

Relationship Between Cigarette Smoking with Vitals of Young Male Adults in District Hyderabad, Sindh

Shakil Ahmed Shaikh¹, Nazia Azam Yousfani², Muhammad Muqem Mangi³, Hafeezullah Wazir Ali⁴, Salma Farukh Memon⁵, Hajira Naila Rahu⁶

- 1 Assistant Professor, Department of Physiology, Suleman Roshan Medical College, Tando Adam Pakistan
Manuscript writing, Statistical analysis
- 2 Assistant Professor, Department of Community Medicine, Suleman Roshan Medical College, Tando Adam Pakistan
Results compiling
- 3 Associate Professor, Department of Physiology, Suleman Roshan Medical College, Tando Adam Pakistan
Data collection
- 4 Associate Professor, Department of Physiology, College of Medicine, Northern Border University, Arar, Saudi Arabia
Data Interpretation
- 5 Professor, Department of Physiology, Liaquat University of Medical & Health Sciences, Jamshoro Pakistan
Concept, Critical analysis
- 6 Professor, Department of Physiology, Peoples University of Medical & Health Sciences, Nawabshah Pakistan
Data Collection

CORRESPONDING AUTHOR

Dr. Shakil Ahmed Shaikh

Assistant Professor, Department of Physiology,
Suleman Roshan Medical College, Tando Adam
Pakistan
Email: sshakilonly@hotmail.com

Submitted for Publication: 31-08-2024

Accepted for Publication: 24-10-2024

How to Cite: Shaikh SA, Yousfani NA, Mangi MM, Ali HW, Memon SF, Laghari KR. Relationship Between Cigarette Smoking with Vitals of Young Male Adults in District Hyderabad, Sindh. APMC 2024;18(4):305-309. DOI: 10.29054/APMC/2024.1679

ABSTRACT

Background: Cigarette smoking is one of the significant public health concerns worldwide. Its effect on various physiological systems is well-documented, with evidence strongly indicating its adverse effects on vitals including heart rate, blood pressure, respiratory rate, and temperature. **Objective:** This study aimed to find the relationship between cigarette smoking and vitals among young male adults of district Hyderabad Sindh, Pakistan. **Study Design:** It was a cross-sectional comparative study. **Settings:** Hyderabad district of Sind, Pakistan. **Duration:** January 2024 to March 2024. **Methods:** A simple random technique was used to collect the data. Blood pressure was measured by a digital sphygmomanometer in a sitting position; Heart rate was measured by using a digital pulse oximeter. **Results:** In this study, 365 individuals participated, categorized into two groups, smokers (n=166) and non-smokers (n=199). The mean ages of smokers were 29.65 ± 4.52 , and non-smokers were 28.87 ± 4.35 . Heart rate was 68.79 ± 3.95 in smokers and in non-smokers 65.85 ± 3.15 beats per minute, respiratory rate was 16.93 ± 2.31 in smokers and 1.27 ± 0.79 beats per minute, the temperature was 97.30 ± 0.60 in smokers, and in non-smokers, 96.48 ± 0.61 Fahrenheit, systolic and diastolic blood pressure in smokers were 121.35 ± 8.56 , 82.35 ± 3.75 and in non-smokers were 116.57 ± 5.65 , 79.68 ± 4.23 . All vitals were found to be higher in smokers compared to non-smokers. **Conclusion:** In this study, the findings concluded the positive association of cigarette smoking with increased vitals among young adults.

Keywords: Cigarette smoking, Vitals, Young adults.

INTRODUCTION

In the world, cigarette smoking is a major preventable cause of morbidity and mortality. Irrespective of wide public health campaigns and regulatory measures taken by the concerned authorities, the prevalence of smoking remains high and has a significant contribution toward the global burden of disease.¹ This demographic is often drawn to smoking due to social, psychological, and environmental factors, making them particularly vulnerable to the adverse effects of smoking on their vitals.² The detrimental effects of cigarette smoking are well published, especially in relationship with respiratory diseases, cardiovascular problems, and different cancers.

Furthermore, cigarette smoking has severe impacts on the vitals of human life, including heart rate, blood pressure, respiratory rate, and temperature.³ Vitals are basic parameters routinely measured in clinical practice to assess an individual's physical and immediate health.⁴ These parameters provide basic information about the cardiovascular, respiratory, and thermoregulatory systems. It is necessary to know for doctors and paramedics that cigarette smoking changes the vitals and increases the risks of diseases associated with cigarette smoking.⁵

Nicotine, it is the basic component of tobacco, has an intense effect on the autonomic nervous system that

causes acute and chronic alteration in the vitae of humans.⁶ Acute changes of smoking change immediate physiological responses, and chronic changes lead to persistent changes that further worsen health conditions. Increased heart rate, increased blood pressure, changed patterns of respiration, and changed thermoregulation are the primary published effects of cigarette smoking on vitals.⁷

While many young smokers may not experience severe clinical symptoms early on, the effects on their vitals set the stage for long-term health consequences. Understanding the impact of cigarette smoking, this study aims to provide a comprehensive relationship between cigarette smoking and the vitals of young adults of district Hyderabad.

METHODS

This cross-sectional comparative study was designed to examine the effects of cigarette smoking on the vital signs (vitals) of young male adults of district Hyderabad, Pakistan, from January 2024 to March 2024. After approval from the research ethics committee of the University of Sindh, letter No: DRGS/Physio 160 dated 23-06-23. The sample size was calculated using Epi Software, and a non-probability convince type sample was used to collect data. Young male adults aged 18-35 years. 400 participants were approached for the study, 365 (91.25%) were recruited, and the remaining 35 (8.75%) refused to provide data. Participants were divided into two groups: smokers (those who have smoked at least one cigarette per day for the past year) and non-smokers (those who have never smoked). Inclusion Criteria: Male, aged 18-35, willing to provide informed consent. Exclusion Criteria: Individuals with chronic diseases (e.g., diabetes, hypertension) or acute illnesses that could affect vital signs. Those individuals using medications that might influence vital signs were excluded.

Participants were recruited from local universities and workplaces. Interested individuals will undergo a brief screening to determine eligibility. Measurements of Vital Signs: Heart Rate (HR) was measured in beats per minute using a digital pulse oximeter. Blood Pressure (BP): Measured using an automated sphygmomanometer (Medisign BPM158), Made by Shanghai International Holding Corp, GmbH (Europe). Respiratory Rate (RR) was measured in breaths per minute by observing the chest rise and fall. Body Temperature (BT): Measured using a digital thermometer.

A detailed questionnaire was given to determine smoking history, frequency, and duration. The demographic data (age, height, weight, etc.) and lifestyle factors (physical activity, alcohol consumption, and dietary habits) were included. Informed Consent was

obtained from all participants after explaining the study's purpose, procedures, and potential risks.

Vital Signs were measured, and the vital signs were in a quiet, controlled environment to ensure accuracy. It was ensured that participants were at rest for at least 5 minutes before measurements were taken.

The means and standard deviations were used for continuous, while frequencies and percentages were used for categorical variables. The t-tests were used to compare the mean vital signs between smokers and non-smokers through SPSS (Statistical Package for Social Sciences) version 23.0. Statistical significance was set at $P < 0.05$.

RESULTS

A total of 400 participants were approached for this study, and finally, 365 participated in this study with a response rate of 91.25%. The participants were categorized into two groups: smokers (n=1660) and non-smokers (n=199). Table 1 indicates the mean age of smokers was 29.65 ± 4.52 while that of non-smokers was 28.87 ± 4.35 . It also indicates that more participants were found in high school education, unmarried, and rural, while employed were higher than unemployed participants.

Table 1: The basic characteristic of participants (n=365)

Variable		Smokers (n=166)	Non-smokers (n=199)
Age (years)		29.65 ± 4.52	28.87 ± 4.35
Socioeconomic status	High status	0 (0.00%)	0 (0.00%)
	Middle status	37 (22.28%)	51 (25.62%)
	Low status	129 (77.71%)	148 (74.37%)
Professional Graduate	High school	15 (9.03%)	09 (4.52%)
	Primary school	47 (28.31%)	27 (13.56%)
	Illiterate	79 (47.59%)	99 (49.74%)
Marital status	Married	55 (33.13%)	59 (29.64%)
	Unmarried	59 (35.54%)	63 (31.65%)
Residence	Married	107 (64.45%)	136 (68.34%)
	Unmarried	59 (35.54%)	63 (31.65%)
Residence	Rural	119 (71.68%)	105 (52.76%)
	Urban	47 (28.31%)	94 (47.23%)
Earning	Employee	71 (42.77%)	137 (68.84%)
	Unemployed	95 (57.22%)	62 (31.15%)

Table 2 indicates the mean values of vitals, mean heart rate, respiratory rate, temperature, systolic blood pressure, and diastolic blood pressure; the mean heart rate in smokers was 68.79 ± 3.95 , and in non-smokers was 65.85 ± 3.15 beats per minute with $P < 0.05$. The respiratory rate in smokers was 16.93 ± 2.31 , and in non-smokers was 14.27 ± 0.79 beats per minute with $P < 0.05$. The temperature in smokers was 97.30 ± 0.60 , and in non-smokers was 96.48 ± 0.61 Fahrenheit, with $P < 0.05$.

Systolic blood pressure in smokers was 121.35 ± 8.56 , and in non-smokers, 116.51 ± 5.65 mmHg, with $P < 0.05$. Diastolic blood pressure in smokers was 82.35 ± 3.75 , and in non-smokers, it was 79.68 ± 4.23 mmHg, with $P < 0.05$.

Table 2: Vitals comparison in smokers & non-smokers

Variable	Smokers (n=166)	Non-smokers (n=199)	P - value
Heart Rate (beats/min)	68.79 ± 3.95	65.85 ± 3.15	< 0.05
Respiratory rate (breaths/min)	16.93 ± 2.31	14.27 ± 0.79	< 0.05
Temperature (°F)	97.30 ± 0.60	96.48 ± 0.61	< 0.05
Systolic Blood Pressure (mmHg)	121.35 ± 8.56	116.57 ± 5.65	< 0.05
Diastolic Blood Pressure (mmHg)	82.35 ± 3.75	79.68 ± 4.23	< 0.05

Table 3 indicates that Pearson's correlation of vitals in smokers and non-smokers, heart rate was found to be positively correlated in smokers than non-smokers with statistical significance. Respiratory rate was positively correlated in smokers than non-smokers with statistically significant. Temperature was positively correlated in smokers than non-smokers with statistically significant. Systolic and diastolic blood pressures were positively correlated in smokers and non-smokers with statistically significant.

Table 3: Correlation of vitals in smokers and non-smokers

Variable	Pearson's correlation	P value
Heart Rate Smokers (n=166) Non-smokers (n=199)	0.215* -0.183	< 0.05
Respiratory Rate Smokers Non-smokers	0.178* 0.023	< 0.05
Temperature Smokers (n=166) Non-smokers (n=199)	0.223* -0.134	< 0.05
Systolic blood pressure Smokers (n=166) Non-smoker (n=199)	0.313** 0.049	< 0.05
Diastolic blood pressure Smokers (n=166) Non-smokers (n=199)	0.31* 0.049	< 0.05

DISCUSSION

Traditionally, vitals are clinical assessments of physical health and the possibility of any illness. They are important in critical conditions and indicate the progress of sick person. In this era, the population has higher

health concerns that also indicate the importance of vitals in daily life. Therefore, monitoring of vitals shows the importance of the overall health of individuals. This study examined the association of cigarette smoking with the vitals of young adults (less than 40 years of age) in the district of Hyderabad.

The results achieved in this study are consistent with the research published. In this study, we found that mean heart rate was higher in smokers than non-smokers, and also found a statistically significant correlation of heart rate in smokers. Similar trends were found in a study in our past study,³ a study conducted by Benowitz *et al*,⁸ another study conducted by K Dimitriadis *et al*,⁹ and Sara Arastoo *et al*.¹⁰ We observed that this increased heart rate may be due to exposure to nicotine which stimulates the sympathetic nervous system in smokers than in non-smokers.

In this study, we found that increased mean respiratory rate in smokers than non-smokers, and also showed a significant correlation of respiratory rate in smokers. Similar trends were found by R.B. Shaikh *et al*,¹¹ and Diana C *et al*.¹² Jennifer E *et al*.¹³ This finding may be due to the effect of nicotine by stimulating the peripheral chemoreceptors.

In this study, we found that mean temperature increased in smokers as compared to non-smokers; we also found a significant correlation between temperature with smokers and non-smokers. A similar trend was found by K Dimitriadis *et al*,⁹ and Hubert Hymczak *et al*,¹⁴ in their opinion, suggested the role of cigarette smoking to increase the core body temperature. This effect may be due to the gradual and rapid non-painful heating of non-glabrous skin by stimulating the sensory nerves that intervene in the axon reflex related to quick vasodilatation.¹⁵

This study also found increased mean systolic and diastolic blood pressure and a significant correlation of increased systolic and diastolic blood pressure in smokers as compared to non-smokers. A similar trend was found in our past study for systolic blood pressure, but diastolic blood pressure was not significant.³ Luehrs *et al*.¹⁶, a cardia study in the United States, found similar results. Benowitz *et al*.⁸ and K Dimitriadis *et al*.⁹ found similar trends.

Nicotine is the major psychoactive ingredient in cigarettes that stimulates the release of catecholamines like adrenaline by activating the sympathetic nervous system, which results in increased heart rate.¹⁷ The substance nicotine also enhances the adrenal medulla, which increases the concentration of adrenaline and causes the heart to work harder and faster.¹⁸

Cigarette smoking causes both acute and chronic elevation of blood pressure. The mechanism is supported by nicotine induces vasoconstriction. Nicotine enhances α -adrenergic receptors in the smooth muscles of the arterial wall, leading to the narrowing of blood vessels, narrowing of the diameter of causes an increase in blood pressure.¹⁹ In addition to these effects, cigarette smoking also enhances arterial stiffness and endothelial dysfunction, and in long-term effects of repeated vasoconstriction include the development of hypertension and atherosclerosis.²⁰

The respiratory system is one of the most affected by cigarette smoking. Smoke irritates and inflames the mucosal lining of the respiratory tract.²¹ Over time, this chronic inflammation leads to damage to the cilia, which is responsible for clearing mucus and debris from the lungs. This results in decreasing lung function, increased respiratory rate and development of chronic conditions like chronic obstructive lung disease.²²

CONCLUSION

This study concluded that cigarette smoking exerts a primarily and multifaceted influence on human vitals by the actions of nicotine, carbon monoxide, and other harmful ingredients. These substances disrupt normal functions of the cardiovascular and respiratory systems, causing increased heart rate, blood pressure, impaired respiratory rate, and temperature. Over time, all these effects increase the chances of severe health conditions, including heart rate and chronic respiratory illness. Smoking cessation is important in reversing these damaging effects on the body's vital function.

LIMITATIONS

This study faces limitations such as a small sample size, reliance on self-reported smoking habits, and confounding factors including factors like pre-existing health conditions or environmental influences. In addition, measurement errors, cultural stigma, and difficulty in establishing causality due to cross-sectional designs can impact the study's reliability.

SUGGESTIONS / RECOMMENDATIONS

Long-term studies that track changes in vital signs over several years. This may help to find a clearer understanding of how prolonged smoking affects vitals. Studies focused on the effects of smoking cessation on vital signs in young adults. Studies focused on biochemical markers (e.g., nicotine level) could provide more objective measures of smoking exposure and its impact on vital signs.

CONFLICT OF INTEREST / DISCLOSURE

The authors declare no conflict of interest.

ACKNOWLEDGEMENTS

We thank all contributors, staff & others for providing useful information.

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