Health & Medical Sciences Volume: 3, Number 2, 2026, *Page*: 1-8

Sleep Quality and Junk Food Consumption in Relation to Body Mass Index Among Medical Students at Universitas Muhammadiyah Yogyakarta

Muhammad Akmal Pramono, Zulkhah Noor*

Universitas Muhammadiyah Yogyakarta

DOI:
https://doi.org/10.47134/phms.v3i2.584
*Correspondence: Zulkhah Noor
Email: zulkhah.noor@umy.ac.id

Received: 22-12-2025
Accepted: 22-01-2026
Published: 22-02-2026

Abstract: This study sought to investigate the correlation between sleep quality and the frequency of junk food consumption with body mass index (BMI) among medical students at Universitas Muhammadiyah Yogyakarta (UMY). A quantitative cross-sectional study was executed via purposive sampling of medical students from the 2020–2022 cohorts. An online questionnaire was used to collect data on the respondents' characteristics, their self-reported weight and height (to calculate BMI), their sleep quality (using the Pittsburgh Sleep Quality Index), and how often they ate junk food (using a food frequency questionnaire). Separate correlation studies were conducted for men and women. There was no significant link between sleep quality and BMI in either males (p=0.502) or women (p=0.118). The frequency of junk food consumption did not show a significant correlation with BMI in women (p=0.292). For men, the frequency of junk food consumption had a strong positive link with BMI (r=0.490, p=0.008). In conclusion, sleep quality did not connect with BMI in either gender; nevertheless, increased junk food consumption was linked to a higher BMI exclusively among male students.

Keywords: Body Mass Index, Junk Food Consumption, Sleep Quality

Introduction

Obesity is becoming acknowledged as a significant public health issue due to its association with heightened risks of cardiometabolic diseases and early mortality; nonetheless, it is frequently undervalued in everyday contexts. According to the 2018 national health survey in Indonesia, 21.8% of individuals (≥18 years) were obese (Kementerian Kesehatan, 2018). Similar concerns have been observed in medical student populations, where elevated academic pressures and lifestyle modifications may heighten susceptibility to unhealthy weight trajectories; for instance, a study in Kerala, India indicated obesity and overweight prevalences of 25.71% and 24.57%, respectively (Manojan et al, 2019). Even while national programs like the Gerakan Nusantara Tekan Angka Obesitas (GENTAS) have been started, they would not have much of an effect unless they are paired with targeted, context-specific strategies that deal with behavioral drivers in high-risk populations (Kementerian Kesehatan Republik Indonesia, 2017).

Significantly, nutritional issues among medical students extend beyond overweight and obesity. Underweight continues to be clinically significant, with a prevalence of 10.9% recorded among medical students (Jannah et al, 2015). Even though being underweight is not as common as being overweight, it can nevertheless make it harder to be physically active and think clearly, which can affect performance in difficult academic settings (Papotot et al, 2021). Consequently, comprehending the determinants of body mass index (BMI) over the entire range of dietary status is crucial.

Many people think that sleep is one aspect that may be changed that affects body weight. Good sleep helps the body heal and work well during the day, but medical students often don't get enough sleep since they study at night, take tests often, and have other obligations (Ali et al, 2013). Nonetheless, the research connecting sleep and BMI is not entirely coherent. Some research indicate that inadequate sleep may facilitate weight gain via appetite-related hormonal alterations specifically, decreased leptin (satiety signaling) and elevated ghrelin (hunger signaling) potentially leading to increased food consumption (Marfuah et al, 2016). Conversely, alternative data suggest that identified relationships may diminish when considering confounding variables such as stress, physical activity, and food habits, showing that sleep may not function as an independent predictor of BMI across all contexts.

Dietary habits, especially the regular intake of energy-dense, nutrient-deficient "junk food," are commonly linked to obesity in adolescents and young adults (Poudel, 2018). Fast food intake seems to be frequent among medical students. Shree et al. found that most students ate fast food once or twice a week, and a significant minority ate it more often (Shree et al, 2018). Nonetheless, the associations between junk food consumption and BMI may fluctuate among populations and by sex, possibly because to variations in overall caloric intake, activity patterns, and reporting behaviors. Due to these concerns and the scant data in Indonesian medical student contexts, this study sought to investigate the correlation between sleep quality and the frequency of junk food consumption with BMI among medical students at Universitas Muhammadiyah Yogyakarta.

Methodology

This quantitative study used a cross-sectional design and was conducted over three months among active medical students in the Universitas Muhammadiyah Yogyakarta (UMY) Medical Study Program from the 2020–2022 cohorts. Participants were recruited using purposive sampling and completed an online questionnaire that collected respondent characteristics and self-reported weight and height to calculate body mass index (BMI), assessed sleep quality using the Pittsburgh Sleep Quality Index (PSQI), and measured the frequency of junk food consumption using a Food Frequency Questionnaire (FFQ). BMI was calculated as weight (kg) divided by height squared (m^2), while PSQI and FFQ responses were scored according to the study protocol. Data were analyzed using IBM SPSS Statistics with Spearman's rank correlation to examine the associations between sleep quality and BMI and between junk food consumption frequency and BMI, with analyses conducted by

sex and statistical significance set at $p<0.05$. The questionnaire materials, scoring and coding protocol, de-identified dataset, and SPSS analysis steps are available from the corresponding author upon reasonable request, with access provided for research purposes while protecting participant confidentiality.

Result and Discussion

Table 1. Respondents' characteristic

	Male	Female
Body mass index		
Below	7.30%	13.40%
Normal	31.70%	60.80%
Overweight	17%	15.40%
Obesity 1	31.70%	9.20%
Obesity 2	12.20%	1%
Junk food consumption		
Often	31.70%	20.60%
Seldom	68.30%	79.40%
Sleep quality		
Good	19.50%	20.60%
Poor	80.50%	79.40%

Table 1 showed that male students are more prone to being in higher BMI categories, which means they are more likely to have too much body weight than female students, who are mostly in the normal range but are slightly more likely to be underweight. This is in line with the behavioral profile in the same table, which shows that men eat junk food more often. This could be because they are more likely to be around foods that are rich in calories and can make them gain weight. Most women, on the other hand, say they don't eat junk food very often, which may help explain why this group has a higher average BMI. Sleep quality seems to be a common issue rather than a distinguishing characteristic between genders, as inadequate sleep is prevalent in both groups; this suggests that sleep-related problems may be widespread among medical students, while variations in BMI are more likely associated with dietary habits or other lifestyle factors rather than sleep alone.

Descriptively, males showed a higher proportion in overweight and obesity categories (Obesity 1: 31.7%; Obesity 2: 12.2%) than females (Obesity 1: 9.2%; Obesity 2: 1.0%), while females were predominantly in the normal BMI range (60.8%) and slightly more often underweight (13.4% vs 7.3%). Frequent junk food intake was reported more often by males (31.7%) than females (20.6%), whereas poor sleep quality was similarly prevalent in both groups (males 80.5%; females 79.4%). In bivariate analysis, sleep quality was not significantly associated with BMI in females ($p=0.118$) or males ($p=0.502$), and junk food frequency was not significantly associated with BMI in females ($p=0.292$); however, among males, junk food frequency showed a significant positive correlation with BMI category ($p=0.008$; $r=0.409$).

Discussion

Overall, this study found a higher prevalence of above-normal BMI among male students than normal BMI, whereas female students were predominantly in the normal BMI category. This pattern may relate to differences in body-image awareness and eating-related behaviors, as women tend to pay more attention to body weight, body shape, and dietary habits than men. Women are also more likely to engage in weight-control practices such as dieting, exercising, self-induced vomiting, and the use of laxatives (Kuan et al, 2011). Consistent with this behavioral profile, frequent junk food consumption in the present study was more common among males than females. Previous evidence suggests that women tend to consume junk food less often, partly because they believe unhealthy foods can lead to unpleasant physical effects or illness (Bärebring et al, 2020). In addition, the high academic workload and demands faced by medical students may contribute to irregular eating patterns and greater reliance on fast, convenient foods, including junk food (V et al, 2018).

Regarding sleep, poor sleep quality was highly prevalent in both males and females, indicating that sleep problems may be widespread among medical students. Although Jin et al. reported that male students tended to have better subjective sleep quality, longer sleep duration, and shorter sleep latency than female students (Jin et al, 2014), the current findings suggest that inadequate sleep affects both groups similarly. The low proportion of students with good sleep quality may be related to lifestyle factors such as insufficient physical activity. Exercise can reduce muscle tension related to stress and promote psychological calm and comfort, which may support better sleep (Hargens et al, 2013). Moreover, the heavy academic burden in medical education often requires students to study for extended periods, which can disrupt sleep quality (Azad et al, 2015). Students may also sleep late because nighttime is frequently used to complete numerous assignments (Gunanthi & Diniari, 2016).

In the bivariate analysis, sleep quality was not significantly associated with BMI in either female or male students. This aligns with findings by Bebasari & Ernalia, who reported no significant relationship between sleep quality and obesity among medical students in Riau (Bebasari & Ernalia, 2015). The absence of a significant association in the present study may reflect the influence of other determinants of BMI such as lifestyle, overall dietary intake, stress, and physical activity that were not examined and therefore represent study limitations (Jha et al, 2021). For instance, medical students particularly those who are underweight or overweight may be more vulnerable to stress symptoms (Jbir et al, 2023). Stress can increase preferences for high-fat and high-sugar foods, potentially elevating BMI (Gibson, 2012). Conversely, in some individuals, stress may suppress appetite through increased corticotropin-related pathways, leading to weight loss and lower BMI (Rahmawati, 2020). Low physical activity may also reduce basal metabolism, contributing to increased fat accumulation and enlargement of adipose cells (Darwin, 2019). Additionally, this study did not assess bedroom lighting during sleep. Light exposure can affect brain activity, impair deep sleep, disrupt circadian rhythms, and reduce melatonin secretion, making it harder to fall and stay asleep. A prior study also reported that some

women with obesity slept with lights on and experienced an average weight gain of approximately 5 kg over one year (Park et al, 2019).

For junk food consumption, our findings were consistent with research among junior high school adolescents, which reported no significant relationship between junk food consumption and nutritional status (Suryani et al, 2020). However, among male students, junk food consumption showed a statistically significant association with BMI. Among females, those who rarely consumed junk food tended to have a higher prevalence of normal BMI than other BMI categories. This may reflect the role of additional factors influencing BMI, such as physical activity, nutrition education, nutritional knowledge, food availability, and sociocultural influences (Annisa et al, 2022). Students with better knowledge about junk food may be more likely to avoid or reduce consumption because of awareness that its nutritional quality is generally unfavorable (Santosa & Imelda, 2022). In contrast, among males, a higher prevalence of elevated BMI even in those reporting rare junk food consumption suggests that other dietary sources particularly high carbohydrate intake may contribute to weight status, especially if not balanced with regular exercise. Excess carbohydrate intake (e.g., exceeding approximately 290–310 g/day) has been linked to a higher likelihood of overweight and obesity (Merchant et al, 2009). When carbohydrate intake exceeds storage capacity, glycogen stores become saturated and excess carbohydrate is converted into fat (Gillespie, 2021) (Reynolds et al, 2019).

Conclusion

This study found clear differences in BMI between male and female medical students at Universitas Muhammadiyah Yogyakarta. Males had a higher prevalence of overweight (17.0%), obesity I (31.7%), and obesity II (12.2%) compared to females (15.4%, obesity I 9.2%, obesity II 1.0%). Conversely, females mostly presented with a normal BMI (60.8%) and were slightly more likely to be underweight (13.4% versus 7.3%). Poor sleep quality was common in both groups (80.5% of males and 79.4% of females) and had nothing to do with BMI (females $p = 0.118$; men $p = 0.502$). Men ate more junk food (31.7% vs. 20.6%), and there was a positive link between junk food and BMI in men ($p = 0.008$; $r = 0.409$) but not in women ($p = 0.292$). In practice, student programs should prioritize sleep health support for all students and dietary interventions for males. Future research should employ longitudinal designs and encompass total dietary intake, physical activity, stress, and sleep duration to elucidate the determinants of BMI.

References

Ali, A., Majeed, M. B., Saba, K., Bodenarain, A., & Bukhari, M. H. (2013). Effects of different sleeping patterns on academic performance in medical school students. *Natural Science*, *05*(11), 1193–1198. https://doi.org/10.4236/ns.2013.511146

Annisa, M., Atmadja, T. F. A.-G., & Susilowati, P. E. (2022). Tingkat pengetahuan dan kebiasaan konsumsi junk food dengan status gizi pada mahasiswa Program Studi Gizi Universitas Siliwangi. *Nutrition Scientific Journal*, *1*(1), 21–29. https://doi.org/10.37058/nsj.v1i1.5804

Azad, M. C., Fraser, K., Rumana, N., Abdullah, A. F., Shahana, N., Hanly, P. J., & Turin, T. C. (2015). Sleep Disturbances among Medical Students: A Global Perspective. *Journal of Clinical Sleep Medicine : JCSM : Official Publication of the American Academy of Sleep Medicine*, *11*(1), 69–74. https://doi.org/10.5664/jcsm.4370

Bärebring, L., Palmqvist, M., Winkvist, A., & Augustin, H. (2020). Gender differences in perceived food healthiness and food avoidance in a Swedish population-based survey: A cross sectional study. *Nutrition Journal*, *19*(1), 140. https://doi.org/10.1186/s12937-020-00659-0

Bebasari, E., & Ernalia, Y. (2015). *Hubungan Kualitas Tidur dengan Obesitas Mahasiswa Fakultas Kedokteran Universitas Riau Angkatan 2014*. https://www.neliti.com/publications/186018/

Chandra, S. (2018). Junk Food Eating Habits and Obesity among Medical College Students in Bangalore: A Cross-Sectional Study. *National Journal of Community Medicine*, *9*(02), 100–105.

Darwin, D. (2019). Perbandingan Laju Metabolisme Basal Menurut Status Berat Badan Atlet Karate Kota Makassar. https://eprints.unm.ac.id/12575/

Gibson, E. L. (2012). The psychobiology of comfort eating: Implications for neuropharmacological interventions. *Behavioural Pharmacology*, *23*(5 and 6), 442–460. https://doi.org/10.1097/FBP.0b013e328357bd4e

Gillespie, J. (2021). "You Are What You Eat": The Role of Dietary Macronutrients and Micronutrients in MAFLD. *Clinical Liver Disease*, *18*(2), 67–71. https://doi.org/10.1002/cld.1083

Gunanthi, N. M. W. W. M., & Diniari, N. K. S. (2016). Prevalensi Dan Gambaran Gangguan Tidur Berdasarkan Karakteristik Mahasiswa Semester I Program Studi Pendidikan Dokter Fakultas Kedokteran Universitas Udayana Tahun 2015. *Jurnal Harian Regional*. https://jurnal.harianregional.com/eum/id-19967

Hargens, T., Kaleth, Edwards, & Butner. (2013). Association between sleep disorders, obesity, and exercise: A review. *Nature and Science of Sleep*, 27. https://doi.org/10.2147/NSS.S34838

Jannah, W., Bebasari, E., & Ernalia, Y. (2015). Profil Status Gizi Mahasiswa Fakultas Kedokteran Universitas Riau Angkatan 2012 Dan 2013 Berdasarkan Indeks Massa Tubuh, Waist Hip Ratio Dan Lingkar Pinggang. *Jurnal Online Mahasiswa (JOM) Bidang Kedokteran*, *2*(1), 1–7.

Jbir, R., Masmoudi, R., Abdelkefi, M., Hentati, S., Feki, I., Sellami, R., & Masmoudi, J. (2023). Role of Body Mass Index on Perceived Stress in Medical Students. *European Psychiatry*, *66*(S1), S907–S907. https://doi.org/10.1192/j.eurpsy.2023.1922

Jha, R. K., Yadav, A. K., Shrestha, S., Shrestha, P. R., Shrestha, S. R., Jha, M., & Nepal, O. (2021). Study of Body Mass Index among Medical Students of a Medical College in Nepal: A Descriptive Cross-sectional Study. *Journal of Nepal Medical Association*, *59*(235). https://doi.org/10.31729/jnma.6282

Jin, Y., Ding, Z., Fei, Y., Jin, W., Liu, H., Chen, Z., Zheng, S., Wang, L., Wang, Z., Zhang, S., & Yu, Y. (2014). Social relationships play a role in sleep status in Chinese undergraduate students. *Psychiatry Research*, *220*(1–2), 631–638. https://doi.org/10.1016/j.psychres.2014.08.029

Kementerian Kesehatan. (2018). *Laporan Nasional RISKESDAS 2018*.

Kementerian Kesehatan Republik Indonesia. (2017). *Klasifikasi Obesitas setelah pengukuran IMT. Direktorat P2PTM.*

Kuan, P. X., Ho, H. L., Shuhaili, M. S., Siti, A. A., & Gudum, H. R. (2011). Gender differences in body mass index, body weight perception and weight loss strategies among undergraduates in Universiti Malaysia Sarawak. *Malaysian Journal of Nutrition*, *17*(1), 67–75.

Manojan, K. K., Benny, P. V., & Bindu, A. (2019). Prevalence of Obesity and Overweight among Medical Students based on New Asia-Pacific BMI Guideline. *Kerala Medical Journal*, *12*(1).

Marfuah, D., Hadi, H., & Huriyati, E. (2016). Durasi dan kualitas tidur hubungannya dengan obesitas pada anak sekolah dasar di Kota Yogyakarta dan Kabupaten Bantul. *Jurnal Gizi Dan Dietetik Indonesia (Indonesian Journal of Nutrition and Dietetics)*, *1*(2), 93. https://doi.org/10.21927/ijnd.2013.1(2).93-101

Merchant, A. T., Vatanparast, H., Barlas, S., Dehghan, M., Shah, S. M. A., De Koning, L., & Steck, S. E. (2009). Carbohydrate Intake and Overweight and Obesity among Healthy Adults. *Journal of the American Dietetic Association*, *109*(7), 1165–1172. https://doi.org/10.1016/j.jada.2009.04.002

Papotot, G. S., Rompies, R., & Salendu, P. M. (2021). Pengaruh Kekurangan Nutrisi Terhadap Perkembangan Sistem Saraf Anak. *Jurnal Biomedik:JBM*, *13*(3), 266–273. https://doi.org/10.35790/jbm.13.3.2021.31830

Park, Y.-M. M., White, A. J., Jackson, C. L., Weinberg, C. R., & Sandler, D. P. (2019). Association of Exposure to Artificial Light at Night While Sleeping With Risk of Obesity in Women. *JAMA Internal Medicine*, *179*(8), 1061. https://doi.org/10.1001/jamainternmed.2019.0571

Poudel, P. (2018). Junk Food Consumption and Its Association with Body Mass Index Among School Adolescents. *International Journal of Nutrition and Food Sciences*, *7*(3), 90. https://doi.org/10.11648/j.ijnfs.20180703.12

Rahmawati, S. (2020, June 26). *Dampak psikologis pengaturan makanan bagi kesehatan* [Workshop]. Webinar "Body and Mind Healing." https://eprints.uai.ac.id/1429/

Reynolds, A., Mann, J., Cummings, J., Winter, N., Mete, E., & Te Morenga, L. (2019). Carbohydrate quality and human health: A series of systematic reviews and meta-analyses. *The Lancet*, *393*(10170), 434–445. https://doi.org/10.1016/S0140-6736(18)31809-9

Santosa, H., & Imelda, F. (2022). *Kebutuhan gizi berbagai usia*. Media Sains Indonesia. https://scholar.google.com/scholar?cluster=3998720362017707211&hl=en&oi=scholarr

Shree, V., Prasad, R. R., Kumar, S., Sinha, S., & Choudhary, S. K. (2018). Study on consumption of fast food among medical students of IGIMS, Patna. *International Journal Of Community Medicine And Public Health*, *5*(7), 2750. https://doi.org/10.18203/2394-6040.ijcmph20182416

Suryani, I. S., Sulastri, M., & Hasrinurhidayat, H. (2020). Hubungan Konsumsi Junk Food Dengan Status Gizi. *Jurnal Mitra Kencana Keperawatan Dan Kebidanan*, *4*(1). https://doi.org/10.54440/jmk.v4i1.101