https://doi.org/10.33451/florafauna.v32i1pp153-160
FLORA AND FAUNA ISSN 2456 - 9364 (Online)
2026 Vol. 32 No.1 PP 153-160 ISSN 0971 - 6920 (Print)

Interrelationships between BMI and Behavioural Health Factors in Young Adult Collegiate: A Cross-Sectional Analysis

Avinash B. Gholap

Department of Zoology,
Padmashri Vikhe Patil (PVP) College of Arts,
Science and Commerce,
PRAVARANAGAR – 413713 (MAHARASHTRA) INDIA.
E-mail : avee143van@gmail.com

Received **:** 11.03.2026; ***Accepted*** : 08.04.2026

How to cite : Gholap AB. Interrelationships between BMI and Behavioural Health Factors in Young Adult Collegiate: A Cross-Sectional Analysis. *Flora and Fauna* 2026. 32(1) : 153-160.

ABSTRACT

Microorganisms, especially fungi and bacteria cause biodeterioration of our cultural heritage including paper, cloths, wood and leather. Cellulolytic Fungi cause decomposition of papers and cloths present in our cultural heritage ***etc.*** In the present investigation, fungi invading books of RajkThis study investigates the interrelationships between Body Mass Index and various behavioural and lifestyle factors among a young adult collegiate population. BMI is utilized as a primary measure to assess nutritional status, categorizing individuals into underweight, normal, overweight, and obese classifications. The analysis reveals that although most students (1,729) having normal BMI range *i.e.* (18.5"25 kg/m2 18.5"25 kg/m2) significant portions of the population exhibit both under nutrition and over-nutrition. This coexistence of health issues is described as malnutrition. A gender-wise students analysis female are more in the under nutrition and over-nutrition categories compared to their male Student. The study correlates BMI with several lifestyle factors. Students having normal BMI are engage in regular physical activity, get proper sleep, and adequate water intake. Conversely students in the underweight categories tend to have lower physical activity and inadequate sleep, while those in the obese and overweight categories show very low physical activity and higher consumption of fast food. Overall, the findings highlight that both under nutrition and obesity are significant concerns within the student population strongly associated with lifestyle behaviour. The study suggests a need for targeted, gender-sensitive health and nutritional interventions within educational institutions to address these dual challenges.

Figures : 03 References : 29 Tables : 03
KEY WORDS : Behavioural Health Factors, Body Mass Index, Nutrition, Obesity.

Introduction

The Body Mass Index is used to measure and calculates an individual's height in relation to their body weight[4]. It used to screen for macro-nutritional status whether under nutrition, normal range or over nutrition[10]. The importance of health to humans is incomparable. Longevity is promoted by living a health-aware way of life. A person's basal index of metabolism would be enhanced because of proper eating. Holding a healthy lifestyle and a proper weight is a duty for all. An unhealthy lifestyle would be bad for holistic growth. The world has changed the way it lives in industry; this lifestyle change has brought about changes in dietary practices that require an increased dietary consumption of fat, sweet, and non-nutritive foods, together with a reduction of healthier eating practices[23]. An individual's weight in kilograms divided by height in meters squared was devised, in the 1830s to enable the comparison of White middle-aged European men of varying heights *via* a common parameter. This Quetelet index was termed the body mass index[10] Four categories of BMI are in common use today to estimate patient conditions: (1) underweight or undernourished status (<18.5 kg/m2); (2) normal BMI (18.5–<25.0 kg/m2); (3) overweight status (25.0–<30.0 kg/m2); and (4) persons with obesity as e"30.0 kg/m2[1]. Obesity status can be subcategorized further to capture severe BMI variance[21]. BMI serves as a valuable tool for assessing the overall health of

ACKNOWLEDGEMENTS : The author sincerely thanks the institutional authorities for permission and support, and I also acknowledge the students and staff for their guidance and assistance during the study.

TABLE-1: BMI Distribution Age and Academic Level-wise Among Students

BMI range - kg/m2	Total No of Students	First year Undergraduate (19 yr. Age)	Second year Undergraduate (20 yr. Age)	Third year Undergraduate (21 yr. Age)	Postgraduate (22 to 23 yr. Age)
Mild Thinness < 16	230	71	56	57	46
Moderate Thinness 16 - 18.5	57	21	14	14	11
Normal 18.5 - 25	1729	531	415	433	348
Overweight 25 - 30	298	91	71	75	60
Obese Class I 30 - 35	29	9	7	7	6
Obese Class III 35 - 40	9	3	2	2	2
Severe Thinness > 40	144	44	35	36	29

populations and identifying trends in weight distribution across different demographic groups[22]. It provides a standardized measure that aids in monitoring the prevalence of underweight, normal weight, overweight, and obesity within a cohort of subjects. By using BMI data, public health officials can develop targeted interventions to address obesity-related health issues such as type 2 diabetes, cardiovascular diseases, and joint problems[7]. Health care providers and public health agencies alike recognize obesity to be a risk factor for multiple outcomes such as cardiovascular disease, diabetes, chronic orthopaedic problems, accidents, collagen vascular diseases, lower quality of life, osteoarthritis, and autoimmune disorders[8] Health Effects of Overweight and Obesity. High BMI is also associated with an increased risk of colorectal cancer[17] primary liver cancer, and cancer mortality[27]. Obesity is a risk factor for death from SARS-CoV-2 infection (COVID-19 disease), perhaps related to stress on lung capacity and complexities in ventilator management in intensive care settings[26]. Besides compromising physical health, obesity very often leads to psychological and social distress. Overweight status is associated with an increased risk of depressive disorder among adults[24]. Individuals with excess weight are subject to social devaluation and discrimination, termed “fat shaming” by some. Such negative stereotypes because of body weight, better termed weight stigma, affect people with obesity; persons feeling ashamed or embarrassed may hesitate to seek timely professional help, may have trouble finding needed social support, and can impede weight loss maintenance[24]. although guidelines exist, many studies show that students’ engagement in physical activity is low. In the study[14] a prevalence of 52% of insufficiently physically active students was recorded, while the research[11] found that 53.1% of female students met the recommended level of physical activity. Studies examining the level of physical activity in Bosnia and Herzegovina have demonstrated inconsistencies in the data. A research[9] indicate that the student population in Bosnia and Herzegovina is predominantly engaged in moderate-intensity physical activities at an adequate level, whereas other studies have concluded that physical activity is maintained at a satisfactory level[19]. Furthermore, female students have been found to be less physically active than their male counterparts[18]. Physical activity has a positive and significant impact on the quality of life of students, with a clear connection to various domains of quality of life[5]. These findings suggest that physical activity is a key factor in improving quality of life, while a low level of physical activity is often associated with an increased presence of psychosomatic disorders, motor function impairments, and reduced social functioning abilities[15]. For this reason, many researchers emphasize the importance of assessing the quality of life in the university student population[12]. The present study was conducted in a population of age ranging between 40 and 60 years. This typically qualified for a middle-aged population. This age group marks a transitory phase between an adventurous, thrill-seeking young adulthood and a retired life, accompanied by a sense of fulfilment of duties and

TABLE-2: Gender-wise Analysis of BMI distribution among students

BMI range - kg/m2	Total No of Students	Male	Female
Mild Thinness < 16	230	102	128
Moderate Thinness 16 - 18.5	57	25	35
Normal 18.5 - 25	1729	768	958
Overweight 25 - 30	298	133	165
Obese Class I 30 - 35	29	12	17
Obese Class III 35 - 40	9	4	5
Severe Thinness > 40	144	63	81

responsibilities, contentment from successfully achieving one's life goals, and gratitude for the divineness of life and its splendour. The various changes that set in are carefully investigated, as those serve as important markers in determining the changed life-path trajectory of individuals[25]. The present study is aimed at investigating the existence of any potential relationship between BMI measure and PWB and memory functioning of middle-aged adults.

Materials and Methods

Study Area

Study Population and Sampling: This paper is a correlational cross-sectional study. The sample comprised 2496 collegiate students belonging to urban communities, having 1107 male and 1389 female students located at P.V.P. College, Pravaranagar.

Sampling Technique: A purposive sampling technique was used to construct the sample at the undergraduate and postgraduate levels.

Age Range: The study included both males and females within the age range of first-year undergraduates (19 yr. ages). Second-year undergraduate (20 yr. age) Third-year undergraduate (21 years old) Postgraduate (22 to 23 yr. age)

Grouping: The sample was divided into seven groups based on BMI range in kg/m² as follows: Mild Thinness < 16, Moderate Thinness 16–18.5, Normal 18.5–25, Overweight 25–30, Obese Class I 30–35, Obese Class III 35–40, and Severe Thinness > 40.

Data Collection Period: Data were gathered over a Six-month period, from Jane to November 2025

Tools used

Behavioural Health Factors and clinical data sheet This consists of the preliminary information of the concerned individual, including name, age, sex, education, Diet Type, Physical Activity, Fast Food Consumption, Sleep Duration, Screen Time (per day) and Water Intake (lit/day) Such personal details were obtained exclusively to investigate the difference between the respective Behavioural Health Factors determining an individual's likely performance. No significant personal information was revealed hence anonymity was maintained throughout.

Height and weight measuring scales: The height and weight measures of everyone were measured using a standard weighing machine and inch-wise calibrated measuring tape

Results and Discussion

The BMI distribution among students across different academic years (Table and Graph No. 1) show that the majority fall within the normal BMI category (18.5–25 kg/m²), totalling 1,729 students, and indicating overall satisfactory nutritional status in the population, consistent with WHO standards for adult BMI classification[1]. However, a notable proportion of students exhibit mild thinness (n = 230) and moderate thinness (n = 57), while 144 students fall under severe thinness, reflecting the continuing burden of under nutrition among young adults, which aligns with patterns reported in earlier studies on Indian college populations. Simultaneously, the presence of overweight (n = 298) and Obese Class I and III categories (n = 29 and n = 9) demonstrate the coexistence of rising overweight and

TABLE-3: BMI Categories with Dietary and Lifestyle Factors among Students

BMI range - kg/m2	No of Student s	Diet Type		Physical Activity		Fast Food Consumption		Sleep Duration		Screen Time (per day)		Water Intake (lit/day)	
		Vege-tarian	Mixed	Yes	No	Daily	Weakly	<6 hr.	>6 hr.	<2 hr.	>2 hr.	<3 Lt	>3 Lt
Mild Thinness < 16	230	97	133	35	195	32	198	88	142	136	94	62	168
Moderate Thinness 16 - 18.5	57	22	35	07	50	09	48	35	22	33	24	23	34
Normal 18.5 - 25	1729	720	1009	955	774	135	1594	1123	606	846	883	1089	640
Overweight 25 - 30	298	103	195	89	209	27	271	109	189	147	151	126	172
Obese Class I 30 - 35	29	10	19	03	26	02	27	18	11	21	08	12	17
Obese Class III 35 - 40	9	03	06	00	09	05	4	05	04	01	08	04	05
Severe Thinness > 40	144	62	82	23	121	21	123	62	82	93	51	100	44

obesity trends, a phenomenon often described as the "double burden of malnutrition" in developing nations[23]. The distribution across First, Second, Third-year undergraduates and postgraduates remain relatively balanced in all BMI categories, suggesting that nutritional challenges persist consistently across ages 19–23. Overall, the data indicate that although normal BMI predominates, both under nutrition and overweight/ obesity are significant concerns, highlighting the need for targeted, year-wise health promotion and nutritional interventions in educational institutions

The gender-wise BMI distribution (Table and Graph No. 2) show that most students fall within the normal BMI range (18.5–25 kg/m²), comprising 1,729 students (768 males and 958 females), and reflecting generally adequate nutritional status as per WHO BMI guidelines[1]. However, under nutrition remains significant, with mild thinness (<16) in 230 students and moderate thinness (16–18.5) in 57 students, where females (128 and 35) outnumber males (102 and 25), suggesting that female students may be more susceptible to under nutrition an observation consistent with national patterns reported[20]. Additionally, severe thinness (>40) affects 144 students (63 males and 81 females), further reinforcing a gender gap that aligns with earlier research indicating higher rates of chronic energy deficiency among young women in India[28]. At the same time, overweight and obesity also appear in the population, with 298 students overweight and smaller proportions in Obese Class I (n = 29) and Obese Class III (n = 9), again showing slightly higher representation among females, reflecting the rising burden of overweight among young adults as highlighted[23]. Overall, the data demonstrate a dual

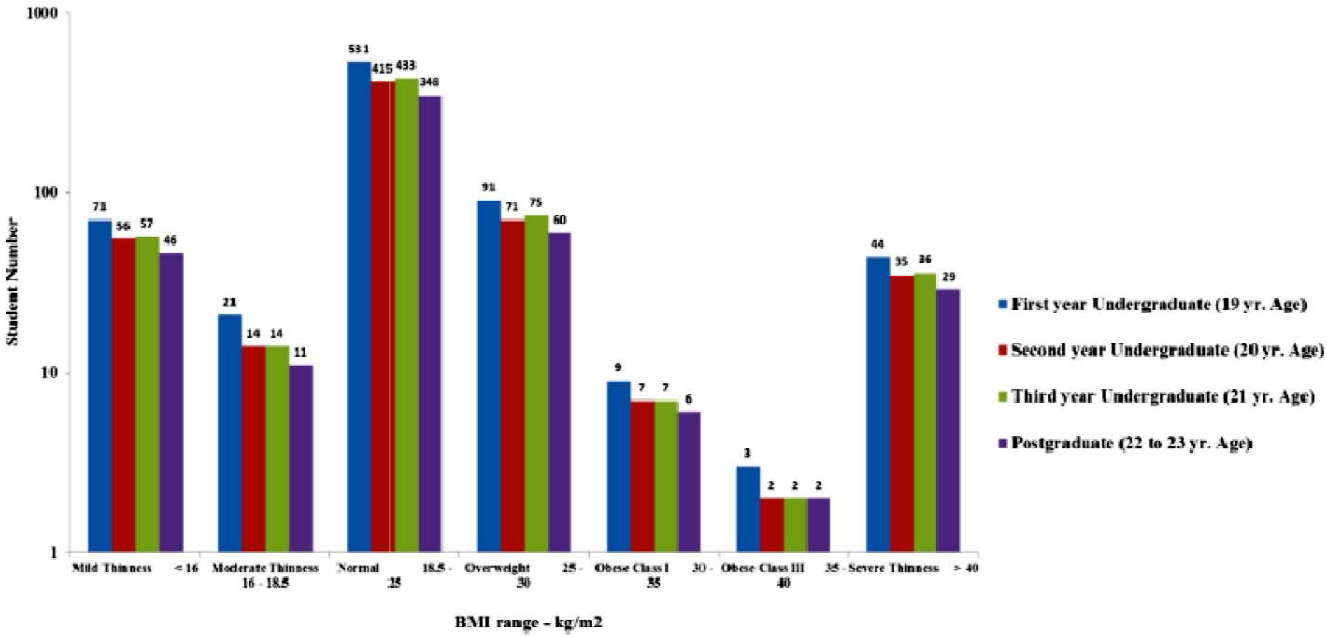

Fig. 1 :BMI Distribution Age and Academic Level-wise Among Students

burden of malnutrition, with both under nutrition and overweight/obesity coexisting, and indicates a need for gender-sensitive nutrition and health interventions within student populations.

The relationship between BMI categories and lifestyle behaviours(Table and Graph No. 3) show that students with a normal BMI (n = 1,729) generally adhere to healthier patterns, including higher levels of physical activity (955), adequate sleep (>6 hr = 1,123), moderate screen time (<2 hr = 606), and sufficient daily water intake (>3 L = 640), which aligns with evidence that balanced sleep, hydration, and activity levels support healthy weight maintenance[1]. In contrast, students with mild thinness (n = 230) and severe thinness (n = 144) show markedly lower physical activity (35 and 23), higher screen time (>2 hr = 142 and 82), shorter sleep duration (<6 hr = 88 and 62), and inadequate hydration (<3 L = 94 and 51), indicating lifestyle deficiencies that contribute to under nutrition, consistent with findings from adolescent nutritional studies in India[20,28]. Meanwhile, students in overweight (n = 298) and obesity categories (Class I = 29; Class III = 9) demonstrate low physical activity (89, 3, and 0), higher fast-food consumption, increased screen time (>2 hr = 189, 21, and 1), and mixed dietary patterns, reflecting behavioural risk factors linked with weight gain and metabolic imbalance, as highlighted in global research on lifestyle-associated obesity among young adults[23]. Overall, the data reinforces that healthy BMI is strongly associated with balanced sleep, limited screen exposure, regular physical activity, and adequate hydration, whereas deviations in these behaviour correlate with both under nutrition and obesity, underscoring the need for targeted lifestyle-based interventions within student populations.

To address the dual burden of malnutrition among students, educational institutions should implement integrated nutrition education and regular health screening programs to identify both under nutrition and overweight at an early stage, in line with WHO recommendations[29]. Promotion of physical activity, adequate sleep, reduced screen time, and proper hydration should be prioritized through structured campus-based lifestyle interventions, as these behaviours are strongly associated with healthy BMI[6]. Gender-sensitive strategies, particularly focusing on female students who are more vulnerable to under nutrition, are essential, along with improving access to nutritious and affordable food options on campus to discourage unhealthy dietary patterns[20,23] reproduction and survival. Similar seasonal patterns, with monsoon minima and winter maxima, have been reported, indicating that seasonal environmental dynamics play a crucial role in regulating copepod populations in freshwater ecosystem

Conclusion

This study demonstrates that although most students fall within the normal BMI range, a considerable proportion experience both under nutrition and overweight/obesity, reflecting a clear double burden of malnutrition. This pattern is consistent across academic years and is influenced by gender, with females showing higher levels of thinness and a slightly greater tendency toward overweight. Lifestyle behaviours strongly

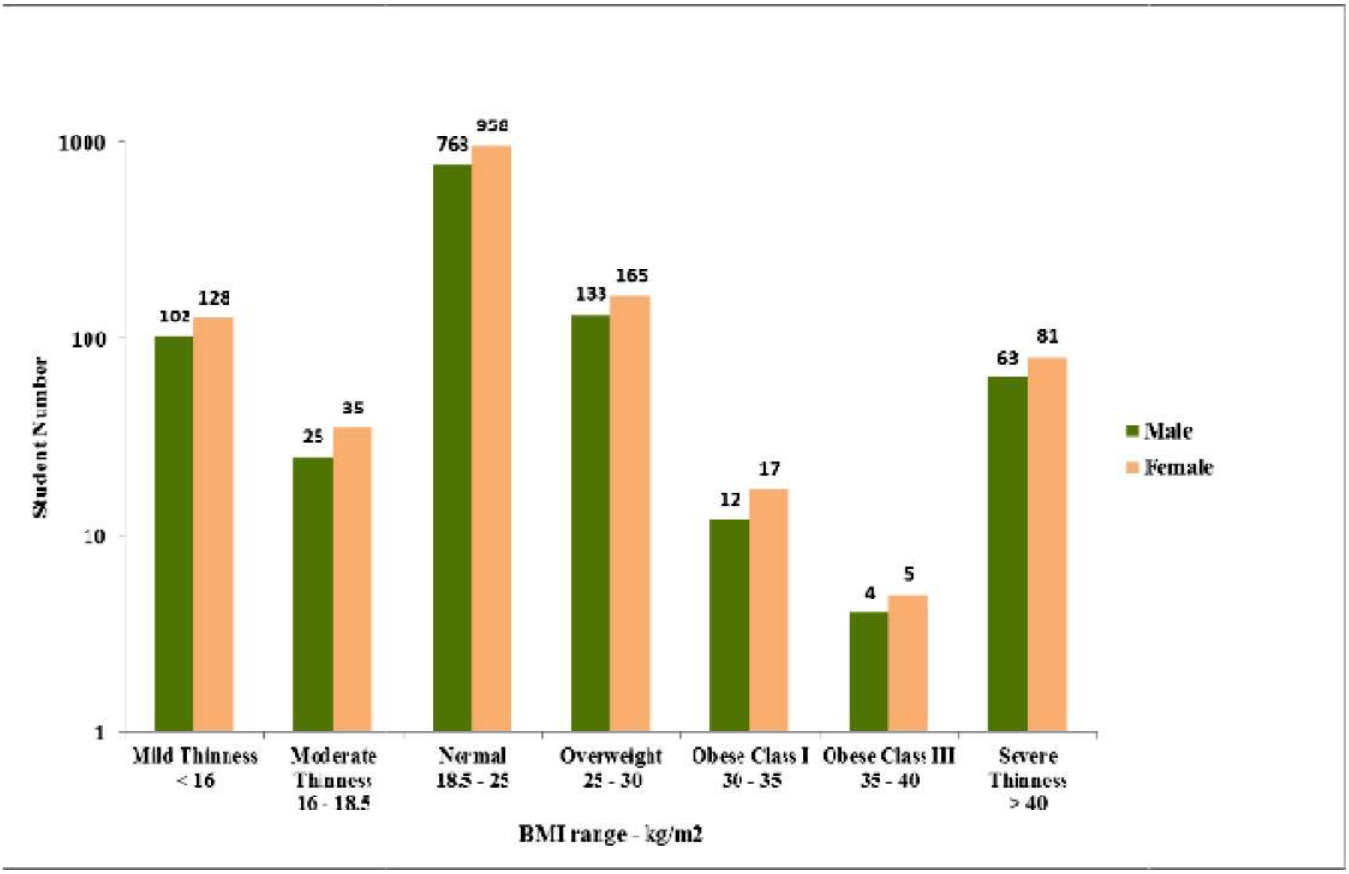

Fig. 2 : Gender-wise Analysis of BMI distribution among students

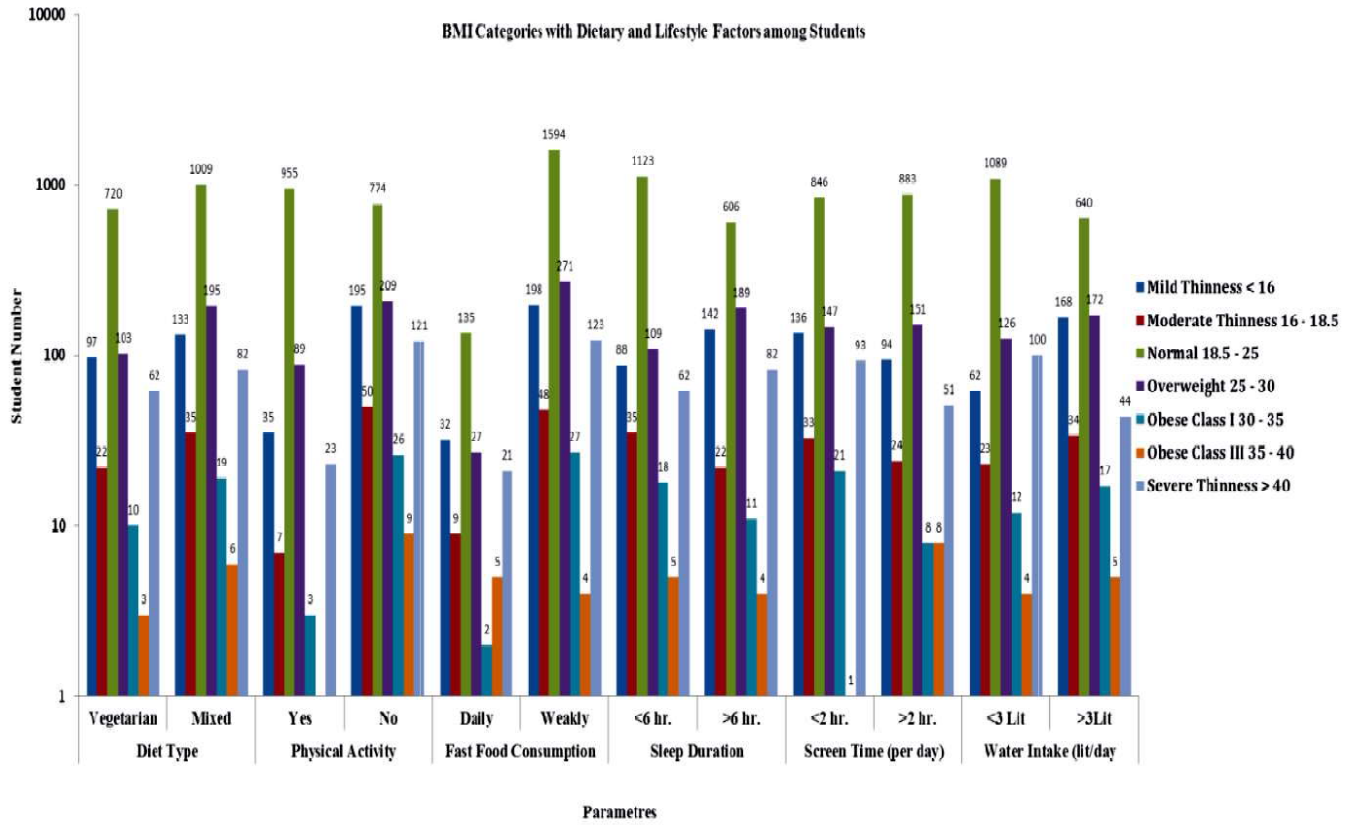

Fig. 3 : BMI Categories with Dietary and Lifestyle Factors among Students

correlate with BMI status, as normal BMI is associated with adequate physical activity, sleep, hydration, and lower screen time, whereas unhealthy lifestyle patterns are linked to both thinness and obesity. Overall, the findings highlight the interrelationship between BMI, gender, academic stage, and lifestyle behaviours, emphasizing the need for integrated, gender- and year-specific lifestyle and nutrition interventions among students

References

1. A Healthy Lifestyle WHO Recommendations. Available online: https://www.who.int/europe/news-room/fact-sheets/item/a-healthy-lifestyle. 2025.
2. Abeer ABK, Ashraaf AN. Levels of Physical Activity among Kuwaiti Adults and Perceived Barriers. *The Open Public Health Journal.* 2016; **9** : 77-87.
3. Amruth M, Akshath K. A cross-sectional study on BMI and eating habits among students. International Journal of Community Medicine and Public Health. 2019; 1285-1294
4. Bray GA. Beyond BMI. *Nutrients*. 2023; **15**(10) : 1-11.
5. Campbell A, Hausenblas HA. Effects of exercise interventions on body image: A meta-analysis. *J. Health Psychol.* 2009; **14** : 780–793.
6. Centers for Disease Control and Prevention (CDC). Physical Activity, Sleep, and Weight Management Guidelines. 2023.
7. Clark DO, Mungai SM. Distribution and association of chronic disease and mobility difficulty across four body mass index categories of African American women. *Am J Epidemiol.* 1997; **145**(10) : 865–75.
8. Darbandi M, Pasdar Y, Moradi S, Mohamed HJJ, Hamzeh B, Salimi Y. Discriminatory Capacity of Anthropometric Indices for Cardiovascular Disease in Adults: A Systematic Review and Meta-Analysis. Prev. Chronic Dis. 2020.
9. Doder I, Kovacevic E, Abazovic E, Babajic F, Mekic A. Physical activity levels of Sarajevo University students. *Homosporticus.* 2021; **23** : 9–12.
10. Eknoyan G, Adolphe Quetelet. The average man and indices of obesity. *Nephrol. Dial. Transplant.* (1796–1874), 2008 ; **23** : 47–51.
11. Farajpourkh M, PishgahRoodsari M, Salehiniya H, Soheilipour F. The relationship between body mass index (BMI) and quality of life in Iranian primary school students in Tehran, Iran. *Biomedicine.* 2018; **8** : 3.
12. Ge Y, Xin S, Luan D, Zou Z, Liu M, Bai X, Gao Q. Association of physical activity, sedentary time, and sleep duration on the health-related quality of life of college students in Northeast China. *Health Qual. Life Outcomes*. 2019; **17** : 124.
13. Health Effects of Overweight and Obesity. Available online: https://www.cdc.gov/healthy-weight-growth/about/index.html. 2024.
14. Kilinc H, Bayrakdar A, Çelik B, Mollaogullari H, Gencer YG. Physical activity level and quality of life of university students. *J. Hum. Sci.* 2016; **13** : 3794–3806.
15. Lins L, Carvalho FM, Menezes MS, Porto-Silva L, Damasceno H. Health-related quality of life of medical students in a Brazilian student loan programme. *Perspect. Med. Educ*. 2016; **5** : 197–204.
16. Luppino FS, de Wit LM, Bouvy PF, Stijnen T, Cuijpers P, Penninx BW, Zitman FG. Overweight, obesity, and depression: A systematic review and meta-analysis of longitudinal studies. *Arch. Gen. Psychiatry*. 2010; **67** : 220–229.
17. Ma Y, Yang Y, Wang F, Zhang P, Shi C, Zou Y, Qin H. Obesity and risk of colorectal cancer: A systematic review of prospective studies. *PLoS One.* 2013; **8** : e53916.
18. Mosqueira-Villegas M, Bardales-Zuta VH, Fernandez-Rodriguez LJ, Villegas MM, Zuta VHB. Association between Quality of Life and Body Mass Index among First-Year Medical Students in a Peruvian Private University: A

Single-Center Cross-Sectional Pilot Study. *Cureus.* 2025; **17** : e81378.

19. Mulahasanovic IC, Mujanovic AN, Mujanovic E, Atikovic A. Level of Physical Activity of the Students at the University of Tuzla According to IPAQ. *Cent. Eur. J. Sport Sci. Med.* 2018; **21** : 23–30.

20. National Family Health Survey – 5 (NFHS-5). Ministry of Health and Family Welfare, Government of India. 2021.

21. Nuttall FQ. Body Mass Index: Obesity, BMI and Health: A Critical Review. *Nutr. Today*. 2015; **50** : 117–128.

22. Ogden CL, Carroll MD, Curtin LR, McDowell MA, Tabak CJ, Flegal KM. Prevalence of overweight and obesity in the United States, 1999-2004, *JAMA.* 2006; **295**(13) : 1549–55.

23. Popkin BM. Global nutrition dynamics: the world is shifting rapidly toward a diet linked with non-communicable diseases: *The American Journal of Clinical Nutrition*. 2006; **84**(2) : 289-29

24. Puhl RM, Himmelstein MS, Pearl RL. Weight stigma as a psychosocial contributor to obesity. *Am. Psychol*. 2020; **75** : 274–289.

25. Ryff CD, Keyes CL. The Structure of Psychological Well-being Revisited. *J Pers Soc Psychol*. 1995; **69** : 719-27.

26. Singh R, Rathore SS, Khan H, Karale S, Chawla Y, Iqbal K, Bhurwal A, Tekin A, Jain N, Mehra I. Association of Obesity With COVID-19 Severity and Mortality: An Updated Systemic Review, Meta-Analysis, and Meta-Regression. *Front. Endocrinol*. 2022; **13** : 780872.

27. Sohn W, Lee HW, Lee S, Lim JH, Lee MW, Park CH, Yoon SK. Obesity and the risk of primary liver cancer: A systematic review and meta-analysis. *Clin. Mol. Hepatol.* 2021; **27** : 157–174.

28. Tashi Choedon, Eilise Brennan, William Joe, Natasha Lelijveld, Oliver Huse, Christina Zorbas, Kathryn Backholer, Zivai Murira, Stephanie V Wrottesley, Vani Sethi. Nutritional status of schoolage children (5–19 years) in South Asia: A scoping review, *Matern Child Nutr.* 2023; **14**; **20**(2) : e13607.

29. World Health Organization (WHO). Body Mass Index Classification and Healthy Lifestyle Guidelines. 2020.