Original Article

Prevalence of cigarette smoking among young adults in Pakistan

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Abstract

Objective: To obtain information about the prevalence of cigarette smoking among a selected sample of university students in Karachi and build our understanding of the determinants of smoking with respect to family smoking, smoking in the home, smoke-free public places, and quit smoking cessation programmes.

Methods: Data were collected as a part of a pilot project initiated by Jinnah University Karachi. Participants were 629 university students (432 males and 197 females) aged 18-25 years from ten universities in Karachi. Descriptive statistics and Logistic regression analyses were used to determine the results and conclusions.

Results: Thirty-nine per cent of students had smoked a whole cigarette in their life time, whereas 25% had smoked 100 or more cigarettes in their lifetime. Overall, 23% of students (31% male and 6% female) were classified as a current smoker and their mean age and standard deviation of smoking initiation was 17±2.7 years (17±2.6) for males and 16±2.9 females. Sixty-three percent of smokers reported that public places should be smoke-free. Logistic regression analyses adjusted by age and gender suggested that parental and sibling influence and number of close friends and individuals who smoke at home were highly predictive of being a smoker.

Conclusion: Findings from this study suggest that student were generally open to smoking cessation treatment and no-smoking restrictions (JPMA 58:597; 2008).

Introduction

Smoking is one of the leading causes of preventable death. According to World Health Organization (WHO) tobacco use is currently responsible for the death of one in ten adults worldwide (about 5 million deaths each year). Moreover, unless circumstances changes, within 25 years the annual death toll will double; millions more will prematurely develop tobacco related illnesses that lead to chronic disability.[1,2] Individuals who smoke cigarettes are 12 times more likely to die from lung cancer, two to four times more likely to develop coronary heart disease, twice as likely to have a stroke, and 10 times more likely to die from chronic obstructive lung disease.[3-5]

In Pakistan, it is estimated that the prevalence of tobacco smoking is 36% for males and 9% for females. Among young adults especially the university students in Pakistan, the prevalence of smoking is 15% with the majority being male smokers.[6,7] Approximately 1,200 children start smoking everyday.[8,9] This represents a huge impact not only in terms of economic costs but it is slowly depriving the country of a healthy workforce and increasing the burden of disease in the already overburdened health sector. The reason young people start to smoke is complex and multi-faceted. It includes a host of interacting biological, genetic, psychological, economic and social variables. Arguably the most modifiable determinants are social and environmental in nature, including exposure to smoking by parents, siblings, friends, and members of the general public.[6,10,11]

Parental smoking behaviours have been found to play a key role not only in youth initiation but also in the escalation of their smoking habits.[12,13] Some studies indicate that youth having at least one smoking parent are more likely to begin smoking themselves.[10] Others have suggested that children with at least one smoking parent are significantly more likely to progress to higher levels of smoking, compared to children whose parents do not smoke.[14]

Numerous authors have observed that a young person's decision to smoke is directly influenced by peers' smoking behaviour.[15,16] In terms of smoking initiation, never smokers whose friends smoke are significantly more likely to begin smoking compared to never smokers whose friends do not smoke, even after adjusting for other variables.[11,15,17,18]

Exposure to smoking in private and public places may also influence tobacco use initiation, maintenance, and cessation.[19] For example, data from California suggests that smokers who worked or lived in a place that was smoke free were significantly more likely to make a quit attempt and

succeed in quitting than smokers who worked or lived in locations that did not have any smoking restrictions.[20] Indeed, the impact of smoke free homes on quitting was of the same order of magnitude as the most popular types of smoking cessation medication (e.g., nicotine replacement products).

The objectives of this study were to provide an initial estimate on the prevalence of cigarette smoking among a select population of university students in Karachi, and explore the potential relationship between tobacco use and various social factors including family smoking habits, smoking in the home, smoke free public places and smoking cessation programmes.

Methods

Cross-sectional data were collected in 2006 as part of a pilot project initiated by Jinnah University Karachi. Ten universities in Karachi and students within each university were selected based on convenience sampling as shown in Table 1. After obtaining verbal consent, students completed confidential, structured surveys outside their class rooms. Demographic information included the participant's institution, as well as their gender, age and educational level. Additional questions were deigned to obtain information about the prevalence, psychosocial correlates and motivational factors for smoking among young adults.

Outcome measure

Smoking status was assessed using three questions: "Have you ever smoked a whole cigarette? (1 = Yes, 2 = No)"; "Have you smoked 100 or more cigarettes in your life time? (1 = Yes, 2 = No)"; "Did you smoke a whole cigarette in the last 30 days? (1 = Everyday, 2 = Almost everyday, 3 = Someday, 4 = 1 or 2 days, 5 = I have never smoked)". Respondents were classified as never smokers if they had not ever smoked a whole cigarette and/or they had not smoked at least 100 cigarettes in their lifetime and rest were defined as smokers.

Measures of predictor variables

Respondents also reported their sex (male, female), age in years, whether the community they lived in was urban or rural, and if they were currently attending school, college or university (yes, no). Parental and sibling smoking behaviour were measured as 1 (At least one parent/sibling smokes) and 0 (No parents/siblings smoke). Perceived smoking rate was a participant's estimate of the percentage of students his/her age at school who smoke cigarettes (1=0-10%, 2=11-20%, 3=21-30%, 4=31-40%, 5=41-50%, 6=51-60%, 7=61-70%, 8=71-80%, 9=81-90%, 10=91-100%). Intention to use a cessation programme was assessed by asking "Would you join a programme to help you quit if you were ever offered? (1 = Yes, 2 = No, 3 = I do not smoke anymore, 4 = I have never smoked)". Attitudes towards

Table 1: Descriptive statistics (N = 629).

Characteristic		Non-Smokers n=484 (%)	Smokers n=145(%)	Total n=629(%)
Gender	Male	298 (61.5)	134 (92.4)	432 (68.7)
	Female	186 (38.4)	11 (7.5)	197 (31.3)
Parents smoking	Any of parents smoke	123 (25.4)	79 (54.5)	202 (32.1)
Sibling smoking	Any of sibling smoke	99 (20.4)	70 (48.3)	169 (26.9)
Ever smoked a whole cigarette	Yes			249 (39.6)
Smoked 100 or more	Yes			154 (24.6)
Smoked in last 30 days	Every day			106 (16.9)
	Almost every day			22 (3.5)
	Some days			45 (7.2)
	1 or 2 days			13 (2.1)
Smoking status	Non-smokers			484 (76.9)
	Smokers			145 (23.1)
Perception of smoking	51-100	275 (56.8)	86 (59.3)	361 (58.0)
	0-50	206 (42.6)	56 (38.6)	262 (42.1)
Smoke free places	Definitely yes	268 (55.4)	44 (30.3)	312 (51.1)
	Probably yes	85 (17.6)	46 (31.7)	131 (21.4)
	Probably not	37 (7.6)	24 (16.6)	61 (10.0)
	Definitely not	82 (16.9)	25 (17.2)	107 (17.5)
Intention to join any cessation programmes	Yes			67 (47.2)

a* Only for smokers

smoke free public places were measured by asking "Should public places be smoke-free? (1 = definitely yes, 2 = probably yes, 3 = definitely no, 4 = probably no)."

Analyses

Descriptive analyses for each variable were performed (e.g., mean standard deviation, range, and correlation for continuous variables and cross tabulation and frequencies for categorical variables). Individuals with missing data were removed prior to the analysis based on a comparison statistic with missing and non missing individual data. Comparisons were made using the demographic and basic smoking behaviour variables. Results suggested that there were no significant differences between students missing data and those not missing data for any of the measured variables. Logistic regression models were used to predict individual smoking behaviour. The predictor variables entered into these models included interval level and dummy coded categorical level measures. Perception of smoking and number of close friends who smoke were used as continuous variables. Each potential risk factor was considered separately in regressions controlling for gender and age. Adjusted odds ratios were calculated for each variable from the logistic regression models. Because many variables were correlated, we considered each variable separately to avoid problems with multi-collinearity. We employed a mixed effect model to control the institutional effect. Since the results from the mixed effect models were similar to those from conventional fixed effect models, we reported the latter.

Results

The final sample consisted of 432 male and 197 female students between the ages of 18-25 years. This provided 80% power to detect a mean difference of at least 1.5 with a standard deviation of 6.5. Descriptive statistics are shown in Tables 1 to 3. Thirty-nine per cent of students had smoked a whole cigarette in their life time, whereas 25% had smoked 100 or more cigarettes in their lifetime. Overall, 23% of students (31% male and 6% female) were classified as a current smoker and their average age and standard deviation of smoking initiation was 17(2.7) years (17(2.6) for males and 16 (2.9) females). Nicotine addiction and stress were the most common reasons given by students for why they smoked (53% and 50%, respectively). Forty-seven per cent of smokers expressed a willingness to join a cessation programme and 73% of smokers reported that public places should be smoke-free. Approximately 75% of respondents indicated that at least one of their five closest friends smoked cigarettes and more than half mentioned that at least one person in their home smoked cigarettes. Fifty-eight per cent of individuals believed that over half of individuals their age were current smokers. Current tobacco users smoked an average of 10 cigarettes per day and most had a high proportion of close friends who smoke cigarettes, especially as compared to nonsmokers. Males are more likely than females to be

Table 2: Distribution Participants by University.

Name of College	N (%)
Baqai University [Baqai Medical University]	84 (13.4)
Dow Medical College [Dow Medical University]	56 (8.9)
Institute of Business Management [CBM]	79 (12.6)
MAJU [Mohammad Ali Jinnah University]	62 (9.9)
PAF-KIET [Pakistan Air Force-Karachi Institute of Economics & Technology]	67 (10.7)
SMC [Sindh Medical University]	69 (11.0)
SZABIST [Shaheed Zulfiqar Ali Bhutto Institute of science and Technology]	83 (13.2)
UIT [Usman Institute of Technology]	72 (11.5)
AIFD [Asian Institute of Fashion Design]	28 (4.5)
Sir Syed University of Engineering and Technology	29 (4.6)

Table 3: Mean and Standard deviation for continuous predictor.

	Non-Smokers mean (std)	Smokers mean (std)
Age	20.93 (1.67)	21.77 (1.82)
Age of initiation	-	-
Five closest friend smoke	2.78 (1.65)	4.45 (1.45)
# of people smoke in home	1.77 (1.31)	2.93 (1.34)
Average number of cigs smoke per daya		10.48 (9.32)

a* Only for smokers

Table 4: Logistic Regression Analysis fitted by Generalized Estimating Equations.

Variable	Estimate	P-Value	Odds Ratio	Confidence Interval
Age	0.20	0.003	1.22	(1.07, 1.41)
Gender	0.88	<0.0001	5.87	(2.74, 12.56)
Number of Family Members that Smoke	0.66	<0.0001	1.94	(1.34, 2.70)
Number of Close Friends that Smoke	0.42	<0.0001	1.53	(1.31, 1.78)
Perception of Smoking	-0.08	0.1052	0.92	(0.83, 1.02)
Number of People who Smoke at Home	0.34	0.0004	1.40	(1.16, 1.69)
Should Public Places be Smoke-Free?	-0.87	0.0006	0.42	(0.26, 0.69)

smokers (OR=5.87, 95% CI 2.74, 2.56).

Results from logistic regression are shown in Table 4. It shows that each additional family member who is a smoker increases the chance of the participant being a smoker by 94% (OR = 1.94, 95% CI 1.39, 2.69). Families where smoking is common (i.e., where more people smoke inside the home) is likely to magnify individual smoking behaviour. Each additional person who smokes in the participant's home increases the chance of the participant being a smoker by 40% (OR = 1.40, CI 1.16, 1.68). Having close friends who also smoke has a significant impact on smoking behaviour. Each additional close friend who is a smoker increases the chance of a participant being a smoker by 53% (OR = 1.53, 95% CI 1.31, 1.78). Students perceptions of the prevalence of smoking was not related to the odds of being a smoker (OR = 0.92, 95% CI 0.83, 1.01). Finally, participants who were strongly in favour of smoking restrictions in public places were less likely to smoke than persons who supported smoking in public places (OR = 0.42; 95% CI 0.26,0.69).

Discussion

This is the first known study to examine the relationship between a handful of psychosocial variables and smoking status among a sample of University students in Karachi, Pakistan. The variables in this study were selected based on findings from high income countries which suggested that the smoking status of young adults' family members and friends, as well as no smoking restrictions in private and public spaces may be related to tobacco initiation, consumption, and cessation.

The prevalence of smoking among university students was found higher as compared to earlier studies conducted in Peshawar and Islamabad universities.[6,7] However, the study variables with a broad sample of university students from Karachi, Pakistan are generally consistent with those from high income countries. Specifically, the smoking status of parents, siblings and peers is related to the smoking status of young adults. Moreover, the greater the number of parents, siblings and peers who smoke, the more likely it is that a university student will be a smoker. This suggests that efforts to increase the number of smoke free homes may be warranted. Studies have shown that smoking restrictions at home not only reduce the overall exposure of tobacco, it can also reduce the smoking uptake in youth.[21] If individuals are not allowed to smoke inside the home, it sends a clear message to youth that smoking is a socially un-acceptable and non-normative behaviour.[22]

Pakistani students in this study reported that they started smoking at an older age, and had lower average daily consumption rates than their western counterparts.[23] However, they were generally open to smoking cessation treatment and no-smoking restrictions. One potential reason for the success of smoking cessation programmes and no-smoking restrictions among young adults from high income countries is that smokers generally have favourable attitudes towards these provisions.[17] Therefore, results from the present study suggest that FCTC provisions calling for more smoking cessation treatments and smoke free spaces will be very effective within Pakistani universities.

The body of evidence demonstrating how social factors can influence tobacco initiation, consumption and cessation is now sufficiently large and compelling that the WHO has adopted several social policy and programme measures into the Framework Convention on Tobacco Control (FCTC). The FCTC is the first global treaty on health initiated by WHO. It has created a regulatory strategy to reduce global tobacco use and to improve public health. Among other things, the treaty requires the governments to adopt measures to restrict exposure to tobacco smoke and to educate and train smokers and members of the public about the dangers of tobacco use and the benefits of quitting. The government of Pakistan signed this document in May 2004, but as of July 2007 it had not been ratified or its provisions implemented. Having research data relevant to strategic populations initiatives (such as social influences on young adults) may be useful in expediting ratification of FCTC and also to monitor its future impact in Pakistan.

Results from this study also appear to warrant FCTC measures aimed at informing parents and the general public about the dangers of tobacco use and exposure. For example, there is evidence that adolescents are less likely to smoke if their parents and siblings engage in anti-smoking socialization practices[10,13,15] such as reducing the normative acceptability and prestige of smoking.[22]

Limitations and Future Directions

Various methodological limitations must be considered when interpreting the data. For instance our study was limited to a convenience sample of university students and did not include students from other government colleges in Karachi. Thus findings from the present study may not generalize to all college students. Secondly, the study involved cross sectional data that is useful for identifying the existence of potential relationships, but not causality. Third, data are based on self reports that may be prone to desirability effects.[23] However, results from developed countries suggest that self reports with a general population of adults are generally quite consistent with valid bio-chemical measures, especially when data collection is unrelated to the provision of treatment or other incentives.[23] Fourth, our survey was focused on cigarette smoking and did not attempt to

understand the relationship with the many other forms of tobacco use that exist in Pakistan such as Pan, Gutkha etc. Finally, in an effort to reduce response burden, only a limited number of variables were examined. Ideally, it would be useful to gather data that will elucidate potential relationships with a broader host of biological, economic, and environmental variables. Additional ongoing longitudinal research with a nationally representative cohort of college students (and non-students) is needed to replicate and extend the present findings.

Conclusion

Despite these shortcomings, the current study contributes to the scientific literature and should help inform public policies and practices. First, it suggests that the factors which influence Pakistani students to smoke may not be significantly different from counties with a broader evidence base. As such, it helps justify the need for the government to adopt the provisions of the FCTC with respect to smoke free places, public education and treatment for tobacco cessation. Second, results are consistent with other surveys of adult smoking in Pakistan. The high prevalence among university students is particularly concerning given that rates are typically higher among less educated populations. Finally, the study lays an important foundation for future research. It helps to justify the need for larger, more sophisticated trials on tobacco use among young adults in Pakistan.

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