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ASSOCIATION OF TOBACCO CONSUMPTION WITH BMI, EATING HABBITS AND SLEEP QUALITY IN UNIVERSITY STUDENTS: A CROSS SECTIONAL STUDY.

Muhammad Imran Hussain [1], Fatima Ashraf[2], Fatima Umar[3], Marsoolah Kasi[4], Aiemen Ibrahim[5], Marjan Qutub[6], Tuba Irfan[7], Huba Khalid[8]

ABSTRACT:

OBJECTIVE: A cross sectional study was conducted to observe the association of tobacco consumption with BMI, eating habits and sleep quality in university students. **INTRODUCTION:** A significant number of university students in Pakistan are daily smokers, with 22 million smokers making up 20% of the adult population. Men are more likely to smoke than women, with a 32% difference. Smokeless tobacco products like paan, ghutka, and naswar are also commonly used. **METHODOLOGY**: A cross sectional survey was conducted in different universities and the association of tobacco consumption among people aged 14 to 55 years, drawn from different parts of Pakistan between December 2022 and January 2023. The interpretations were done to evaluate whether this study evident the other studies as published before. **RESULTS**: Results have been evaluated on the basis of the responses and feedback as the result of the survey. A few important indicators were used in the survey to observe the association of tobacco smoking with BMI, sleep cycle and eating pattern like weight fluctuations in smokers and non-smokers and sleep apnoea and insomnia. One more very important factor discussed is depression which can be the leading cause of smoking or vice versa. Discussion: In this part of the article the comments and comparison between different actors with its association to tobacco smoking have been discussed. The interpretations are made on the basis of the response has received and evaluations are done to go for the findings of the study. The association of tobacco consumption with sleep cycle, eating patterns and BMI had been observed and discussed under this heading. **CONCLUSION**: The present study clearly indicates that there is significant Association between Tobacco consumption with BMI, poorer eating habits, and lower sleep quality in university students. These findings suggest that tobacco consumption may have negative effects on the health and well-being of university students, and interventions to reduce tobacco consumption may improve their overall health.

KEYWORDS: Tobacco consumption, Eating Habits, sleep apnea, insomnia, BMI, sleep quality,

1. Assistant Professor Department of Human Nutrition and Dietetics, Riphah International University, Lahore.
2. BS Students Department of Human Nutrition and Dietetics, Riphah International University, Lahore.
3. BS Students Department of Human Nutrition and Dietetics, Riphah International University, Lahore.
4. BS Students Department of Human Nutrition and Dietetics, Riphah International University, Lahore.
5. BS Students Department of Human Nutrition and Dietetics, Riphah International University, Lahore.
6. BS Students Department of Human Nutrition and Dietetics, Riphah International University, Lahore.
7. BS Students Department of Human Nutrition and Dietetics, Riphah International University, Lahore.
8. MS Students Department of Human Nutrition and Dietetics, Riphah International University, Lahore.

Corresponding Author: Muhammad Imran Hussain, Assistant Professor Department of Human Nutrition and Dietetics, Riphah International University, Lahore.
Email ID imran.hussain@riphah.edu.pk

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INTRODUCTION

In Pakistan, there are around 22 million smokers—20% of the adult population. Men smoke 32% more than women do (6%). [1] However, smokeless tobacco products including paan, ghutka, and naswar are also well-liked. In their homes, more than one in four young people (aged 13 to 15) are exposed to second hand smoke. 15 percent of male fatalities and 1 percent of female fatalities are related to tobacco use and exposure. Almost 110,000 people pass away in Pakistan each year as a result of diseases linked to tobacco usage. Those older than or equal to 20 were studied in urban and rural areas of Pakistan's four regions, Sindh, Khyber Pakhtunkhwa, and Baluchistan—to determine the prevalence of tobacco, ex-tobacco users, and non-tobacco users. Rural areas had an 11.7% tobacco usage, whereas urban areas had 16.3%. Males in urban and rural areas used tobacco at percentages of 26.1% and 24.1%, respectively, while female tobacco usage was 7.7% and 3.1%. [2,3] The Pakistan Institute of Development Economics (PIDE) authored a working paper. The working paper examines the link between parental smoking and undernutrition in children which lead to adulthood smoking. Stunting underweight, and wasting were the three key reasons that the researchers used to quantify child malnutrition. 21.6% of kids live with a parent who smokes, including 7% of moms and 16.3% of dads. Rural places have a higher prevalence of this condition. According to the research, children exposed to their parents' smoking were most likely to become stunted, notably when the mother smoked and they adopted that similar behaviour as their lifestyle in their adulthood. Among rural areas, there existed a significantly negative relationship between parental, maternal, and paternal smoking and stunting. [4] Sleep loss is increasingly recognized as a key public health issue among adults. Tobacco use is one of the leading causes of preventable disease and death in the world. Sleep loss is a generic term that best defines ‘insufficient sleep’ or ‘less sleep than needed’. Sleep loss is increasingly viewed as a chronic health problem among adults, as it is associated with increased risk of motor vehicle crashes, delinquent behaviours, depression/suicidal ideation, and poor academic performance. Stress has been consistently cited as a cause for sleep loss. Stress refers to the feeling of emotional or physical tension, potential threats, uncertainties or risks, and is a core construct in anxiety disorders. According to Harvey’s cognitive model of insomnia, excessive negatively toned cognitive activity such as worry is closely implicated in the initiation and continuation of sleep loss. Empirically, emotional or physical tension has been linked to problems with sleep among high trait worriers and patients with generalized anxiety disorder. A positive relation between sleep problems and tobacco smoking has been well studied in the adult population. A mechanism has been possibly observed is that nicotine which is a highly addictive substance in tobacco, exerts its function through stimulating the release of neurotransmitters that also effects and regulate the sleep cycles, which leads to impairment in it. Poor sleep quality is a commonly reported problem, with approximately a third of adult survey respondents not meeting the recommended sleep duration guidelines. Evidence for associations between tobacco consumption and sleep disturbances in Regularity, Timing, Efficiency, and Duration domains may result in sleep deprivation, which poses a serious health risk including vast no of chronic disease which include a large number of preventable diseases among growing adults.[5]. It has been observed that in university undergraduate students have a high rate of tobacco consumption, which often begins in their adolescence and it got strengthened in university as the base was formed in their early life when one is setting their grounds to apt their habits for life time. Also, they are vulnerable group to nutrition. In this study we have observed that there is a strong association between food intake and the consumption of psychoactive substances. Low intake of food consumption has been observed and intake of these psychoactive compounds leads to calcium deficiency. The impact of such psychoactive compounds including tobacco on the nutritional status can turn into primary and secondary malnutrition. Furthermore, tobacco consumption also interferes with absorption of nutrient.

MATERIAL AND METHODOLOGY

This was a cross-sectional observational study that enrolled 154 individuals (68 smokers and 85 non-smokers), aged 14 to 55 years, drawn from different parts of Pakistan between December 2022 and January 2023. The total number of smokers was 28 after some of the exclusion criteria which included the exclusion of people who have tried cigarettes for 2-3 times in life and people who take 1-2 puffs on daily basis. The inclusion criteria were the ones who

were smokers and chain smokers. Smokers were who consumed 3-4 puffs daily and chain smokers are the one who had 6 or more than 6 puffs a day. Body mass index (BMI) was computed using the subject's height and weight. Participating studies contain varying levels of information on smoking, some with simple binary variables and others with repeated and precise data. The influence of smoking on the risk of having a higher BMI is evaluated using hierarchical generalized models (HGM), which account for demographic, household, and environmental factors. The second estimation uses a multinomial instrument (IV) for smoking level and takes the likelihood that smoking is endogenous into account. The BMI is an excellent indicator of body size and fatness for the majority of people since it has a strong correlation with body fat. A person's BMI is typically used to categorize them as underweight, healthy weight, overweight, or obese. Due to intrinsic biological differences and variable growth rates, analysis is undertaken separately for men and women in order to investigate the association between BMI and cigarette smoking. Smoking categories correspond to designations as never or non-smokers, light smoker, moderate smoker, and heavy smoker based on both average numbers of cigarettes smoked and number of days smoked. Each weight and smoking category have a different mean incidence and proportion of males and females. Most respondents were normal or overweight and described themselves as non-smokers. The surveys created also included questions about dietary habits. The study tracks both healthy and bad eating patterns and is self-administered.

RESULTS

Table 1: Comparison of BMI between smokers, chain-smokers and non-smokers.

Categories	BMI (kg/m2) (Mean values)
Smokers (n=14) Overweight	26.6
Non-smokers(n=14) Overweight	29.5
Chain-smokers (n=13) Overweight	27.4

The observations were made through survey on the fluctuations in weight and BMI in smokers and chain smokers. The comparison was made by categorizing two main categories (smokers and chain smokers) into three sub categories under the heading of BMI were underweight, overweight and normal. Chain smokers who are underweight make up 0.6%, overweight is 3.2% and the one with normal BMI are 4.5% from the study population of 154. Smokers which fall in the category of underweight are 1.95%, overweight are 3.3% and the ones with normal BMI are 3.9%.

Table 2: Comparison of drinking habits score between smokers and non-smokers

Categories	Drinking soft drinks, sodas or pop (Mean values)
Smoker (n=14)	2.71
non-smoker(n=100)	2.34

Note: Mean value of drinking sodas or soft drinks among smokers are higher than non-smokers.

Table 3: Comparison of vegetable consumption in smokers and non-smokers.
Note: Average value of smokers consuming vegetables per week or day is more than non-smokers.

Category	How often did you eat vegetables? (Mean value)
Smokers (n= 27)	3.18
Non-smokers (n=116)	3.14

Category	Snoring rate
Smokers	19%
Non-smokers	81%

Table 4: Comparison of snoring rate in smokers and non-smokers

Note: Percentage values of snoring rate in smokers is less than non-smokers.

Throughout the survey on snoring in smokers and non-smokers, the observations were made. In the 154-person study sample, 19% of smokers snore when they sleep compared to 81% of non-smokers. Non-smoker shows higher snoring percentage which fall in mild category whereas, smokers show higher snoring percentage in moderate category.

Table 5: Comparison of sleep apnea rate in smokers and chain-smokers

Category	Sleep Apnea in Smokers	Sleep Apnea in chain-smokers
Mild	0%	14%
Moderate	1.5 %	3.4%
Severe	1.5 %	3.4%

Note: percentage values of sleep apnea rate in smokers are less than chain-smokers.

71% smokers from the study population of 154 faced sleep apnoea and the count of non-smokers were 29%.

Table 6: Comparison of physical activity rate in smokers and non-smokers

Category	Physical activity rate
Smokers	19%
Non-smokers	81%

Note: percentage values of physical activity rate among smokers are less than non-smokers

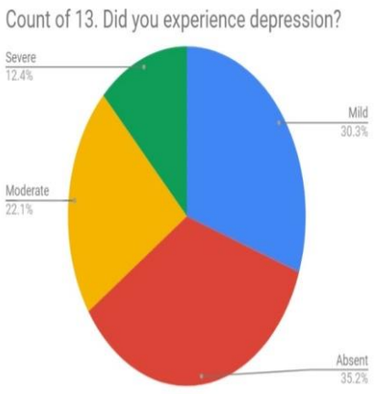
The observations were made through survey on presence of physical activity in smokers and non-smokers. 19% smokers from the study population of 154 are having their physical activities and the count of non-smokers was 81%. As concluded, non-smokers were more physical active than smokers.

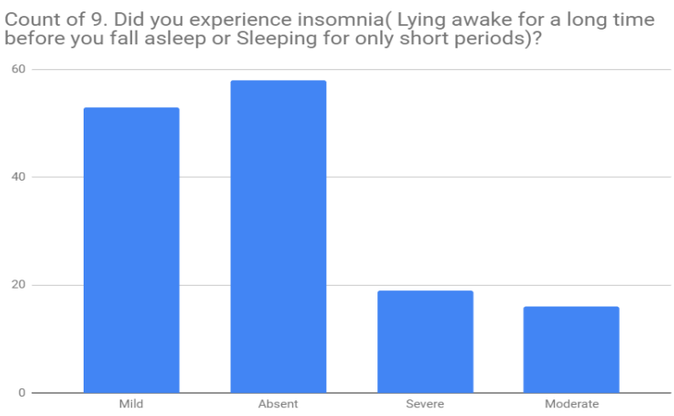
Table 7: Comparison of depression in smokers and non-smokers.

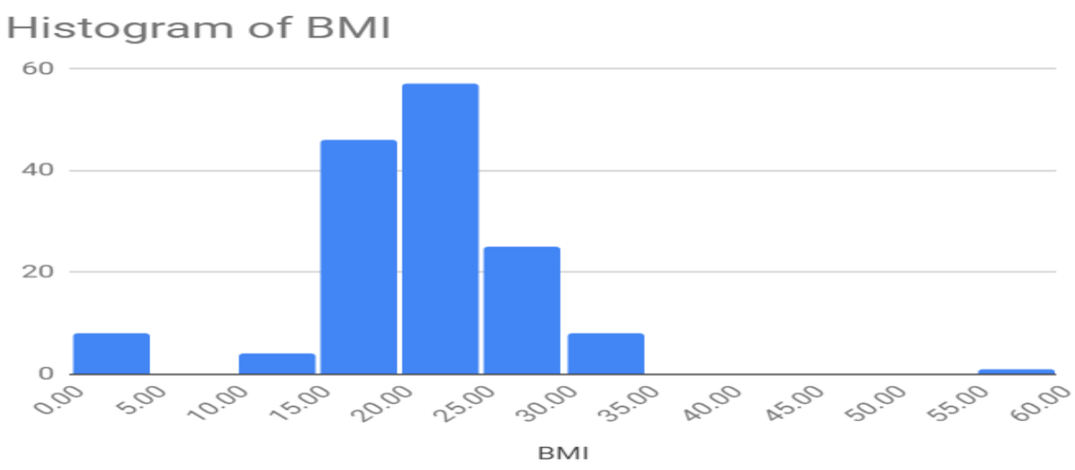
Category	Depression in Smokers	Depression in Non- smokers
Mild	13%	54%
Moderate	1%	20%
Severe	4%	6%

Note: Percentage values of depression rate in smokers and non-smokers

The observations were made through survey on presence of depression in smokers and non-smokers. 19% were smokers from the study population of 154 and the count of non-smokers was 81%. These two broad categories were further categorized into sub categories of mild, moderate and severe. The comparison was made between these sub-categories such as under the category of smokers there were 13% in mild cases, 1% moderate and 4% in severe. Whereas in non-smokers mild counted up to 54%, moderate were 20% and severe were 6.







The same categories were made for the comparison of presence of insomnia in smokers' and chain smokers. In smokers the mild category was 14%, moderate cases were 3.4% and severe were 3.4%.

DISCUSSION

Throughout the survey on snoring in smokers and non-smokers, the observations were made. In the 154-person study sample, 19% of smokers snore when they sleep, compared to 81% of non-smokers. Non-smoker shows higher snoring percentage which fall in mild category whereas, smokers show higher snoring percentage in moderate category. According to one idea, smoking irritates and inflames the upper airways, increasing the likelihood of snoring. Snoring is the main symptom of sleep disordered breathing (SDB), which is a documented comorbidity of asthma and is linked to poorer asthma control and asthma severity. Smokers and non-smokers alike were found to have obesity and asthma, which may be the main causes of snoring.

The observations were made through survey on presence of physical activity in smokers and non-smokers. 19% smokers from the study population of 154 are having their physical activities and the count of non-smokers was 81%. As concluded, non-smokers were more physical active than smokers

It was found that smokers accounted up 17% of mild instances of bone pain, 0% of intermediate cases, and 2% of severe cases. In contrast, light symptoms accounted for 62% of cases in non-smokers, while moderate and severe symptoms made for 2% and 3% of cases, respectively. A number of theories exist about the precise process whereby smoking lessens vitamin D levels. For instance, the PTH inhibition brought on by smoking may be connected to the decline in vitamin D. Smoking can cause problems with vitamin D catabolism as well. Through increasing the activation of CYP24A1 promoters, benzo(a)pyrene (BaP), a polycyclic aromatic hydrocarbon found in cigarette smoke, is mediated by 1,25(OH)2D3-dependent Vitamin d receptor and retinoid X receptors. It raises effects of cyp450 24A1 (CYP24A1), which reduces

vitamin D levels by boosting 1,25(OH)2D3 breakdown in human leucocytes THP1 cell . [6]

It has been demonstrated that smoking contributes to sleep disruptions. Moreover, we found out that people who were smokers have severe depression about 4% rather than non-smokers who possess 6% severe depression. Mental illnesses including schizophrenia, bipolar disorder, anxiety, and depression can all have an impact on a person's thoughts, feelings, and behaviour. Numerous studies have shown that long-term use of alcohol, narcotics, and tobacco results in significant health deterioration, incapacity, and inability to perform demanding duties.[7]

Tobacco consumption is also considered one of the diseases which is considered highly addictive one. WHO has recognized it the root cause of unnecessary death in the world. It includes high morbidity rate for the diseases including lung diseases, cancer of larynx, cerebrovascular systems as well as obstructive pulmonary disease. The children who are exposed to such lifestyle are more at risk to apt the same lifestyle in their adulthood. One in three smokers start in adolescence or between 18 and 25 years old, according to recent research that looked at the age at which smoking begins. The responses about medical background showed that Diabetes type 1 or 2 = 30.5%, Obesity=30.5%, Anaemia (specifically iron deficiency anaemia) 24.6%, others24.4, Hypertension (high blood pressure) =24.4%, none22%, Asthma=22%, any kind of cancer =22%, heart disease=2%. According to our study most of the study population falls in normal category for BMI which include both the smoker and non-smoker. Moreover, we categorize smoker into two subgroups (smokers and chain smokers) to study the association of tobacco consumption with BMI. In regard to our observation the average of smokers and chain smokers was overweight or high BMI. A small number of chain smokers and smokers were underweighted. High consumption of sodas was observed; only 3.5% out of only smokers and chain smokers was not consuming the cold drinks,[8]

A cross sectional survey was conducted to execute the objective. Nutritional status was evaluated by BMI. A questionnaire was provided to the study population out of which only smokers and non-smokers were categorized after the inclusion and exclusion criteria. The participants Enrolled were 154 out of which 68 smokers and 85 were non-smokers, aged 14 to 55 years, drawn from different parts of Pakistan between December 2022 and January 2023. The observations were made through survey on presence of physical activity in smokers and non-smokers. 19% smokers from the study population of 154 are having their physical activities and the count of non-smokers was 81%. As concluded, non-smokers were more physical active than smokers. Our findings suggests that Tobacco consumption is linked with increase in BMI which can negatively influence on health status by developing CVDs. Moreover, smoking has been reported to be associated with poor dietary habits such as increased intake of high-fat and high-sugar foods and decreased intake of fruits and vegetables [9]. Our studies are in line with the Kaczynski et al who proved that tobacco consumption is associated with an increased risk of obesity and higher BMI in university students. Kaczynski et al. (2018), reported that smokers had a higher BMI compared to non-smokers [10]. High consumption of sodas was observed; only 3.5% out of only smokers and chain smokers was not consuming the cold drinks. According to our study most of the study population falls in normal category for BMI which include both the smoker and non-smoker. Moreover, we categorize smoker into two subgroups (smokers and chain smokers) to study the association of tobacco consumption with BMI. In regard to our observation the average of smokers and chain smokers was overweight or high BMI. A small number of chain smokers and smokers were underweighted. Furthermore, tobacco consumption has been linked to poor sleep quality, which can negatively impact academic performance and overall health [11,12,13]. Smoking cessation is made more challenging by nicotine, a stimulant that is addictive and causes withdrawal effects, such as insomnia or restless nights, which occur every night.[14] In our study we have observed the association of tobacco consumption with insomnia and sleep apnea. Findings seem to be completely in agreement with other studies. Sleep disturbances are observed in such people that have been associated with detrimental effects on physical, mental, and public health.

CONCLUSION:

Tobacco consumption is one of the leading causes of health destruction which causes huge number of preventable diseases. The objective of this study was to study the relation of tobacco consumption to anthropometrics such as fluctuation in BMI

and weight, dietary patterns and sleep quality. Moreover, we found out that people who were smokers have severe depression about 4% rather than non-smokers who possess 6% severe depression. In conclusion, students of both sexes who smoke have more unfavourable health factors and a poorer quality of life.

ETHICS APPROVAL: The ERC gave ethical review approval

CONSENT TO PARTICIPATE: written and verbal consent was taken from subjects and next of kin

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AUTHORS' CONTRIBUTIONS: All persons who meet authorship criteria are listed as authors, and all authors certify that they have participated in the work to take public responsibility of this manuscript. All authors read and approved the final manuscript.

CONFLICT OF INTEREST: No competing interest declared.

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