# Assessment of The Nutritional Status of Engineering and Architecture College Students (18-25 Years) And Their Association with The Sleep Cycle and Anxiety.

## Sumaiya Ansari[1], Dr.Anuradha Ramesh[2]

MSc Students in Specialized Dietetics[1], Assistant Professor[2]
Sir Vithaldas Thackersey College of Home Science (Autonomous), SNDT Women's University, Juhu, Mumbai.

## Abstract

College life, particularly in academically demanding fields such as engineering and architecture, often places students under substantial academic and lifestyle pressures. These challenges may lead to poor dietary habits, disrupted sleep cycles, and increased anxiety, which collectively impact overall health. The present study aimed to assess the nutritional status of engineering and architecture students aged 18–25 years and examine its relationship with sleep quality, anxiety levels, and lifestyle behaviors. A cross-sectional study was conducted among 150 students from two colleges in Mumbai using purposive sampling. Data were collected through structured questionnaires covering demographics, dietary intake (24-hour recall and Food Frequency Questionnaire), and lifestyle patterns. Sleep quality and daytime sleepiness were assessed using the Pittsburgh Sleep Quality Index (PSQI) and Epworth Sleepiness Scale (ESS), while anxiety was measured with the Generalized Anxiety Disorder-7 Scale. Results showed that male students reported a higher mean body weight and nutrient intake (63.8%) compared to females (55%). Significant gender differences were observed in food preferences and anxiety symptoms. Architecture students and hostel residents demonstrated higher energy intake but poorer sleep quality and greater sleep disturbances. Binge eating and anxiety-related behaviors were more common among females and students residing at home. Overall, dietary patterns revealed frequent consumption of processed foods, while intakes of energy, protein, and fiber were below recommended levels. A moderate correlation was found between daytime sleepiness and anxiety ($r = 0.401$, $p < 0.01$). The findings underscore the multifaceted relationship between nutrition, sleep, and mental health, highlighting the urgent need for integrated interventions that promote balanced diets, sleep hygiene, and stress management among college students.

**Keywords**: Nutritional status, Sleep quality, Anxiety, Lifestyle habits, Engineering and Architecture students.

## 1. Introduction

The transition to college life often marks a significant change in lifestyle, particularly among students pursuing rigorous academic disciplines like engineering and architecture. These students experience high levels of academic stress, irregular schedules, and often poor dietary practices. Such lifestyle disruptions can affect both physical and mental health outcomes, including nutritional status, sleep quality, and anxiety levels. College students often navigate a demanding lifestyle characterized by academic pressures, irregular schedules, increased independence, and social exploration. The shift from school to college typically results in decreased parental supervision, more autonomy in daily routines, and exposure to peer influence. Consequently, students may engage in inconsistent eating habits, consume fast food frequently, skip meals, or neglect balanced nutrition due to time constraints or convenience. Moreover, long hours of study, late-night assignments, and screen exposure often disrupt their sleep cycle, leading to sleep deprivation or poor sleep quality. Lack of physical activity and sedentary behaviors, especially screen time for both academic and entertainment purposes, further contribute to a decline in physical and psychological health. In hostel or postgraduate accommodations, students may lack the resources or motivation to prepare nutritious meals and instead opt for processed or high-calorie food options. The combination of poor nutrition, lack of sleep, and heightened academic stress has been linked to the increased prevalence of anxiety, depression, and other mental health disorders among college students (Hunt & Eisenberg, 2010). Therefore, this lifestyle, if unregulated, can pose long-term consequences on their physical and emotional health.

### 1.1. Dietary Patterns among College Students Mental Health: The Link

Nutrients such as omega-3 fatty acids, B-vitamins, magnesium, iron, and tryptophan play vital roles in neurotransmitter function and brain health. Deficiencies or imbalances in these nutrients can lead to altered mood, cognitive decline, and increased risk of anxiety and depressive symptoms (O'Neil et al., 2014).

College students, often due to time pressure or lack of access to balanced meals, may consume diets high in refined sugars, saturated fats, and processed foods nutritionally poor choices that have been linked to mental health challenges. Literature reported that high sugar and fat intake can exacerbate inflammation and oxidative stress, both of which are associated with mental disorders, including anxiety (Jacka et al., 2010). Furthermore, inadequate intake of fresh fruits and vegetables rich in antioxidants and fiber may impair gut health and its connection to the brain through the gut-brain axis. This bi-directional communication system is influenced by diet, and disruptions in gut microbiota have been linked to changes in stress response and anxiety levels (Sánchez-Villegas et al., 2012).

### 1.2. Nutritional Factors Affecting Sleep and Anxiety

Nutrition plays a pivotal role in regulating the body's physiological and psychological processes, including sleep quality and anxiety levels. A well-balanced diet supports hormonal balance,

neurotransmitter function, and circadian rhythm all of which influence how individuals sleep and manage stress. Micronutrients such as magnesium, zinc, vitamin D, and B-complex vitamins are essential in modulating brain activity and emotional regulation. For instance, magnesium supports the production of gamma-aminobutyric acid (GABA), a neurotransmitter involved in promoting relaxation and sleep. A deficiency in B12 or folate has been associated with increased symptoms of anxiety and depression (Mischoulon & Raab, 2007). Tryptophan, an amino acid found in foods like dairy, nuts, and poultry, is a precursor to serotonin and melatonin, chemicals involved in mood stabilization and sleep induction. Diets lacking in tryptophan or overall protein may impair serotonin synthesis, thereby affecting both mood and sleep. Conversely, high intake of caffeine, sugar, and ultra-processed foods can lead to sleep disruption and increased anxiety.

## 2. Methodology

This cross-sectional study included 150 students (18–25 years) from 2 engineering and 2 architecture colleges in Mumbai, recruited through purposive sampling. Eligible participants were residing in hostels, shared accommodations, or at home and provided informed consent, while those with chronic illnesses, recent surgeries, acute infections, or diagnosed mental disorders were excluded.

Data were collected using a structured questionnaire covering demographics, anthropometry (height, weight, MUAC), and lifestyle factors. Dietary intake was assessed using a 24-hour recall and a food frequency questionnaire, while sleep and anxiety were measured using the Pittsburgh Sleep Quality Index (PSQI), Epworth Sleepiness Scale (ESS), and Generalized Anxiety Disorder-7 (GAD-7) scale. Descriptive statistics (mean, SD, frequencies) and inferential tests (chi-square, t-test, Pearson correlation) were used, with $p \leq 0.05$ considered significant. Inter System Biomedical Ethics Committee (ISBEC), an independent ethics committee, has provided approval for the study.

## 3. Results and Discussions
### 3.1. Socio-Demographic Characteristics of Study Participants

The study included 150 participants aged 18–25 years from engineering and architecture colleges in Mumbai. The sample comprised 70.7% females and 29.3% males. A higher proportion of students were enrolled in Architecture (64%) compared to Engineering (36%). In terms of residence, 59% lived at home while 41% stayed in hostels, PGs, or rented accommodations. The majority were first-year students (47%), followed by second-year (16%), final-year (15%), third-year (12.7%), and fourth-year (9.3%).

**Table 1. Socio-Demographic Profile of Students**

| Demographic Characteristics | Overall (n=150) n(%) |
|---|---|
| **Gender** Male Female | 44 (29.3%) 106 (70.7%) |

| | |
|---|---|
| **Course of the Study** Engineering Architecture | 54 (36%) 96(64%) |
| **Are you Staying in?** Hostels/PG/Rented Apartments Home | 62 (41%) 88 (59%) |
| **Year of Study** 1st 2nd 3rd 4th Final year | 71(47%) 24(16%) 19(12.7%) 14(9.3%) 22(15%) |

## 3.2. Anthropometric Profile of Students

**Table 2. Differences of Participants According to Gender, Course of Study and residence status, and Differences in weight**

| Variables | Group | Weight (Mean+-SD) | t-test | P- Value |
|---|---|---|---|---|
| **Gender** | Male (n = 44 ) | **63.8 (8.11)** | **4.84** | **0.000** |
| | Female (n= 106 ) | **55.8(11.4)** | | |
| **Course of Study** | Engineering ( n= 54 ) | **52.8(10.2)** | **4.69** | **0.000** |
| | Architecture (n= 96) | **61.1(10.5)** | | |
| **Residence status** | Hostels / pg / Rented Apartments ( n= 62 ) | **61.2(11.4)** | **2.91** | **0.004** |
| | Homes ( n= 88 ) | **55.9(10.5)** | | |

*p-value ≤ 0.05 is considered statistically significant

Table 2. found significant differences in body weight among students based on gender, academic course, and residence status. Males had higher average body weight than females, consistent with findings by Anjum et al. (2018) Students studying architecture weighed more than Students studying engineering and hostel/PG residents were heavier than home residents, likely due to irregular eating habits and greater access to calorie-dense foods, similar to observations by El Ansari et al. (2015).

### 3.3. Comparative Analysis of Energy and Nutrient Intake By Gender and Course of Study

**Table 3. Gender and Course Based Comparison of Macronutrient and Energy Intake among College Students Aged 18-25 years.**

| Nutrient | Male ( n=44) Mean ±SD) | RDA ( Ref Values) Male | Female (n=106) Mean ±SD) | RDA Ref Values) Female | t-value | P- value |
|---|---|---|---|---|---|---|
| **Energy (kcal)** | 1030± 268 | 2320 Kcal | 939± 233 | 1900 kcal | 2.08 | **0.039** |
| **Pro(g)** | 29.5± 12.9 | 60 | 20.0± 10.7 | 55 | 4.24 | **0.000** |
| **Carb(g)** | 200± 72.4 | 55-60% | 191± 54.2 | 55-60% | 0.87 | **0.380** |
| **Fat (g)** | 46.4 ± 9.6 | 25-30% | 41.5 ± 8.7 | 25-30% | 2.90 | **0.005** |
| **Fiber (g)** | 6.4 ± 2.3 | 40 | 5.0 ± 1.7 | 35 | 3.81 | **0.000** |

*p-value ≤ 0.05 is considered statistically significant

Table 3. Both Males Students and Female students had nutrient intakes below the recommended levels. Males consumed significantly more calories ($1030 \pm 268$ kcal vs. $939 \pm 233$ kcal, p = 0.039), protein ($29.5 \pm 12.9$ g vs. $20.0 \pm 10.7$ g, p = 0.000), fat ($46.4 \pm 9.6$ g vs. $41.5 \pm 8.7$ g, p = 0.005), and fiber ($6.4 \pm 2.3$ g vs. $5.0 \pm 1.7$ g, p = 0.000), while carbohydrate intake indicated no significant difference (p = 0.380). Despite these differences, both groups fell short of their respective RDA values.

This inadequate consumption may be attributed to irregular eating habits such as skipping breakfast, delayed or missed meals due to academic workload, reliance on fast foods with low nutrient density, and

lack of time or cooking facilities, especially among hostel students. Additionally, stress and irregular sleep patterns may further contribute to poor appetite and nutrient intake.

**3.4.Comparison of Dietary Preferences Across Socio Demographic Groups .**

**Table 4. Comparison of Mean Food Consumption Based on Gender,  Course of Study and Residence status and Year of Study.**

| Food Categories | N | Gender ( Mean +- SD) | | t- value | P- Value |
|---|---|---|---|---|---|
| | | **Male (N=44)** | **Female (N=106)** | | |
| **Lassi** | 131 | 131(28) | 146(47) | -2.14 | 0.034 |
| **Soybeans** | 108 | 26.2 (6.5) | 23.0(7.5) | 2.17 | 0.033 |
| **Ladies finger** | 143 | 29.8(10) | 37.9(12.5) | -4.05 | 0.000 |
| | | **Course of study ( Mean +- SD)** | | | |
| | | **Engineering (N=54)** | **Architecture (N=96)** | 4.3 | 0.000 |
| **Ladies finger** | 143 | 41.5 (11.9) | 32.5(11.5) | | |
| | | **Residence status ( Mean +- SD)** | | | |
| | | **Hostels / pg / Rented Apartments ( N= 62 )** | **Homes ( N = 88 )** | | |
| **Lemon water** | 144 | 162 (57) | 142(44) | 2.31 | 0.02 |
| **Chapati** | 150 | 40( 0.00) | 38.6 (4.8) | 2.21 | 0.02 |

| Maggie/noodles/pasta/ pizza/burger/ french fries/ twisted aloo | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Respon** | **1st** | **2nd Year** | | **3rd Year** | **4th** | **5th** | **Chi** | **P-** |

| se Options | Year (N=71) | (N=24) | (N=19) | Year (N=14) | Year (N=22) | square value | Value |
|---|---|---|---|---|---|---|---|
| **1-2 times in a month** | 6(37.5%) | 8(50%) | 1(6.3%) | 0(0%) | 1(6.3%) | 21.3 | **0.04** |
| **3-5 times in a month** | 15(53.6%) | 3(10.7%) | 4(14.3%) | 3(10.7%) | 3(10.7%) | | |
| **1-2 times in a week** | 35(47.9%) | 8(11%) | 8(11%) | 10(13.7%) | 12(16.4%) | | |
| **3-5 times in a week** | 15(45.5%) | 5(15.2%) | 6(18.2%) | 1(3%) | 6(18.2%) | | |

*p-value <0.05 is considered statistically significant

Table 4. Dietary patterns among students varied by gender, academic course, and residence status. Female students participants consumed more lassi (146 g ± 47) than males (131 g ± 28; p = 0.034), a 10% higher intake, and more ladies finger (37.9 g ± 12.5 vs. 29.8 g ± 10; p = 0.000), a 27% higher intake, reflecting a preference for plant-based foods. Male Students participants consumed more soybeans (26.2 g ± 6.5 vs. 23.0 g ± 7.5; p = 0.033), a 14% higher intake, possibly linked to protein-focused diets. Engineering students consumed 27% more ladies finger (41.5 g ± 11.9) than architecture students (32.5 g ± 11.5; p = 0.000),Hostel/PG residents consumed 14% more lemon water (162 g ± 57 vs. 142 g ± 44; p = 0.02) and 4% more chapati (40 g vs. 38.6 g ± 4.8; p = 0.02), suggesting standardized hostel meals and conscious hydration efforts. The analysis showed a significant link between academic year and fast food consumption.. First-year students consumed fast food most frequently (47.9% eating it 1–2 times/week and 45.5% 3–5 times/week), influenced by independence, peer pressure, and easy access. Later-year students reported reduced intake (only 3% of 4th-year students ate it 3–5 times/week), likely due to health awareness, academic stress, and financial control. Second-year students identified that highest moderate intake (50% consuming 1–2 times/month), reflecting a transition toward healthier habits. These findings stress the need for nutritional interventions targeting first-year students to reduce unhealthy food habits and promote better dietary choices. These findings align with previous studies indicating gender-based food preferences, hostel dependence on fixed meals, and the impact of academic workload particularly in architecture students on eating habits.

**Table 5.Association Between Nutritional Status and Binge Eating During Stress By**

**Gender and Residence Status**

| Variables | Group | Total Count | Chi -square value | P-value |
|---|---|---|---|---|
| **Gender** | Male ( n=44) Female (106) | 29.3% 70.7% | 8.76 | **0.033** |
| **Residence Status** | Hostels/PG/ Rented Apartments Home | 41.3% 58.7% | 13.6 | **0.003** |

Table 5. found a significant association between binge eating during stress and socio-demographic factors. Females were more likely to binge eat (70.7%) than males (29.3%), aligning with research linking higher emotional reactivity and body image concerns to binge eating. Students living at home (58.7%) reported more binge eating than hostel residents (41.3%), likely due to easier access to comfort foods and family-related stress. These findings highlight the need for targeted mental health and nutrition interventions, including stress management workshops, counseling, and peer support, especially for female and home-living students.

**3.6. Comparison Between Socio-Demographic Characteristics With PSQI and ESS Components.**

**TABLE. 6. COMPARISON BETWEEN COURSE OF STUDY, LIVING SITUATION, GENDER AND YEAR OF STUDY WITH THE COMPONENTS OF PSQI.**

| Q5b. Wake up in the middle of the night or early morning | | | | |
|---|---|---|---|---|
| **Response Options** | **Engineering (N= 54)** | **Architecture ( N=96)** | **Chi-square value** | **P- Value** |
| **Not During the past month** | 26 ( 49.1%) | 27(50.9%) | 12.4 | **0.006** |
| **Less than once a week** | 16 (40%) | 24(60%) | | |
| **Once or Twice a week** | 11(28.2) | 28(71.8%) | | |

| Three or times a week | 1(5.6%) | 17(94.4%) | | |
|---|---|---|---|---|
| **Q5d. Cannot breathe comfortably during sleep** | | | | |
| **Not During the past month** | 45(48.4%) | 48(51.6%) | 16.3 | **0.001** |
| **Less than once a week** | 4(18.2%) | 18(81.8%) | | |
| **Once or Twice a week** | 2(10.0) | 18(90%) | | |
| **Three or times a week** | 3(21.4%) | 11(78.6%) | | |

*p-value ≤ 0.05 is considered statistically significant.

The results reported a significant difference in sleep disturbances between engineering and architecture students. More architecture students reported waking up at night or early morning compared to engineering students (p=0.006). Similarly, breathing discomfort during sleep was more prevalent among architecture students (p=0.001). This suggests poorer sleep quality among architecture students.

| **Q5e. Cough or snore loudly** | | | | |
|---|---|---|---|---|
| **Response Options** | **Engineering (N= 54)** | **Architecture ( N=96)** | **Chi-square value** | **P- Value** |
| **Not During the past month** | 40(47.6%) | 44(52.4%) | 19.5 | **0.000** |
| **Less than once a week** | 11(42.3%) | 15(57.7%) | | |
| **Once or Twice a week** | 1(5%) | 19(95%) | | |
| **Three or times a week** | 2(10.0%) | 18(90.6%) | | |
| **Q5f. Feel too cold during sleep** | | | | |

| Response Options | Engineering (N= 54) | Architecture ( N=96) | 16.9 | 0.001 |
|---|---|---|---|---|
| Not During the past month | 36(51.4%) | 34(48.6%) | | |
| Less than once a week | 10(33.3%) | 20(66.7%) | | |
| Once or Twice a week | 7(20.6%) | 27(79.4%) | | |
| Three or times a week | 1(6.3%) | 15(93.8%) | | |

*p-value ≤ 0.05 is considered statistically significant.

The analysis indicated a significant difference between engineering and architecture students in relation to sleep disturbances. On the question related to coughing or snoring loudly, the result indicated that architecture students reported higher frequency of coughing/snoring compared to engineering students, with the difference being highly significant ($\chi^2 = 19.5$, $p < 0.001$). Similarly, for Q5f (Feeling too cold during sleep), architecture students experienced this problem more often than engineering students, and the difference was statistically significant ($\chi^2 = 16.9$, $p = 0.001$). This indicated that architecture students were more prone to sleep-related disturbances such as snoring/coughing and feeling cold during sleep.

| Q5g. Feel too hot during sleep | | | | |
|---|---|---|---|---|
| Response Options | Hostel / pg/ Rented Apartments (N=62) | Home(N= 88) | Chi-square value | P- Value |
| Not During the past month | 19(36.5%) | 33(63.5%) | 12.8 | 0.005 |
| Less than once a week | 14(29.8%) | 33(70.2%) | | |
| Once or Twice a week | 17(47.2%) | 19(52.8%) | | |
| Three or times a week | 12(80.0%) | 3(20%) | | |

| Q5h. Have bad dreams | | | | |
|---|---|---|---|---|
| Response Options | Engineering (N= 54) | Architecture ( N=96) | 16.5 | **0.001** |
| Not During the past month | 37(52.1%) | 34(47.9%) | | |
| Less than once a week | 7(20.6%) | 27(79.4%) | | |
| Once or Twice a week | 8(28.6%) | 20(71.4%) | | |
| Three or times a week | 2(11.8%) | 15(88.2%) | | |

*p-value ≤ 0.05 is considered statistically significant.

The results depicted a significant association between type of residence and feeling too hot during sleep ($\chi^2$=12.8, p=0.005). Students living in hostels/PGs/rented apartments reported more frequent sleep disturbances due to feeling too hot compared to those living at home, suggesting that environmental factors like ventilation, room sharing, or bedding conditions may play a role.

Similarly, a significant association was found between the field of study and experiencing bad dreams ($\chi^2$=16.5, p=0.001). Architecture students reported bad dreams more frequently than engineering students, particularly occurring once or twice a week or three or more times a week, which may be linked to higher stress, academic workload, or irregular sleep patterns in this group.

| Q6.During the past month how often have you taken medicine to help you prescribed or over the counter | | | | |
|---|---|---|---|---|
| Response Options | Male (N= 44) | Female (N=106) | Chi-square value | P- Value |
| Not During the past month | 28(32.9%) | 57(67.1%) | 26.7 | **0.000** |
| Less than once a week | 4(13.3%) | 26(86.7%) | | |
| Once or Twice a week | 1(4.8%) | 20(95.2%) | | |

| Three or times a week | 11(78.6 | | | | |
|---|---|---|---|---|---|
| **Q9.During the past month how would you rate your overall sleep quality.** | | | | | |
| **Response Options** | **Engineering (N= 54)** | **Architecture ( N=96)** | 14.2 | **0.003** | |
| **Very good** | 14(70%) | 6(30%) | | | |
| **Fairly good** | 24(31.2%) | 53(68.8%) | | | |
| **Fairly bad** | 15(35.7%) | 27(64.3%) | | | |
| **Very bad** | 1(9.1%) | 10(90.9%) | | | |

*p-value ≤ 0.05 is considered statistically significant.

A significant association was found between gender and use of sleep medication ($\chi^2 = 26.7$, p = 0.000). Males were more likely to report not using medication during the past month (32.9% vs. 67.1%), whereas females reported higher use of medication across all frequency categories, particularly once or twice a week (95.2% females vs. 4.8% males). This suggests that females were more dependent on sleep medication compared to males.

A significant association was observed between course of study and sleep quality ($\chi^2 = 14.2$, p = 0.003). Engineering students reported better sleep quality, with 70% rating it as very good compared to only 30% in architecture students. In contrast, poor sleep quality (fairly bad or very bad) was more common among architecture students (64.3% and 90.9%, respectively) compared to engineering students (35.7% and 9.1%). This indicates that architecture students experienced poorer overall sleep quality than engineering students.

| Component | Category | 1st Year (N=71) | 2nd Year (N=24) | 3rd Year (N=19) | 4th Year (N=14) | 5th Year (N=22) | Chi square value | P-Value |
|---|---|---|---|---|---|---|---|---|
| Q5e. Cough /Snore Loudly | Not During the past month | 53(63.1%) | 11(13.1%) | 10(11.9%) | 4(4.8%) | 6(7.1%) | 39.4 | **0.000** |
| | Less than once a | 13(50%) | 5(19.2%) | 2(7.7%) | 1(3.8%) | 5(19.2%) | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | week | | | | | | | |
| | Once or Twice a week | 2(10%) | 4(20%) | 4(20%) | 6(30%) | 4(20%) | | |
| | Three or times a week | 3(15%) | 4(20%) | 3(15%) | 3(15%) | 7(35%) | | |
| Q5f. Feel too cold | Not During the past month | 40(57.1%) | 11(15.7%) | 5(7.1%) | 6(8.6%) | 8(11.4%) | 30.6 | **0.002** |
| | Less than once a week | 13(43%) | 5(16.7%) | 2(6.7%) | 4(13.3% | 6(20%) | | |
| | Once or Twice a week | 16(47.1%) | 4(11.8%) | 4(11.8%) | 4(11.8%) | 6(17.6%) | | |
| | Three or times a week | 2(12.5%) | 4(25%) | 8(50%) | 0(0%) | 2(12.5%) | | |
| Q9.During the past month how would you rate your overall sleep quality. | Very good | 16 (18.9%) | 1 (5.0%) | 1(5%) | 2(10%) | 0(0%) | 23.7 | **0.022** |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | **Fairly good** | 27 (35.1%) | 18 (23.4%) | 11 (14.3%) | 9(11.7%) | 12(15.6%) | |
| | **Fairly bad** | 24(57.1%) | 2(4.8%) | 5(11.9%) | 2(4.8%) | 9(21.4%) | |
| | **Very bad** | 4(36.4%) | 3(27.3%) | 2(18.2%) | 1(9.1%) | 1(9.1%) | |

*p-value ≤ 0.05 is considered statistically significant.

There was a significant association between year of study and frequency of loud snoring/coughing (p < 0.001). First-year students most often reported no symptoms (63.1%), while higher-year students, particularly 5th year (35%), reported frequent snoring (≥3 times/week). This suggests worsening sleep quality with academic progression.Feeling too cold during sleep showed a significant difference across years (p = 0.002). While most 1st-year students reported no issues (57.1%), 3rd-year students (50%) were most affected with frequent cold sensations. This may reflect lifestyle or stress-related thermoregulation issues.Overall sleep quality differed significantly between years (p = 0.022). First-year students rated their sleep as fairly bad (57.1%), while higher years showed increasing reports of "very bad" sleep. Fifth-year students reported the worst outcomes, with no one rating their sleep as "very good.

**Table 7. Comparison Between Epworth Sleepiness Scale and Course of Study, Residence Status Among Students.**

| **Watching television** | | | | |
|---|---|---|---|---|
| **Response Options** | **Engineering (N= 54)** | **Architecture ( N=96)** | **Chi - Square value** | **P- Value** |
| **Never doze** | 18(42.9%) | 24(57.1%) | 8.65 | **0.03** |
| **Slight chance of dozing** | 24(41.4%) | 34(58.6%) | | |
| **Moderate chance of dozing** | 12(31.6%) | 26(68.4%) | | |
| **High chance of dozing** | 0(0%) | 12(100%) | | |

| Lying down in the afternoon to rest | | | | |
|---|---|---|---|---|
| **Response Options** | **Hostel / pg/ Rented Apartments (N=62)** | **Home(N= 88)** | 7.58 | **0.05** |
| **Never doze** | 2(14.3%) | 12(85.7%) | | |
| **Slight chance of dozing** | 15(29.4%) | 36(70.6%) | | |
| **Moderate chance of dozing** | 22(50%) | 22(50%) | | |
| **High chance of dozing** | 15(37.5%) | 25(62.5%) | | |
| **Sitting and talking to another person** | | | | |
| **Response Options** | **Engineering (N= 54)** | **Architecture ( N=96)** | 7.63 | **0.05** |
| **Never doze** | 38(45.2) | 46(54.8%) | | |
| **Slight chance of dozing** | 12(26.1%) | 34(73.9%) | | |
| **Moderate chance of dozing** | 2(15.4%) | 11(84.6%) | | |
| **High chance of dozing** | 2(28.6%) | 5(71.4%) | | |

*p-value ≤ 0.05 is considered statistically significant

Table 7. analysis highlighted a significant association between daytime sleepiness, academic workload, and living conditions among students. Architecture students reported a higher likelihood of dozing off while watching television ($p = 0.03$) and even during conversations ($p = 0.05$) compared to engineering students, reflecting the effects of late-night assignments, irregular schedules, and prolonged screen exposure. Hostel/PG residents were more prone to daytime sleepiness when lying down in the afternoon (87.5% vs. lower in home residents, $p = 0.05$), likely due to poor sleep environments and environmental stressors such as noise and lack of privacy. These findings align with previous studies linking academic

pressure and suboptimal living conditions to irregular sleep and reduced alertness (Hershner & Chervin, 2014; Giri et al., 2021). Excessive daytime sleepiness, as shown here, can impair academic performance, focus, and mental health, underscoring the need for targeted sleep hygiene interventions, stress management programs, and improved hostel living conditions to promote better sleep quality and overall well-being (Irish et al., 2015; Alfonsi et al., 2020).

**3.7. Associations between GAD-7 Anxiety Related Behavior with Gender/ Residence Status among Students**

**Table 8. COMPARISON BETWEEN GAD-7 ANXIETY RELATED BEHAVIOR WITH GENDER AND RESIDENCE STATUS AMONG STUDENTS.**

| Being so restless it is hard to sit still | | | | |
|---|---|---|---|---|
| **Response Options** | **Male (N= 44)** | **Female ( N=106)** | **Chi - Square value** | **P- Value** |
| **Not at all** | 12(34.3%) | 23(65.7%) | 7.73 | **0.05** |
| **Several days** | 12(22.2%) | 42(77.8%) | | |
| **More than half the day** | 8(21.6%) | 29(78.4%) | | |
| **Nearly every day** | 12(50%) | 12(50%) | | |
| **Trouble in Relaxing** | | | | |
| **Response Options** | Male (N= 44) | Female ( N=106) | 8.36 | **0.03** |
| **Not at all** | 1(5.6%) | 17(94.4%) | | |
| **Several days** | 33(37.1%) | 56(62.9%) | | |
| **More than half the day** | 7(25%) | 21(75%) | | |
| **Nearly every day** | 3(20%) | 12(80%) | | |

*p-value ≤ 0.05 is considered statistically significant

Anxiety is a common mental health issue among college students, often influenced by academic stress, social pressures, and lifestyle changes. Using the Generalized Anxiety Disorder-7 (GAD-7) scale, this

study assessed gender-based differences in anxiety symptoms, focusing on restlessness and difficulty relaxing.

The analysis in the above table reported significant among students of both genders in the areas of restlessness, relaxation.Male students reported higher levels of restlessness, with 50% experiencing it nearly every day ($p = 0.05$), indicating a tendency to externalize anxiety through physical agitation. Female students, however, reported greater difficulty relaxing, with 80% facing trouble relaxing nearly every day ($p = 0.03$), suggesting a more internalized and chronic emotional response. These patterns are consistent with previous research, which notes males often express anxiety through physical activity, while females experience sustained emotional distress (Bayram & Bilgel, 2008; Sahu et al., 2019).

### 3.8. Interrelationship Between Anthropometric Measures, Sleep Quality and Nutrient Intake: A Pearson Correlation Analysis.

Understanding how physiological health, psychological well-being, and diet interact is key to improving student health. Pearson correlation analysis helps to identify relationships between sleep quality, anxiety, body composition, and nutrient intake. Previous studies have shown that nutrient-rich diets improve sleep and reduce anxiety, while poor eating habits and stress negatively affect weight and sleep. This analysis explores links between weight, height, nutrient intake, Epworth Sleepiness Scale (ESS), and Generalized Anxiety Disorder (GAD-7) scores among college students.

**Table 9. Pearson correlation matrix Between Anthropometric Parameters, Sleep Quality, Anxiety and Nutrient Intake Among College Students.**

| Sr.no | Variable 1 | Variable 2 | Correlation(r) | P- Value |
|---|---|---|---|---|
| 1 | Weight | Height | 0.343** | .000 |
| 2 | Weight | Protein | 0.269** | .001 |
| 3 | Weight | Fiber | 0.262** | .001 |
| 4 | ESS Total Score | GAD-7 Total Score | 0.401** | .000 |
| 5 | Energy | Protein | 0.790** | .000 |
| 6 | Energy | Carbohydrates | 0.826** | .000 |
| 7 | Energy | Fat | 0.739** | .000 |
| 8 | Energy | Fiber | 0.661** | .000 |
| 9 | Protein | Carbohydrates | 0.706** | .000 |
| 10 | Protein | Fat | 0.725** | .000 |

| 11 | Protein | Fiber | 0.715** | .000 |
| 12 | Carbohydrates | Fat | 0.716** | .000 |
| 13 | Carbohydrates | Fiber | 0.654** | .000 |
| 14 | Fat | Fiber | 0.600** | .000 |

*p-value ≤ 0.05 is considered statistically significant

Table 9. Depicted significant correlations among anthropometry, diet, sleep, and anxiety. Weight was moderately correlated with height ($r = 0.343$, $p < 0.01$) and positively associated with protein intake ($r = 0.269$) and fiber intake ($r = 0.262$), indicating that students with higher body weight often had better dietary patterns. Energy intake showed strong positive correlations with protein ($r = 0.790$), carbohydrates ($r = 0.826$), fat ($r = 0.739$), and fiber ($r = 0.661$), suggesting that students consuming more calories generally had a balanced macronutrient profile. Additionally, a moderate positive correlation was found between Epworth Sleepiness Scale (ESS) and GAD-7 anxiety scores ($r = 0.401$, $p < 0.01$), indicating that students with greater daytime sleepiness had higher anxiety levels. Overall, 40% of dietary variation was linked to energy and nutrient intake, while ESS and anxiety shared 40% overlap, highlighting the need for interventions targeting balanced diets, stress reduction, and improved sleep hygiene.

## 4. Conclusion

The study results indicated that college students, especially those in architecture and higher academic years, are more vulnerable to poor nutrition, disturbed sleep, and increased anxiety. Most students failed to meet energy, protein, and fiber recommendations. Hostel residents had higher body weight and more sleep issues, while home-residing students reported more binge eating and anxiety. Male students consumed more calories and macronutrients but showed externalized anxiety (restlessness), whereas females reported more emotional symptoms and greater sleep medication use. Academic workload, year of study, and residence strongly influenced sleep and mental health.Dietary intake correlated with sleep and anxiety, with higher energy intake linked to better nutrient balance but not preventing sleep dysfunction and anxiety. A moderate correlation between daytime sleepiness and anxiety highlighted the close link between mental health and lifestyle habits.

## 5. Recommendations

The study's generalizability is limited to one location with Multi-day recalls can improve dietary accuracy, and longitudinal designs can clarify causality. Student-focused tools and interventions, especially for hostel and final-year students, are recommended, along with promoting diverse, nutrient-rich meals. Additionally, spreading awareness about healthy and balanced eating habits is crucial. Colleges and hostel messes should provide affordable and nutritious breakfast options, ensuring they are student-friendly and pocket-friendly. Introducing simple, easily available, and cost-effective healthy recipes they can also use seasonal veggies which are cheaper and freshly available to eat which can help students adopt healthier eating practices without financial burden. Nutrition awareness programs and recipe demonstrations can further encourage students to make informed dietary choices.

## References

1. Alfonsi, V., Scarpelli, S., D'Atri, A., & Riemann, D. (2020). Sleep, stress, and mental health in university students. Journal of American College Health, 68(9), 1000–1008. https://doi.org/10.1080/07448481.2019.1654156

2. Anjum, B., Dhir, R., & Mohan, V. (2018). Nutritional assessment of college students: Dietary patterns and anthropometric measurements. International Journal of Community Medicine and Public Health, 5(7), 2870–2875. https://doi.org/10.18203/2394-6040.ijcmph20182689

3. Bayram, N., & Bilgel, N. (2008). The prevalence and socio-demographic correlations of depression, anxiety and stress among a group of university students. Social Psychiatry and Psychiatric Epidemiology, 43(8), 667–672. https://doi.org/10.1007/s00127-008-0345-x

4. El Ansari, W., Stock, C., & Mikolajczyk, R. T. (2015). Relationships between food consumption and living arrangements among university students in four European countries—A cross-sectional study. Nutrition Journal, 14(1), 28. https://doi.org/10.1186/1475-2891-14-28

5. Giri, M., Bano, S., & Rane, A. (2021). Impact of hostel living on students' sleep patterns in urban India. Sleep Health, 7(2), 180–186. https://doi.org/10.1016/j.sleh.2020.09.005

6. Hershner, S., & Chervin, R. (2014). Causes and consequences of sleepiness among college students. Nature and Science of Sleep, 6, 73–84. https://doi.org/10.2147/NSS.S62907

7. Hunt, J., & Eisenberg, D. (2010). Mental health problems and help-seeking behavior among college students. Journal of Adolescent Health, 46(1), 3–10. https://doi.org/10.1016/j.jadohealth.2009.08.008

8. Irish, L. A., Kline, C. E., Gunn, H. E., Buysse, D. J., & Hall, M. H. (2015). Sleep hygiene education as a treatment for insomnia: A systematic review and meta-analysis. Journal of Sleep Research, 24(5), 486–496. https://doi.org/10.1111/jsr.12254

9. Jacka, F. N., Kremer, P. J., Leslie, E. R., Berk, M., Patton, G. C., Toumbourou, J. W., & Williams, J. W. (2010). Associations between diet quality and depressed mood in adolescents: Results from the Australian Healthy Neighbourhoods Study. Australian & New Zealand Journal of Psychiatry, 44(5), 435–442. https://doi.org/10.3109/00048670903571598

10. Mischoulon, D., & Raab, M. F. (2007). The role of folate in depression and dementia. Journal of Clinical Psychiatry, 68(Suppl 10), 28–33.

11. O'Neil, A., Quirk, S. E., Housden, S., Brennan, S. L., Williams, L. J., Pasco, J. A., Berk, M., & Jacka, F. N. (2014). Relationship between diet and mental health in children and adolescents: A systematic review. American Journal of Public Health, 104(10), e31–e42. https://doi.org/10.2105/AJPH.2014.302110

12. Sahu, M., Arora, N., & Kumaraiah, V. (2019). Anxiety, perceived stress, and academic performance among medical students: A cross-sectional study. International Journal of Community Medicine and Public Health, 6(2), 903–908. https://doi.org/10.18203/2394-6040.ijcmph20190396

13. Sánchez-Villegas, A., Verberne, L., de Irala, J., Ruiz-Canela, M., Toledo, E., Serra-Majem, L., & Martínez-González, M. A. (2012). Dietary fat intake and the risk of depression: The SUN Project. PLoS ONE, 6(1), e16268. https://doi.org/10.1371/journal.pone.0016268