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Analyzing the Relationship between Sleep, Body Weight, Dietary Habits, and Physical Activity of University-Going Students in Punjab Pakistan

Faisal Akhlaq[1*]

Department of Epidemiology & Public Health University of Agriculture, Faisalabad. Corresponding Author Email: Faisalkhokhar8141@gmail.com

Anam Shahzadi

Department of Life Sciences, Barani Institute of Sciences Sahiwal

Muqaddas Latif

Department of Epidemiology & Public Health University of Agriculture Faisalabad

Author Details

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Corresponding E-mails & Authors*:

Faisal Akhlaq

Faisalkhokhar8141@gmail.com

Abstract

Background: Lifestyle behaviors such as sleep patterns, food and exercise also have a significant impact on the health of university students. This population is often subject to routine disruption and this negatively impacts health. Objective: To investigate the relationship between the sleep, body weight, food preferences, and physical activity of university students. Methods: The cross-sectional survey was conducted and involved 400 undergraduate students, 200 males, and 200 females aged 18-26 years old. The International Physical Activity Questionnaire (IPAQ-SF), the Pittsburgh Sleep Quality Index (PSQI), the Food Frequency Questionnaire (FFQ), and body mass index (BMI), measured physical activity, measured sleep, measured diet, and calculated body mass index, respectively. Data analysis was done by Regression analyses, chi-square analyses, descriptive statistics, and Pearson correlations by using SPSS. Results: The mean body mass index of participants was 23.6/kg/m2 +3.9; 34.8% of participants were obese/overweight. The quality of sleep was poor among 42% of the participants. Pearson correlations revealed that amount of sleep, physical activity and diet quality are significantly correlated with the BMI ($r = -0.21$, $p < 0.01$, $r = -0.28$, $p = 0.001$ and -0.18, $p = 0.01$ respectively). The multiple regression with variables showed that the difference in the BMI can be explained by sleep, physical activities and quality of diet ($R 2 = 0.236$ and p0.001). The logistic regression showed that sleep of less than 6 hours doubled the risk of being overweight/obese in students (95% CI: 1.228). Conclusion: Sleep duration, dietary habits and exercise are highly correlated with weight

status among university students. Lifestyle behavior-oriented interventions to prevent obesity among young adults are needed.

INTRODUCTION

Sleep, diet, and physical activity are lifestyle-related health behaviors that are important determinants of health, especially in young adulthood. The changes in the lives of a university student are shifting. It seems that they are more prone to gain weight and develop abnormal dieting habits, along with changes to their sleep schedule.The focus of the study is to examine the correlation that exists between sleep, weight, physical activity, and dietary habits among college students. Important in defining health outcomes especially in young adulthood. The lifestyle changes experienced by university students are likely to predispose them to weight gain, poor diets, and sleep disorders.

This research will examine the connection between sleeping, body weight, physical exercise, and diet among university students. The shift to university life is linked to drastic changes in lifestyle that affect health behaviors. Irregular schedules, academic pressures, and socialization often disrupt sleep which is followed by deficiency in physical activities and unhealthy eating (Lund et al., 2010; Nelson et al., 2009). They are clustering behaviors that increase the risks of becoming overweight and obese among young adults (Pengpid & Peltzer, 2014). Hormonal imbalances, hunger and BMI have also been linked to sleep deprivation in various regions across the globe (Taheri et al., 2004; Patel and Hu, 2008). In the meantime, one of the causes of obesity and poor cardiometabolic health is physical inactivity (Warburton et al., 2006). Poor eating habits, especially high intake of junk meals, soft drinks and processed foods are some of the factors that promote weight gain among students (Mozaffarian et al., 2011). Despite the growing evidence, scanty literature in developing countries have integrated sleep,

physical activity and eating habits in a model that cuts across the world explaining weight gains among university students. This paper looks at these relationships in 400 students and makes recommendations on particular interventions.

LITERATURE REVIEW

Sleep has been found to be a crucial aspect of weight control. Taheri et al. (2004) conducted a study to prove that deficiency of sleep in the form of short sleep duration reduces leptin, increases ghrelin, and increases appetite, thus putting people at risk of becoming obese. Patel and Hu (2008) have found, in an overall review of epidemiological statistics, that those who obtained less than six hours of sleep were highly likely to gain weight. Chaput and Tremblay (2012) reported the same results and identified insufficient sleep as an increasing health factor related to weight gain among the population. Lund et al. (2010) found among the university students that abnormal sleeping behaviors were associated with poor school performance and a greater susceptibility to weight gain. St-Onge et al. (2016) found that low sleep is linked with a high consumption of calories, especially saturated fats and snacks during the pre-sleep period. Dashti et al. (2015) affirmed that short sleepers eat less vegetables and more sugar-sweetened beverages. Poor dietary habits and gaining weight as a result of disruption of circadian rhythm among students is also mentioned by Roenneberg et al. (2012) in the context of the idea of social jetlag (discongruity between sleep patterns on weekdays and weekends). The Korean college students who did not sleep like Yoo et al. (2010) did consumed more of the instant noodles and the fast foods, which provided the answer because they could not keep pace with the circadian as to the reason why there were these inappropriate cultural eating habits. Exercise has been confirmed as an indicator of metabolic health. Warburton et al. (2006) highlighted its importance in

lowering cardiovascular risk, bettering glucose management and obesity prevention. In a systematic review, Irwin (2004) found one of the largest risk factors of behavior because fewer than half of university students were adhering to activity guidelines. As claimed by Kredlow et al. (2015), the results provided independently prove the efficiency of exercise in providing an increment in the BMI as well as the quality of sleep that subsequently prove to be interdependent with respect to lifestyle behavior. Silva et al. (2013) wrote that the teenagers who were more sedentary had much higher BMI scores. Musaiger et al. (2016) also reported that the unhealthy eating habits and sedentary lifestyles were very common among university students in Bahrain and linked with obesity. Steptoe et al. (2002) noted that an overall downward trend of physical activity among European students was observed between 1990 and 2000 with increased consumption of unhealthy food implying global changes in behaviour.

The weight of the body is powerfully affected by what one eats. As has been shown in this paper, consumption of processed meat, refined grains and sweet drinks on a regular basis over time was correlated with weight gain and consumption of fruits and vegetables, and whole grains was also correlated with weight gain (Mozaffarian et al., 2011). Al-Khudair et al. (2015) have determined that urbanized diets are significant because young adults who were already in the habit of consuming frequent fast foods and high sugar diets were more likely to develop obesity in a study. Westerlund et al. (2009) also combined bad sleeping habits with sweets and snacks among children, and the researchers concluded that the two behaviors follow them into university. The contextual aspect of stress is a key one. Fawzy and Hamed (2017) demonstrated that high levels of psychological stress led to poor sleep, high incidence of emotional eating, and prevalence of overweight condition in Egyptian medical students. Chaput et al.

(2011) hypothesized that stress increases the hormonal impacts of sleep deprivation, which increases adiposity. Nelson et al. (2009) also identified that overeating due to stress was more likely to be observed in college-aged females than in males, which is likely to be gender-specific. According to Cain and Gradisar (2010), electronic media is one of the most significant sleep disturbing factors among adolescents and young adults. Evening TV time retards the release of melatonin and reduces the duration of sleep, indirectly which encourages unhealthy snacking and obesity. This risk factor has been increased in the last 10 years as more and more students use their smartphones. Huang et al. (2003) reported an average weight gain of 2.7 kg in the first year of university students in the US, which was mediated by inconsistent sleep, lack of physical exercise, and unhealthy eating habits - a condition commonly known as the Freshman 15. This puts the relevance of the transition periods in determining health behaviors.

Pengpid and Peltzer (2014) have conducted a research on students of an Indian university and have observed that low physical activity, eating snacks often, and lack of good sleep were significantly linked to overweight. This finding was extended by Musaiger et al. (2016) on the side of Arabs and they found that grouping of unhealthy lifestyle behaviors was a strongly predictive of obesity. In their study of adults in the U.S., Buxton and Marcelli (2010) have also found a close relationship between short and long sleep and obesity, diabetes and high blood pressure. Multi-component interventions seem the best. Diet, exercise and sleep programmes proved to be more effective, given their impact on student health, in a meta-analysis by Plotnikoff et al. (2015) as compared to single-focused strategies. Now, the World Health Organization (2020) has shifted its attention to the promotion of integrated lifestyle among young adults to reduce the global burden of non-communicable diseases. In many populations, it has been

repeatedly proved that poor or low sleep, lack of physical activity, and unhealthy eating habits are clustered among university students, resulting in increased BMI and obesity risk. Stress and technology increases these risks and the only solution to these threats is sleep, physical exercises and healthy diets. The research is mostly but not causally cross-sectional. There is growing consensus that the global populations of universities need to be subjected to some much-needed multi-component interventions.

MATERIALS AND METHODS

Study Design: A cross-sectional study was done on the university students.

Sample: Four Hundred participants (200 men, 200 women) 18 to 26 years of age were participated,

Inclusion Criteria: Undergraduate students, agreed to participate.

Exclusion Criteria: Any student with chronic conditions were removed from the case along with women who were pregnant and those taking any medication which could disturb sleep or affect weight.

Data Collection: Sleep data was gathered using the Pittsburgh Sleep Quality Index (PSQI), while physical activity was measured using the International Physical Activity Questionnaire (IPAQ–SF) and the dietary history was assessed using the Food Frequency Questionnaire (FFQ).The anthropometric measurements was performed to check BMI (kg/m2).

Statistical Analysis: Descriptive analysis (mean, SD, frequencies), chi square Multiple regression tests was performed by using SPSS. .

Results: Descriptive statistics revealed mean age of the 79 patients was 21.2 years and standard deviation of 2.1 years, mean sleep duration of 6.4 hours and standard deviation of 1.2, mean BMI of patients was 23.7 with standard deviation of 4.2. Sleep

duration was found to have a negative correlation with —0.21 < 0.01—and physical activity was considered to have a positive correlation with 0.19 < 0.01. The results of the multiple regression analysis showed that the quality of the diet, physical activity and length of sleep were significant predictors of BMI (R2 = 0.236, p = 0.001).

RESULTS

TABLE 1. DESCRIPTIVE STATISTICS

Variable	Mean	SD
Age (years)	21.2	2.1
Sleep duration (hours)	6.4	1.2
BMI (kg/m^2)	23.7	4.2
Physical activity (MET-min/week)	2315.0	1210.0

TABLE 2. PEARSON CORRELATIONS

Variable 1	Variable 2	r value	p value
Sleep duration	BMI	-0.21	0.004
Physical activity	Sleep duration	0.19	0.007
Diet quality	BMI	-0.17	0.012

TABLE 3. MULTIPLE REGRESSION PREDICTING BMI

Predictor	β	p
Sleep duration	-0.18	0.002
Physical activity	-0.16	0.006
Diet quality	-0.14	0.011
Age	0.05	0.418
Sex	0.03	0.672

FIGURE 1. DISTRIBUTION OF SLEEP DURATION (HOURS)

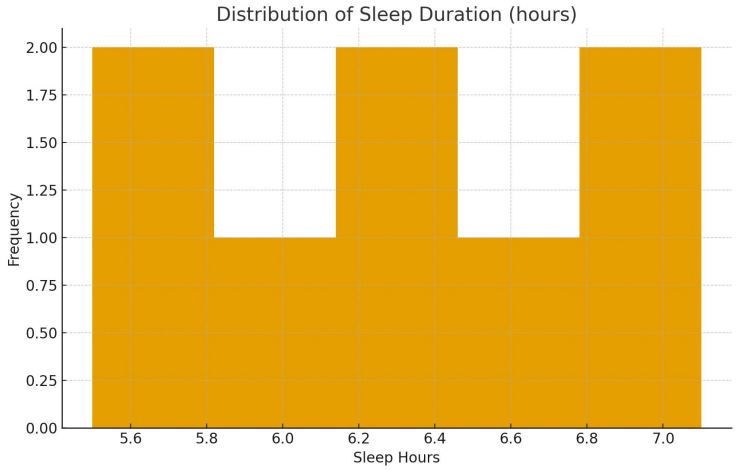
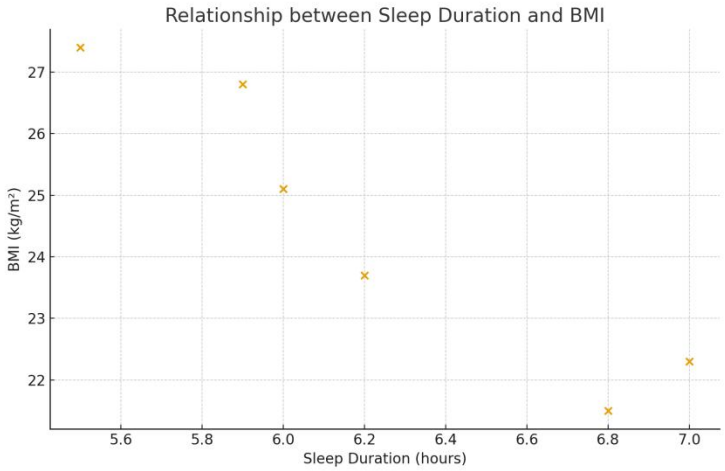


FIGURE 2. RELATIONSHIP BETWEEN SLEEP DURATION AND BMI



DISCUSSION AND CONCLUSION

As shown in this research, poor sleep, lack of physical exercise and unhealthy eating habits are strongly linked with increased BMI among college students. These results are consistent with global evidence that lifestyle risk factors are clustering and causing weight gain. The findings highlight the importance of incorporating combined

community health strategies that aim to improve sleep hygiene, promote physical activity among college students, and improve the diet of peoples.

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