

Exploring the Predictors of Quitting Tobacco Usage among Patients Attending a Private Dental Institution-A survey from Jodhpur, India

Chaya Chhabra¹, Kumar Gaurav Chhabra², Sharda Bishnoi³, Jaspal Singh⁴, Vimlesh Sahu⁵, Abhishek Lohra⁶, Ashish Sharma²

¹Department of Pedodontics and Preventive Dentistry, Jodhpur Dental College General Hospital, Narnadi, Boranada, Jodhpur – 342001, Rajasthan, India. ²Department of Public Health Dentistry, Jodhpur Dental College General Hospital, Narnadi, Boranada, Jodhpur – 342001, Rajasthan, India. ³Department of Public Health Dentistry, Darshan Dental College General Hospital, Loyara, Udaipur, Rajasthan, India. ⁴Department of Orthodontics and Dento Facial Orthopedics, Rayat Bahara Dental College and Hospital, Sahauran-140104, Punjab, India. ⁵Department of Oral and Maxillofacial Surgery, Medical officer (Dental), Community Health Centre, Sri Dungarpur, Bikaner, Rajasthan, India. ⁶Department of Oral and Maxillofacial Pathology, Jodhpur Dental College General Hospital, Narnadi, Boranada, Jodhpur – 342001, Rajasthan, India.

Abstract

Background: Burden of tobacco epidemic has swiftly moved to developing countries making the exploration of predictors of quitting tobacco usage extremely important.

Aim: To assess the willingness to quit tobacco use and to ascertain the predictors of quitting tobacco as well as tobacco dependency by employing Fagerstrom scale.

Methods: The study consisted of 252 subjects visiting the Public Health Dentistry department in a Dental institution JDCGH (Jodhpur Dental College General Hospital), Rajasthan, India. Data on demographic information, tobacco usage and quitting, information on reasons for quitting like; self-concepts, social concerns, legal issues, and health concern was collected by interview schedule method.

Results: Overall 76% of the study participants were planning to quit. Demographic variables like age, marital status and religion were significant predictors of planning to quit tobacco usage ($p \leq 0.05$). Significant relationship was observed on Fagerstrom Scale with place of residence, type of tobacco use and frequency of tobacco use ($p \leq 0.05$). The most frequent cited reason for quitting tobacco usage was spitting and ash dropping which was embarrassing in-front of others (75.65%) and least reported reason was future health concerns (33.16%).

Conclusions: Most of the respondents had favourable attitude towards quitting tobacco usage and social concern was the main predictor of quitting tobacco usage. Less reported reasons like legal issues and health concerns have to be explored in depth. The present study highlights the need for more researches exploring the predictors of quitting tobacco usage in India and further nationwide study.

Key Words: Tobacco, Tobacco quitting, Predictors, Dental institution, Indian scenario

Introduction

Tobacco has emerged as the killer of the century and is a major threat to public health in India. Tobacco kills a third to half of all people who use it, on average 15 years prematurely [1,2]. According to Jha et al., in Indian scenario the proportion of deaths credited to tobacco use is mounting swiftly, and probably 1 million Indians are expected to die from tobacco related problems annually with 1 in 20 deaths of females and 1 in 5 deaths of males aged 30 to 69 years [3]. The most popular form of tobacco usage in India is smokeless tobacco. According to the Global Adult Tobacco Survey 2010 (GATS), the prevalence of smokeless tobacco usage in India is highest in the world which is around 60% (163.7 million). Smoker's population in India is estimated around 68.9 million [4]. The causal association of tobacco usage with general and oral diseases is well established. Smoking tobacco usage causes lung cancers, cardiovascular diseases, chronic obstructive pulmonary diseases, strokes, infertility, bone thinning causing fractures and periodontal diseases which leads to premature tooth loss [5]. The effects of tobacco use on the public's oral health also are frightening. Smokeless tobacco usage is associated with precancerous lesions; oral cancer, periodontal diseases, complications with healing at extraction site, staining

of teeth, and failure of many dental procedures [6]. India has one of the highest rates of oral cancer in the world [7,8]. The International Classification of Diseases (ICD-10) has recognized "tobacco dependence" as a diseased state (WHO 1994). Based on the WHO guidelines; India was the 7th country in the world which endorsed WHO FCTC (WHO Framework Convention on Tobacco Control) in February 2004. Ministry of Health and Family Welfare, Government of India has opened 18 tobacco cessation centers in various cities in India. All these centers are mainly concerned with educating people in terms of adverse health effects of tobacco, prevention and control of tobacco usage, but the capacity of the same is very much in the infancy stage.

Initiation of tobacco usage involves interactions of multiple factors, similarly quitting also involves exchange of various factors like demographics, self-concept issues, health concerns, legal issues, and social influence. All the aforementioned determinants require exploration as these might play a crucial role as predictors of quitting tobacco usage. Most of the earlier studies have focused on finding reasons for initiation of tobacco usage [9-11] but none have explored the predictors for quitting tobacco usage. The present study might provide a fertile ground for health promoting activities and

Corresponding author: Chaya Chhabra, Department of Pedodontics and Preventive Dentistry, Jodhpur Dental College General Hospital, Narnadi, Boranada, Jodhpur, Rajasthan, India; Tel: +91-99295-35666; e-mail: chaya.chhabra@gmail.com

inculcating health development behavior among population and individuals.

The objective of the study was to assess the willingness to quit tobacco use, explore the reasons for quitting tobacco use and to determine if any association exists between those who want to quit and the demographic variables. Further the study also determines the tobacco dependency among tobacco users by employing Fagerstrom test for smoking and Modified Fagerstrom for smokeless form of tobacco.

This is the first attempt which explores various issues and reasons related to quitting tobacco among patients visiting dental college in India, which may provide vital information for implementing more effective, tailor-made and targeted intervention for tobacco control at both micro as well as macro level.

Methods

A cross-sectional explanatory study was conducted among patients visiting Tobacco Counseling Centre in Department of Public Health Dentistry, Jodhpur Dental College General Hospital, Jodhpur National University, Jodhpur, Rajasthan, India. Prior to the study, ethical clearance was obtained from the Ethical Committee of the Institutional Review Board of JDCGH (Jodhpur Dental College General Hospital), Rajasthan.

Purpose of the study was explained to the patients and a written informed consent was obtained from the participants. 252 respondents participated in the study. Data was collected using structured interview schedule consisting of investigator developed, close ended, pretested questions. The interview schedule comprised of a total of 23 items apart from the demographic variables such as age, gender, education, occupation, religion and marital status.

The study was conducted during the months of January 2013 - October 2013. Pilot study was conducted on 30 individuals who were interviewed in their local language to assess the clarity of questions and accordingly necessary modifications were made in the interview schedule for effective communication. The interview schedule had the Cronbach's α value of 0.83.

Patients were asked whether they had any plans to quit tobacco, for those who replied yes; a total of four items explored various self-concept issues for quitting tobacco usage; like having seen any family member or neighbor dying of cancer, having their children start tobacco and history of chronic disease in the family. Three items explored social influence as a reason for quitting like, tobacco causes staining of teeth and bullying by people, smell of tobacco is being disgusting and ash dropping, spitting looking embarrassing. Three items explored health concerns like, tobacco usage causes gum diseases, oral precancerous and cancers lesions and whether they involved in some sportive activity or not.

Only one item explored legal issues as a reason for quitting (tobacco users not get sufficient public places to use tobacco in any form). Other 11 items for exploring quitting tobacco usage included were type of tobacco use, age when tobacco usage started; frequency and quantity, cessation aid required for quitting, number of quit attempts, and maximum duration of abstinence and overall reasons for quitting. Dependency

on tobacco was assessed by Fagerstrom test for smoking and Modified Fagerstrom questionnaire for smokeless tobacco [12].

Data was entered into the computer (MS Excel, MS Word) and Statistical Package for Social Sciences (SPSS), version 16.0 (SPSS Inc, Chicago IL) was employed for data analysis. Level of significance was kept at 5%. Association of planning to quit and demographic variables such as age, sex, education, occupation, religion and marital status was assessed by chi-square test. Association between dependency on tobacco and demographic variables was also assessed by chi square analysis. Logistic regression analysis for quitting tobacco use by different variables was performed.

Results

Table 1 Shows that age, marital status, and religion to be significantly ($p \leq 0.05$) associated with plans to quit tobacco. Place of residence ($p \leq 0.05$), type of tobacco and tobacco use per day ($p=0.00$) were significantly associated with Fagerstrom Scale for tobacco usage.

Figure 1 shows that embarrassment in front of others due to ash dropping and spitting of tobacco (75.65%) was the most frequent cited reason followed by smell of tobacco (74.61%), staining of teeth and bullying by people (68.91%). Least reported reason was future health concern (33.16%).

Most of the study subjects (33%) expressed that they don't require any cessation aid to quit tobacco while 25% of study subjects felt the need of cessation clinics for quitting tobacco. Prescription medication was preferred by 21% of study subjects. On applying logistic regression model only marital status had significant ($p=0.03$; $p \leq 0.05$) impact on quitting of tobacco.

Discussion

Tobacco remains one of the major, modifiable and preventable cause of not only morbidity and mortality worldwide but also addictedness and sickness. Most of the literature evidence on successful quitting of tobacco use from western countries is in the form of cigarettes usually [13], which is in contrast to India where tobacco use patterns are varied like cigarettes, bidis, hukkah, chillum, gutka (pan masala with tobacco), khaini (Mixture of sun dried tobacco and slaked lime), masher (roasted dried tobacco applied on teeth), mawa (Pan betel leaf/Nut with tobacco) and many other forms [9-11]. This situation is further compounded by social and cultural acceptance of tobacco in Indian scenario. There is a severe dearth of literature in Indian scenario which could unearth the reasons for quitting tobacco usage. Hence there is an urgent need to explore various predictors of quitting tobacco usage so that more effective, precise and targeted interventions can be put forward pertaining to quitting tobacco usage. The present study is the first exploration to assess various predictors of quitting tobacco and its association with different demographic variables comprehensively.

In the present study age was significantly associated with planning to quit tobacco usage, and most of the participants were in the age group of 21-30 years. The study results are in accordance with the studies done by Kabat and Wynder [13], Marques-Vidal P et al. [14] and Kaleta et al. [15]. This could

Table 1. Association between plans to quit tobacco use with different characteristics and Fagerstrom Scale for tobacco usage.

Factors		Yes (Quit)%	No (Quit)%	Total (%)	P-value	High dependency	Medium dependency	Low dependency	P value
Gender	Male	138 (77.97)	39 (22.03)	177 (70.24)	0.4272	21 (11.86)	70 (39.55)	86 (48.59)	0.2670
	Female	55 (73.33)	20 (26.67)	75 (29.76)		14 (18.67)	31 (41.33)	30 (40)	
Age	<20 years	40 (83.33)	8 (16.67)	48 (19.05)	0.0121*	8 (16.67)	22 (45.83)	18 (37.50)	0.4432
	21-30 years	70 (66.67)	35 (33.33)	105 (41.67)		15 (14.29)	46 (43.81)	44 (41.90)	
	31-40 years	55 (80.88)	13 (19.12)	68 (26.98)		7 (10.29)	24 (35.29)	37 (54.41)	
	>40 years	28 (90.32)	3 (9.68)	31 (12.30)		5 (16.14)	9 (29.03)	17 (54.84)	
Place of residence	Urban	46 (80.70)	11 (19.30)	57 (22.62)	0.4043	2 (3.51)	22 (38.60)	33 (57.89)	0.0183*
	Rural	147 (75.38)	48 (24.62)	195 (77.38)		33 (16.92)	79 (40.51)	83 (42.56)	
Education	Illiterate	51 (79.69)	13 (20.31)	64 (25.40)	0.0975	8 (12.5)	29 (45.31)	27 (42.19)	0.3591
	Primary education	74 (74.00)	26 (26.00)	100 (39.68)		19 (19)	42 (42)	39 (39.0)	
	Secondary education	47 (85.45)	8 (14.55)	55 (21.83)		5 (9.09)	18 (32.73)	32 (58.18)	
	PUC	8 (53.33)	7 (46.67)	15 (5.95)		2 (13.33)	5 (33.33)	8 (53.33)	
Occupation	Degree	13 (72.22)	5 (27.78)	1 (87.14)	0.4559	1 (5.56)	7 (38.89)	10 (55.56)	0.1667
	Unemployed	11 (78.57)	3 (21.43)	14 (5.56)		2 (14.29)	7 (50.0)	5 (35.71)	
	Agriculture	77 (71.96)	30 (28.04)	107 (42.46)		19 (17.76)	41 (38.32)	47 (43.93)	
	Laborer	53 (81.54)	12 (18.46)	65 (25.79)		8 (12.31)	22 (33.85)	35 (53.85)	
	Self Employed	41 (77.36)	12 (22.64)	53 (21.03)		4 (7.55)	24 (45.28)	25 (47.17)	
	Employed	7 (100.00)	00.00	7 (2.78)		0 (0.00)	6 (85.71)	1 (14.29)	
Family Income	Retired	4 (66.67)	2 (33.33)	6 (2.38)	0.5321	2 (33.33)	1 (16.67)	3 (50.0)	0.0554
	0-5000	52 (82.54)	11 (17.46)	63 (25.00)		13 (20.63)	25 (39.68)	25 (39.68)	
	5000-10000	90 (76.27)	28 (23.73)	118 (46.83)		12 (10.17)	54 (45.76)	52 (44.07)	
	10000-15000	37 (72.55)	14 (27.45)	51 (20.24)		5 (9.80)	19 (37.25)	27 (52.94)	
Marital status	>15000	14 (70.00)	6 (30.00)	20 (7.94)	0.0220*	5 (25.0)	3 (15.0)	12 (60.0)	0.4391
	Married	163 (79.51)	42 (20.49)	205 (81.35)		28 (13.66)	86 (41.95)	91 (44.39)	
Religion	Unmarried	30 (63.83)	17 (36.17)	47 (18.65)	0.0074*	7 (18.97)	15 (31.91)	25 (53.19)	0.0625
	Hindu	141 (72.68)	53 (27.32)	194 (76.98)		24 (12.37)	73 (37.63)	97 (50.0)	
Type of tobacco use	Others	52 (89.66)	6 (10.34)	58 (23.02)	0.2452	11 (18.97)	28 (48.28)	19 (32.76)	0.0000*
	Betalquid with tobacco	64 (82.05)	14 (17.95)	78 (30.95)		16 (20.51)	34 (43.59)	28 (35.90)	
	Gutkha	90 (76.27)	28 (23.73)	118 (46.83)		17 (14.41)	60 (50.85)	41 (34.75)	
	Masheri	1 (50.00)	1 (50.00)	2 (0.79)		0 (0.00)	0 (0.00)	2 (100.00)	
	Khaini	22 (78.57)	6 (21.43)	28 (11.11)		1 (3.57)	5 (17.86)	22 (78.57)	
Age at tobacco which use started	Smoking + Smokeless tobacco	2 (61.54)	(38.46)	26 (10.32)	0.4179	1 (3.85)	2 (7.69)	33 (88.46)	0.6123
	>18 years	116 (75.32)	38 (24.68)	154 (61.11)		18 (11.69)	66 (42.86)	70 (45.45)	
	18-25 years	69 (81.18)	16 (18.82)	85 (33.73)		14 (16.47)	31 (36.47)	40 (47.06)	
	25-30 years	6 (60.00)	4 (40.00)	10 (3.970)		3 (30.00)	3 (30.00)	4 (40.00)	
Frequency of Tobacco use per day	<30 years	2 (66.67)	1 (33.33)	3 (1.19)	0.1381	0 (0.00)	1 (33.33)	2 (66.67)	0.0000*
	≤3 per day	43 (76.79)	13 (23.21)	56 (22.22)		15 (26.79)	24 (42.86)	17 (30.36)	
	4-6 per day	87 (82.08)	19 (17.92)	106 (42.06)		14 (13.21)	52 (49.06)	40 (37.74)	
≥7 per day	63 (70.00)	27 (30.00)	90 (35.71)	6 (6.67)	25 (27.78)	59 (65.56)			

*p<0.05, Test of Significance- chi square test

be attributed to the fact that most of the participants started tobacco usage in early age and by the time they reached the grown-up age, the health could have worsened and incidence of symptoms caused by tobacco related diseases would have increased. Similar study by Sieminska et al. showed that poor health motivates people to quit in order to reduce the negative health effects of tobacco use.

Present study revealed that marital status was a significant predictor of quitting tobacco usage as more of the married people had the tendency to quit. This is in line with the studies done by Rice et al. [16] and Augustson et al. [17]. This could

be explained on the basis that marriage creates a very positive force to quit tobacco habit and helps gather a greater social support from the partner and the family members if the person is non-tobacco user. In the present study most common reported reason for quitting tobacco was social concern. Marriage is a social binding of two families which assist positive health behavior changes like quitting tobacco uses and continued abstinence [16].

Another predictor that was statistically significant with quitting tobacco use was religion. Studies conducted by Jabbour [18], Fouad and Whooley et al. [19] have shown the

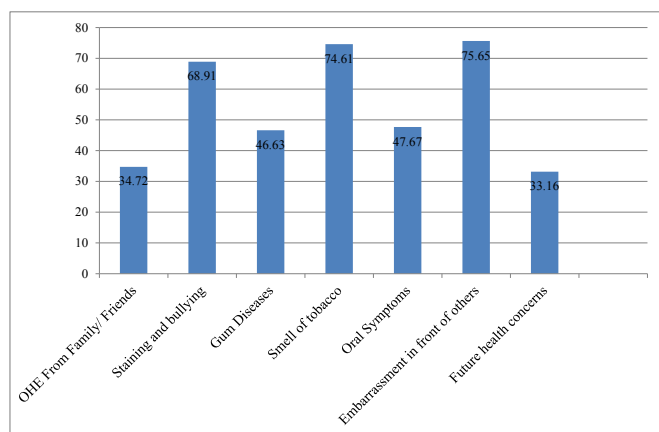


Figure 1. Reasons for quitting tobacco use.

same results: religion does play a greater role than any other demographic variable on tobacco use and quitting. India is a multi-religious state where Hindus are in majority followed by Muslims, Christians, Jains and Sikhs and among all, tobacco use is highly prohibited as it is addictive and harmful to general health. Unfortunately religious (spiritual) dimension of health is highly unexplored worldwide. There is an urgent need to uncover this dimension so that this predictor can be utilized to the best in quitting tobacco habits.

Nicotine dependency was assessed by Fagerstrom score, both for smoking and smokeless types of tobacco use [12]. In the present study Fagerstrom scale (Dependency on Nicotine) and place of residence was significantly associated. Most of the study subjects with high and medium dependency on nicotine were found in the rural population. The finding is in accordance with the reports of GATS India 2010 [4]. This could be attributed to less educational levels and lesser knowledge regarding harmful effects of tobacco use. The finding also suggests low knowledge of the adverse effects of tobacco use in rural population as they are deprived of health educational activities. Findings of the present study can also be inflated because of uneven distribution of study participants in the study group; further studies with even distribution of study participants are warranted to explore the real nature of this sort of association. Community based interventions and intensive health education programs are the need of the hour to make rural population aware and act on quitting tobacco use.

Majority of the smokeless tobacco users were gutka chewers with high to medium dependency on Fagerstrom scale (14.41%) and (50.85%) followed by betel users with high to medium dependency (20.51%) and (43.59%). The results are in accordance with the study by Sharmila et al. with 41.2% of gutka users [20]. The finding can be corroborated to the fact that gutka is available in readily prepared form and can be consumed instantly without wasting time to prepare.

On Fagerstrom scale, majority of the subjects with high and medium dependency on tobacco (13.21%) and (49.06%) was among those who consumed tobacco four to six times per day. And most interestingly people who consumed tobacco more than seven times a day, the dependency level was low (65.56%). This could be attributed to the fact that they might not use tobacco in the morning when they get up or they did not keep tobacco in the mouth for longer period of time.

The most common reason cited for quitting tobacco was spitting and ash dropping in front of others which was

reported to be embarrassing 75.67%, followed by smell of tobacco 74.61% and staining and bullying by people 68.91%. In all these findings, social concern and peer pressure is associated which can drive people to quit tobacco habits. This is in contrast to the study done by Siemińska et al. which reported social concern to be 32% [21]. In most of the earlier studies health concern was the most important reason cited by tobacco users [14,22,23]. Only 33.16% people (least cited reason) reported future health concern to be reason for quitting tobacco habit. This is the alarming situation because most of the participants were from the rural areas with most of them being dependent on tobacco and unaware of the carcinogenic potential of tobacco. It can be attributed to the fact that they might have negative concern regarding adverse effects of tobacco and had a wrong perception that they are in good health even though they use tobacco and erroneously recognize that tobacco won't affect their health. Hence extensive anti-tobacco campaigns and health education focusing on ill effects of tobacco consumption is immensely needed.

When participants were asked about the cessation aid required for tobacco quitting 33% participants said they did not require any cessation aid. This shows the will power and cold turkey approach for quitting in the study population. This is in line with other studies Fiore et al. [24], Baillie et al. [25] and Doran et al. [26]. The success rate of this unaided tobacco cessation is approximately 5% only as reported by Alicja et al. [27].

Overall 25% and 21% of participants asked for counseling and pharmacotherapy to reduce the urge for tobacco use and to overcome withdrawal symptoms. All these are the strong indication that tobacco addiction is a medical disorder and require health professional's intervention. There is an urgent need to put more of tobacco cessation clinics in the Indian scenario, as this condition qualifies itself for treatments for those who are tobacco addicts. Nicotine Replacement Therapy, bupropion, varenicline and cytisine have been shown to improve the chances of quitting. Combination NRT and varenicline are equally effective as quitting aids. Nortriptyline also improves the chances of quitting. On current evidence, none of the treatments appear to have an incidence of adverse events that would mitigate their use [28]. Present study is a good platform for nationwide studies.

Logistic regression model revealed that marital status has an impact on quitting tobacco usage, which is again a social concern and makes people more responsible towards life partners and be socially more connected and recognized.

The strength of the study is the comprehensive assessment of the patient visiting dental institution regarding quitting tobacco usage and exploring the dependency level by Fagerstrom scale which fills the important literature gap in the existing literature in the Indian scenario with respect to predictors associated with quitting tobacco usage. Self-reported answers to sensitive issues like tobacco use and quitting the habit might cause some biases in responses because of social pressure (faking good or faking bad). Thus, to reduce self-report bias, participants were assured that all

survey responses would be entirely anonymous and would be kept confidential to protect their privacy. Nonetheless, the present study provides an interesting platform for future research to uncover the association between certain multi-factorial predictors of quitting tobacco usage.

To conclude, the burden of tobacco epidemic has swiftly moved to developing countries and there is an urgent need of research which can explore the tobacco cessation more comprehensively and on larger samples. Demographic variables like age, marital status and religion were significant predictors of planing to quit tobacco usage. Tobacco dependency on Fagerstrom Scale was significant with place of residence, type of tobacco use and frequency of tobacco use. Social concerns in specific are the most probable predictors to be explored in depth to help people quit tobacco successfully.

References

1. Peto R, Lopez AD, Boreham J, Thun M, Heath C. Mortality from smoking worldwide. *British Medical Bulletin*. 1996; **52**: 12-21.
2. Murray CJL, Lopez AD. Alternative projections of mortality and disability by cause 1990-2020: Global burden of disease study. *The Lancet*. 1997; **349**: 1498-1504.
3. Jha P, Jacob B, Gajalakshmi V, Gupta PC, Dhingra N. RGI-CGHR Investigators. A nationally representative case-control study of smoking and death in India. *New England Journal of Medicine*. 2008; **13**: 1137-1147.
4. International Institute for Population Sciences (IIPS). Global Adult Tobacco Survey India (GATS India), 2009–2010. New Delhi: Ministry of Health and Family Welfare, Government of India; 2010.
5. Aveyard P, Martin R. Improving smoking cessation approaches at the individual level. *Tobacco Control*. 2012; **21**: 252-257.
6. Scott LT. Dentistry's role in tobacco control. *Journal of the American Dental Association*. 2001; **132**: 30-35.
7. Dikshit R, Kanhere S. Tobacco habits and risk of lung, oropharyngeal and oral cavity cancer: a population-based case-control study in Bhopal, India. *International Journal of Epidemiology*. 2000; **29**: 609-614.
8. Mathers CD, Loncar D. Projections of global mortality and burden of disease from 2002 to 2030. *PLoS Medicine*. 2006; **3**: 442.
9. Hu M, Rich ZC, Luo D, Xiao S. Cigarette sharing and gifting in rural China- A focus group Study. *Nicotine and Tobacco Research*. 2012; **14**: 361-367.
10. Bhojani UM, Chander SJ, Devadasan N. Tobacco use and related factors among pre-university students in a college in Bangalore, India. *National Medical Journal of India*. 2009; **22**: 294-297.
11. Narain R, Sardana S, Gupta S, Sehgal A. Age at initiation & prevalence of tobacco use among school children in Noida, India: a cross-sectional questionnaire based survey. *Indian Journal of Medical Research*. 2011; **133**: 300-307.
12. Heatherton TF, Kozlowski LT, Frecker RC, Fagerstrom KO. The Fagerstrom Test for Nicotine Dependence: A revision of the Fagerstrom Tolerance Questionnaire. *British Journal of Addiction*. 1991; **86**: 1119-1127.
13. Kabat G, Wynder E. Determinants of quitting smoking. *American Journal of Public Health*. 1987; **77**: 1301-1305.
14. Marques-Vidal P, Melich CJ, Paccaud F, Waeber G, Vollenweider P. Prevalence and factors associated with difficulty and intention to quit smoking in Switzerland. *BMC Public Health*.

Funding

The present study didn't receive funds or grants from any of the agencies in India or Abroad.

Conflicts of Interest

There are no conflicts of interest among the authors

This paper was presented at 18th National conference of Indian association of Public Health Dentistry held on 22nd to 24th of November 2013 at Lucknow, India.

Acknowledgements

The authors acknowledge the support of all the study participants. The authors would like to thank Professor and Head Dr. Sumita Kaswan, (Vice- Principal), Jodhpur Dental College General Hospital for her constant support and encouragement. The authors also acknowledge the support of Dr Jaddu Jyothirmai Reddy, Reader, Department of Public Health Dentistry, Jodhpur Dental College General Hospital, Jodhpur, Rajasthan.

2011; **11**: 227.

15. Kaleta D, Korytkowski P, Makowiec-Dąbrowska T, Usidame B, Bąk-Romaniszyn L, Fronczak A. Predictors of long term smoking cessation: results from global adult tobacco survey in Poland (2009-2010). *BMC Public Health*. 2012; **12**: 1020.

16. Rice VH, Templin T, Fox DH, Jarosz P, Mullin M. Social context variables as predictors of smoking cessation. *Tobacco Control*. 1996; **5**: 280-285.

17. Augustson EM, Wanke KL, Rogers S, Bergen AW, Chatterjee N. Predictors of sustained smoking cessation: A prospective analysis of chronic smokers from the alpha-tocopherol Beta-carotene cancer prevention study. *American Journal of Public Health*. 2008; **98**: 549-555.

18. Jabbour S, Fouad F. Religion-based tobacco control interventions: How should WHO proceed? *Bulletin of World Health Organization*. 2004; **82**: 923-927.

19. Whooley MA, Boyd AL, Gardin JM, Williams DR. Religious involvement and cigarette smoking in young adults: the CARDIA study (coronary artery risk development in young adults study). *Archives of Internal Medicine*. 2002; **162**: 1604-1610.

20. Sharmila P, Mangesh P, Majmudar P, Nilesh I, Savita G. An Integrated Approach to Worksites Tobacco Use Prevention and Oral Cancer Screening Among Factory Workers in Mumbai, India. *Asian Pacific Journal of Cancer Prevention*. 2012; **13**: 527-532.

21. Siemińska A, Jassem-Bobowicz JM, Uherek M, Wilanowski T, Nowak R. Medical students' attitudes towards tobacco smoking at the first and sixth year of their studies 2002-2008. *Pneumonologia i Alergologia Polska*. 2009; **77**: 371-379

22. Halpern M, Warner K: Motivations for smoking cessation: a comparison of successful quitters and failures. *Journal of Substance Abuse*. 1993, **5**: 247-256.

23. Bednarek M, Gorecka D, Wielgomas J, Czajkowska MM, Regula J. Smokers with airway obstruction are more likely to quit smoking. *Thorax*. 2006, **10**: 869-873.

24. Fiore MC Novotny T, Pierce JP, Giovino GA, Hatziandreu EJ, Newcomb PA. Methods used to quit smoking in the United States. Do cessation programs help? *Journal of American Medical Association*. 1990; **263**: 2760-2765.

25. Baillie AJ, Mattick RP, Hall W. Quitting smoking: Estimation by meta-analysis of the rate of unaided smoking cessation. *Australian Journal of Public Health*. 1995; **19**:129-131.

26. Doran CM, Valenti L, Robinson M, Britt H, Mattick RP. Smoking status of Australian general practice patients and their attempts to quit. *Addictive Behaviors*. 2006; **31**: 758-766.

27. Sieminska A, Buczkowski K, Jassem E, Lewandowska K, Romana U. Patterns of motivations and ways of quitting smoking among Polish smokers: A questionnaire study. *BMC Public Health*. 2008; **8**: 274.

28. Cahill K, Stevens S, Perera R, Lancaster T. Pharmacological interventions for smoking cessation: An overview and network meta-analysis. *Cochrane Database of Systematic Reviews*. 2013; **2013**: CD009329.