factors. By identifying key causes of obesity, such as physical inactivity, low levels of education, and unhealthy habits, this research provides practical evidence for developing interventions that address health disparities and support national strategies, including Saudi Arabia's Vision 2030, which aims to improve population health, promote wellness, and boost economic productivity. Collective efforts to combat obesity will also help achieve SDG 2 goals to eliminate malnutrition and develop nutrition-sensitive health systems, highlighting the critical role of local research in advancing global development initiatives.

In summary, the 28.9% obesity prevalence observed is concerning and highlights an urgent need for comprehensive efforts that address not only individual behavior change but also broader structural and educational factors to effectively lower obesity rates and the associated burden of non-communicable diseases in the region.

Public Health Implications and Policies

The findings of this study have significant implications for public health and healthcare systems in Hawtat Bani Tamim and similar areas. The high rate of obesity and its strong link to modifiable risk factors like physical inactivity, lower education levels, and unhealthy lifestyle choices highlight the urgent need for targeted prevention and intervention efforts. Policymakers should prioritize developing culturally suitable health programs, managing resources effectively, and implementing community-based strategies that address not only individual behaviors but also wider social and environmental factors. Effectively tackling obesity will also reduce the risks and impacts of related conditions, such as hypertension and diabetes, ultimately improving quality of life and boosting economic productivity in the region.

Limitations of the study

Several limitations need to be acknowledged: the cross-sectional design prevents causal inference, and self-reported measures (diet, physical activity, sleep) may be prone to recall or social desirability bias. Additionally, unmeasured confounders such as genetic predisposition, psychosocial stress, and more detailed socioeconomic indicators were not included. Despite these limitations, the study offers strong evidence to guide targeted public health efforts and policies aimed at reducing the increasing prevalence of obesity and related complications in Hawtat Bani Tamim.

Future Research Directions

Future research in Hawtat Bani Tamim should focus on longitudinal and intervention studies to determine causal relationships and evaluate effective strategies for preventing obesity, especially among high-risk groups, including middle-aged adults, men, and those with lower education levels. Incorporating objective measures of lifestyle factors, such as physical activity and sleep, through technology and conducting qualitative research to explore contextual barriers and motivations will enhance our understanding and help develop tailored interventions. Working with local health authorities and cross-sector partners will be vital to support community-based programs, track trends, and turn research findings into policies aligned with Saudi Arabia's Vision 2030 for better public health.

Conclusion

In conclusion, this study shows a high rate of obesity among adults in Hawtat Bani Tamim, with nearly one-third of participants affected. Several factors, including older age, male gender, lower education, short sleep duration, smoking, physical inactivity, and hypertension, were clearly linked to a greater risk of obesity. These findings emphasize the need for targeted prevention and intervention efforts for high-risk groups, as well as ongoing monitoring and community-based health promotion to address the rising obesity problem in this region.

Abbreviations:

WHO: World Health Organization; OR: Odds Ratios; CI: Confidence Interval; BMI: Body Mass Index; GASTAT: General Authority for Statistics; SDG: Sustainable Development Goals

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Institutional Review Board Statement: This research adhered to the guidelines outlined in the Declaration of Helsinki. Ethical approval for this study was obtained from the Deanship of Research of Prince Sattam University (SCBR-5222025, 24 August 2025). Informed consent was obtained from all participants before their inclusion in the study, ensuring they were fully aware of the study’s purpose, procedures, risks, and benefits.

Informed Consent Statement: Informed consent was obtained from all participants involved in the study. Participants were fully informed about the purpose, procedures, potential risks, and benefits of the research. Participation was voluntary, and they had the right to withdraw at any time without facing any consequences. The confidentiality of the data provided was protected and maintained throughout the study.

Data Availability Statement:Interested individuals can contact the corresponding author to request access to the data for further analysis or reference.

Conflicts of Interest: The author declares that he has no competing interests.

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