

SELF-ASSESSMENT AND PERCEPTION OF HEALTH AND GENETIC HAZARDS OF SMOKING AMONG MEDICAL AND NON-MEDICAL STUDENTS

Gulshan Ara Trali¹, Asifa Majeed², Khadija Qamar³

¹Department of Biochemistry, Swat Medical College, Swat

²Department of Biochemistry and Molecular Biology, Army Medical College, National University of Medical Sciences, Rawalpindi, Pakistan,

³Department of Anatomy, Army Medical College, National University of Medical Sciences, Rawalpindi, Pakistan

ABSTRACT

Objective: To determine medical and non-medical students' self-assessment and perception of smoking's health and genetic risks.

Study Design: Cross sectional descriptive

Place and Duration of Study: Army Medical College, Dec 2017 to June 2018.

Patients and Methods: A total of one hundred medical and non-medical students volunteered to participate. To collect data on the health and genetic hazards of smoking, passive smoking, and self-assessment of smoking, a closed-ended structured questioner was developed and a survey was conducted. SPSS 17 was used to analyze the data, which was then presented in frequency and percentage.

Results: The study included 49 (51.5.1 percent) males and 45 (47.4 percent) females, with a mean age of 19.33 ± 0.709 . Participants' educational levels ranged from high school to doctorate. The majority of participants were medical students, with second-year medical students accounting for 69.1 percent of the total. The analysis revealed that there was sufficient recognition of the health risks of smoking and passive smoking. However, there was a lack of knowledge about the genetic risks of smoking. According to self-assessment data, 83 percent were nonsmokers and 17 percent smoked. Furthermore, 62.7 percent of medical students had received formal education on smoking issues and health repercussions.

Conclusion: The participants were cognizant about the significant health harms of smoking. However, limited information regarding genetic hazards reaffirms to enhance knowledge-driven learning of medical and non-medical students for better results of tobacco cessation measures.

Key words: *Passive smoking, nicotine, Cancer, DNA damage*

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INTRODUCTION

Tobacco smoking is one of the most serious public health issues, killing around 6 million people each year. According to estimates, more than 5 million people are killed by direct tobacco use, while second-hand smoking ends up killing more than 0.6 million people. Previous data predicted that tobacco use would cause more than eight million deaths by 2030¹. Tobacco use, particularly among the youth, is linked to an increase in the prevalence of cardiovascular & respiratory diseases and lung cancer. The Framework Convention on Tobacco Control (FCTC), which was established in February 2005, was a substantial attainment in tobacco control. As preventive measures, policies such as higher taxes on tobacco, a

ban on smoking at public places, and anti-smoking advertising were implemented². In order to achieve the FCTC goals, the World Health Organization devised monitor tobacco use and prevention policies (MPOWER) in 2008. It included tobacco use monitoring & prevention policies, an educational campaign to protect and assist people in quitting smoking, user counselling, increased taxation, advertising prohibition, and a ban on sponsorship³. More than a billion people smoke tobacco, with the majority living in middle and low income countries. Modern smoking techniques are enticing yet harmful ways to attract people. Research has demonstrated that exposure to secondhand smoking causes major ailments such as respiratory and cardiovascular conditions, lung cancer, and behavioral problems⁴. Long-term health damage may result from both active and passive exposure to fetuses, newborns, and children⁵. Smoking is practiced in various ways. Shuja et al. found that medical professionals had little knowledge about the dangers of water-pipe smoking on oral health⁶. Smoking behavior and inconsistency are influenced by environmental and genetic factors. In one study, the role of genetic polymorphism in the SLC6A3 gene in smokers and non-smokers was found to have a substantial impact on nonsmoking behavior. Furthermore, alkaloids of tobacco have a detrimental effect on the metabolism of steroid hormones, upregulation of the cytochrome P450

Correspondence to: Dr. Asifa Majeed, Department of Biochemistry and Molecular Biology, Army Medical College, National University of Medical Sciences, Rawalpindi, Pakistan

Email: asifamajeed@amc.numspak.edu.pk

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(CYP) family genes, which catalyzes estradiol hydroxylation and thus endangers fertility in female⁷. In some cohorts, H19-ICR , CYP1A1 gene promoters hypomethylation and SNRPN-ICR gene promoters hypermethylation were linked to male infertility and prostate cancer, where smoking enhanced the risks^{8,9}. The genetic behavior is dependent on gene interaction as well as endogenous and exogenous stimuli. Wang et al. discovered a link between CHRN gene polymorphism and smoking cessation in the Chinese population¹⁰. In general, passive smoking is not considered hazardous to one's health. Likewise, a lack of knowledge about the genetic risks of smoking does not limit tobacco use. As a result, such research will aid in gathering data on the level of knowledge among young adults. Furthermore, such a survey will increase participants' knowledge of various types of smoking hazards, particularly among medical students, which will aid in smoking control.

PATIENTS AND METHODS

It was a cross-sectional descriptive study, carried out at Army Medical College, Rawalpindi, from December 2017 to June 2018. The participants were students from medical and non-medical colleges and universities who were included after their consent. RAOSOFT software calculated sample size using a 10% precision margin and a 90% confidence interval. The sample size was one hundred. The closed-ended structured questionnaire included twenty-three questions with multiple choice answers such as "Strongly Agree," "Agree," "Neutral," "Disagree," "strongly disagree," "I don't know," "Yes," and "No." These questions were subdivided into three sections: perception of genetic risks of smoking, perception of passive smoking, and self-assessment of smoking outcomes. Age, gender, educational information, smoking status, and duration of smoking were also recorded. The data was analyzed and represented in frequencies and percentages using SPSS version 17.

RESULTS

This study included 49 (51.5 %) males and 45 (47.1 %) females, with an average age of 19.33 ± 7.09 , five participants did not respond. Participants' educational levels ranged from high school to doctorate. The significant proportion of those who took part were medical students. Second-year medical students had the highest participation rate (69.1 % (Figure 1). The first section discussed the genetic risks of smoking. Out of 95 participants, 86 completed all questions. Incomplete data was omitted. The study discovered a high level of knowledge about genetic changes caused by long-term and persistent smoking (65 %). A mixed response was observed regarding human leukocyte antigen suppression by smoking due to genetic susceptibility. Damage to DNA caused by smoking was very not well-understood, with 54 percent responding positively and 44

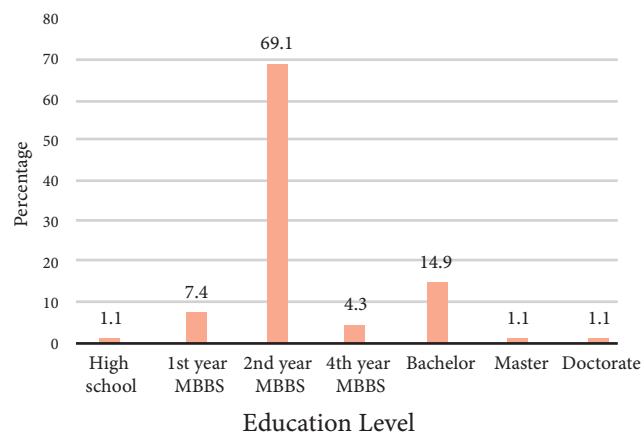


Figure 1 : The educational status of participants

percent responding negatively. A large majority (72 %) agreed that quitting smoking can reduce the risk of cardiovascular disease and cancer. However, participants lacked adequate knowledge of genetics and responded negatively to smoking-induced gene damage (62%) methylation and acetylation (58%). (Table 1).

The second section dealt with passive smoking. Passive smoking is largely ignored by both smokers and nonsmokers. 94 of the 95 participants answered all of the questions. Participants were well aware of the hazards associated with passive smoking. More than 80% of participants agreed that passive smoking, along with all forms of smoking, is harmful to human health. Unexpectedly, the majority of participants, including medical students, were unaware of the risks of smoking to a developing fetus. Participants agreed with a score of 79 percent and 65 percent that room smoking or environmental smoke can turn somebody into a passive smoker, which can be detrimental to human health (Table 2) Data from self-assessment revealed that medical students had received formal education about smoking problems and health repercussions (62.7 percent). Nonsmokers made up 83 percent of the population, while smokers were 17 percent. According to the data, 29 percent had been habitual smokers for 11to15 Years, and 7 percent had been smokers for more than 20 years. Because most of the participants were nonsmokers, smoking outcomes were not measurable (Table 3). However, there was a mixed reaction concerning whether interrupted smoking is more risky than continuous smoking (Table 3).

DISCUSSION

In Pakistan, smoking prevalence among young people is increasing, despite the government implementing the WHO FCTC. As per Pakistan Pediatrics Association, one thousand to twelve hundred high school and college students are into smoking. It's a concerning state of affairs. WHO

CAPSULE SUMMARY

Medical and non-medical students were well aware of the potential health hazards of smoking. However, scarce information about the genetic hazards calls for an enhanced knowledge-based learning for better outcome of smoking cessation initiatives.

Table 1: Perception about genetic hazard of smoking

Questions	Variables	Frequency	Percentage (%)
Smoking for a long time and consistently can alter your genes and your epigenome.	SA	14	16.2
	A	42	48.8
	N	13	15.1
	DA	2	2.3
	IDK	15	17.4
Which element has the most impact on sibling smoking?	Social/Shared environment	67	77.9
	Genetics	8	9.3
	IDK	13	15.1
Do you know that smoking suppresses human leukocyte antigen, increasing genetic susceptibility?	Y	33	38.3
	N	33	38.3
	IDK	20	23.2
DNA damage may come from ambient smoke exposure.	SA	9	10.4
	A	38	44.1
	N	15	17.4
	DA	5	5.8
	SD	1	1.1
	IDK	18	20.9
Persistence in smoking is largely influenced by heritable traits	SA	2	2.3
	A	24	27.9
	N	19	22
	DA	21	24.4
	SD	5	5.8
	IDK	15	17.4
Giving up smoking may reduce your risk of developing cancer, cardiovascular disease, multiple sclerosis and obesity	SA	12	13.9
	A	48	55.8
	N	11	12.7
	DA	4	4.6
	IDK	11	12.7
Smoking can result in gene damage in minutes	SA	7	8.1
	A	18	20.9
	N	18	20.9
	DA	41	47.6
	IDK	2	2.3
Are you familiar with terms methylation and acetylation induced by smoking	✓	36	41.8
	X	50	58.1

SA: Strongly Agree, A: Agree, N: Neutral, DA: Disagree, SD: Strongly Disagree, IDK: I Don't Know, ✓: Yes, X: No

Table 2: Perception regarding passive smoking

Questions	Variables	Frequency	Percentage (%)
Smoke in which form(s) is/are hazardous to human health: Huqqah, Cigarette, Cigar, Industrial Smoke	None	2	2.1
	All forms	77	81.9
	Few of them	8	8.5
	IDK	4	4.3

Active smoking poses the same health risks as passive smoking	SA	43	45.7
	A	33	35.1
	N	5	5.3%
	DA	5	5.3
	SD	2	2.1
	IDK	4	4.3
All age groups are equally impacted by passive smoking	SA	30	31.9
	A	43	45.7
	N	5	5.3
	DA	6	6.3
	IDK	10	10.6
A developing fetus is harmed by passive smoking	SA	8	8.5
	A	31	32.9
	N	3	3.1
	DA	3	3.1
	SD	1	1.1
	IDK	48	51
Presence in a room where other people are smoking makes one a passive smoker	SA	40	42.5
	A	35	37.2
	N	3	3.1
	DA	7	7.4
	SA	1	1.1
	IDK	8	8.5
Living continuously in an environment exposed to industrial smoke makes one a passive smoker	SA	23	24.4
	A	39	41.4
	N	12	12.7
	DA	6	6.3
	IDK	14	14.8

SA: Strongly Agree, A: Agree, N: Neutral, DA: Disagree, SD: Strongly Disagree, IDK: I Don't Know

Table 3: Self-assessment regarding the smoking outcomes

Questions	Variables	Frequency	Percentage (%)
What is/was your preferred manner of consuming nicotine?	Cigarette	18	19.1
	Hookah	5	5.3
	Cigar	2	2.1
	E-cigarette	1	1.1%
	Chewing tobacco	1	1.1%
	Other	8	8.5
	None	59	62.8
Smoking enhances one's attractiveness.	✓	15	17.4
	X	52	60
	N	23	26.7
Have you had any formal education about the health consequences of exposure to smoke?	✓	54	62.7
	X	25	29
	N	7	8.1

Do you/have you ever considered yourself addicted to cigarettes?	✓	7	8.1
	X	66	76.7
	N	13	15.1
Has anyone ever had concerns about your smoking habits?	✓	24	27.9
	X	46	53.4
	N	16	18.6
Have you ever attempted to quit cigarettes?	✓	13	15.1%
	X	63	73.2
	N	10	11
Have you ever felt pressured to smoke by your peers?	✓	18	20.9
	X	66	76.7
	N	2	2.3
Have you ever suffered from a smoke-related health issue?	X	67	77.9
	N	16	18.6
	✓	3	3.4
Interrupted smoking is dangerous than continuous smoking	SA	2	2.3
	A	17	19.7
	N	23	26.7
	DA	21	24.4
	SD	2	2.3
	IDK	21	24.4

SA: Strongly Agree, A: Agree, N: Neutral, DA: Disagree, SD: Strongly Disagree, IDK: I Don't Know, ✓: Yes, X: No

has recommended prohibition of tobacco advertisement & sponsorship, and an increased tobacco taxation. A research conducted in Jeddah, Saudi Arabia, revealed that medical students had insufficient knowledge about the health risks of second-hand smoking and emphasized the need to modify medical curricula for better academic performance and smoking cessation¹¹. However, the results of this survey were encouraging. Our participants were well-versed in the effects of smoking on human health, including passive smoking, which is a major public health concern.

The current study found that the majority of participants were unaware with genetics and had limited knowledge of the genetic risks of smoking and genetic material damage. A number of studies have reported the recognition of smoking markers linked to DNA methylation^{12,13}. As a result, medical graduates would benefit from adequate knowledge of the genetic consequences. The application of such understanding in clinics will assist in the control of smoking and its adverse health outcomes. A study found a high prevalence of smoking among university students in Karachi, with a particularly concerning trend among female students. Some smokers preferred to quit smoking by enrolling in some rehabilitation center¹⁴. Moreover, we found a low %age of smokers, knowledge about various types of smoking surroundings, and causes of smoking. Smokers also knew the dangers of smoking and attempted to quit. Tobacco cessation in medical students will promote their participation in smoking prevention campaigns also lowering smoking-related mortality and morbidity¹⁵.

The formal training of medical students in smoking cessation and quitting was a positive finding. Education about the

dangers of all types of smoking and how to quit is an effective intervention. It should be done clinically on a regular basis to avoid heart disease, cancers, fetal abnormalities & fetal mortality.

CONCLUSION

The participants were well aware of the potential health risks associated with smoking in all forms. However, a lack of knowledge about genetic risks reinforces the need to improve knowledge-based learning among medical and non-medical students in order to improve the outcomes of smoking cessation initiatives.

LIMITATIONS

Single center study and small sample size. Small sample size was due to quitting the participation.

RECOMMENDATIONS

Multicenter study will help to gather comprehensive data. Educational and awareness programs enforce to limit the smoking and tobacco use in our population. Efforts are required to motivate the doctors to take active part in smoking cessation support.

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AUTHORS' CONTRIBUTION

Gulshan Ara Trali	Acquisition of data, Drafting the Article
Asifa Majeed	Conception and design, Analysis and interpretation of data, Critical revision
Khadija Qamar	Analysis and interpretation of data

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