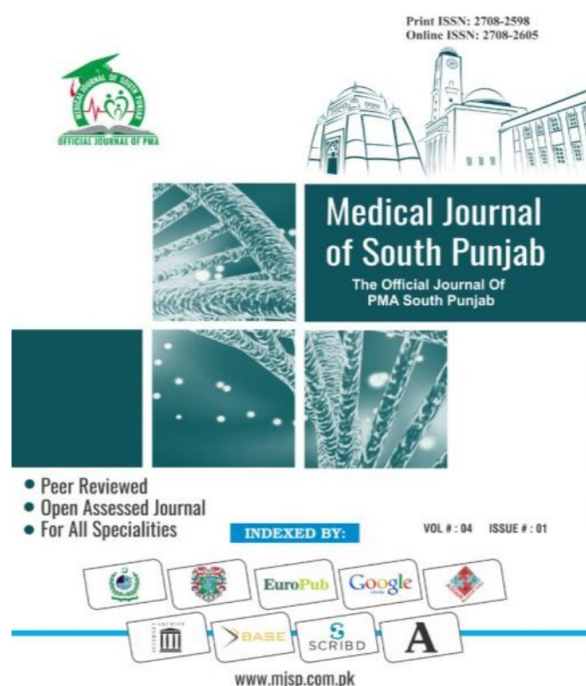


ISSN (E): 2708-2601

ISSN (P): 2708-2598

Medical Journal of South Punjab
Article DOI:10.61581/MJSP.VOL04/02/05
Volume 4, Issue 2, 2023



Understanding How Cities Demographics Incite and Determine the Use of Tobacco in Punjab, Pakistan

Publication History

Received: Sep, 07 2023 Revised: Sep 026 2023
Accepted: Oct 09, 2023 Published: Dec 30, 2023

Authors and Affiliation:

Kalsoom Zulfiqar¹, Kiran Sultana², Ali Asad Sabir^{3*}, Abdul Rehman Nawaz⁴, Faisal Asghar⁵, Romila Qamar⁶

^{1,2} School of Economics, University of the Punjab, Lahore-Pakistan

³Institute of Development and Economics Alternatives, Lahore-Pakistan

⁴Central European University, Austria

⁵Commissioner, Inland Revenue FBR, Pakistan

⁶SDC Unit, Sustainable Development Policy Institute, Islamabad, Pakistan

*Corresponding Author Email:

aasad6889@gmail.com

Copyright & Licensing:



Authors retain copyright and grant the journal right of first publication with the work simultaneously licensed under a [Creative Commons Attribution \(CC-BY\) 4.0 License](https://creativecommons.org/licenses/by/4.0/) that allows others to share the work with an acknowledgment of the work's authorship and initial publication in this journal.

Conflict of Interest:

Author(s) declared no conflict of interest.

Acknowledgment:

No Funding received.

Citation: Zulfiqar K, Sultana K, Sabir AA, Nawaz AR, Asghar F, Qamar R. Understanding How Cities Demographics Incite and Determine the Use of Tobacco in Punjab, Pakistan. Medical Journal of South Punjab. 2023 Dec 30; 4(2):46-55.

Please scan me to access online.



An official publication of

Medteach Private Limited, Multan, Pakistan.

Email: farman@mjsp.com.pk, Website: <https://mjsp.com.pk/index.php/mjsp>



Understanding How Cities Demographics Incite and Determine the Use of Tobacco in Punjab, Pakistan

Kalsoom Zulfiqar¹, Kiran Sultana², Ali Asad Sabir^{3*}, Abdul Rehman Nawaz⁴, Faisal Asghar⁵, Romila Qamar⁶

^{1,2} School of Economics, University of the Punjab, Lahore-Pakistan

³Institute of Development and Economics Alternatives, Lahore-Pakistan

⁴Central European University, Austria

⁵Commissioner, Inland Revenue FBR, Pakistan

⁶SDC Unit, Sustainable Development Policy Institute, Islamabad, Pakistan

*Corresponding Author Email: aasad6889@gmail.com

ABSTRACT

Objective: The alarming usage of tobacco and its detrimental effects on health is a serious concern and smoking is a leading cause of deaths which result in 7 million deaths annually. Authors aimed to examine the driving trend of tobacco usage among adults in Punjab, Pakistan. The axes of this study are to investigate the socio-economic and demographic factors to understand the smoking patterns in Punjab.

Methods: Authors undertook the study by taking cross-sectional household survey; MICS datasets from every district of Punjab by running a logistic regression model.

Results: We find that individuals with higher education and income levels are less likely to smoke, while married individuals and older adults have a higher probability of using tobacco. Additionally, life satisfaction plays a critical role in tobacco usage, with happier individuals having a lower likelihood of smoking. Authors also observed that highly educated, and wealthy females have a higher chance of using tobacco compared to their less educated counterparts.

Conclusion: Authors are not condoning the ways and patterns of smoking but are suggesting that the government must implement targeted anti-smoking policies that consider the unique characteristics of different population sub-groups, with a particular emphasis on increasing education and reducing poverty.

Keywords: Smoking, Tobacco, Health, Education, Lungs, Environment

1. INTRODUCTION

Smoking poses a significant threat to health, increasing the risk of death from various diseases such as cancer, heart disease, COPD, and stroke. The utilization of any form of tobacco, including smoking, is considered a major challenge to worldwide anti-tobacco efforts. The prevention of tobacco-related fatalities is a global issue that requires attention. Smoking is a leading cause of death worldwide, resulting in 7 million deaths annually and costing billions of dollars in healthcare and low productivity¹. This number is projected to rise to 8 million by the end of the decade with 1.2 billion smokers worldwide, including 800 million in developing economies. Pakistan has a large population of tobacco users and is among the top 15 countries with the highest burden of tobacco-related illness. Monkey pox, a communicable disease with zoonotic origins, initially identified in monkeys in 1958, has recently become a significant global concern^{1,2}. Belonging to the Orthopoxvirus genus, it spreads through respiratory secretions, skin lesions, or contaminated objects, sharing clinical similarities with smallpox³. Despite historically being limited to central and west Africa, alarming outbreaks surfaced in non-endemic countries^{3,4}, leading the World Health Organization (WHO) to declare it a Public Health Emergency in 2022. By June 2023, the WHO reported nearly 88,000 confirmed cases and 146 deaths^{5,6}. Approximately 6% of cases require hospitalization, and the observed fatality rate is below 0.1%. The high incidence of tobacco usage in Pakistan, including 27% of adult males and 5.5% of adult females, poses a significant health and economic threat to individuals, families, and society².

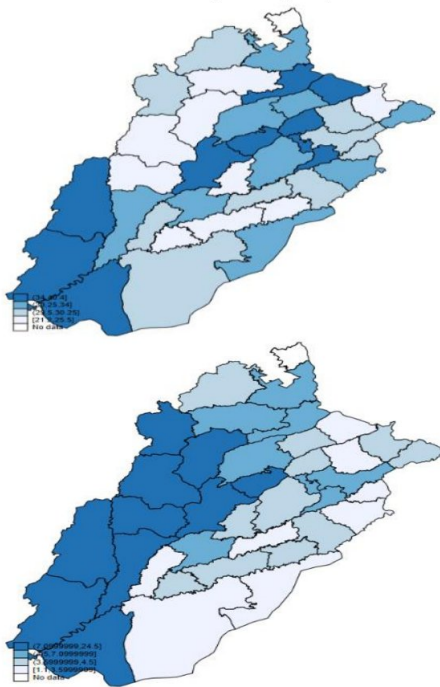
By 2030, tobacco is expected to be the leading cause of death with 8 million deaths per year^{4,8}. It's worth noting that, "as a result of stronger laws and heavier taxation in Western countries", "the tobacco industry has turned its focus to developing countries like Pakistan". Tobacco usage has increased in low-income nations because of aggressive "marketing efforts"^{3,4}.

In 2007, WHO recommended six evidence-based measures to combat the global tobacco epidemic and protect public health. These measures include monitoring tobacco use and implementing prevention strategies, protecting people from secondhand smoke, providing support for smokers who want to quit, warning the public about the dangers of smoking, enforcing bans on tobacco advertising and promotion, and raising awareness about the harm caused by tobacco use⁵. The UNDP Sustainable Development Goals (SDGs) also call for the implementation of the WHO framework for tobacco control in all countries to improve health outcomes and prevent non-communicable diseases⁶. This highlights the need for a deeper examination of the problem to develop effective policy changes to address this public health issue.

In Pakistan, smoking and chewing tobacco is the most common form of tobacco use and the only most adjustable risk factor for long-lasting illness. There are more than 22 million active tobacco smokers in Pakistan causing about 100,000 early deaths every year^{7,8}. Pakistan is not only member of the World Health Organization (WHO) Framework Convention on Tobacco Control (FCTC) since early 2005 and its tobacco control legislation policy exists since 1965 but there seems no effective implementation till 2003. Pakistan has adopted various measures to curb tobacco usage like health cautions on cigarette packets; banning smoking in public spaces and automobiles; barring cigarette sales to children; banning

commercials of tobacco-related products in media; and restraints on the supply of free cigarette tasters. However, due to ineffective policy implementation, it is feared that Pakistan may not achieve its goal of a 30% reduction in tobacco usage by 2030 rather it is expected to increase further.

Figure 1: Percentage of Men & Women aged 15-49 years by the pattern of use of tobacco, Punjab, 2017-18



The left image illustrates the percentage of men in Punjab who use tobacco. Chiniot has the highest percentage of men using tobacco at 40.4%, while Layyah has the lowest at 21.2%. The right image shows the percentage of women in Punjab who use tobacco. Rajanpur has the highest percentage of women using tobacco at 24.5%, and Gujranwala has the lowest at 1.1%.

A plethora of studies has been conducted since 2003 on tobacco consumption, its associated health risks, and other related issues in Pakistan^{10, 11, 12}. Many of these studies have examined the incidence of

tobacco use and its underlying causes in different regions, among different genders and demographic groups. However, many of these studies have limited scope and have focused on specific localities, genders, or demographic groups^{13,14,15,16,17,18,19}.

Pakistan has implemented national tobacco control policies, such as the "Tobacco Control Action Plan and the Strategy for Prevention and Control of Tobacco Use", yet the demographics of tobacco use and the factors that drive it are not well understood²⁰. It is crucial for monitoring tobacco consumption patterns, assessing the effectiveness of control measures over time, and understanding the role of socioeconomic factors in shaping smoking decisions²¹.

Despite previous studies that have examined socioeconomic disparities in tobacco usage across different districts in Pakistan, none have specifically examined these differences in the province of Punjab or evaluated variations by gender and area of residence. The current study aims to fill this gap by investigating the socioeconomic and demographic factors that influence smoking in Punjab, providing a deeper understanding of the problem and informing the development of effective intervention strategies.

2. METHODOLOGY

The study employs data from the latest available Multiple Indicator Cluster Survey (MICS) which is a cross-sectional household survey performed in 36 Punjab districts by UNICEF and the Punjab government. The consistency of measurements, sample size determination, sampling, and post-stratification modifications allow data to be compared throughout the province. The present study

includes data from both male and female respondents.

The study adopts a logistic regression model with two dependent variables of dichotomous nature. Respondents are classified as either smokers or non-smokers. The explanatory variables are a set of socioeconomic variables that may impact the smoking behavior of an individual. The following model explains the relationship between dependent and independent variables.

$$Y_i = f(X_{1i}, X_2, \dots, X_{ki})$$

(1) Y_i stands for respondents smoking behavior (current use of tobacco for smoked and smokeless use are binary variables and coded as yes or no) and X_s denote various socioeconomic and demographic variables that determine the smoking behavior. We can estimate Equation (2)

$$Y_i^* = \sum_{j=0}^K X_{ij}\beta_j + \epsilon_i$$

In equation (2) y^* represents latent variables and X is a dummy variable that assumes the value of 1 or 0 otherwise and ϵ denotes the error term. Suppose P_i represents the probability that i th respondent is a tobacco user and its distribution is determined by the trajectory of predictors X , so the probability is given by,

$$P(X) = \frac{e^{\beta X}}{1+e^{\beta X}}$$

Where β stands for a row vector, and we can write the logit model as;

$$\ln\left(\frac{p}{1-p}\right) = \sum_{j=1}^K X_{ij}\beta_j + \epsilon_i$$

The main reason for smoking and usage of tobacco in various forms is the utility which outweighs the hazards associated with the consumption of tobacco products. Rational

people are less likely to use tobacco products. Previous studies have shown different factors with different results in different countries. This heterogeneity in the same factors among different nations leads us to examine the determinants of tobacco use in Punjab, Pakistan. Based on previous literature and theoretical logic, the following models are constructed to investigate the socioeconomic and demographic factors to ¹ Summary statistic of data on males and females is provided in Appendix. analyze tobacco usage among males and females. The following model is estimated using the logit estimation technique separately for males and females.

$$SK_i = \alpha + \beta *EDU_i + \gamma *INC_i + \delta * DIV_i + \eta *MS_i + \pi *LS_i + \mu *AGE_i + \epsilon_i$$

(5) In equation (5) SK represents tobacco usage and i is the index for individuals. There are six explanatory variables based on the information provided in the survey namely, education (EDU), income (INC), locality of residence (DIV), marital status (MS), life satisfaction (LS), and age (AGE). For education level preschool, primary school, middle school, secondary school, and “higher education” are coded from 0 to 4 respectively. Individual incomes are divided into five quintiles from the first quintile (poorest 20%) to the fifth (richest 20%). It is the wealth quintiles of the household to which the respondent belongs at the time of the survey. The wealth quintile is coded as 1, 2, 3, 4, and 5 for wealth quintiles respectively. However later in estimations dummy for one of the quintiles is omitted to avoid the dummy variable trap¹. There are nine divisions of Punjab, so they are coded from 1 to nine according to their alphabetical order. The marital status of an individual is categorized as single or married. A married individual is given a code of 1 and 2 otherwise. The question

asked to assess life satisfaction from individuals that “taking all things together, would you say you are happy”, not happy, or neither happy nor not happy with your current life these categories are coded as 1, 2, and 0 respectively. Age is measured in a number of years and is the age of an individual at which he or she first time used tobacco in a smoked or smokeless form.

3. RESULTS

We have estimated the Model presented in Equation (5) both for males and females separately to examine the socio-economic and demographic determinants of tobacco usage (tobacco usage includes both smoked and smokeless tobacco). Smoked tobacco includes cigarettes, cigars, water pipes, cigarillos, pipes, or shisha. While smokeless tobacco is used in the form of Pan, Gutka, and Mawa, and eating and chewing tobacco in any other form). Results of the estimated logit model and average marginal effects for both males and females are provided in Table 1.

Table 1: Socio-demographic and Economic determinants of Smoking among Males & Females

Variables	Males		Females	
	Coefficient	dy/dx	Coefficient	dy/dx
Education level (Ref: uneducated)				
Primary	-0.1751* (0.8816)	-0.0319* (0.0160)	-0.4236* (0.1237)	-0.0697* (0.0213)
Middle	-0.1814** (0.0947)	-0.0331** (0.0173)	-0.8532* (0.1939)	-0.1489* (0.0374)
Secondary	-0.2877* (.09476)	-0.0537* (0.0177)	-1.2847* (0.2032)	-0.2342* (0.0418)
Higher	-0.5907* (.11050)	-0.1169* (0.0225)	-1.6478* (0.2592)	-0.3077* (0.0539)
Division (Ref: Bahawalpur)				
DG Khan	-0.4018* (0.14491)	-0.0841* (0.0302)	0.7414* (0.2391)	0.0997* (0.0348)
Faisalabad	0.3588* (0.12991)	0.0645* (0.0239)	-0.3625 (0.2389)	-0.0607* (0.0391)
Gujranwala	0.0384 (0.12569)	0.0074 (0.0243)	-0.7472* (0.2404)	-0.1331* (0.0411)
Lahore	0.1727 (0.13096)	0.0324 (0.024)	-1.2301* (0.2609)	-0.2323* (0.0476)

Multan	-0.3585* (0.13208)	-0.0744* (0.0270)	-0.3958 (0.2520)	-0.0667 (0.0417)
Rawalpindi	-0.3271* (0.13693)	-0.0675* (0.0280)	-0.4741** (0.2354)	-0.0809** (0.0389)
Sahiwal	0.6864* (0.17611)	0.1138* (0.0279)	-0.6822* (0.2822)	-0.1204* (0.0509)
Sargodha	0.1672 (0.15695)	0.0314 (0.0293)	0.3866*** (0.2341)	0.0561 (0.0353)
Windex5 (Ref: Poorest)				
Second	-0.2371* (0.09551)	-0.0408* (0.0163)	-0.2268*** (0.1272)	-0.0336** (0.0191)
Middle	-0.4718* (0.09997)	-0.0857* (0.0179)	-0.7876* (0.1415)	-0.1289* (0.0246)
Fourth	-0.5342* (0.10695)	-0.0984* (0.0195)	-1.1338* (0.1708)	-0.1951* (0.0326)
Richest	-0.6754* (0.11778)	-0.1281* (0.0225)	-1.2382* (0.2086)	-0.2158* (0.0413)
Marital status (Ref: Married)				
Single	-0.4749* (0.0691)	-0.0901* (0.0129)	-0.1904* (0.0856)	-0.02792* (0.0125)
Life Satisfaction level (Ref: indifferent)				
Happy	-0.1493* (0.0644)	-0.0279* (0.0119)	0.0081 (0.1135)	0.00118 (0.0166)
Not happy	-0.2205** (0.11521)	-0.0419* (0.0224)	-0.0205 (0.1744)	-0.00301 (0.0257)
Age	0.0203* (0.0053)	0.0038* (0.0011)	.02958* (0.0059)	0.0043 (0.0008)
Constant	1.8202* (0.1869)		0.9590** (0.3544)	

***, **and* denote significance at 90%, 95% and 99%, respectively. Standard errors are in parentheses.

Estimated results of logistic regressions and marginal effects are shown in Table 1 for males and females. Estimated marginal effects show that the probability of tobacco use for males varies with the change in socioeconomic and demographic factors.

4. DISCUSSION

Results suggest a significant negative association between education level and tobacco usage, when education level

goes from 'uneducated' to 'primary level of education, the probability of smoking decreases by 3.19 percentage points and the probability of smoking decreases by 3.31 and 5.37% as education level increases from primary to middle and from middle to secondary level respectively. Our findings are consistent with previous literature²⁴. Similarly, the change in probability of tobacco usage among males, when education level changes from 'uneducated' to 'higher level of education, decreases by 11.69 percentage points. The marginal effect of different education levels is shown in Figure 1.

The marginal effects reveal that place of residence also impacts the smoking behavior of adult males as results reveal residing in DG Khan, Multan, and Rawalpindi decreases the probability of smoking by 40.18%, 35.85%, and 32.71%. Literature shows that adults in rural regions smoke at a rate of 19.0% as compared to 11.4% in urban areas. They are also more likely to smoke heavily, smoking 15 or more cigarettes per day, as compared to individuals who smoke and reside in cities²⁵. Similarly, the probability of tobacco use increases for an individual belonging to Faisalabad and Sahiwal by 35.88% and 68.64% in comparison to the Bahawalpur region. However, residents in Lahore, Gujranwala, and Sargodha show an insignificant association with the probability of tobacco usage among males. Similarly, the probability of tobacco usage among males of a second, third or middle, fourth or rich, and fifth or richest wealth quintile index decreases by 4.08%, 8.57%, 9.84%, and 12.81 percentage points respectively as compared to the males belong to poorest wealth quintile.

The results also show that males belonging to the higher wealth quintile have a lower probability of tobacco use for each level of education. The research of²⁶ also

discovers in the case of Ghana that males from poor socioeconomic backgrounds (low education and poverty) are more likely to smoke. The individuals of each wealth quintile with no preschool education level have more probability of tobacco use as compared to the individuals of the same wealth quintile with a higher level of education. Any individual with the highest wealth quintile and a higher level of education has the least probability of tobacco usage. In addition, the incidence of smoking tobacco is higher for males who are married. There is a 9.01% less chance for an unmarried male to smoke tobacco. These findings vary from region to region. Like in US single adults have a high prevalence of current cigarette smoking²⁷. In Jordan, smoking frequency was nearly the same among single and married people, with just a tiny difference²⁸. Age is another significant factor impacting tobacco usage among males. We find that as the age of an individual increases by one unit then the probability of tobacco uses increases by 0.38% for males. According to a study, there is a significant increase in tobacco use between the ages of 18 and 26, with the majority of daily smokers attempting their first cigarette by the age of 18 and 99% by the age of 26²⁹.

The life satisfaction level of individuals shows a substantial relationship with the probability of tobacco usage. Table 1 shows the probability of tobacco usage for males, happy with their current life, and males, who were not happy with their current life, decreased by 2.79 and 4.19% respectively as compared to the individuals who remained indifferent to their current life. Figure 4 and Figure 5 show that the males happy with their current life at each level of education have more probability to consume tobacco in any form than those who are not happy with their current life and associated with a lower level of education. Although some

research indicates a causal relationship between smoking and happiness, there is a greater agreement that quitting or never smoking increases happiness levels³⁰.

Similarly, the males who are happy with their life consume more tobacco than those who are not happy with their current life, regardless of which wealth quintile they belong to. But in both Figures, we can see that a higher level of education and any male belonging to the highest wealth quintile has less probability to consume tobacco than the male belonging to the lowest wealth quintile.

Our results show that as the education level increases the probability of tobacco usage among females decreases. With an increase in education level from 'uneducated' to 'primary level, the probability of smoking tobacco decreases by 6.97%. An increase in education level from primary to secondary, and from secondary to higher education reduces the probability of smoking tobacco by 14.89, 23.42 30.77% respectively. The marginal effect of different education levels is shown in Figure 6. The marginal effects in Table 1 show an insignificant association between female tobacco smoking and residing in the districts of Faisalabad, Multan, and Sargodha. Results reveal that the probability of tobacco usage among females belonging to Gujranwala, Lahore, Rawalpindi, and Sahiwal decreases by 13.31%, 23.23%, 8.09%, and 12.04% while the probability of tobacco use increases for individual women belonging to DG Khan by 9.97% as compared to the individual females who belong to Bahawalpur region.

The probability of tobacco usage among females of a second, third or middle, fourth or rich, and fifth or richest wealth quintile decreases by 3.36%, 12.89%, 19.51%, and 21.58% respectively as compared to the females belonging to the poorest wealth quintile. The average marginal effects of the

wealth quintile index and the average marginal effects for females belonging to different wealth quintiles with different levels of education on the probability of tobacco use also varied. It can be that individuals who belong to the higher wealth quintile have less probability of tobacco use for each level of education. The individuals of each wealth quintile with no preschool education level have more probability of tobacco usage as compared to the individual of the same wealth quintile with a high education level. Females who belong to the third, fourth, and richest wealth quintile with higher education have more probability of tobacco use than the females of the same wealth quintile associated with a secondary level of education. The frequency of smoking was greater among the poorest women than among the richest women in 20 out of the world's countries, where pro-rich relative socioeconomic disparity was statistically significant³¹.

Any individual woman with the highest wealth quintile and secondary level of education has the least probability of tobacco usage. Higher mandatory schooling decreases the likelihood of smoking by 23% and the number of cigarettes smoked by 27% for women³². While the probability of tobacco use for single females decreases by 2.79% relative to married females. Marital status and smoking behavior interact in a negative manner. Especially single women are less likely to smoke than those who are married, split from their spouse, or who are cohabiting³³. Age also shows a significant and positive relationship with the probability of tobacco usage for females. Results show that as the age of an individual increases by one unit then the probability of tobacco use increases by 0.43% for females. The study³⁴ shows that smoking probabilities rise with age (from 1.00 [for ages 15–19 years] to 3.01 and 5.78, respectively, for females and males aged 45–49 years) in Pakistan. The

life satisfaction level of the individual females shows an insignificant association with the probability of tobacco usage.

5. CONCLUSION

There are stark differences between the global north and global south regarding proportionality because there are no effective design interventions in the Global South²². This study is an attempt to discuss the underlying causes of tobacco consumption by focusing on district wise socioeconomic and demographic factors of smoking consumption. The study also presented findings on the use and prevalence of tobacco which was only segregated by gender and type²³.

The study is an attempt to fill the gap in the existing literature by using demographics and socio-economic conditions as variables. The results depict that individuals from poor socioeconomic backgrounds are more prone to smoke cigarettes and suffer tobacco-related disorders with the increase in education level, the probability of tobacco usage decreases. Similarly, individuals who belong to the higher wealth quintile have the least probability of tobacco usage than individuals of the lower wealth quintile. Marital status, life satisfaction, and demographics also show a significant association, except in Gujranwala, Sargodha, and Lahore.

Males who belong to the lowest and lower wealth quintiles are at more risk. They are more probable to tobacco use than males who belong to the higher or highest wealth quintile. Government should focus on this disadvantaged group through their health-related and tobacco control policies by imposing high tax rates on tobacco products

to increase the prices of tobacco products. An increase in prices of tobacco products to such an extent will result in the least tobacco usage by this disadvantaged group. The study also found that individuals with no education are more likely to consume tobacco, government should make policies to educate them about the harmful effects of tobacco use and provide counseling and advertisement to decrease the probability of tobacco use.

REFERENCES

1. Chen S, Cao Z, Prettner K, Kuhn M, Yang J, Jiao L, et al. Estimates and projections of the global economic cost of 29 cancers in 204 countries and territories from 2020 to 2050. *JAMA oncology*. 2023;9(4):465-72.
2. Xie L, Shang Z. Burden of oral cancer in Asia from 1990 to 2019: Estimates from the Global Burden of Disease 2019 study. *Plos one*. 2022;17(3):e0265950.
3. Sheth J. New areas of research in marketing strategy, consumer behavior, and marketing analytics: the future is bright. *Journal of Marketing Theory and Practice*. 2021;29(1):3-12.
4. WHO. Global tobacco epidemic, 2013: enforcing bans on tobacco advertising, promotion and sponsorship: Executive summary. World Health Organization; 2013.
5. WHO. the global tobacco epidemic 2015: raising taxes on tobacco: World Health Organization; 2015.
6. Voola R, Bandyopadhyay C, Voola A, Ray S, Carlson J. B2B marketing scholarship and the UN sustainable development goals (SDGs): A systematic literature review. *Industrial Marketing Management*. 2022;101:12-32.

7. Sung H, Ferlay J, Siegel RL, Laversanne M, Soerjomataram I, Jemal A, et al. Global cancer statistics 2020: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. *CA: a cancer journal for clinicians*. 2021;71(3):209-49.
8. Saqib MAN, Rafique I, Qureshi H, Munir MA, Bashir R, Arif BW, et al. Burden of tobacco in Pakistan: findings from global adult tobacco survey 2014. *Nicotine and Tobacco Research*. 2018;20(9):1138-43.
9. Country details for Pakistan [Internet]. 2017. Available from: <https://www.tobaccocontrolaws.org/>.
10. Ali A, Manzoor MF, Ahmad N, Aadil RM, Qin H, Siddique R, et al. The burden of cancer, government strategic policies, and challenges in Pakistan: A comprehensive review. *Frontiers in nutrition*. 2022;9:940514.
11. Khan Z, Suliankatchi RA, Heise TL, Dreger S. Naswar (smokeless tobacco) use and the risk of oral cancer in Pakistan: a systematic review with meta-analysis. *Nicotine and Tobacco Research*. 2019;21(1):32-40.
12. Rozi S, Butt ZA, Zahid N, Wasim S, Shafique K. Association of tobacco use and other determinants with pregnancy outcomes: a multicentre hospital-based case-control study in Karachi, Pakistan. *BMJ open*. 2016;6(9):e012045.
13. Ahmad K, Jafary F, Jehan I, Hatcher J, Khan AQ, Chaturvedi N, et al. Prevalence and predictors of smoking in Pakistan: results of the National Health Survey of Pakistan. *European Journal of Preventive Cardiology*. 2005;12(3):203-8.
14. Bile K, Shaikh J, Afridi H, Khan Y. Smokeless tobacco use in Pakistan and its association with oropharyngeal cancer. *EMHJ-Eastern Mediterranean Health Journal*, 16 (Suppl), 24-30, 2010. 2010.
15. Gilani SI, Leon DA. Prevalence and sociodemographic determinants of tobacco use among adults in Pakistan: findings of a nationwide survey conducted in 2012. *Population health metrics*. 2013;11(1):1-11.
16. Ashraf S, Ashraf A, Jabeen N, Zaman M, Anwar R, Khan N. Female Tobacco Users: Causative Factors and their Perception about Tobacco health hazards. *Pakistan Journal of Chest Medicine*. 2016;22(3):107-11.
17. Ali S, Sathiakumar N, Delzell E. Prevalence and socio-demographic factors associated with tobacco smoking among adult males in rural Sindh, Pakistan. *Southeast Asian journal of tropical medicine and public health*. 2006;37(5):1054.
18. Alvi M, Naz F, Khan MMQ, Mirza MH, Ikram M, Bux A. Analyzing the Pattern of Smoker in Karachi. 2016.
19. Aslam M, Asif M, Altaf S. Estimation of smoking index for male smokers in Multan city. *Pakistanian Journal of Nutrition*. 2011;10(1):80-5.
20. Craig L, Fong GT, Chung-Hall J, Puska P. Impact of the WHO FCTC on tobacco control: perspectives from stakeholders in 12 countries. *Tobacco Control*. 2019;28(Suppl 2):s129-s35.
21. Flor LS, Reitsma MB, Gupta V, Ng M, Gakidou E. The effects of

- tobacco control policies on global smoking prevalence. *Nature Medicine*. 2021;27(2):239-43.
22. Kumar N, Janmohamed K, Jiang J, Ainooson J, Billings A, Chen GQ, et al. An overview of tobacco control interventions in the Global South. *Drugs and Alcohol Today*. 2020;20(3):207-1
 23. Sinha DN, Palipudi KM, Rolle I, Asma S, Rinchen S. Tobacco use among youth and adults in member countries of South-East Asia region: review of findings from surveys under the Global Tobacco Surveillance System. *Indian journal of public health*. 2011;55(3):169-76.
 24. Wang Q, Shen JJ, Sotero M, Li CA, Hou Z. Income, occupation and education: Are they related to smoking behaviors in China?. *PloS one*. 2018 Feb 8;13(2):e0192571.
 25. Denlinger-Apte RL, Pacek LR, Ross JC, Bansal-Travers M, Donny EC, Hatsukami DK et al. Risk perceptions of low nicotine cigarettes and alternative nicotine products across priority smoking populations. *Intern J Environmental Res and public health*. 2021 May 17;18(10):5311.
 26. Nketiah-Amponsah E, Afful-Mensah G, Ampaw S. Determinants of cigarette smoking and smoking intensity among adult males in Ghana. *BMC public health*. 2018 Dec;18(1):1-0.
 27. Jaghbir M, Shreif S, Ahram M. Pattern of cigarette and waterpipe smoking in the adult population of Jordan. *EMHJ-Eastern Mediterranean Health Journal*. 2014 Sep 1;20(9):529-37.
 28. Ramsey Jr MW, Chen-Sankey JC, Reese-Smith J, Choi K. Association between marital status and cigarette smoking: Variation by race and ethnicity. *Preventive medicine*. 2019 Feb 1;119:48-51.
 29. Bonnie RJ, Stratton K, Kwan LY, editors. *Public health implications of raising the minimum age of legal access to tobacco products*. Washington, DC: National Academies Press; 2015 Jul 23.
 30. Ataeiasl M, Sarbakhsh P, Dadashzadeh H, Augner C, Anbarlouei M, Mohammadpoorasl A. Relationship between happiness and tobacco smoking among high school students. *Epidemiology and health*. 2018;40.
 31. Hosseinpoor AR, Parker LA, Tursan d'Espaignet E, Chatterji S. Socioeconomic inequality in smoking in low-income and middle-income countries: results from the World Health Survey.
 32. Özmen MU. Causal Effect of Education on Tobacco Use in Low-and-Middle-Income Countries. *Nicotine and Tobacco Research*. 2023 Apr 5:ntad056.
 33. CDC. Current cigarette smoking among adults in the United States. Centers for Disease Control and Prevention. 2020 Dec 10.
 34. Zubair F, Husnain MI, Zhao T, Ahmad H, Khanam R. A gender-specific assessment of tobacco use risk factors: evidence from the latest Pakistan demographic and health survey. *BMC Public Health*. 2022 Jun 6;22(1):1133.