Insomnia-Diet Relationship among Egyptian Emerged Females: A Cross-Sectional Study

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ABSTRACT

Insomnia, characterized by difficulty starting or maintaining sleep, is a prevalent sleep disorder affecting 10–30% of adults globally. This study aimed to identify the correlation between food consumption and insomnia severity among female university students. It recruited 1170 female students aged 20 to 23 from Menoufia and Banha Universities. Research data were collected through a questionnaire and face-to-face interviews. The study began in October 2023 and concluded in May 2024. A food frequency questionnaire was used to gather data about food consumption, classifying foods into seven major groups: vegetables, fruits, starchy foods, dairy, meats, drinks, and miscellaneous foods. The study utilized the Insomnia Severity Index (ISI) for classification; it consists of 7 items, each rated on a scale from 0 to 4, with a total score ranging from 0 to 28. Results showed that 56.2% of females in this study have moderate or severe insomnia. The ISI was lower among those who ate three meals daily. Consuming honey, nuts, potatoes, milk, dairy, vegetables, onions, garlic, dried fruits, and fresh juices helped alleviate the severity of insomnia. The consumption of carbonated and energy drinks, fast food, salad dressing, ketchup, and chips was correlated with increased insomnia severity. Foods such as rice and pasta, sugary foods, chocolate, meats, ice cream, fresh fruits, coffee, red and green tea, relaxing beverages, and processed foods did not substantially influence sleep quality. In conclusion, dietary patterns impact sleep quality among female university students.

Keywords: Dairy products, Fast Foods, Fruits, Meats, Sleep, Vegetables

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INTRODUCTION

Insomnia, characterized by difficulty initiating or maintaining sleep, is a common sleep disorder prevalent among 10–30% of adults worldwide (**National Sleep Foundation, 2021**). The Norwegian National Survey of University Students revealed that 34.2% of females and 22.2% of males had insomnia (**Sivertsen et al., 2019**). A most recent study found that 57.6% of college females across 60 countries suffered from insomnia symptoms (**Babicki et al., 2023**). Chronic insomnia causes dysfunction and increases the risk of cardiovascular disease, diabetes, depression, and anxiety (**Sateia, 2014**). Insomnia is primarily correlated with mental health disorders among college students. The emerging research highlights the role of diet and nutrition in sleep quality. Dietary patterns can influence neurotransmitter systems, hormonal regulation, and circadian rhythms (**St-Onge et al., 2016**).

Diets with low glycemic index carbohydrates may promote better sleep by facilitating tryptophan uptake, which boosts serotonin production (**Afaghi et al., 2007**). However, high-fat diets and excessive caffeine can worsen sleep quality (**Grandner et al., 2014**). Micronutrients such as magnesium and B vitamins also play a role in improving sleep quality (**Abbasi et al., 2012**). Furthermore, changes in the composition of macronutrients consumed can also affect sleep quality (**Crispim et al., 2011**). A healthy dietary pattern in Japanese adults characterized by a high intake of vegetables, mushrooms, potatoes, seaweeds, soy products, and eggs was inversely associated with sleep symptoms (**Katagiri et al., 2014**). **Alibabaei et al. (2021)** found a direct relationship between adherence to healthy diets and longer sleep duration. Furthermore, research by **Adelantado-Renau et al., (2019)** demonstrated a positive association between adherence to the Mediterranean diet and sleep quality. Likewise, **St-Onge et al. (2023)** suggested that diet and the composition of different meals can have both

chronic and acute effects on sleep. Additionally, it has been observed that sleep disturbances can influence food consumption, leading to increased energy intake and a greater desire for energy-dense foods (**Saidi et al., 2021**).

The present cross-sectional study aimed to examine the relationship between dietary patterns and the insomnia index among a large sample of emerging adult females aged 20–23 from Menoufia and Banha Universities.

SUBJECTS AND METHODS

Subjects

This study recruited female university students from Menoufia University and Banha University in Egypt. The sample comprised 1,170 students, including 670 from Menoufia University and 500 from Banha University. Participants were selected from all university faculties.

The inclusion criteria for the study were as follows:

Female students enrolled at Menoufia and Banha University, in their first to fourth years of academic education, residing in Banha and Menoufia governorates, aged between 20 and 23 years, and who agreed to participate by signing a consent form.

The exclusion criteria included

Male students, married students, students with disabilities or mental health issues, and students suffering from chronic illnesses.

Methods

Research data were collected using a questionnaire and face-to-face interviews. The study took place during the first and second semesters of the academic year 2023-2024, beginning in October 2023 and concluding in May 2024.

Anthropometric Indices

Body weight (kg) was determined using a portable scale accurate to 0.1 kg. A non-stretchable measuring tape assessed body height (cm) to the nearest 0.1 cm, as per **Lacey et al., (2003).** Body mass index (BMI) was calculated from height and weight measure-ments. BMI categorized subjects into the following

classifications: thinness (BMI < 16.5 kg/m²), underweight (16.5-18.5 kg/m²), healthy weight (18.5-25 kg/m²), overweight (25-30 kg/m²), obesity grade II (30-35 kg/m²), obesity grade III (35-40 kg/m²), and morbid obesity (BMI ≥ 40 kg/m²), following the guidelines set by **WHO (2018).**

Food Consumption Pattern

The researchers employed a fully quantitative food frequency questionnaire (FFQ) for data collection according to **Cheng et al., (2008)**. The FFQ was structured according to the major food groups as follows:

a- Vegetables (fresh vegetables; leafy vegetables; cooked vegetables; and onions and garlic)

b- Fruits (fresh; dried; and fresh juices)

c- Starchy and sugary foods (bread; rice and pasta; potatoes; honey; sweets, molasses, and jam; chocolate; and nuts)

d- Milk and dairy products (milk, yogurt, cheese, ice cream, and butter and cream)

e- Meats and fish (meats (red meats, organ meats, and chicken); fish (all kinds); processed meats (e.g., luncheon, etc.)

f- Drinks (coffee (all kinds); red tea; green tea; relaxing beverages; and carbonated and energy drinks)

g- Miscellaneous (fast foods; dressings; chips and/or endomi; and processed foods)

Participants were asked about the quantities (serving size and grams) and frequency of consumption (daily, weekly, monthly, rarely, or never) for each food item.

Insomnia Severity Index (ISI)

The study classified females using the Insomnia Severity Index (ISI), a widely used screening tool to assess insomnia severity (**Morin et al., 2011**). In this study, we used an Arabic version of the ISI that was translated from English to Arabic (**Alkhatatbeh et al., 2021**).

The ISI consists of 7 items, each assessing different aspects of insomnia.

1. Difficulty falling asleep: Frequency of trouble initiating sleep.

2. Difficulty staying asleep: Frequency of waking up during the night.
3. Early morning awakening: Frequency of waking up too early.
4. Sleep dissatisfaction: Overall satisfaction with sleep quality.
5. Interference with daily functioning: Impact of sleep problems on daily activities.
6. Noticeability of sleep problems: Awareness of sleep issues by others.
7. Level of distress: Distress caused by sleep problems.

Scoring

Each item is rated on a scale from 0 to 4, with the total score ranging from 0 to 28:

1- 0-7: No clinically significant insomnia
2- 8-14: Subthreshold insomnia
3- 15-21: Moderate insomnia
4- 22-28: Severe insomnia

Statistical Analysis

All collected data were statistically analyzed by SPSS version 28 and presented as frequency, percentage, mean, and standard deviation (±SD). Significant differences between numeric variables were determined using analysis of variance (ANOVA) and the least significant differences (LSD) test. The Chi-square test and a 95% confidence interval were employed to compare categorical variables. The *P* value less than 0.05 indicated statistical significance according to **Chan (2003).**

Ethical approval:

Respondents participated voluntarily and were well-informed of the study's objectives and methods. The questionnaires contained no derogatory, discriminatory, or improper language that could offend participants. No private or personal questions were included in the questionnaire, which was designed to collect data relevant to the study questions. Subjects who refused to sign the consent form were excluded from the study. All Experiments for this Study were Ethically Approved by the Scientific Research Ethics Committee (Approval No. 13 - SREC- 04 -2024).

RESULTS AND DISCUSSION

According to the Insomnia Severity Index (ISI),

only 179 females (15.3%) surveyed reported good sleep quality and did not experience insomnia. At the same time, 333 females (28.5%) were identified as suffering from mild insomnia. The majority of females in this study, comprising 401 individuals (34.3%), had moderate insomnia, whereas 257 females (21.9%) had severe insomnia. In conclusion, 56.2% of participants had moderate or severe insomnia. These results agreed with a study involving 20,139 college students from 60 countries, which found that 57.6% of participants exhibited insomnia symptoms, with women and low-income students being more affected (**Babicki et al., 2023**).

Table 1 demonstrates that the mean age across all groups is consistent, ranging from 20.8 to 20.9 years, with a P-value of 0.943. The females' body weights ranged from 66.4 kg to 67.9 kg. Additionally, participant heights range from 162.6 cm to 163.5 cm. The BMI values were also similar across groups, ranging from 25.0 to 25.6 kg/m². Overall, the lack of significant differences in age, weight, height, and BMI among the classifications of insomnia severity indicates that age and body dimensions are not key determinants of insomnia severity in this sample.

Table 2 shows the frequency distribution of studied females according to BMI and Insomnia Severity Index (ISI) scores. Only six females (0.5%) were classified as thin, representing no or a minimal association with insomnia severity levels. While 35 females (3.0%) were classified as underweight, representing a uniform distribution of insomnia levels, which suggests that, although some underweight individuals may experience insomnia, the overall incidence is relatively low. Females with normal weight comprised half of the sample, and insomnia severity levels were balanced, indicating no significant concern in this group. However, overweight individuals constituted 30.4% of the sample and exhibited a slightly elevated prevalence of severe insomnia (35.8%). This correlation proposes a potential association between overweight and raised

insomnia severity. Moreover, 15.4% of females were obese. Here, 17.2% had moderate insomnia, while 14.4% had severe insomnia cases, indicating a possible association between obesity and insomnia severity. Only eight participants (0.7%) suffered from morbid obesity, with no severe insomnia cases reported, indicating a lower prevalence of morbid obesity within this sample. These results agree with existing studies that link insomnia and short sleep durations with weight gain and obesity. However, hormonal changes and increased appetite due to sleep deprivation are potential explanations for this relationship (**Allison et al., 2024**). For instance, a study focusing on older Mexican adults found that insomnia was associated with obesity, reinforcing the notion that sleep disturbances may contribute to weight gain (**Momin et al., 2023**). Further, a study conducted in Norway reported a curvilinear relationship between BMI and insomnia in girls, indicating that both underweight and overweight adolescents tend to have shorter sleep durations (**Sivertsen et al., 2014**). Moreover, it is important to note that insomnia and other sleep disturbances are closely correlated to increased body weight and adiposity (**Hargens et al., 2013**). Interestingly, recent findings suggest that insomnia accompanied by physiological hyperarousal may lead to lower body weight, indicating that the most severe cases of chronic insomnia could potentially cause weight loss rather than gain (**Ren et al., 2021**).

Table 3 represents the severity of females' insomnia, as measured by the ISI, and the number of daily meals, which ranged from less than two meals, two meals, and three meals to more than three meals daily. Among females consuming fewer than two meals daily, 17.5% have severe insomnia, contributing to an overall prevalence of insomnia in this group of 10.7%. Most studied females comprise those consuming two meals daily (52.1%), with relatively balanced distributions of insomnia severity: 43.0% report no insomnia, and 52.5% experience

severe insomnia. Females who eat three regular meals (breakfast, lunch, and dinner) constitute 28.3% of the total sample, with moderate and severe insomnia reported by 26.2% and 20.6%, respectively. The group consuming more than three meals represents 8.9%, wherein 9.3% have severe insomnia. The results from the Chi-square test (Value = 39.422, p = 0.000) indicate a statistically significant relationship between daily meal frequency and insomnia severity. This correlation emphasizes that meal numbers significantly impact female university students' sleep quality. Published results indicate that regular meal timing correlates with improved sleep quality; thus, a consistent meal schedule may influence insomnia severity (**Alhussain et al., 2024**). Moreover, evening consumption behaviors have been documented to impact sleep quality negatively. For instance, delayed evening meals correlate with higher odds of insomnia and reduced sleep quality. Conversely, adopting an early consumption schedule shows positive effects on sleep outcomes, highlighting the timing of meals, especially the last meal of the day, as critical for sleep health (**Nunes et al., 2024**). Furthermore, **Nunes et al. (2024)** found that consuming large evening meals or those rich in caffeine and sugars is associated with shorter sleep duration and higher insomnia severity, underscoring the importance of both the composition and timing of meals concerning sleep health.

Table 4 investigates the relationship between the consumption of starchy and sugary foods (including rice, pasta, potatoes, honey, confections, chocolate, and nuts) and the ISI. All females consumed different types of popular breads daily, with no significant differences identified among participants. The results revealed that 21.4% of females who either abstained from or occasionally consumed rice and pasta suffered severe insomnia, resulting in an overall insomnia prevalence of 18.6%. Females who consumed rice and pasta monthly demonstrated a marginally increased insomnia prevalence of 5.4%. On the

other hand, females who consumed these starchy foods weekly constituted the most significant subgroup, exhibiting an insomnia prevalence of 40.9%, with 41.2% of them having severe insomnia. Daily consumers comprised 36.0% of the research group, with 31.9% suffering from severe insomnia. However, there was no significant difference between insomnia severity and the frequency of rice and pasta consumption (P = 0.474). The results suggest that the consumption of rice and pasta did not markedly affect insomnia severity among the studied females. Previous studies indicate a beneficial association between rice consumption and improved sleep quality. A study in Japan revealed that higher rice consumption was highly correlated to improved sleep quality, likely because of its elevated glycemic index **(Yoneyama et al., 2014). Koga et al. (2020)** suggest that rice may improve sleep by increasing the availability of tryptophan, a precursor to serotonin and melatonin, both essential for sleep regulation. They concluded that a rice-rich diet has been linked to decreased oxidative stress, perhaps enhancing sleep quality. In contrast, refined carbs, like those in pasta, are associated with sleep disturbances. These foods frequently prompt significant insulin reactions, which may diminish tryptophan availability and negatively impact sleep quality **(Sawasdee et al., 2023).** Additionally, in young women, elevated consumption of refined carbs has been associated with poor sleep quality and worsened insomnia symptoms. This discovery corresponds with research demonstrating that diets high in processed foods like pasta are linked to reduced sleep duration and inferior sleep quality **(Aneesh and Chaganty, 2021).** The correlation between potato consumption and sleep quality is complicated. Among persons who either do not consume potatoes or do so occasionally, a significant percentage, 64.6%, had severe insomnia. Conversely, individuals who consumed potatoes monthly reported an insomnia

prevalence of 17.5%, whilst those who consumed them weekly demonstrated a rate of 13.2%. Females who consumed potatoes daily exhibited the lowest incidence of insomnia (6.3%), with only 4.7% suffering from severe insomnia. The statistical analysis suggests a possible correlation between heightened potato consumption and enhanced sleep quality, although this finding is not statistically significant (p = 0.064). Potatoes are classified as high-glycemic index (GI) foods, which can lead to a fast increase in blood sugar levels, thereby disturbing sleep patterns due to ensuing energy fluctuations (**Heidari-Beni et al., 2015**). One study found that a dietary pattern marked by high glycemic load (GL), encompassing high-GI items such as potatoes, correlates with elevated sleeplessness in adults (**Farhadnejad et al., 2023**). These contradictory findings emphasize the necessity for a more sophisticated awareness of the impact of diet on sleep quality. Among those who never or rarely consumed sugary foods, 33.9% had severe insomnia. Monthly consumers of sugary foods demonstrated an insomnia prevalence of 17.5%, but weekly consumers reported a rate of 30.0%. The insomnia rate among daily customers was 18.7%. However, statistical analysis indicated no significant correlation between sugary food consumption and insomnia severity (P=0.157). In contrast, studies on adults reveal that those consuming 50 grams or more of sugar daily are significantly more prone to poor sleep quality, indicating a robust correlation between elevated sugar intake and sleep disturbances (**Innachit et al., 2024**). Further research with university students indicates that persons with suboptimal sleep quality typically consume more sugary foods than their counterparts, establishing a direct correlation between sugar consumption and sleep disturbances (**Boozari et al., 2021**). Research on Iranian people similarly found that diets rich in rapidly digestible carbs, particularly sweets, may worsen sleep problems (**Farhadnejad et al., 2023**). Moreover, studies on young Saudi females

indicated that inadequate sleep quality correlated with insulin resistance, a condition frequently associated with excessive sugar intake, thereby spotlighting possible metabolic mechanisms by which sugar consumption may affect sleep (**Al-Musharaf et al., 2022; Alahmary et al., 2019**).

The effects of honey ingestion on insomnia were also examined. Among persons who either never consumed honey or consumed it rarely, 65.4% had severe insomnia, resulting in a prevalence rate of 59.7%. Monthly honey consumers demonstrated a notable insomnia prevalence of 13.6%, whereas weekly consumers reported a prevalence of 10.1%. The prevalence among daily consumers was the lowest at 10.9%. A Chi-square test (P=0.005) showed a significant correlation between honey consumption and diminished insomnia severity. These findings confirm previous research indicating that honey may improve sleep quality. Honey contains natural sugars and many bioactive substances and may have palliative effects that improve sleep quality (**Zulkifli et al., 2023**).

Among persons who either do not consume chocolate or do so rarely, 50.2% had severe insomnia, contributing to an overall insomnia prevalence of 52.2%. Monthly consumers displayed a 15.6% incidence of severe insomnia, whereas weekly consumers showed a rate of 24.5%, and daily consumers showed a prevalence of 9.7%. However, the statistical analysis indicates no significant correlation between chocolate consumption and insomnia severity (P=0.201). Like chocolate, diets with a high glycemic load have been linked to an elevated risk of sleep disturbances (**Farhadnejad et al., 2023**). The current findings, however, affirm prior research indicating no significant correlation between chocolate consumption and sleep quality, suggesting that the impact of chocolate on sleep may be negligible or indirect (**Balboa-Castillo et al., 2015**). While chocolate consumption has been linked to mental health advantages, such as fewer depressed symptoms, its effects

on sleep are unclear. Dark chocolate has been associated with a reduced likelihood of depression symptoms, which may indirectly affect sleep quality (**Jackson et al., 2019**). Ultimately, 77.4% of participants who either did not consume nuts or consumed them rarely experienced severe insomnia, resulting in an overall incidence of 69.7%. Monthly consumers exhibited severe insomnia at a rate of 12.5%, whilst weekly consumers reported a severity rate of 8.2%, and daily consumers showed the lowest incidence at 1.9%. The Chi-square test ($p = 0.097$) suggests a trend indicating that higher nut consumption may correlate with enhanced sleep quality. A randomized-controlled experiment affirmed present findings, revealing that a daily intake of 40 grams of walnuts improved sleep quality in young adults, including university students (**Izquierdo-Pulido et al., 2024**). The research indicated enhance-ments in sleep latency and efficiency and diminished daytime tiredness linked to elevated melatonin levels resulting from walnut intake (**Izquierdo-Pulido et al., 2024**). Another study examined the impact of sweet almond consumption on sleep quality in students and found that daily intake over two weeks diminished insomnia severity, indicating possible advantages of almonds on sleep quality (**Ghafarzadeh et al., 2019**).

Table 5 shows the relationship between meat and fish consumption and insomnia severity (ISI). The findings indicate varying levels of insomnia among different consumption patterns.

Among participants who rarely or never consume meat, 10.1% had severe insomnia. Among monthly meat consumers, 4.4% had severe insomnia. A substantial percentage (57.6%) of females consumed meat weekly, and within this cohort, the prevalence of severe insomnia rose dramatically to 56.8%. Daily meat consumers, comprising 29.3% of participants, indicated that 27.2% had severe insomnia. However, the statistical analysis reveals no significant ($p = 0.307$) association between meat

consumption and insomnia severity. Regarding fish consumption, females who never or rarely consumed fish reported a severe insomnia rate of 32.3%. Monthly fish consumers showed a severe insomnia rate of 24.5%, while the weekly consumers group, which constituted 42.2% of subjects, recorded a lower prevalence of severe insomnia at 40.1%. Daily fish consumers exhibited the lowest incidence (3.1%). Again, the Chi-square test ($p = 0.172$) indicates no significant correlation between fish consumption and insomnia severity. As for processed meats, females who never or rarely consumed them reported a striking 60.7% severe insomnia prevalence, distinguishing from a total reported prevalence of 59.8%. Monthly consumers of processed meats exhibited a rate of 19.1%, while weekly consumers noted 14.4%, and daily consumers accounted for a lower rate of 5.8%. The Chi-square test ($p = 0.868$) shows no significant association between processed meat consumption and insomnia severity.

Despite Table 5 not identifying significant differences between meat consumption and sleep quality, the literature presents inconsistent findings. Some studies suggest that higher protein intake correlates with improved sleep quality (**Aslan Çin and Yardimci, 2021**), while others indicate that sufficient protein intake, including meat sources, may enhance sleep outcomes (**Zhang et al., 2024b**). A controlled study comparing meat and vegetarian meals found no significant differences in sleep quality, suggesting that the meal type, whether meat-based or vegetarian, may not substantially impact sleep quality (**Amit et al., 2021**). Conversely, research among Malaysian adults indicated that increased red meat consumption correlated with poorer sleep quality. In contrast, white meat and seafood consumption were associated with improved sleep outcomes, emphasizing the significance of the type of meat consumed (**Ghani et al., 2023**). Further exploration into the sleep patterns of older adults revealed that higher meat

consumption was linked to substantial alterations in sleep duration and diminished sleep quality across various meat types, including red and processed meats (**Lana et al., 2019**). Additionally, another study observed a correlation between meat intake and reduced sleep quality, declaring that high levels of meat consumption could adversely affect sleep (**Oliveira and Marques-Vidal, 2023**). An analysis of dietary patterns derived from Hew Health and Nutrition Examination Survey (NHANES) data concluded that diets characterized by high meat intake were associated with an elevated risk of sleep disorders and reduced sleep duration (**Wang et al., 2022**). Furthermore, a study indicated that consuming processed foods, often high in meat products, was linked to low sleep quality and increased daytime dysfunction among female college students (**Aneesh and Chaganty, 2021**).

In conclusion, while the current findings from Table 5 indicate no significant associations between meat and fish consumption and insomnia severity, the existing literature reveals complex and often contradictory relationships that warrant further investigation and a more minute analysis of how dietary patterns influence sleep quality.

Table 6 shows the relationship between the consumption of milk and dairy products (specifically milk, ice cream, and butter/cream) and insomnia severity. The results reveal that among females who never or rarely consume milk, yogurt, and cheese, 47.5% had severe insomnia, contributing to an overall prevalence of 42.1%. In contrast, those who consume dairy products monthly account for 9.9%, with 9.3% having severe insomnia. Weekly consumers represent 25.2% of the total subjects, with a prevalence of 24.9%, while daily consumers comprise 22.8%, with 18.3% having severe insomnia. A Chi-square test ($p = 0.001$) indicates a significant association, suggesting that higher consumption of dairy products is correlated with lower levels of insomnia severity. Furthermore, existing literature supports the concept

that low calcium intake from dairy products is linked to increased rates of insomnia. For instance, a study conducted in Jordan revealed that 96.5% of university students reported low calcium intake from dairy, corresponding with moderate to severe insomnia in 15.6% of participants (**Alkhatatbeh et al., 2021**). Increasing dietary calcium to recommended levels may alleviate insomnia symptoms, as calcium is vital for melatonin production, a hormone that regulates sleep (**Alkhatatbeh et al., 2021**). Additionally, probiotics found in fermented dairy products, such as yogurt, have the potential to enhance sleep quality by promoting a healthy gut microbiome, which is linked to the gut-brain axis, an important factor in mental health and the regulation of sleep patterns (**Ito et al., 2024; Sridhar, 2024**). Research has demonstrated that probiotic consumption can significantly improve sleep quality, as evidenced by reduced scores on the Pittsburgh Sleep Quality Index and the Insomnia Severity Index (**Ito et al., 2024**). Moreover, a study conducted in Turkey found that improved sleep quality was associated with higher dairy intake, suggesting that sufficient dairy consumption may positively influence sleep quality (**Aslan Çin and Yardimci, 2021**).

In terms of ice cream consumption, individuals who never or rarely consumed, 39.3% had severe insomnia, leading to an overall prevalence of 40.3%. Monthly consumers show a 29.2% incidence, while weekly consumers report 25.3%. In contrast, daily consumers exhibit a significantly lower prevalence of 6.2%. The statistics indicate no significant ($p = 0.836$) relationship between ice cream consumption and insomnia severity. However, it was evident that consuming foods high in added sugars and processed ingredients, including ice cream, has been associated with poorer sleep quality and shorter sleep duration (**Aneesh and Chaganty, 2021; Alahmary et al., 2019**).

Finally, regarding the consumption of butter and cream, individuals who never or

rarely consume these products show a high rate of severe insomnia (65.0%), contributing to an overall prevalence of 58.9%. Monthly consumers account for 9.7%, while weekly and daily consumers have incidences of 18.7% and 6.6%, respectively. A Chi-square test ($p = 0.009$) demonstrates a significant association between increased consumption of butter and cream and lower insomnia severity, suggesting potential benefits for sleep quality. It is important to believe that existing studies have indicated that high saturated fat intake may correlate with poorer sleep quality among female students (**Aslan Çin and Yardimci, 2021**). It is plausible to postulate that participants in our study may consume these products in moderation.

Table 7 shows the relationship between vegetable consumption (fresh vegetables, leafy vegetables, cooked vegetables, onions, and garlic) and insomnia severity.

Among participants who rarely or never consume fresh vegetables, 45.1% had severe insomnia. Those consuming fresh vegetables every week have a moderate prevalence of severe insomnia (23.3%), while daily consumers have a higher prevalence (31.5%). A Chi-square ($p = 0.032$) indicates a statistically significant association between the frequency of fresh vegetable consumption and insomnia severity, suggesting that increased fresh vegetable intake may be an effective strategy to alleviate insomnia symptoms. For females who never or rarely consume cooked vegetables, 37.4% have severe insomnia. Monthly consumers exhibited a low incidence of severe insomnia (5.4%). However, weekly consumers displayed a high prevalence (40.5%), while daily consumers showed a lower prevalence (16.7%). A Chi-square test ($P=0.003$) indicates a significant correlation between the frequency of cooked vegetable consumption and insomnia severity, emphasizing the importance of encouraging cooked vegetable consumption.

Among females who rarely or never consume leafy vegetables, 46.3% have severe insomnia. Conversely, monthly

consumers demonstrated a significantly lower prevalence of severe insomnia (3.9%). Weekly consumers have a prevalence of 30.7%, while those consuming leafy vegetables daily have the lowest severity, with a prevalence of 18.7%. A Chi-square test ($p = 0.017$) provides evidence that increased consumption of leafy vegetables correlates with reduced severity of insomnia. In alignment with our findings, research involving middle-aged Japanese females identified an association between poor sleep quality and low vegetable intake, indicating that higher vegetable consumption may enhance sleep quality (**Katagiri et al., 2014**). Additionally, a study of older Japanese adults suggested that a vegetable-rich diet was associated with fewer insomnia symptoms, supporting the potential benefits of vegetable-rich diets for sleep (**Kinugawa et al., 2023**). Furthermore, research among female university students in Turkey indicated that higher ISI scores correlated with lower vegetable intake, suggesting a relationship between vegetable consumption and decreased insomnia severity (**Aslan Çin and Yardimci, 2021**). Notably, a study revealed that vegetarians had a significantly lower risk of insomnia compared to non-vegetarians (**Gan et al., 2024**).

Among participants who never or rarely consume onions and garlic, 45.1% have severe insomnia. In contrast, monthly consumers have a low incidence (7.0%), while weekly consumers reported a prevalence of 28.4% for severe insomnia. Daily consumers had a lower prevalence (19.5%). A Chi-square test ($P=0.004$) revealed that regular consumption of onions and garlic may decrease insomnia severity. Supporting current results, a study showed that onion extract, rich in cysteine sulfoxides, significantly improved sleep quality by increasing delta power during non-rapid eye movement sleep and reducing sleep latency (**Nakayama et al., 2020**). The extract also lowered salivary α-amylase levels, reflecting reduced stress commonly associated with insomnia (**Nakayama et al., 2020**). While the direct impact of garlic on

sleep quality remains uncertain, its potential anti-inflammatory properties could indirectly contribute to better sleep by enhancing overall health (**Dorant et al., 1995**).

Table 8 shows the correlation between fruit consumption patterns (specifically fresh fruits, dried fruits, and fresh fruit juices) and insomnia severity.

In the never or rare consumption group, 23.0% of females had severe insomnia, representing 21.6% of this cohort. Monthly consumers account for 11.5%, showing steady levels of insomnia severity. Notably, 45.4% of females consume fresh fruits weekly, with 42.0% having severe insomnia. Daily consumers, comprising 21.5% of the sample, exhibit a severe insomnia prevalence of 23.7%. However, the statistical analysis indicates no significant association ($p = 0.091$) between insomnia severity and fresh fruit consumption. Among never or rare consumers, 84.0% have severe insomnia, contributing to an overall prevalence of 80.9%. In contrast, monthly consumers have a severe insomnia rate of 10.1%, while the weekly group shows a prevalence of 5.1%, and daily consumers exhibit a significantly lower rate of 1.9%. The Chi-square test ($p = 0.000$) reveals a highly significant association, providing strong evidence that increased consumption of dried fruits is associated with decreased insomnia severity.

In the never or rare consumption group, 33.5% have severe insomnia, contributing to a total prevalence of 28.6%. Monthly consumers have a prevalence rate of 17.9%, while weekly consumers report 36.6%. Interestingly, the Daily group presents a lower prevalence of 12.1%. The Chi-square test ($p = 0.024$) indicates a significant association, suggesting that higher consumption of fresh juices may correlate with lower insomnia severity. These findings strengthen that increasing fruit and vegetable consumption may help improve sleep quality and eliminate insomnia symptoms (**Jansen et al., 2021; Börnhorst et al., 2015**). The relationship between insomnia and fruit consumption

has emerged as an area of interest, with various studies indicating that certain fruits may have beneficial effects on sleep quality and duration. Notably, research shows that consuming more than two servings of fruits and vegetables daily significantly reduces the prevalence of poor sleep quality and restless sleep (**Pengpid and Peltzer, 2020**). Additionally, diets rich in fiber, whole grains, fruits, and vegetables correlate with better sleep quality and longer sleep duration (**Gangwisch et al., 2020; Zuraikat and St-Onge, 2020**).

Kiwi fruit has been shown to enhance sleep quality and daytime functioning in individuals suffering from chronic insomnia symptoms, attributed to its rich content of antioxidants, flavonoids, carotenoids, and melatonin (**Nødtvedt et al., 2017**). Furthermore, increased consumption of berries, particularly strawberries and blueberries, has been linked to improved sleep quality (**Zhang et al., 2023**). Research has also explored the mechanisms linking fruit consumption with improved sleep. The polyphenol content in fruits is suggested to influence sleep through various pathways, thereby enhancing sleep quality (**Noorwali, 2019**). Notably, berries are of particular interest due to their melatonin content, antioxidants, and essential nutrients (e.g, potassium, vitamin C, calcium, iron, and selenium), all of which have been associated with better sleep quality (**Godos et al., 2020; Zisapel, 2018; Grandner et al., 2014**).

Table 9 examines the relationship between the consumption of various beverages (specifically, coffee, red tea, green tea, relaxing beverages, carbonated, and energy drinks) and insomnia severity.

Among females who never or rarely consume coffee, 26.8% had severe insomnia. This percentage grew to 51.4% among those who consumed coffee daily. However, the statistical analysis indicated no statistically significant association between coffee consumption and insomnia severity (P=0.193). For red tea consumption, 36.6% of females who did not or rarely consume it

had severe insomnia, compared to 48.2% of daily consumers. However, the Chi-square test result (p = 0.486) indicated no significant relationship between red tea consumption and insomnia severity. Moreover, in the case of green tea, 85.2% of females who did not consume it had severe insomnia, whereas only 7.8% of daily consumers had severe insomnia. Also, the Chi-square test (p = 0.337) revealed no significant association between green tea consumption and insomnia severity. Among participants who never or rarely consume relaxing beverages, 59.9% had severe insomnia, while only 10.9% of daily consumers did. Again, the Chi-square test (p = 0.620) suggests no significant association between the consumption of relaxing beverages and insomnia severity. In congruence with our findings, a study on Saudi adults proved that caffeine consumption was not directly associated with sleep disturbances (**Almutairi et al., 2024**). Also, a study in Bandung Islamic University reported no significant relationship between coffee consumption frequency and sleep quality among medical students (**Badiiah et al., 2023**). Besides, **Zhang and Du (2024a)** found no significant association between tea consumption and insomnia. Contrarily, a study on medical interns in the Dominican Republic indicated that individuals who consumed coffee regularly were more likely to suffer from insomnia symptoms, indicating a negative effect of caffeine on sleep quality (**Ogando and Nuñez, 2024**). Also, caffeine consumption has been associated with sleep disturbances in older adults (**van der Linden et al., 2023**). Caffeinated beverages, including coffee and tea, are frequently linked to sleep disturbances (**Marmorstein, 2017**). A systematic review has indicated that low tea intake could facilitate sleep and alleviate stress and anxiety (**Koreki et al., 2025**). Other studies have demonstrated positive effects; for instance, quantitative analyses have shown that tea consumption may be associated with increased sleep duration

(**Zamora et al., 2024). Li et al. (2024)** suggest that tea may protect against developing sleep behavior disorders. Moreover, green tea, which contains few amounts of caffeine, has improved sleep quality (**Unno and Nakamura, 2020**). **Unno and Nakamura (2020)** postulated that the amino acid theanine, which occurs in green tea, may balance the sleep-disrupting effects of caffeine. Also, **Wei et al. (2023)** observed that tea's active ingredients, such as L-theanine and polyphenols, may improve sleep by modulating neurotransmitter activity and the immune system.

As for carbonated beverages and energy drinks, among participants who did not or rarely consume carbonated and energy drinks, 38.1% had severe insomnia, a rate that declined to 23.7% among daily consumers. Although the Chi-square test results ($p = 0.120$) indicate no significant association, but a trend suggests that higher consumption may correlate with increased insomnia severity. In alignment with the trend of present results, a study among college students found that excessive caffeine intake from carbonated beverages and other drinks was significantly associated with poor sleep quality, with 83.3% of students having poor sleep quality linked to high caffeine consumption (**AlSharif et al., 2018**). In their adolescent study, **Marmorstein (2017)** found that energy drink was associated with sleep disturbances. **Khan and Uddin (2020)** reported that adolescents consuming soft drinks three or more times daily had double the odds of having sleep disturbances compared to those with lower consumption. Finally, **Vézina-Im et al. (2024)** demonstrated that consuming caffeinated sweetened beverages, such as energy drinks, was negatively correlated with sleep quality.

Table 10 shows the correlation between the consumption of distinct food categories (fast foods, ketchup, chips, and/or endomi, and processed foods) and insomnia severity. Among participants who rarely or never consumed fast foods, 30.0% had severe insomnia, resulting in an overall prevalence of 33.0%. In the

monthly consumption of females, 16.3% had severe insomnia. The weekly consumption group, consisting of 28.9% of individuals, showed a 28.0% prevalence of severe insomnia. Daily customers, comprising 21.3% of total subjects, indicated a 25.7% incidence of severe insomnia. The Chi-square test results ($p = 0.027$) indicate a statistically significant correlation between fast food consumption and insomnia severity. Increased frequency of fast-food consumption is associated with elevated or severe insomnia. A study on female college students confirmed these findings, revealing that females who consumed more quantities of fast food experienced diminished sleep quality (**Aneesh and Chaganty, 2021**). Likewise, another study indicated that adolescents who regularly ate fast food had anxiety-related sleep difficulties (**Khan and Uddin, 2020; Kruger et al., 2014**). Moreover, two studies demonstrate that adolescents with reduced sleep lengths are more predisposed to consume fast food (**Barreto et al., 2024; Min et al., 2018**). Among those who rarely or never used salad dressing, 43.2% had severe insomnia, resulting in an overall incidence of 49.7%. The monthly consumption group demonstrated a severe insomnia prevalence of 12.5%. In the weekly consumption group, 25.4% had severe insomnia, whereas daily users, representing 12.1% of the total, indicated a severe insomnia prevalence of 17.5%. The Chi-square test ($p = 0.013$) indicates a significant correlation, suggesting that reduced consumption of salad dressing may be associated with improved sleep quality. This observation may demonstrate the impact of many components in dressings, including sugars and food additives, which could negatively impact sleep.

Consuming junk meals, marked by elevated levels of refined carbohydrates and unhealthy fats, has been associated with diminished sleep quality. A study indicated that those with an unhealthy diet had a reduction in sleep quality comparable to those following a

healthier diet (**Brandão et al., 2023; Min et al., 2018**). Moreover, fast food consumption, notably ketchup, has been repeatedly linked to poor sleep quality (**Kasmarini et al., 2023**). Among participants who rarely or never consumed chips and/or instant noodles, 14.8% had severe insomnia, resulting in an overall prevalence of 19.9%. The monthly consumption group exhibited a severe insomnia prevalence of 7.4%. The weekly consumption group constituted 27.7%, with a greater incidence of severe insomnia (30.7%). Daily consumers constituted 44.5%, with the highest prevalence of severe insomnia (47.1%). Despite not achieving significance levels, these findings indicate a potential correlation between higher consumption of chips and/or instant noodles and increased insomnia severity. Chips, a frequently consumed evening snack, may interfere with sleep because of their elevated fat and salt levels. Studies suggest that evening intake of chips may disrupt the body's intrinsic circadian rhythm, possibly resulting in sleep difficulties (**Saidi et al., 2021**). A respective study indicated that the consumption of potato chips before sleep correlated with diminished satisfaction and promoted bloating, adversely affecting sleep quality (**Sanchez et al., 2018**). The consumption of ultra-processed foods, such as chips and instant noodles, has been associated with reduced sleep duration and poor sleep quality in adolescents (**Rocha et al., 2024**).

Among those who rarely or never consumed processed foods, 64.2% reported undergoing severe insomnia, resulting in an overall prevalence of 64.8%. The monthly consumption group exhibited a reduced prevalence of severe insomnia at 12.1%. The weekly consumption group comprised 14.9% of subjects, exhibiting a severe insomnia prevalence of 17.5%. Daily customers constituted 6.9% of the total, with a similar incidence of severe insomnia at 6.2%. Statistical analysis revealed no significant correlation between processed food consumption and insomnia

severity, indicating that processed foods may not considerably affect sleep quality within this population. In contrast to our findings, a study from the Nutri Net-Santé cohort indicated that higher consumption of ultra-processed foods (UPFs) correlated with an increased likelihood of chronic insomnia. They calculated that a 10% rise in UPF intake was associated with a 6% increase in the likelihood of chronic insomnia (**Duquenne et al., 2024**). A study of Brazilian adolescents showed that increased consumption of UPF was associated with a higher incidence of poor sleep quality (**Rocha et al., 2024; Sousa et al., 2020**). A study among teenagers in Korea found that poor sleep quality correlated with increased intake of unhealthy foods, mainly processed items (**Min et al., 2018**). Furthermore, a study conducted in Brazil during the COVID-19 pandemic indicated that those with elevated UPF consumption scores had markedly increased probabilities of suffering poor sleep quality (**de Menezes-Júnior et al., 2022**).

CONCLUSION

The results of this study indicate that elevated BMI correlates with elevated insomnia levels. Moreover, participants who indicated a lower frequency of daily meals demonstrated a higher incidence of severe insomnia than those with more regular eating patterns, implying that consistent food habits may enhance sleep quality. The results reveal a significant relationship between vegetable consumption and insomnia severity, indicating that increased consumption of fresh, cooked, leafy vegetables, onions, and garlic may enhance sleep quality and reduce insomnia among the studied females. Furthermore, the data indicate that an elevated intake of berries, dried fruits, and fresh juices correlates with reduced severe insomnia. The intake of honey is associated with diminished severity of insomnia. While trends suggest a possible correlation between potatoes and nuts and improved sleep quality, these relationships

did not achieve statistical significance. Subsequent analysis indicates substantial associations between milk and dairy product consumption, emphasizing their potential influence on improving sleep quality. In contrast, no significant correlations were found between consuming meat, fish, processed meats, coffee, tea, or relaxing drinks and insomnia severity. Trends indicate that increased consumption of carbonated and energy beverages may correlate with elevated insomnia severity. Prospective research is required to determine the feasibility of targeting dietary patterns to decrease the severity of insomnia. Moreover, those with elevated intake of fast food, ketchup, chips, and similar products exhibit elevated incidences of severe insomnia. Processed foods demonstrated minimal to no effect on sleep quality in the examined population.

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Conflict of Interest

The authors declare that there is no conflict of interest.

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Table 1: Mean±SD of Age and Anthropometric Data Across Four Groups Classified by the Insomnia Severity Index (ISI).

Groups Classified	None (ISI 0-7) (n=179)	Subthreshold (ISI 8-14) (n-333)	Moderate insomnia (ISI 15-21) (n=401)	Severe insomnia (ISI 22-28) (n=257)	ANOVA	
	Mean±SD	Mean±SD	Mean±SD	Mean±SD	f-value	p-value
Age (year)	20.9±1.5	20.9±1.4	20.9±1.3	20.8±1.5	0.13	0.943NS
Weight (kg)	67.9±14.0	66.4±14.3	67.9±15.4	67.9±13.2	0.89	0.448 NS
Height (cm)	163.3±7.9	162.6±7.3	162.6±8.0	163.5±8.0	1.06	0.364 NS
BMI (kg/m2)	25.5±5.1	25.0±4.8	25.6±5.2	25.4±4.5	0.91	0.438 NS

SD: Standard Deviation, NS: Not significant

Table 2: Frequency Distribution of Participants Classified by BMI and their Corresponding ISI Scores.

BMI classification	Insomnia Severity Index (ISI)				
	None (ISI 0-7)	Subthreshold (ISI 8-14)	Moderate insomnia (ISI 15-21)	Severe insomnia (ISI 22-28)	Total
	No (%)	No (%)	No (%)	No (%)	No (%)
Thinness (<16.5 kg/m2)	2(1.1%)	2(0.6%)	2(0.5%)	0(0.0%)	6(0.5%)
Underweight (16.5<18.5 kg/m2)	6(3.4%)	10(3.0%)	13(3.2%)	6(2.3%)	35(3.0%)
Normal weight (18.5 <25.0 kg/m2)	88(49.2%)	177(53.2%)	198(49.4%)	122(47.5%)	585(50.0%)
Overweight (25.0<30.0 kg/m2)	51(28.5%)	99(29.7%)	114(28.4%)	92(35.8%)	356(30.4%)
Obesity (30.0 <40.0 kg/m2)	31(17.3%)	43(12.9%)	69(17.2%)	37(14.4%)	180(15.4%)
Morbid obesity (>40.0 kg/m2)	1(0.6%)	2(0.6%)	5(1.2%)	0(0.0%)	8(0.70%)
Total	179(100%)	333(100%)	401(100%)	257(100%)	1170(100%)

Chi-Square Tests (Value = 13.94, and P=0.530)

Table 3: Frequency distribution of participants classified by number of daily meals and their corresponding ISI scores.

No. of meals	Insomnia Severity Index (ISI)				
	None (ISI 0-7)	Subthreshold (ISI 8-14)	Moderate insomnia (ISI 15-21)	Severe insomnia (ISI 22-28)	Total
	No (%)	No (%)	No (%)	No (%)	No (%)
Less than 2 meals	11(6.1%)	25(7.5%)	44(11.0%)	45(17.5%)	125(10.7%)
Two meals	77(43.0%)	178(53.6%)	219(54.6%)	135(52.5%)	609(52.1%)
Three meals	75(41.9%)	98(29.5%)	105(26.2%)	53(20.6%)	331(28.3%)
More than 3 meals	16(8.9%)	31(9.3%)	33(8.2%)	24(9.3%)	104(8.9%)
Total	179(100%)	332(100%)	401(100%)	257(100%)	1169(100%)

Chi-Square Tests (Value = 39.422a, and P=0.000)

Table 4: Frequency Distribution of Participants Classified by Starchy and Sugary Foods Consumption Pattern (Rare and none, Monthly, Weekly, and Daily) and their Corresponding ISI Scores.

No. of meals	Insomnia Severity Index (ISI)					Chi2 Tests	
	None (ISI 0-7)	Subthreshold (ISI 8-14)	Moderate insomnia (ISI 15-21)	Severe insomnia (ISI 22-28)	Total	Value	Sig.
	Rice and Pasta						
	No (%)	No (%)	No(%)	No(%)	No(%)	8.60	**0.474 NS**
Rare	30(16.8%)	56(16.8%)	77(19.2%)	55(21.4%)	218(18.6%)		
Monthly	5(2.8%)	15(4.5%)	19(4.7%)	14(5.4%)	53(4.5%)		
Weekly	82(45.8%)	141(42.3%)	149(37.2%)	106(41.2%)	478(40.9%)		
Daily	62(34.6%)	121(36.3%)	156(38.9%)	82(31.9%)	421(36.0%)		
Total	179(100%)	333(100%)	401(100%)	257(100%)	1170(100%)		
	Potatoes						
Rare	96(53.6%)	209(62.8%)	259(64.6%)	166(64.6%)	730(62.4%)	16.16	**0.064 NS**
Monthly	31(17.3%)	61(18.3%)	61(15.2%)	45(17.5%)	198(16.9%)		
Weekly	39(21.8%)	37(11.1%)	58(14.5%)	34(13.2%)	168(14.4%)		
Daily	13(7.3%)	26(7.8%)	23(5.7%)	12(4.7%)	74(6.3%)		
Total	179(100%)	333(100%)	401(100%)	257(100%)	1170(100)		
	Sugary foods (e.g. sweets, molasses, and jam)						
Rare	**52(29.1%)**	**85(25.5%)**	**120(29.9%)**	**87(33.9%)**	**344(29.4%)**	**13.12**	**0.157 NS**
Monthly	34(19.0%)	63(18.9%)	96(23.9%)	45(17.5%)	238(20.3%)		
Weekly	57(31.8%)	126(37.8%)	122(30.4%)	77(30.0%)	382(32.6%)		
Daily	369(20.1%)	59(17.7%)	63(15.7%)	48(18.7%)	206(17.6%)		
Total	179(100%)	333(100%)	401(100%)	257(100%)	1170(100%)		
	Honey						
Rare	94(52.5%)	180(54.1%)	256(63.8%)	168(65.4%)	698(59.7%)	23.73	**0.005 ****
Monthly	19(10.6%)	49(14.7%)	37(9.2%)	35(13.6%)	140(12.0%)		
Weekly	36(20.1%)	52(15.6%)	62(15.5%)	26(10.1%)	176(15.0%)		
Daily	30(16.8%)	52(15.6%)	46(11.5%)	28(10.9%)	156(13.3%)		
Total	179(100%)	333(100%)	401(100%)	257(100%)	1170(100%)		

Con. Table 4

	Chocolate						
Rare	91(50.8%)	159(47.7%)	232(57.9%)	129(50.2%)	611(52.2%)	12.23	0.201 NS
Monthly	38(21.2%)	66(19.8%)	62(15.5%)	40(15.6%)	206(17.6%)		
Weekly	37(20.7%)	79(23.7%)	81(20.2%)	63(24.5%)	260(22.2%)		
Daily	13(7.3%)	29(8.7%)	26(6.5%)	25(9.7%)	93(7.9%)		
Total	179(100%)	333(100%)	401(100%)	257(100%)	1170(100%)		
	Nuts						
Rare	117(65.4%)	219(65.8%)	280(69.8%)	199(77.4%)	815(69.7%)	14.78	0.097 NS
Monthly	26(14.5%)	56(16.8%)	63(15.7%)	32(12.5%)	177(15.1%)		
Weekly	26(14.5%)	45(13.5%)	42(10.5%)	21(8.2%)	134(11.5%)		
Daily	10(5.6%)	13(3.9%)	16(4.0%)	5(1.9%)	44(3.8%)		
Total	179(100%)	333(100%)	401(100%)	257(100%)	1170(100%)		

^{NS} *Not Significant, ** P<0.01*

Table 5: Frequency Distribution of Participants Classified by Meats and Fish Consumption Pattern (Rare and none, Monthly, Weekly, and Daily) and their Corresponding ISI Scores.

No. of meals	Insomnia Severity Index (ISI)					Chi2 Tests	
	None (ISI 0-7)	Subthreshold (ISI 8-14)	Moderate insomnia (ISI 15-21)	Severe insomnia (ISI 22-28)	Total	Value	Sig.
	Meats (Red meats, Organ meats, and Chicken)						
	No(%)	No(%)	No(%)	No(%)	No(%)		
Rare	8(4.5%)	25(7.5%)	42(10.5%)	26(10.1%)	101(8.6%)	10.55	0.307 NS
Monthly	6(3.4%)	14(4.2%)	17(4.2%)	15(5.8%)	52(4.4%)		
Weekly	108(60.3%)	201(60.4%)	219(54.6%)	146(56.8%)	674(57.6%)		
Daily	57(31.8%)	93(27.9%)	123(30.7%)	70(27.2%)	343(29.3%)		
Total	179(100%)	333(100%)	401(100%)	257(100%)	1170(100%)		
	Eat fish (all kinds)						
Rare	40(22.3%)	90(27.0%)	126(31.4%)	83(32.3%)	339(29.0%)	12.79	0.172 NS
Monthly	40(22.3%)	95(28.5%)	95(23.7%)	63(24.5%)	293(25.0%)		
Weekly	93(52.0%)	135(40.5%)	163(40.6%)	103(40.1%)	494(42.2%)		
Daily	6(3.4%)	13(3.9%)	17(4.2%)	8(3.1%)	44(3.8%)		
Total	179(100%)	333(100%)	401(100%)	257(100%)	1170(100%)		
	Eat processed meats (e.g., luncheon... etc.)						
Rare	103(57.5%)	204(61.3%)	237(59.1%)	156(60.7%)	700(59.8%)	4.599	0.868 NS
Monthly	29(16.2%)	66(19.8%)	73(18.2%)	49(19.1%)	217(18.5%)		
Weekly	33(18.4%)	45(13.5%)	65(16.2%)	37(14.4%)	180(15.4%)		
Daily	14(7.8%)	18(5.4%)	26(6.5%)	15(5.8%)	73(6.2%)		
Total	179(100%)	333(100%)	401(100%)	257(100%)	1170(100%)		

^{NS} *Not Significant*

Table 6: Frequency Distribution of Participants Classified by Milk and Dairy Products Consumption Pattern (Rare and none, Monthly, Weekly, and Daily) and their Corresponding ISI Scores.

No. of meals	Insomnia Severity Index (ISI)					Chi2 Tests	
	None (ISI 0-7)	Subthreshold (ISI 8-14)	Moderate insomnia (ISI 15-21)	Severe insomnia (ISI 22-28)	Total	Value	Sig.
	Milk, yoghurt, and cheese						
	No(%)	No(%)	No(%)	No(%)	No(%)		
No/Rare	58(32.4%)	124(37.2%)	188(46.9%)	122(47.5%)	492(42.1%)	27.58	0.001 **
Monthly	16(8.9%)	36(10.8%)	40(10.0%)	24(9.3%)	116(9.9%)		
Weekly	43(24.0%)	91(27.3%)	97(24.2%)	64(24.9%)	295(25.2%)		
Daily	62(34.6%)	82(24.6%)	76(19.0%)	47(18.3%)	267(22.8%)		
Total	179(100%)	333(100%)	401(100%)	257(100%)	1170(100%)		
Ice cream							
Rare	69(38.5%)	126(37.8%)	176(43.9%)	101(39.3%)	472(40.3%)	4.978	0.836 NS
Monthly	52(29.1%)	96(28.8%)	111(27.7%)	75(29.2%)	334(28.5%)		
Weekly	44(24.6%)	92(27.6%)	91(22.7%)	65(25.3%)	292(25.0%)		
Daily	14(7.8%)	19(5.7%)	23(5.7%)	16(6.2%)	72(6.2%)		
Total	179(100%)	333(100%)	401(100%)	257(100%)	1170(100%)		
Butter and cream							
Rare	96(53.6%)	176(52.9%)	250(62.3%)	167(65.0%)	689(58.9%)	21.94	0.009 **
Monthly	25(14.0%)	58(17.4%)	44(11.0%)	25(9.7%)	152(13.0%)		
Weekly	35(19.6%)	69(20.7%)	82(20.4%)	48(18.7%)	234(20.0%)		
Daily	23(12.8%)	30(9.0%)	25(6.2%)	17(6.6%)	95(8.1%)		
Total	179(100%)	333(100%)	401(100%)	257(100%)	1170(100%)		

*NS Not Significant, ** P<0.01*

Table 7: frequency distribution of participants classified by vegetable consumption pattern (rare and none, monthly, weekly, and daily) and their corresponding ISI scores.

No. of meals	Insomnia Severity Index (ISI)					Chi2 Tests	
	None (ISI 0-7)	Subthreshold (ISI 8-14)	Moderate insomnia (ISI 15-21)	Severe insomnia (ISI 22-28)	Total	Value	Sig.
	Fresh vegetables						
	No (%)	No (%)	No (%)	No (%)	No (%)	18.3	0.032 *
Rare	61(34.1%)	125 (37.5%)	171(42.6%)	116 (45.1%)	473 (40.4%)		
Monthly	2(1.1%)	2 (0.6%)	8(2.0%)	0(0.0%)	12(1.0%)		
Weekly	36(20.1%)	78(23.4%)	80(20.0%)	60(23.3%)	254(21.7%)		
Daily	80(44.7%)	128(38.4%)	142(35.4%)	81(31.5%)	431(36.8%)		
Total	179(100%)	333(100%)	401(100%)	257(100%)	1170(100%)		
	Leafy vegetables						
Rare	62(34.60%)	133(39.9%)	194(48.4%)	119(46.3%)	508(43.4%)	20.1	0.017 *
Monthly	6(3.4%)	10(3.0%)	19(4.7%)	11(4.3%)	46(3.9%)		
Weekly	61(34.1%)	109(32.7%)	123(30.7%)	79(30.7%)	372(31.8%)		
Daily	50(27.9%)	81(24.3%)	65(16.2%)	48(18.7%)	244(20.9%)		
Total	179(100%)	333(100%)	401(100%)	257(100%)	1170(100%)		
	Cooked vegetables						
Rare	43(24.0%)	79(23.7%)	133(33.2%)	96(37.4%)	351(30.0%)	25.4	0.003 **
Monthly	8(4.5%)	13(3.9%)	19(4.7%)	14(5.4%)	54(4.6%)		
Weekly	77(43.0%)	160(48.0%)	176(43.9%)	104(40.5%)	517(44.2%)		
Daily	51(28.5%)	81(24.3%)	73(18.2%)	43(16.7%)	248(21.2%)		
Total	179(100%)	333(100%)	401(100%)	257(100%)	1170(100%)		
	Onions and garlic						
Rare	52(29.1%)	140(42.0%)	189(47.1%)	116(45.1%)	497(42.5%)	24.4	0.004 **
Monthly	14(7.8%)	10(3.0%)	20(5.0%)	18(7.0%)	62(5.3%)		
Weekly	66(36.9%)	112(33.6%)	112(27.9%)	73(28.4%)	363(31.0%)		
Daily	47(26.3%)	71(21.3%)	80(20.0%)	50(19.5%)	248(21.2%)		
Total	179(100%)	333(100%)	401(100%)	257(100%)	1170(100%)		

** P<0.05, ** P<0.01*

Table 8: frequency distribution of participants classified by fruit consumption pattern (rare and none, monthly, weekly, and daily) and their corresponding ISI scores.

No. of meals	Insomnia Severity Index (ISI)					Chi2 Tests	
	None (ISI 0-7)	Subthreshold (ISI 8-14)	Moderate insomnia (ISI 15-21)	Severe insomnia (ISI 22-28)	Total	Value	Sig.
	Fresh fruits (e.g. citrus, grapes, banana, pomegranate, melons, and berries)						
	No(%)	No(%)	No(%)	No(%)	No(%)	14.9	0.091 NS
Rare	27(15.1%)	64(19.2%)	103(25.7%)	59(23.0%)	253(21.6%)		
Monthly	24(13.4%)	38(11.4%)	44(11.0%)	29(11.3%)	135(11.5%)		
Weekly	91(50.8%)	167(50.2%)	165(41.1%)	108(42.0%)	531(45.4%)		
Daily	37(20.7%)	64(19.2%)	89(22.2%)	61(23.7%)	251(21.5%)		
Total	179(100%)	333(100%)	401(100%)	257(100%)	1170(100%)		
	Dried fruits (i.e, apricots, figs, etc)						
Rare	126(70.4%)	263(79.0%)	342(85.3%)	216(84.0%)	947(80.9%)	32.93	0.000 ***
Monthly	26(14.5%)	30(9.0%)	39(9.7%)	23(8.9%)	118(10.1%)		
Weekly	21(11.7%)	25(7.5%)	9(2.2%)	13(5.1%)	68(5.8%)		
Daily	6(3.4%)	15(4.5%)	11(2.7%)	5(1.9%)	37(3.2%)		
Total	179(100%)	333(100%)	401(100%)	257(100%)	1170(100%)		
	Drink fresh fruits juices						
Rare	41(22.9%)	81(24.3%)	127(31.7%)	86(33.5%)	335(28.6%)	19.17	0.024 *
Monthly	37(20.7%)	63(18.9%)	85(21.2%)	46(17.9%)	231(19.7%)		
Weekly	65(36.3%)	141(42.3%)	145(36.2%)	94(36.6%)	445(38.0%)		
Daily	36(20.1%)	48(14.4%)	44(11.0%)	31(12.1%)	159(13.6%)		
Total	179(100%)	333(100%)	401(100%)	257(100%)	1170(100%)		

*NS Not Significant, *P<0.05, *** P<0.001*

Table 9: Frequency Distribution of Participants Classified by Drinks Consumption Pattern (Rare and none, Monthly, Weekly, and Daily) and their Corresponding ISI Scores.

No. of meals	Insomnia Severity Index (ISI)					Chi2 Tests	
	None (ISI 0-7)	Subthreshold (ISI 8-14)	Moderate insomnia (ISI 15-21)	Severe insomnia (ISI 22-28)	Total	Value	Sig.
	Coffee (All kinds)						
	No(%)	No(%)	No(%)	No(%)	No(%)	12.37	0.193 NS
Rare	57(31.8%)	118(35.4%)	123(30.7%)	69(26.8%)	367(31.4%)		
Monthly	10(5.6%)	19(5.7%)	27(6.7%)	16(6.2%)	72(6.2%)		
Weekly	31(17.3%)	68(20.4%)	64(16.0%)	40(15.6%)	203(17.4%)		
Daily	81(45.3%)	128(38.4%)	187(46.6%)	132(51.4%)	528(45.1%)		
Total	179(100%)	333(100%)	401(100%)	257(100%)	1170(100%)		
	Red tea						
Rare	74(41.3%)	133(39.9%)	145(36.2%)	94(36.6%)	446(38.1%)	8.485	0.486 NS
Monthly	5(2.8%)	10(3.0%)	11(2.7%)	5(1.9%)	31(2.6%)		
Weekly	13(7.3%)	42(12.6%)	60(15.0%)	34(13.2%)	149(12.7%)		
Daily	87(48.6%)	148(44.4%)	185(46.1%)	124(48.2%)	544(46.5%)		
Total	179(100%)	333(100%)	401(100%)	257(100%)	1170(100%)		
	Green tea						
Rare	151(84.4%)	288(86.5%)	347(86.5%)	219(85.2%)	1005(85.9%)	10.17	0.337 NS
Monthly	3(1.7%)	9(2.7%)	14(3.5%)	6(2.3%)	32(2.7%)		
Weekly	17(9.5%)	20(6.0%)	21(5.2%)	12(4.7%)	70(6.0%)		
Daily	8(4.5%)	16(4.8%)	19(4.7%)	20(7.8%)	63(5.4%)		
Total	179(100%)	333(100%)	401(100%)	257(100%)	1170(100%)		
	Relaxing beverages						
Rare	101(56.4%)	206(61.9%)	237(59.1%)	154(59.9%)	698(59.7%)	7.169	0.620 NS
Monthly	23(12.8%)	44(13.2%)	65(16.2%)	36(14.0%)	168(14.4%)		
Weekly	36(20.1%)	48(14.4%)	68(17.0%)	39(15.2%)	191(16.3%)		
Daily	19(10.6%)	35(10.5%)	31(7.7%)	28(10.9%)	113(9.7%)		
Total	179(100%)	333(100%)	401(100%)	257(100%)	1170(100%)		
	Carbonated and energy drinks						
Rare	78(43.6%)	126(37.8%)	162(40.4%)	98(38.1%)	464(39.7%)	14.05	0.120 NS
Monthly	30(16.8%)	50(15.0%)	51(12.7%)	31(12.1%)	162(13.8%)		
Weekly	45(25.1%)	105(31.5%)	123(30.7%)	67(26.1%)	340(29.1%)		
Daily	26(14.5%)	52(15.6%)	65(16.2%)	61(23.7%)	204(17.4%)		
Total	179(100%)	333(100%)	401(100%)	257(100%)	1170(100%)		

^{NS} *Not Significant*

Table 10: Frequency Distribution of Participants Classified by Miscellaneous Consumption Pattern (Rare and none, Monthly, Weekly, and Daily) and their Corresponding ISI Scores.

	Insomnia Severity Index (ISI)					Chi² Tests	
	None (ISI 0-7)	Subthreshold (ISI 8-14)	Moderate insomnia (ISI 15-21)	Severe insomnia (ISI 22-28)	Total	Value	Sig.
	Fast foods						
	No (%)	No (%)	No (%)	No (%)	No (%)		
Rare	79(44.1%)	112(33.6%)	118(29.4%)	77(30.0%)	386(33.0%)	18.75	0.027 *
Monthly	23(12.8%)	62(18.6%)	70(17.5%)	42(16.3%)	197(16.8%)		
Weekly	45(25.1%)	89(26.7%)	132(32.9%)	72(28.0%)	338(28.9%)		
Daily	32(17.9%)	70(21.0%)	81(20.2%)	66(25.7%)	249(21.3%)		
Total	179(100%)	333(100%)	401(100%)	257(100%)	1170(100%)		
	Dressing (ketchup, sauce, mayonnaise, etc.)						
Rare	94(52.5%)	172(51.7%)	205(51.1%)	111(43.2%)	582(49.7%)	20.858	0.013 *
Monthly	20(11.2%)	54(16.2%)	44(11.0%)	32(12.5%)	150(12.8%)		
Weekly	49(27.4%)	68(20.4%)	111(27.7%)	69(26.8%)	297(25.4%)		
Daily	16(8.9%)	39(11.7%)	41(10.2%)	45(17.5%)	141(12.1%)		
Total	179(100%)	333(100%)	401(100%)	257(100%)	1170(100%)		
	Chips and/or endomi						
Rare	51(28.5%)	70(21.0%)	74(18.5%)	38(14.8%)	233(19.9%)	14.92	0.093 NS
Monthly	15(8.4%)	23(6.9%)	35(8.7%)	19(7.4%)	92(7.9%)		
Weekly	42(23.5%)	92(27.6%)	111(27.7%)	79(30.7%)	324(27.7%)		
Daily	71(39.7%)	148(44.4%)	181(45.1%)	121(47.1%)	521(44.5%)		
Total	179(100%)	333(100%)	401(100%)	257(100%)	1170(100%)		
	Processed foods						
Rare	118(65.9%)	213(64.0%)	262(65.3%)	165(64.2%)	758(64.8%)	6.822	0.656 NS
Monthly	30(16.8%)	48(14.4%)	48(12.0%)	31(12.1%)	157(13.4%)		
Weekly	20(11.2%)	46(13.8%)	63(15.7%)	45(17.5%)	174(14.9%)		
Daily	11(6.1%)	26(7.8%)	28(7.0%)	16(6.2%)	81(6.9%)		
Total	179(100%)	333(100%)	401(100%)	257(100%)	1170(100%)		

*NS Not Significant, *P<0.05, *** P<0.001*

العلاقة بين الأرق ونمط الغذاء لدى الفتيات المصريات: دراسة ميدانية

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يُعرَّف الأرق، الذي يتميز بصعوبة النوم أو الحفاظ عليه، كواحد من اضطرابات النوم السائدة التي تؤثر على 10-30% من البالغين عالميًا. هدفت هذه الدراسة الميدانية إلى تحديد العلاقة بين استهلاك الطعام وشدة الأرق بين طالبات الجامعات من الإناث. تم اجراء الدراسة على عدد 1,170 طالبة تتراوح أعمارهن بين 20 و23 عامًا من جامعتي المنوفية وبنها. تم جمع بيانات الدراسة باستخدام استبيانات وطريقة المقابلات وجهاً لوجه. بدأت الدراسة في أكتوبر 2023 واستمرت حتى مايو 2024. تم استخدام استبيان تكرارية استهلاك الأطعمة لجمع بيانات حول أنماط تناول الطعام، حيث تم تصنيف الطعام إلى سبع مجموعات رئيسية (الخضروات، الفواكه، الأطعمة النشوية، منتجات الألبان، اللحوم، المشروبات، والأطعمة المتنوعة). استخدمت الدراسة مؤشر شدة الأرق (ISI) لتصنيف المشاركات، وهو يتكون من سبعة عناصر، لكل عنصر منها مقياس يمتد من 0 إلى 4، مع إجمالي النقاط يتراوح بين 0 و28. أظهرت النتائج أن 56.2% من المشاركات في هذه الدراسة يعانين من أرق متوسط أو شديد. كان مؤشر شدة الأرق (ISI) أقل بين المشاركات اللواتي يتناولن ثلاث وجبات يوميًا. ساعد تناول العسل والمكسرات والبطاطس والحليب ومنتجات الألبان والخضروات والبصل والثوم والفواكه المجففة والعصائر الطازجة في تخفيف شدة الأرق. بينما كانت هناك علاقة طردية بين استهلاك المشروبات الغازية ومكملات الطاقة والطعام السريع والصلصة والكاتشب والشبس وزيادة معدلات الأرق الشديد. لم يؤثر استهلاك الأطعمة مثل الأرز والمعكرونة والأطعمة الحلوة والشوكولاتة واللحوم والآيس كريم والفواكه الطازجة والقهوة والشاي الأخضر والأحمر والمشروبات المهدئة والأطعمة المصنعة بشكل كبير على جودة النوم. بناءً على ذلك، خلصت الدراسة إلى أن الأنماط الغذائية لها تأثير واضح على جودة النوم بين طالبات الجامعات من الإناث.

الكلمات المفتاحية: *منتجات الألبان، الطعام السريع، الفواكه، اللحوم، النوم، الخضروات*