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Prevalence and Factors Influencing Obesity among Medical Students, Salem District, Tamilnadu.

***Dr. Sangeetha S, **Dr. Kavya S, ***Dr. Lovling Aarthy Maria, ****Dr.R. Shankar, *****Dr.Elakkiya S (Corresponding author).**

* HOD & Professor, Vinayaka Mission Kirupananda Variyar Medical College and Hospital ,Vinayaka Mission Research Foundation

**Postgraduate , Vinayaka Mission's Kirupananda variyar medical college, Salem, mail: dr.kavya2996@gmail.com

***Associate Professor, Vinayaka Mission Kirupananda Variyar Medical College and Hospital, Vinayaka Mission Research Foundation

**** Professor, Vinayaka Mission Kirupananda Variyar Medical College and Hospital, Vinayaka Mission Research Foundation

***** Senior resident , Vinayaka Mission Kirupananda Variyar Medical College and Hospital ,Vinayaka Mission Research Foundation

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KEYWORDS

Obesity, Overweight, Medical students, Sedantary lifestyle, Risk factors.

ABSTRACT:

Background: Obesity is a significant worldwide health issue, associated with higher rates of morbidity and chronic illnesses. Its rising prevalence in both developed and developing countries is largely attributed to sedentary lifestyles, unhealthy dietary patterns, and psychosocial stress. Medical students are particularly vulnerable to weight gain due to demanding academic schedules, prolonged study hours, irregular meals, inadequate sleep, and limited physical activity. Despite their medical knowledge, many adopt unhealthy coping mechanisms such as frequent fast-food consumption, emotional eating, and increased screen time. Academic pressure and stress may further contribute to unhealthy lifestyle behaviors. Assessing the prevalence and identifying factors influencing obesity among medical students is essential to design targeted preventive strategies and promote healthier behaviors among future healthcare professionals.

Objectives:

- To estimate the prevalence of obesity among medical students
- To determine the associated biological, behavioral, and lifestyle-related risk factors.

Methodology: A cross-sectional study was conducted among 200 medical students. Data on BMI, demographics, diet, sleep habits, screen time, physical activity, and family history were collected via semi structured questionnaires. Data was imported to IBM SPSS statistical software version 27. Statistical analysis included chi-square tests and multivariate logistic regression to identify significant predictors of obesity.

Results: A total of 44.5% of participants were overweight or obese. Obesity was significantly correlated with family history ($p < 0.001$) and much more common in females ($p = 0.004$). Lower frequency of physical activity showed a significant correlation with obesity ($p = 0.002$), while exercise duration and perceived barriers were not significant. . There were no apparent correlations between dietary factors, such as the use of processed foods and caloric drinks. Obesity was significantly correlated with screen time exceeding four hours per day ($p = 0.001$). Screen usage, family history, and sex were found to be independent predictors by multivariate analysis.

Conclusion: Obesity among medical students is influenced by biological and lifestyle factors, particularly hereditary predisposition, inactivity, and high screen exposure. Despite high awareness of associated risks, behavioral change remains limited. Interventions promoting reduced screen time and increased structured physical activity may be effective in mitigating obesity risk in this population.

Journal of Chemical Health Risks
www.jchr.org
JCHR (2026) 16(2), 482-494 | ISSN:2251-6727

INTRODUCTION:

Obesity is a growing health problem characterized by an abnormal accumulation of body fat and associated with increased mortality and morbidity. One of the primary health problems of the twenty-first century is obesity, which is defined by the World Health Organization (WHO) as having a body mass index (BMI) of ≥25 kg/m² and ≥30 kg/m², respectively (3). Over the past few years, obesity has risen in incidence globally, significantly raising morbidity, death, and healthcare expenses (3). It is a major risk factor for noncommunicable diseases such type 2 diabetes, cardiovascular conditions, and some malignancies (3).Due to their rigorous curriculum and the stress of medical school, medical students make up a unique population among young adults. Studies have demonstrated that medical students are not immune to lifestyle-related illnesses, such as obesity and overweight, despite their knowledge of health and illness (1,2,4). According to a global meta-analysis by Shafiee et al. (2024), medical students are highly likely to be overweight or obese, with regional and socioeconomic variations (1). Similar results were found among medical students in Malaysia, where behaviors such as irregular eating habits, insufficient exercise, and extended study sessions were found to be important factors (2).

Recent cross-sectional and longitudinal research has also shown that sleep deprivation, physical inactivity, and eating habits are important factors that contribute to weight gain in medical students (6,7). Overweight and obesity among medical students in India is on the rise, with incidence ranging from 20% to 35%, according to several studies (9,10,11). Stress related to education, consuming food high in calories, not exercising, and spending more time on screens are all contributing causes (7,8,10). Among this group of people, eating habits and weight control have been found to be impacted by stress in particular (7).

Social media's increasing influence has also been linked to medical students' disordered eating habits and negative body image (14). There is a gap between knowledge and lifestyle, as evidenced by the fact that many people fail to adopt healthy habits in practice while having a theoretical understanding of health promotion (15). Therefore, creating successful interventions targeted at improving health outcomes in this population requires an understanding of the causes and prevalence of overweight and obesity among medical students (4,21). Promoting healthy lifestyles among medical students is essential for their wellbeing as future healthcare professionals as well as for raising health awareness in the populations they will serve.

AIMS & OBJECTIVES:

- To estimate the prevalence of obesity among medical students
- To determine the associated biological, behavioral, and lifestyle-related risk factors.

METHODOLOGY:

STUDY DESIGN AND STUDY SETTING: A descriptive cross-sectional study was conducted among medical students in Vinayaka Mission's Kirupananda Variyar medical college & hospitals, Salem district of Tamilnadu.

SAMPLE SIZE AND SAMPLING METHOD: For calculation of sample size, the prevalence of obesity was calculated from previous studies. For a 95% confidence level and 20% relative precision of the estimate, the final sample size of 200 was obtained. A simple random sampling method was used to select the study participants.

STUDY PERIOD: The study was carried out for a period of 3 months (April 2025 to June 2025)

STUDY TOOL &ANALYSIS: Data were collected using a pretested semi structured questionnaire. The questionnaire had been validated by conducting pilot study. The responses were exported to Microsoft Excel and checked for their completeness of consistency. Data was imported to IBM SPSS statistical software version 27.Descriptive statistics, Chi-square tests and regression analysis were used. p value <0.005 was considered statistically significant with 95% confidence interval.

ETHICAL APPROVAL: The study was approved by the ethics committee of the institution before starting the study **(VMKVMC&H/IEC/25/041)**. Informed consent was obtained from all participants. The study information was provided as part of the survey form in the E-mail that was circulated to the participants. Their confidentiality was protected, by anonymizing the

Journal of Chemical Health Risks
www.jchr.org
JCHR (2026) 16(2), 482-494 | ISSN:2251-6727

questionnaires and delinking the identifying information, such as E-mail and IP address from the database.

ETHICAL COMMITTEE: Institutional Ethical Committee, Vinayaka Mission's Kirupananda Variyar medical college & Hospitals, Vinayaka Mission's Research Foundation (Deemed university).

CLINICAL TRIAL NUMBER – Not applicable

RESULTS:

TABLE-1: Socio demographic details of the study participants

Variables		**Frequency (n=200)**	**n (%)**	**Chi square**	**P value**
AGE	Above 20 years	128	64	0.675	0.411
	Below 20 years	72	36		
SEX	Male	89	44.5	8.554	0.004
	Female	111	55.5		
BMI	More than 25	89	44.5		
	Less than 25	111	55.5		
Place of stay	Hostel	154	77	0.377	0.539
	Dayscholar	46	23		
Family history of obesity	Yes	149	74.5	18.15	0.000
	No	51	25.5		

Responses	**Category**	**Frequency (n)**	**n (%)**	**Chi square**	**p value**
In the past 6 months weight has	Increased	58	29	0.263	0.877

Journal of Chemical Health Risks
www.jchr.org
JCHR (2026) 16(2), 482-494 | ISSN:2251-6727

	Decreased	57	28.5		
	Remains the same	85	42.5		
Frequency of engaging in physical activity	Everyday	37	18.5	12.324	0.002
	4-6 times / week	38	19		
	1-3 times / week	71	35.5		
	Once a month	54	27		
Exercise	>45 mis	0	0	0.426	0.808
	30- 45 mins	84	42		
	15-30 mins	65	32.5		
	Not at all	51	25.5		
Barriers to physical activity	Less/ No time	44	22	5.133	0.163
	Joint pain	14	7		
	Lack of motivation	91	45.5		

Journal of Chemical Health Risks
www.jchr.org
JCHR (2026) 16(2), 482-494 | ISSN:2251-6727

	Not applicable	51	25.5		
Average hours of sleep	<5 hours	21	10.5	0.705	0.872
	5-6 hrs	89	44.5		
	7-8 hrs	80	40		
	>8 hrs	10	5		
Concern of your weight	Unconcerned	12	6	7.234	0.271
	Concerned	114	59.5		
	Neutral	69	34.5		
Weight change	Yes	135	67.5	6.209	0.013
	No	65	32.5		
Methods of changing weight	Nutrition and diet	89	44.5	1.022	0.6
		110	55		

Journal of Chemical Health Risks
www.jchr.org
JCHR (2026) 16(2), 482-494 | ISSN:2251-6727

	Physical activity				
	Weight loss medications & surgery	1	0.5		
Type of diet	Vegetarian	12	6	1.822	0.177
	Mixed	188	94		
Current eating habits		113	56.5	2.245	0.326
		67	33.5		
		20	10		
Habit of eating refined foods	Yes	170	85	0.095	0.758
	No	30	15		
Frequency of consuming these foods	Daily / alternate days	45	22.5	1.004	0.8

Journal of Chemical Health Risks
www.jchr.org
JCHR (2026) 16(2), 482-494 | ISSN:2251-6727

	Weekly twice	76	38		
	Weekly once	48	24		
	Monthly once	31	15.5		
Frequency of having caloric bevarages	Weekly twice	44	22	3.31	0.191
	Weekly thrice	69	34.5		
	Weekly once	87	43.5		
Triggers for eating	Hunger	76	38	4.942	0.176
	Stress	32	16		
	Cravings	75	37.5		
	Boredom	16	8.5		
Habit of eating fruits and vegetables	Yes	182	91	2.35	0.125
	No	18	9		
	Always	16	8		

Journal of Chemical Health Risks
www.jchr.org
JCHR (2026) 16(2), 482-494 | ISSN:2251-6727

Frequency of eating sweets after meals					
	Very often	40	20		
	Sometimes	115	57.5		
	Never	29	14.5	3.392	0.335
Screen time	Less than 1 hr	26	13	15.77	0.001
	More than 2 hrs	66	33		
	More than 4 hrs	108	54		
Awareness of screen time and health issues	Yes	168	84		
	No	32	16	1.287	0.257

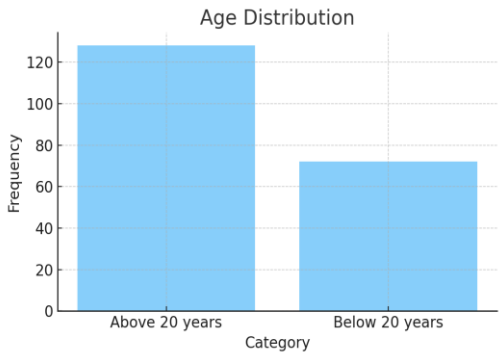
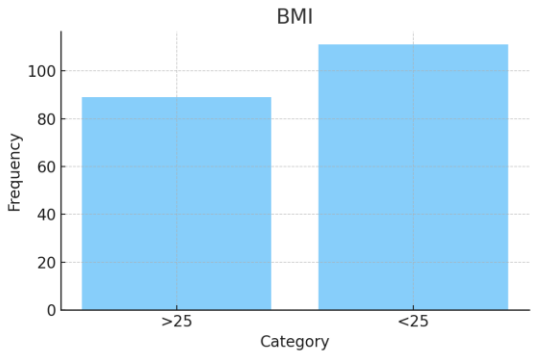


Figure-1: Represents the age distribution of the study participants.

Figure-2: Represents the BMI of the study participants.:



Journal of Chemical Health Risks
www.jchr.org
JCHR (2026) 16(2), 482-494 | ISSN:2251-6727

Figure-3: Represents the place of stay of the study participants.

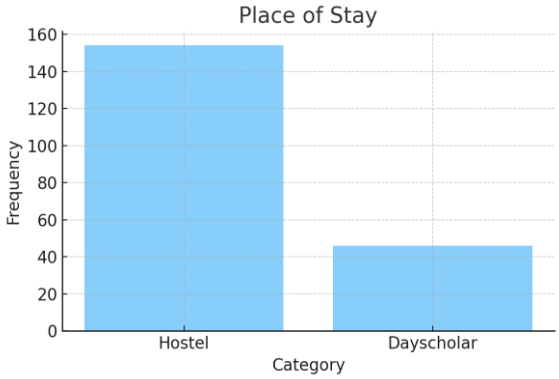


Figure:4 Represents the family history of obesity among the study participants.

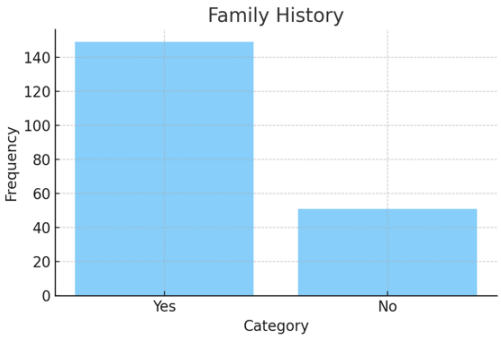


Figure-5: Represents the frequency of physical activity of the study participants.

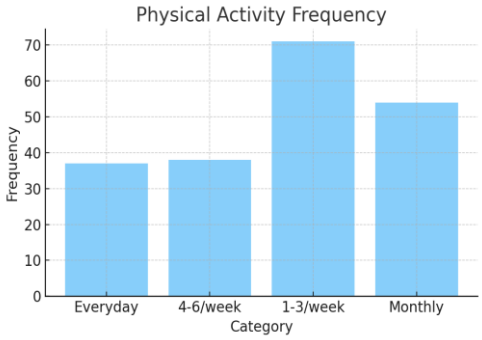


Figure-6: Represents the exercise duration of the study participants.

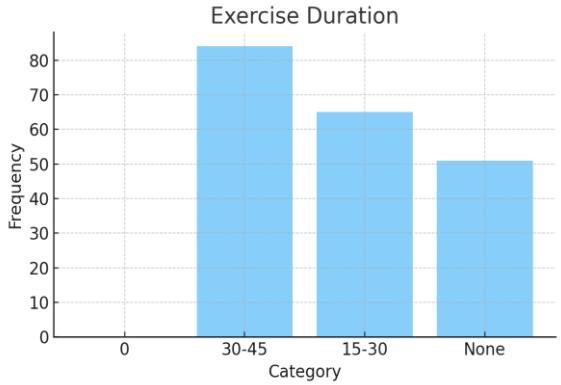


Figure-7: Represents the barriers to physical activity among the study participants.

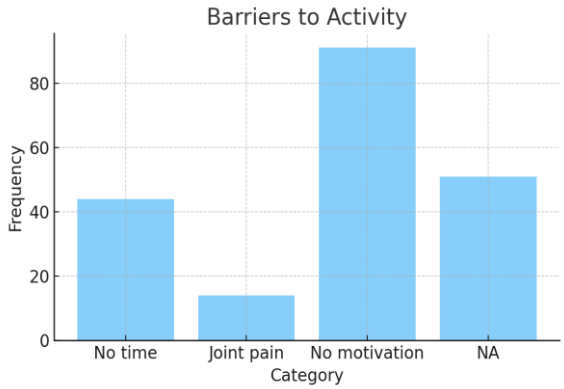


Table 2: Binary logistic regression for factors influencing obesity among medical students:

Variables	Category	P value	Crude Odds ratio
Age	Above 20 years	.412	.784
	Below 20 years		

Journal of Chemical Health Risks
www.jchr.org
JCHR (2026) 16(2), 482-494 | ISSN:2251-6727

Sex	Male	**0.003**	**1.85**
	Female		
Family history	Yes	**.000**	**.241**
	No		
Frequency of engaging in physical activity	Everyday	**0.021**	**0.68**
	4-6 times / week		
	1-3 times / week		
	Once a month		
Average sleep	<5 hours	.616	1.100
	5-6 hrs		
	7-8 hrs		
	>8 hrs		
Place of stay	Hostel	**0.032**	**1.54**
	Dayscholar		
Exercise	>45 mis	**0.015**	**1.72**
	30- 45 mins		
	15-30 mins		
	Not at all		
Barriers to physical activity		.026	1.311
Concern of weight		.059	1.633
Type of diet	Vegetarian	.188	.429
	Mixed		
	Yes	.759	1.133

Journal of Chemical Health Risks
www.jchr.org
JCHR (2026) 16(2), 482-494 | ISSN:2251-6727

Habit of taking refined foods	No		
Frequency of having refined foods		.405	.885
Habit of taking caloric beverages	Weekly twice	**.0019**	**1.63**
	Weekly thrice		
	Weekly once		
Triggers of eating		.488	.909
Habit of eating fruits and vegetables	Yes	.132	.467
	No		
Frequency of taking sweet dish after meals		.231	1.249
Screen time	Less than 1 hr	**0.004**	**1.96**
	More than 2 hrs		
	More than 4 hrs		
Awareness of screentime on health issues	Yes	.259	.646
	No		

Variable	**P value**	**Crude Odds ratio**
Sex	0.003	**1.85**
Family history	.000	**.241**
Frequency of engaging in physical activity	0.021	**0.68**
Place of stay	0.032	**1.54**
Exercise	0.015	**1.72**
Habit of taking caloric beverages	.0019	**1.63**
Screen time	0.004	**1.96**

Journal of Chemical Health Risks
www.jchr.org
JCHR (2026) 16(2), 482-494 | ISSN:2251-6727

Table-3: Multivariate logistic regression analysis:

Variable	P value	Adjusted odds	95% CI
Sex	0.003	**1.85**	1.23- 2.77
Family history	0.001	**0.24**	0.13-0.42
Screen time	0.004	**1.96**	1.25- 3.06

The prevalence of obesity and its contributing factors were evaluated in 200 participants.

The results showed that 36% were under 20 age group and 64% were above 20 years. The age group above 20 years had a higher prevalence of obesity, however the fact that age did not significantly correlate with obesity ($\chi^2 = 0.675$, $p = 0.411$). The distribution of genders was 44.5% male and 55.5% female. Sex and obesity were found to be significantly correlated ($\chi^2 = 8.554$, $p = 0.004$), suggesting that obesity was more common in women.

According to the participants' mean Body Mass Index (BMI), 44.5% were overweight or obese (BMI >25), whereas 55.5% had a BMI below 25. Among the participants, 23% were day scholars and 77% stayed in hostels. However, there was no discernible connection between obesity and place of stay ($p = 0.539$). A significant correlation was found between current obesity status and family history of obesity ($\chi^2 = 18.15$, $p < 0.001$), with 74.5% of respondents having a positive family history.

29% of respondents said they had gained weight, 28.5% said they had lost weight, and 42.5% said they had not changed their weight in the previous six months. At $p = 0.877$, this variation was not statistically significant. The percentage of people who exercised varied: 18.5% did so every day, 19% four to six times a week, 35.5% one to three times a week, and 27% once a month. Obesity and physical activity frequency had a significant relationship ($\chi^2 = 12.324$, $p = 0.002$), indicating that a higher risk of obesity was associated with lower levels of physical activity.

Among the people who exercised, 42% did so for 30 to 45 minutes, 32.5% for 15 to 30 minutes, and 25.5% did not exercise at all. However, there was no significant correlation between this feature and obesity ($p = 0.808$). Lack of motivation (45.5%), lack of time (22%), and joint pain (7%) were the most frequently mentioned barriers to physical exercise; however, these barriers did not achieve statistical significance ($p = 0.163$).

Participants' sleep durations ranged; 44.5% slept for five to six hours, 40% slept for seven to eight hours, and 10.5% slept for less than five hours. Sleep duration and obesity did not significantly correlate ($p = 0.872$). The majority of respondents (59.5%) said that they were worried about their weight, compared to 34.5% who were neutral and 6% who weren't; this was not statistically significant ($p = 0.271$). However, a significant correlation ($p = 0.013$) was found between reported weight changes and obesity, with 67.5% reporting noticeable changes.

With respects to weight management strategies, 55% engaged in physical activity and 44.5% followed dietary modifications, while only 0.5% used medications or surgery. Just 6% of people were vegetarians, while 94% of people had varied diets. 33.5% reported irregular or bad eating habits, whereas 56.5% reported healthy eating habits. Although a large percentage (85%) reported consuming processed foods, there was no significant correlation between this and obesity ($p = 0.758$). Similarly, there was no significant difference in the frequency of consuming refined meals ($p = 0.800$).

In terms of having caloric beverages, 43.5% consumed them once weekly, 34.5% thrice weekly, and 22% twice weekly, though no significant relationship was found ($p = 0.191$). Hunger (38%), desires (37.5%), stress (16%), and boredom (8.5%) were common eating causes. 91% of participants reported eating fruits and vegetables, compared to 9% who did not. There was no significant correlation ($p = 0.335$) between the frequency of eating sweets after meals, which was 57.5% occasionally, 20% very often, 8% often, and 14.5% never.

Journal of Chemical Health Risks
www.jchr.org
JCHR (2026) 16(2), 482-494 | ISSN:2251-6727

The link between screen time and obesity was a noteworthy finding. 13 percent said that they spent less than an hour a day on screens, thirty-three percent said that they spent more than two hours, and fifty-four percent said that they spent more than four hours. Screen time and obesity were significantly correlated (χ^2 = 15.77, p = 0.001). Despite the fact that 84% of respondents were aware of the negative health implications of excessive screen time, there was no significant correlation between this awareness and BMI status (p = 0.257).

Binary logistic regression analysis identified sex (p = 0.003, OR = 1.85), family history of obesity (p < 0.001, OR = 0.24), frequency of physical activity (p = 0.021, OR = 0.68), place of stay (p = 0.032, OR = 1.54), exercise (p = 0.015, OR = 1.72), caloric beverage consumption (p = 0.0019, OR = 1.63), and screen time (p = 0.004, OR = 1.96) as significant indicators. With adjusted odds ratios of 1.85 (95% CI: 1.23–2.77), 0.24 (95% CI: 0.13–0.42), and 1.96 (95% CI: 1.25–3.06), respectively, multivariate analysis verified that sex, family history, and screen time were independent predictors of obesity.

DISCUSSION:

The present study looked at the prevalence of obesity and its associated factors among 200 participants. In accordance with a number of previous studies, the data showed that obesity was significantly more prevalent in women than in men. The study by Gopalakrishnan et al. found that female medical students in Malaysia had increased obesity rates, which they attributed to women's lower levels of physical activity and dietary habits (2). Similarly, Verma et al. discovered that female students in Central India had higher rates of obesity (9). These results support the current study's finding that sex was a independent indicator of obesity. This is, however, conflicting evidence: Shafiee et al. found that gender differences were inconsistent across nations (1), while Rai et al. reported higher overweight rates among male students (4). Cultural standards, food diversity, and variations in physical activity among cultures can all contribute to this variability.

Although a larger percentage of obesity among participants over 20, age did not significantly correlate with obesity in this study. Szemik et al. found considerable weight gain over time among medical students, which is consistent with prior study linking higher age with greater obesity risk (5). Kowsalya and Parimalavalli discovered that among teenage girls, age was a significant predictor of being overweight (12). On the other hand, studies like Naik et al. supported the current findings by finding no significant correlation between age and BMI among young adult students (10). These inconsistencies imply that populations with a limited age range, such college students, may have less noticeable age-related variances.

In this study, obesity was found to be strongly and independently predicted by a family history of obesity. Numerous studies have revealed similar relationships, such as those by Naik et al. (10) and Sharma et al. (11), who highlighted the impact of shared habits and genetic predisposition. Additionally, Szemik et al. found that kids who had fat parents were much more likely to become obese themselves (5). This significant correlation, however, is contradicted by other evidence. Nowara et al. found only a weak connection between obesity and family history, suggesting that behavioral factors like eating disorders and sedentary lifestyles may outweigh genetic contributions (6). These conflicting results imply that, even in high-risk patients, lifestyle modification is still an important preventive strategy, even when heredity plays a part.

In accordance with worldwide research highlighting inadequate physical activity as a significant behavioral risk factor, physical activity was substantially linked to obesity. Low levels of physical activity is a key factor in obesity, according to the WHO's Global Physical Activity Questionnaire (16). Joshi et al. also found a strong association between medical students' greater BMI and less physical activity (8). Gupta et al. discovered that weight gain was substantially influenced by academic stress and associated sedentary behaviors (7). Some research show that activity duration and intensity are more important than frequency, which contradicts our findings. Craig et al. showed a strong correlation between the risk of obesity and activity duration as measured by IPAQ (17). However, there was no discernible connection between exercise duration and obesity in this study. This discrepancy could be explained by participants overestimating or misreporting the length of their workouts, or by irregularities in their actual practice.

Journal of Chemical Health Risks
www.jchr.org
JCHR (2026) 16(2), 482-494 | ISSN:2251-6727

Although time constraints, joint pain, and lack of enthusiasm were common barriers to physical activity, there was no statistically significant correlation between them and obesity. In contrast, Harsavarthini et al. (20) found that medical students' perceived barriers considerably reduced their levels of physical exercise, hence raising their risk of obesity. Despite being widespread, these barriers could not have been significant enough in the current investigation to show variations in BMI.

Obesity was not found to be significantly correlated with dietary practices, such as the use of refined meals and calorie-dense drinks. A large portion of the research currently in publication contradicts this finding. While Guleri et al. reported that frequent consumption of calorie-dense foods significantly contributed to overweight (22), Nowara et al. discovered clear connections between processed food intake and elevated BMI among university students (6). However, in accordance with the present findings, Rai et al. (4) did not consistently discover associations between dietary categories, such as vegetarian versus mixed diets, and obesity. The consistency of dietary patterns—94% of individuals consumed mixed diets—and similar eating habits may be the cause of the study's lack of relationship.

The results of Gopalakrishnan et al. (2) were supported by the lack of a significant association between sleep duration and obesity. However, due to hormonal changes affecting appetite, there is widespread evidence from around the world linking shorter sleep duration with an increased risk of obesity. Rather than a complete lack of correlation, the difference could be explained by the rather consistent sleep patterns in this population.

The strong correlation between screen time and obesity was a notable discovery. The frequency of obesity was higher among those who used screens for more than four hours a day. This is consistent with the findings of Mathew et al., who observed that among medical students, excessive screen time was linked to increased sedentary behavior, unhealthy snacking, and body dissatisfaction (14). Additionally, Sharma et al. found that longer screen time was positively correlated with being overweight (11). The current study's adjusted odds ratio (1.96) is consistent with research published in BMC Public Health that found screen time to be a significant predictor of a rise in BMI (6). There is conflicting evidence; other studies suggest that screen time by itself may not be a reliable indicator of obesity unless it is paired with a poor diet and poor exercise. The influence of sedentary digital activities on student populations is still shown by the significant correlation found here.

Although 84% of people were aware of the negative effects of screen usage on their health, this awareness did not translate into better weight results. This highlights the gap between behavior and knowledge, a phenomenon also noted by Ockene et al., who observed that educational interventions by themselves did not always result in students adopting successful weight control techniques (15). This implies that in order to make significant lifestyle changes, awareness must be combined with structured behavioral therapies.

Overall, the current study shows that a mix of biological, behavioral, and environmental factors affect young people' obesity. The WHO's model describing the multidimensional nature of obesity is supported by significant factors like sex, screen time, physical inactivity, and family history (3). The complex nature of obesity factors, particularly in comparatively homogeneous student populations, is highlighted by the non-significant correlations seen with food, exercise duration, and sleep. Differences between this study and other research show that obesity predictors differ depending on institutional and cultural environments. For the purpose of creating focused solutions, localized research is still essential.

CONFLICTS OF INTEREST: NIL

FUNDING : NIL

DATA AVAILABILITY STATEMENT: NA

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