Tobacco Smoking and its Susceptibility to Acquire Acute Respiratory Diseases

Dr. Aprajita Singh & Mohammed Zahid

ABSTRACT

In the current scenario, Tobacco smoking have become a common threat to human health. Smoking tobacco affects active and passive smoker's lungs differently, which will result in respiratory diseases at different stages of life.

This pandemic has shown us that respiratory health and Tobacco smoking are intricately connected. In this study, we estimate the potential risk of smoking cigarettes in active and passive smokers. In a cohort of 154 active and passive smokers from diverse demographics, we investigated the consequences of tobacco use. In India, between April 2022 and June 2022, we calculated the impact of tobacco use on the active smoking population at 33.6% and the passive smoking population at 66.4%. We discovered a relative relationship between smoking and ARD.

According to data analysis, there is a 28.0% incidence of respiratory disease in the community of smokers who are using tobacco actively (p value 0.05). Additionally, Nicotine is a potential factor in acquiring acute respiratory disease following Coronavirus diseases (p value <0.05). Cigarette smoking is associated with evidence of mild to severe respiratory illness and intake of nicotine in active smokers that causes acute respiratory diseases.

Keywords: ARD (acute respiratory diseases), active smokers, nicotine, passive smokers, and tobacco smoking.

Classification: DDC Code: 823.8 LCC Code: PR4622

Language: English

London Journals Press

LJP Copyright ID: 392856

London Journal of Medical and Health Research

Volume 22 | Issue 11 | Compilation 1.0

Tobacco Smoking and its Susceptibility to Acquire Acute Respiratory Diseases

Dr. Aprajita Singh[α] & Mohammed Zahid[σ]

ABSTRACT

In the current scenario, Tobacco smoking have become a common threat to human health. Smoking tobacco affects active and passive smoker's lungs differently, which will result in respiratory diseases at different stages of life.

This pandemic has shown us that respiratory health and Tobacco smoking are intricately connected. In this study, we estimate the potential risk of smoking cigarettes in active and passive smokers. In a cohort of 154 active and passive smokers from diverse demographics, we investigated the consequences of tobacco use. In India, between April 2022 and June 2022, we calculated the impact of tobacco use on the active smoking population at 33.6% and the passive smoking population at 66.4%. We discovered a relative relationship between smoking and ARD.

According to data analysis, there is a 28.0% incidence of respiratory disease in the community of smokers who are using tobacco actively (p value 0.05). Additionally, Nicotine is a potential factor in acquiring acute respiratory disease following Coronavirus diseases (p value <0.05). Cigarette smoking is associated with evidence of mild to severe respiratory illness and intake of nicotine in active smokers that causes acute respiratory diseases.

Keywords: ARD (acute respiratory diseases), active smokers, nicotine, passive smokers, and tobacco smoking.

I. INTRODUCTION

Global evaluation propounded that in the early 21st century respiratory diseases accounts for around 16% of all deaths worldwide [123]. In the year 2017 there were 3.91 million deaths reported due to chronic lung diseases which approximately accounts for 7% of all deaths worldwide[2]. Global estimates suggest that the public health crises due to chronic lung diseases ranged from 97.2 to 112.3 million a year from 1990 to 2017 which portray gradual increase in mortality rate association with respiratory diseases[2]. Impact of chronic respiratory diseases on public health in India increased from 4·5% in 1990 to 6·4% in 2016[3].

According to few studies in year 2016, India alone it reported 32% of the total global population affected with chronic lung disease. Chronic obstructive pulmonary disease (COPD) and asthma falls under the category of common chronic lung disease[4]. Pneumoconiosis, and interstitial lung disease and pulmonary sarcoidosis are other categories. Acute and chronic lung conditions clinical syndromes has been epidemiologically associated with cigarette smoking s5. A number of various etiologic causes like viral infections (HIV), occupational gasses and particles, passive exposure to cigarette smoke, inhaling highly polluted air, genetic predisposition, compromised immunity, poor nutritional status and biomass fuel smoke are in close proximity to severe the respiratory diseases [4]. This pandemic caused devastating effects on the respiratory health of people. Tobacco smoking and respiratory health are intricately connected.

Smoking cigarette increases susceptibility to acquire respiratory infections and epigenetic disorder[5]. Inhibition of defense mechanism of airway epithelium, ciliary activity in upper respiratory tract, and immune cells are closely linked/ associated with smoking cigarette, which directly or indirectly promotes microbial pathogens to house in the lungs[5]. Some reports suggested that there is significant high risk for active and former smokers to get infected by the coronavirus diseases[67]. In this research we aim to

provide information about how smoking cigarettes gradually decreases the respiratory health and makes personnel to acquire respiratory infections[5]. In addition, cessation of cigarette smoking brings lung capacity, maximum oxygen uptake and its ability to eliminate foreign bodies entering until the red ludicrously voluminous air bags of lungs. Respiratory health can be whisk vigorously holds together if a person decides to quit smoking and opening hearts for exuberantly safe life in future.

II. METHODOLOGY

2.1 Data source and analysis

Data for this study was collected from various groups that includes IT sector, students, field workers, and non- workers (unemployed). Based on a history of smoking tobacco these groups where divided into active smokers and passive smokers. Furthermore we subdivided these groups into active smokers/passive smokers in IT sector, students, field workers and unemployed.

For each selection were made to collect required data from IT sectors and students. The final sample consists of 2 groups with 154 participants. A questionnaire were given to all participants of several field from April 2022 to June 2022. To ensure the confidentiality, names of the participants were not included in the questionnaires.

Data for the analyses presented in this report were drawn from a special saturated set of population. These questionnaires were given to these groups of population in which we got approximately 70-90% response. However 66.4% people did not responded to question related to smoking (non-smokers), remaining 33.6% who are active smokers (current smokers).

2.2 Statically analysis

Statistical significance was defined as p value less than or equal to 0.05, using two-tailed tests of hypotheses. Categorical data were analysed by chi-square test. The categorical variables are summarized as frequency and percentage. The chi-square test is used to test the association between two categorical variables. The data analysis is done using SPSS (version 27).

III. RESULTS

In this study, we investigated the association between current smoking and the severity of acute respiratory and COVID-19 illness. Preliminary analysis revealed that 33.6 % of the population are active smokers with few symptoms of breathiness and post COVID complication. Likewise 49.8% of the population are passive smokers with respiratory symptoms and post COVID complication. Thought both active and passive smokers show overlapping in respiratory illness, it was hard to distinguish causative agents in both the groups. Of the 154 participants enrolled in tobacco smoking studies, 39 had mention smoking association and remaining 64 has shown no association to tobacco smoking. Of the included participants, either age or marital status show no significant association to tobacco smoking. Additionally, with active smoking in 39%; there was a significant association between tobacco smoking and respiratory illness with incidence of 28.0% (p value <0.05). Furthermore, active smoking in 22.9% has shown correlation with tobacco smoking and alcohol with incidence of 57.4% (p value <0.05). Analysis show no association between COVID-19 and tobacco smoking. Active smokers show some tolerance when compared to passive smoker. Active smoker or former smokers with smoking history consuming nicotine in 27.0% has shown association, predicating that nicotine could associated with consistent smoking and developing respiratory illness. There is association between nicotine and smoking (p value <0.05).

IV. DISCUSSION

The findings of the aforementioned research show that the prevalence of respiratory disease was assessed using a variety of questionnaire (which is include in (tables 2), (table 3), and (table 4).

Smoking has a harmful impact on a person's general health. Since smoking cigarettes changes the physiology of the lungs, it puts population to

an increased risk of developing lung-related infection. Furthermore, there is possible microbiological infections that increases colonisation of the airway of smokers by the bacterial pathogens with accompanying risk of severe infection is reported by various tobacco smoking patients. Moreover, smoking cigarettes can impair immunity, which raises the probability of contracting an infectious disease. Both active and passive smokers are susceptible to viral infections of the upper and lower respiratory tracts as well as invasive diseases brought on by different bacterial pathogens that, when left untreated and undiagnosed, can result in chronic lung disease[5]. More research is required to provide insight on the pathogens since these viruses penetrate host cells utilizing nicotine receptors [8].

When people starts smoking, it may seem as though their lungs are growing defences against the hazardous chemicals. On hypothetical basis, this might be because lungs generate new mutations that cause them to destroy more dangerous heavy metals (Cr , Pb, Cd, and Ni) than healthy persons, or what is known as "super lungs,"(hypothetical affirmation). Smokers' lungs eventually start to work harder to get rid of pollutants from their body, which makes them loses their natural ability for gas exchange and leads to the emergence of lung illnesses. Smoking appears to be advantageous, but it really does more damage than favorable. Exposure to COVID-19 increased the risk various respiratory disease in a proportional manner. It was claimed that smokers had more severe respiratory symptoms and post-COVID-19 complications.

Additionally, former smokers had more severe respiratory illnesses and post-COVID-19 complications, which put them at the risk for ARS and respiratory failure[9]. Although the 7 subtype of nicotine acetylcholine receptors (7-nAChR) is discreetly linked to coronavirus infection, contemporary smokers who consume nicotine were at risk [10]. A substantial correlation between active smoking and an increased risk of COVID-19 appears to exist.

The fundamental cause of progressively deteriorating immunological and lung function, as well as the possibility for lung cancer development, is chronic exposure to toxicants produced from smoking. Numerous chemical components of cigarettes are strong carcinogens. Additionally, there has been much empirical research on the connection between alcohol dependency and cigarette use. Both have a chance of contracting the illness. Smoking and alcoholism both have high systemic toxicity, thus those who have a history of both conditions run the risk of developing lung and liver cancers, respectively.

V. CONCLUSION

The statistics analysis show that smoking cigarettes has immediate and reversible impacts on both active and passive smokers. This study examines the acute impact of smoking on smokers' respiratory-related issues. Each of the events—pathogen presence, immunological dysfunction, and antibiotic resistance—increases a smoker's predisposition factors for lung infection.

However, irreparable lung injury will make it easier for these viruses to induce further lung damage, which will eventually lead to lung failure.

Furthermore, since smoking increases the risk of respiratory diseases. In conclusion chemical toxicants with consistent smoking and alcohol dependence may help each other to harm the human body as a whole factor. Smoking cigarette increases susceptibility to acquire respiratory infections and leads to ARS (acute respiratory syndrome). Nicotine may be one of the potential factor for acquiring ARS and ARDS Following Coronavirus diseases. Actively smoking population may be more vulnerable than passive smokers to the effects of Tobacco on health. If a smoker decides to stop, their lungs can recover their potential to function as healthy lungs.

ACKNOWLEDGMENTS

I would like to express my thanks of gratitude to my corresponding author Dr. Aprajita Singh for guidance and constant support. Additionally, special thanks to Miss. Fathima Inthiasunisja for the help and assistance in statistical analysis. I

would also like to thank Mr.Vinayaka Salunke and Mr.Vaibhav Shetty for their contribution in completing my research. I would also like to extent my gratitude to Jain University – SAHS for granting permission and support in my research.

REFERENCE

1. Laniado-Laborin R. Smoking and Chronic Obstructive Pulmonary Disease (COPD). Parallel Epidemics of the 21st Century. Int J Environ Res Public Heal 2009, Vol 6, Pages 209-224.2009;6(1):209-224. doi:10.3390/IJERPH6010209
2. Li X, Cao X, Guo M, Xie M, Liu X. Trends and risk factors of mortality and disability adjusted life years for chronic respiratory diseases from 1990 to 2017: systematic analysis for the Global Burden of Disease Study 2017. BMJ. 2020;368. doi:10.1136/BMJ.M234
3. Salvi S, Kumar GA, Dhaliwal RS, et al. The burden of chronic respiratory diseases and their heterogeneity across the states of India: the Global Burden of Disease Study 1990–2016. Lancet Glob Heal. 2018;6(12):e1363-e1374. doi:10.1016/S2214-109X(18)30409-1
4. Ferkol T, Schraufnagel D. The global burden of respiratory disease. Ann Am Thorac Soc. 2014;11(3):404-406. doi:10.1513/ANNALSATS.201311-405PS/SUPPL_FILE/DISCLOSURES.PDF
5. Feldman C, Anderson R. Cigarette smoking and mechanisms of susceptibility to infections of the respiratory tract and other organ systems. J Infect. 2013;67(3):169-184. doi:10.1016/J.JINF.2013.05.004
6. Gülsen A, Yigitbas BA, Uslu B, Drömann D, Kilinc O. The Effect of Smoking on COVID-19 Symptom Severity: Systematic Review and Meta-Analysis. Pulm Med. 2020;2020. doi:10.1155/2020/7590207.
7. Haddad C, Malhab SB, Sacre H, Salameh P. Smoking and COVID-19: A Scoping Review. https://doi.org/101177/1179173X21994612. 2021;14:1179173X2199461. doi:10.1177/1179173X21994612.
8. Unverdorben M, Mostert A, Munjal S, et al. Acute effects of cigarette smoking on pulmonary function. Regul Toxicol Pharmacol. 2010;57(2-3):241-246. doi:10.1016/J.YRTPH.2009.12.013.
9. Hsieh SJ, Zhuo H, Benowitz NL, et al. Prevalence and Impact of Active and Passive Cigarette Smoking in Acute Respiratory Distress Syndrome. Crit Care Med. 2014;42(9):2058. doi:10.1097/CCM.0000000000000418.
10. Tizabi Y, Getachew B, Copeland RL, Aschner M. Nicotine and the nicotinic cholinergic system in COVID-19. FEBS J. 2020; 287(17):3656-3663. doi:10.1111/FEBS.15521.

Table 1: Static characteristic of response (n=154)

Parameters of analysis	Categories	Smokers (active smoker)	Non-smoker (passive smoker)	Total sample	P value
Gender	Male	39	64	150	0.2311
	Female	11	34		
	Prefer not to say	1	1		
Marital status	Married	8	15	152	0.390
	Unmarried	36	79		
	In relationship	7	7		

Table 2: Smoking and Health Characteristic of Response (n=154)

Parameters of analysis	Smokers (active smoker)	Smokers (active smoker) Incidence%	Non-smoker (passive smoker)	Non-smoker (passive smoker) Incidence%	Total sample	P value
Breathing difficulty	34	58.6%	89	41.4%	123	0.003
Coughing	35	59.3%	90	40.7%	125	0.004
Performance difficulty	95	35.3%	40	64.7%	135	0.009
Pain/ fullness in chest	36	51.7%	87	48.3%	123	0.037
Headache	37	34.1%	74	65.9%	111	1.000
Clubbing in finger (a) never (b) sometime (c) most of the time	 37 8 4	 34.3% 44.4% 57.1%	 71 10 3	 65.7% 55.6% 42.9%	133	0.328
Swelling in ankles	42	52.9%	98	47.1%	140	0.128
Sleeping difficulty (a) Normal (b) Distorted (c) No change	 27 12 9	 32.5% 38.7% 42.9%	 56 19 12	 67.5% 61.3% 57.1%	135	0.623

Table 3: Smoking and factorial of response (n=154)

	Smokers (active smoker)	Smokers (active smoker) Incidence%	Non-smoker (passive smoker)	Non-smoker (passive smoker) Incidence%	Total sample	P value
Alcohol intake	24	57.4%	81	42.6%	105	<0.001
Nicotine intake	34	65.4%	92	34.6%	126	<0.001

Table 4: Smoking and COVID-19 of response (n=154)

	Smokers (active smoker)	Non-smoker (passive smoker)	Total sample	P value
COVID-19 infection	31	52	83	0.559
Frequency of infection (a) Nil (b) Once (c) Twice (d) Trice	 25 17 5 1	 53 30 8 2	141	0.951

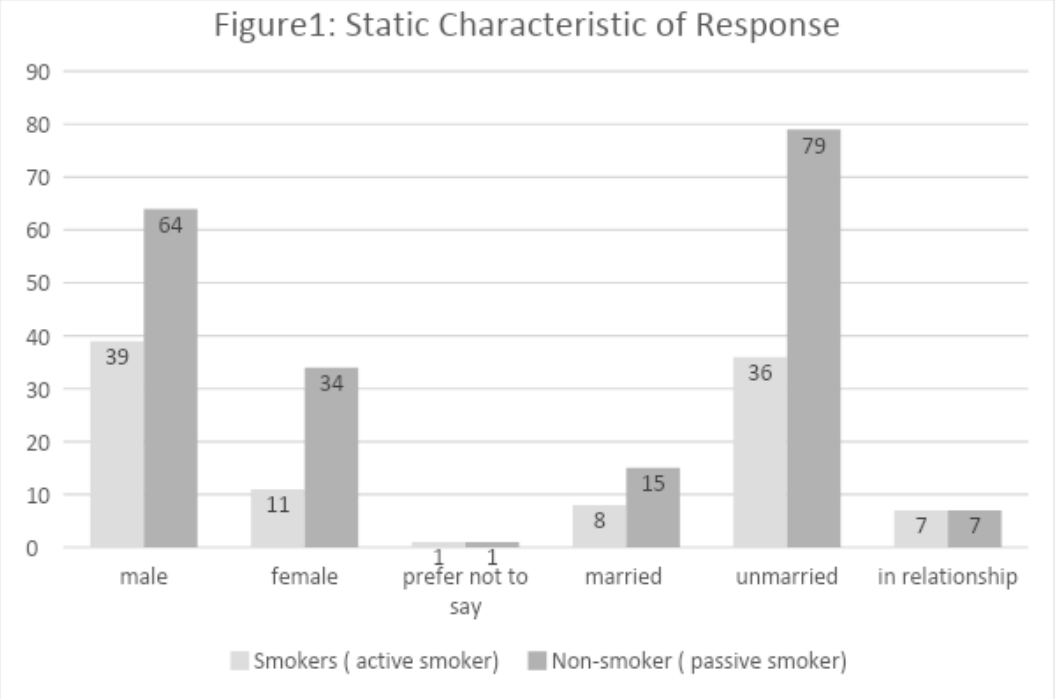

Figure 1: Static Characteristic of Response

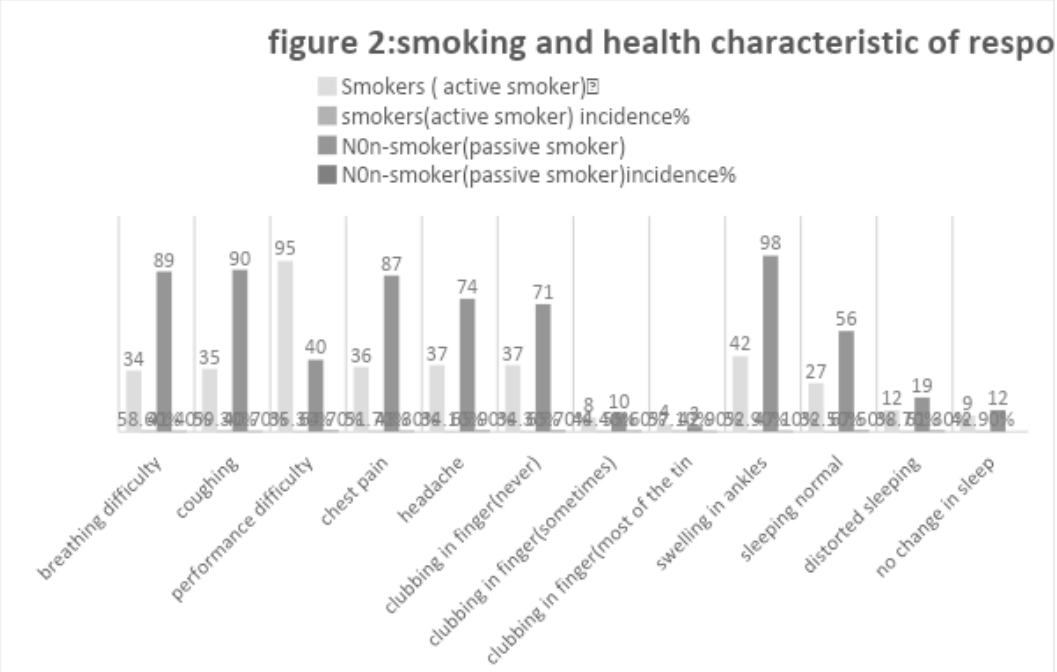

Figure 2: Smoking and health characteristic of respo

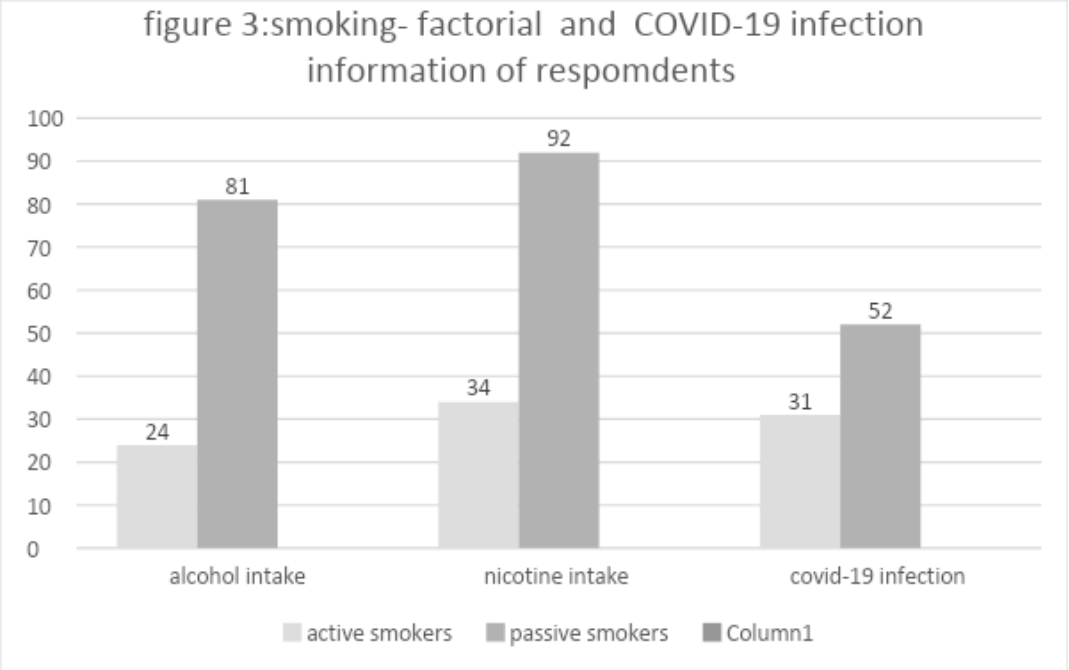

Figure 3: Smoking factorial and COVID - 19 infection information of respondents

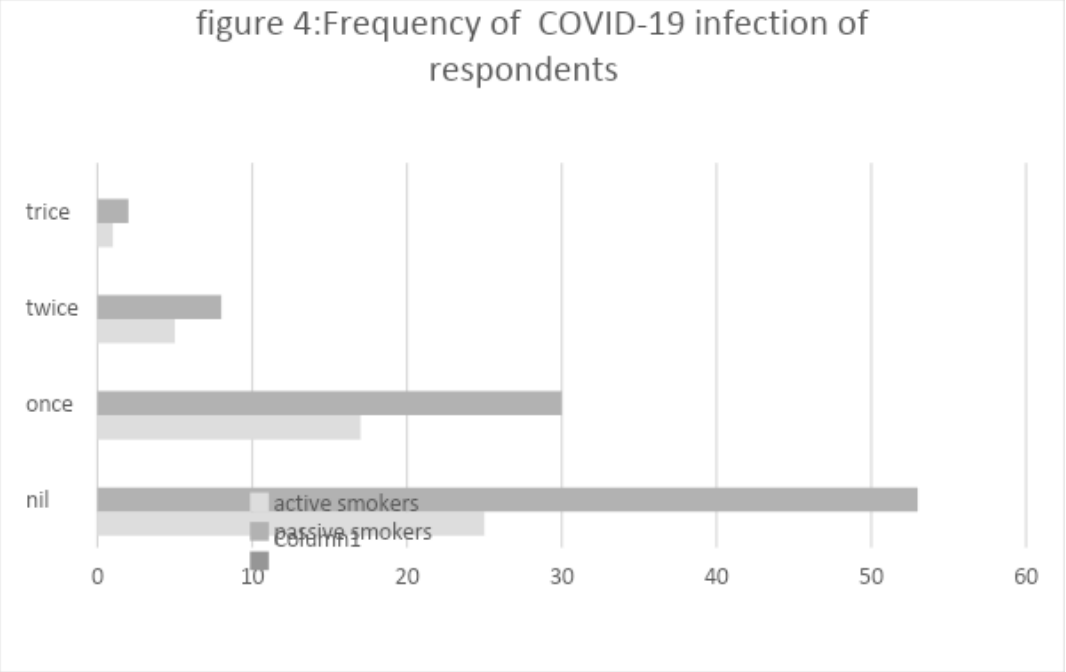

Figure 4: Frequency of COVID - 19 infection respondents

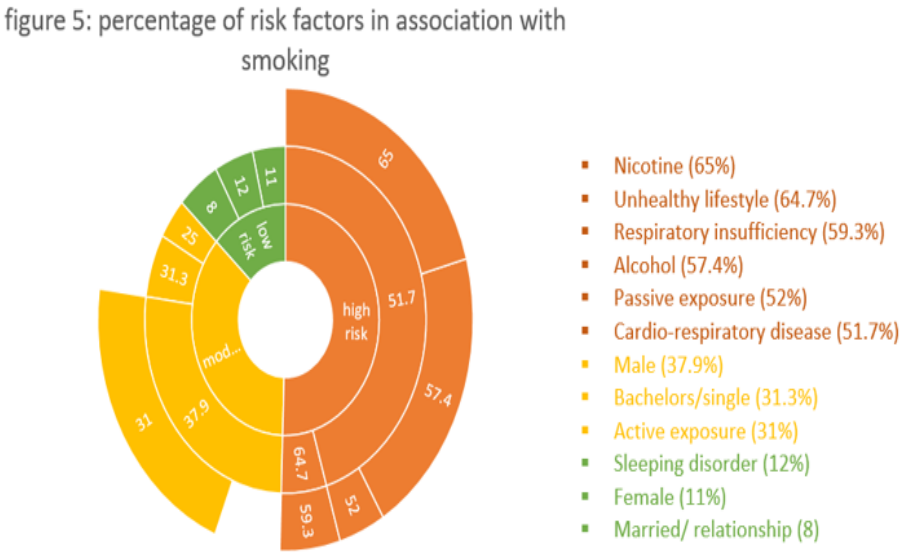

Figure 5 Percentage of risk factors in association with smoking