Prevalence of Smoking Among Prison Population in Punjab, Pakistan: A cross-Sectional Study

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Abstract

Objective: The study was conducted to assess the prevalence of active and passive smoking among prisoners confined in Punjab Prisons.

Methods: A cross-sectional study was conducted during 15th January to 15th March, 2017. A total of 301 male adult prisoners were enrolled through proportionate random sampling from 29 prisons of Punjab. Trained medical staff administered a structured pre-tested questionnaire to collect data on tobacco consumption, exposure to secondhand smoke and demographic variables. Data was analyzed by Epi Info software and chi-square test at 95% level of confidence applied.

Results: Mean age of participants was 40 years (range; 16 – 90 years). Prevalence of smoking among prisoners was 43% (95% confidence interval [CI]: 37.2 - 48.7). Out of nonsmokers, 84% (95% CI: 77.34 – 88.90) prisoners were exposed to secondhand smoke. High education was protective against smoking (27% versus 45% with below college degree; OR: 0.45; (95% CI: 0.2 – 0.96). Higher prevalence trend was observed with increasing age (39% up to 25 years, 42% among 26 to 45 years and 47%, > 45 years). Prevalence was high among single as compared to married (46% versus 41%) males.

Conclusion: Prevalence of smoking and exposure to secondhand smoke among prisoners was high which indicates an epidemic like situation. Being single, illiteracy and age were the associated factors with high prevalence of active smoking. There is an urgent need for health promotion and anti-tobacco education campaign in prisons.

Keywords: Smoking, Prevalence, Prison population, Punjab, Pakistan

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Introduction

Smoking, the inhalation of the smoke of burning tobacco in different ways,[1] kills up to half of its user.[2] Smoking is the leading cause of preventable deaths and incurs billions of dollars to the United States each year.[3] Smokers die 10 years earlier when compared to non-smokers.[3] More than 8 million people die each year due to smoking tobacco[2] which accounts for 11.5% deaths worldwide.[4] Almost 7 million deaths are due to direct smoking, whereas, 1.2 million deaths are due to secondhand smoking.[2] Low-and-Middle income countries share almost 80% of the world's 1.3 billion tobacco smokers' burden.[2] About 20% of the adult men smoke in Pakistan.[5] Though thousands of young people start smoking each day, many young adults want to quit this addiction but with a low success rate.[3]

In many developed countries, it has been observed that there is a declining trend in tobacco smoking prevalence except for prisons,[6] where there is exponential increase in the population across the globe.[7] The over-representation of disease, illness and health-related behaviours especially smoking have been evident within this population group.[8] Smoking tobacco is an integral part of prison life in the form of stress reliever and social control or lubricant.[9] Furthermore, high nicotine dependency,

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mental illness, and lack of smoking cessation programmes are the identified determinants of smoking in prisons.[9] In recent times, the ban on smoking in prisons gained favours especially in North America, but in other Western World, prisoners are facilitated with enclosed spaces for smoking.[9]

Around 16 million of Americans are living with a disease caused by smoking.[3] Smoking not only causes cancer, heart disease, stroke, lung disease, diabetes, Chronic Obstructive Pulmonary Disease (COPD) but also increases the risk of tuberculosis, eye problems, and poor immune functionality, such as rheumatoid arthritis.[3] Tobacco as a cardiac poison is although an established fact yet is the most ignored aspect of Heart Health programs. By and large cigarette smoke is associated with lung carcinoma, however, the cardiovascular morbidity is a major outcome of smoking. The elemental biochemistry of tobacco has an integral role in atherosclerosis.[10] Nicotine being the crucial culprit can be traced in blood as well as in the urinary metabolites such as cotinine, thiocyanate, and carbon monoxide, play the cardinal role in the pathogenesis of endothelial dysfunction[(10)]. The atherogenic cascade is inclusive of intimal damage, by lipoprotein deposition, which undergoes the oxidative process, followed by inflammatory mediators eventually causing a plaque formation.[10] Consequential additive damage of hematological nature adds further insult by increasing leucocyte count and platelet aggregation which causes enhanced adhesiveness with raised fibrinogen on existent dyslipidemia.[10] It is also a known cause of erectile dysfunction in males, leading to poor sexual life.[3] It is evident that smoking can initiate the use of drugs[11] like research exhibited that the drugs like heroin, crystals, cannabis, synthetic substances, ice, and opioids were commonly used among male prisoners.[12]

When it comes to breathing the air of prisons, where the prevalence of smoking is high, it is often an unbreathable air.[13] It is not only the active smoking which is the killer but rather the passive exposure which is an equal offender in putting the non-willing individuals to a deadly threat. Exposure to secondhand smoke has been proven as a health deterioration factor for at least the last thirty-five years.[14] Secondhand smoking is not only harmful to prisoners but also an unavoidable risk factor for prison staff as it has been accentuated for the development of smoke-free policies in a survey of 15 prisons in Scotland.[14] In comparison to this, it is worth mentioning that out of 32 prisons in Punjab, with a capacity of 21,500, around 52,318 persons are being kept in prisons amplifying the exposure.[15] In 2016, almost 16.99% of male deaths were attributed to smoking in Pakistan and this was more than on average as compared to medium human development index - countries.[5]

According to Pakistan Prisons Rules 1978, Rule 345, condemned prisoners can smoke cigarettes or biris at their own expense, but these will be obtained through the prison.[16] Prisoners who smoke and are unable to obtain cigarettes at their own cost, may be given five cigarettes daily at Government expense.[16] Smoking is not only harmful to health but also the treasury of Pakistan due to additional economic loss.[5] Overcrowding and confinement of smokers with nonsmoker prisoners leads to passive smoking, the prevalence of smoking, the burden of secondhand smoke and associated factors among prisoners in Punjab Prisons are yet to be explored as there was very limited evidence available making the rationale of this study. The primary objective of this study was to assess the prevalence of active and passive smoking among prisoners confined in Punjab Prisons and associated risk factors. Findings will be valuable for policy makers to formulate evidence-based strategies to minimize smoking among prisoner population in Punjab.

Methods

A descriptive cross-sectional study was conducted during 15th January to 15th March, 2017 in 29 male prisons of Punjab, Pakistan. The sample size was calculated by using Epi Info software. The data was collected from 301 male adult prisoners by proportionate random sampling. The inclusion criteria were all the male adult inmates those were present during study period irrespective of their age and status in any prison and those refused to participate were excluded. Pretested structured interview-based questionnaire translated to the local language was administered.

Data were collected by trained prison medical staff after obtaining informed consent. The variables were age, residential status (rural and urban), marital status (divorced, married, unmarried and widower), education (illiterate, primary, secondary, above secondary), duration of confinement, tobacco consumption and exposure to secondhand smoke (yes or no). Data was analyzed by Epi Info software. Prevalence and Odds Ratios were calculated with 95% confidence interval. Chi-square test was applied. p value ≤ 0.05 was considered as significant.

Results

The mean age of the participants was 40 years (Range: 16-91 years). The prevalence of tobacco smoking was found to be 43% (95% confidence interval [CI]: 37.2 - 48.7). Exposure to secondhand smoke was 84% (95% confidence interval [CI]: 77.34 – 88.90) out of non-smokers.

Out of smokers, 69% were from rural background but there was no association of smoking with rural or urban background (Odds Ratio: 1.018: 95% confidence interval [CI]: 0.62 – 1.67) and duration of incarceration (x^2 [4] = 2.956; P-value = 0.56). High education was depicted protective against smoking (27% versus 45% with below college degree; Odds Ratio: 0.45; 95% confidence interval [CI]: 0.20 – 0.96). Higher prevalence trend was observed with increasing age (39% up to 25 years versus 42%, among 26 to 45 years versus 47%, > 45 years). Prevalence of smoking high among single as compared to married (46% versus 41%).

Table 1: *Age Distribution of Smokers and Non- Smokers Among Sample Population*

S/N	Age Groups	Smokers (n = 129)	Non-smokers (n = 172)	Total (N= 301)
1.	≤24 Years	13 (10%)	14 (8%)	27 (9%)
2.	25 - 34 Years	41 (32%)	69 (40%)	110 (37%)
3.	35 - 44 Years	27 (21%)	38 (22%)	65 (22%)
4.	45 - 54 Years	21 (16%)	24 (14%)	45 (15%)
5.	≥55 Years	27 (21%)	27 (16%)	54 (18%)

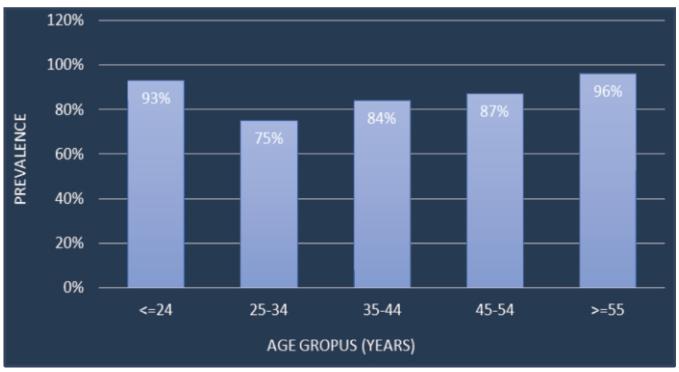

Fig- 1: *Prevalence of Secondhand Smoking among Different Age Groups of Non-Smoker Prisoners (N= 172).*

The prevalence of secondhand smoking in non-smokers was found to be very high in all age-groups (>=55 age group, the highest prevalence as shown in **Fig-1**).

There was no significant difference found between the type of prison and the prevalence of smoking (P-value = 0.27).

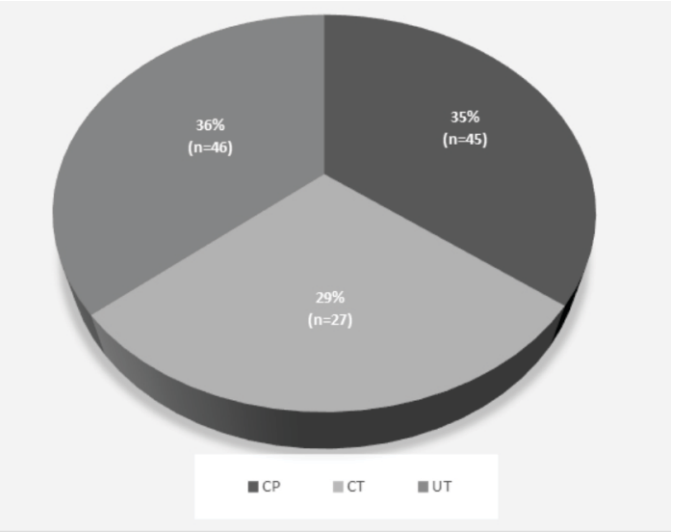

Fig-2: *Prevalence of Smoking among different Categories of Prisoners: Condemned Prisoner (CP), Convicted Prisoner (CT), Under Trial Prisoners (UT)*

Discussion

This study, aimed to identify the prevalence of smoking among male prisoners in Punjab, depicted very high prevalence as compared to the general population (male adults) in Pakistan (43% vs 20.6%).[5] The high smoking rate in prisons is not only a public health problem of developing countries but also the persistent problem of developed countries. There are many factors causing the surge in prevalence of smoking in prisons. The prevalence of smoking in Punjab prisons in this study was found slightly lower as compared to 55.6% identified in both black and non-black current prisoner smokers in a study conducted in three states of USA.[17] Most of the studies identified smoking prevalence 50% to 83 % among prisoners in different settings[17] and nearly 70% far higher than the prevalence of smoking in the general population of USA.[18] The possible reasons for the slightly lower prevalence of smoking among Punjab prisons may be due to restriction, availability, and affordability, socio-economic, and cultural factors.

It is evident that 33.33% of the World's population is exposed to secondhand smoking with 600,000 deaths annually.[19] Pakistan's 69.1% population is exposed to secondhand smoking at public places compared to 43.3% exposed at homes.[19] This study explored 84% prevalence of secondhand smoking among male prisoners which is comparatively higher than among the general population in Pakistan. The burden of hazard to secondhand smoke among non-smoker inmates is obvious. It is indirect indicator of high concentration

of fine particulate matter (PM2.5) in prisons.[20]

The higher education had been identified as a protective factor against smoking in prisons (Odds ratio: 0.45). Such characteristic is bolstered by a study in which same trend had been observed for the Greeks.[21] In contrast with prisoners, it is worth mentioning that same trend has had been observed for the general population.[22] Illiterate as well as elderly prisoners were more indulged to active smoking.[22] Living background (rural or urban) did not find to be associated with smoking among prisoners as the Odds Ratio was 1.08, though it is aforementioned that education is a protective factor against smoking and rural/urban background prisoners might differ in education status too, but there was no association in smoking. The possible factor might be the behavior adaption in mixed population and urban prisoners might started smoking during incarceration period. Although, it is evident that the rural population of Pakistan was more active tobacco cigarette smokers as compared to urban population (21.1% vs 15.9%).[23]

Our findings showed that the single men were more exposed to active smoking as compared to married. It is evident that the married men (USA) were less exposed to smoking "as reported in four Health Information National Trends (HINTS) 2011-2017",[24] supporting the current study. In a survey of 172 men prisoners, released from California State (United States of America) between 2009 and 2011, 74% were current smokers and odds of smoking habit was high among inmates those were incarcerated since five years.[25] However, in our study impact of duration of incarceration on smoking was statistically insignificant.

In general population, smoking cessation programs more focus on youth instead of elderly population although the elders are at high risk of lung cancer, chronic obstructive pulmonary disease, and cardiovascular disease. The results of this study showed increasing trend of smoking with increasing age. The incarceration beyond capacity might not only affect the smoking behavior but also increase the risk of premature mortality among elders. The choice of high to low or no exposure from cigarette smoke (secondhand smoke) is unavoidable among all age groups especially when prisons are overcrowded as we did not find any difference between secondhand smoke in all age groups. The inexistence of any association between type of prison and smoking might be justified by the same social environment, lack of smoking cessation programs, and mental illness throughout the prisons.

Recommendations

Prison period is an ideal time for education and any type of intervention. A complete ban on smoking did not prove helpful in preventing tobacco use among prisoners. Confining separately smokers and non-smokers will be a successful strategy to prevent non-smokers from secondhand smoke. There is an urgent need for health promotion and anti-tobacco education campaign. Cost-free cessation medications may be helpful to decline or quit the smoking among prisoners. History of incarceration might be a strong predictor of high rates of smoking-related morbidity and mortality among male prisoners, thus needed to be explored Tobacco smoking is the leading cause of preventable mortality across the world. Hence authentic measures are to be taken to not only for an awareness campaign for those directly affected but also the exposed innocent individuals who can avoid it altogether if necessary, precautions are taken to steer clear of such a drastic menace. Prisoners remained the marginalized group and have rarely been included in national tobacco control interventions. So, by including prisoners in such programs can lower the mortality and morbidity caused by smoking.

About 250,000 prisoners release annually from Punjab Prisons. Anti-smoking education in prisons will benefit prisoners before release and after release. Released prisoners spread the message to a wider community. Further studies should be conducted aiming pathways for the policy modifications in smoking clauses of Pakistan Prisons Rules, 1978.

Conclusion

High prevalence of smoking was observed among prison population. Single, illiterate as well as elderly prisoners were more indulged to active smoking. Smoking is the preventable risk factor associated with high rates of morbidity and mortality. This can be minimized by initiating smoking cessation programs inclusive of educational strategies. Otherwise, this smoking epidemic like situation will worsen if ignored in prisons.

Conflict of Interest None

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M.R.M: Conceptualization of project, Manuscript writing
K.M: Literature Search and Supervision of Data Collection, cleaning of collected Data.

B.F: Statistical Analysis, & discussion

U.I: Literature search and data compilation

A.P: Drafting, Revision, Discussion & Recommendations