

# Demographic Profile, Smoking Cessation Interventions and Continuous Abstinence of Tobacco Users at Two Years

Raj Kumar, Shyam Kanhaiya Saroj, Manoj Kumar and Gopal C. Mahakud

Tobacco Cessation Center, Vallabhbhai Patel Chest Institute, University of Delhi, Delhi, India

## Abstract

**Background.** Vallabhbhai Patel Chest Institute, Delhi is providing tobacco cessation services since November 2001. Since then many tobacco users visited and availed these services.

**Objectives.** This study was undertaken to assess the demographic profile and the abstinence rate of the tobacco users at two years, outcomes of a cessation clinic in India, its success rate, type of people enrolling for cessation services, type of tobacco and tobacco dependence.

**Methods.** Tobacco cessation counselling and pharmacotherapy, if required, were provided to tobacco users registered at Tobacco Cessation Centre (TCC) of our Institute from November 2001 to December 2016. During counselling, demographic details and details of tobacco use were obtained. Brief intervention strategies of RAJKUMAR (R=Reaching to the subject, A=assess the stage of change, J=Judge the severity, K=Know the risky situations, U=Use coping skills, M=Medication required or not, A=Arrange follow up, R=Re-evaluation) were applied.

**Results.** Out of a total 7231 registered tobacco users, 7010 (97%) were males with a mean age ( $\pm$ SD) of 42.2 ( $\pm$ 14.9) years. Most of the subjects (81%) belonged to urban areas. Majority of them (58.8%) were smokers, with 21.7% severely dependent on tobacco. Overall, continuous abstinence rate was observed to be 53.7%, 47.7%, 38.7%, 31%, 29.5%, 28.8% and 24% at 1, 3, 6, 9, 12, 18 and 24 months, respectively. In non-pharmacotherapy group, continuous abstinence rate for the same period was 55.3%, 46.1%, 35%, 23.9%, 22.4%, 22% and 18.3%, respectively, while in the pharmacotherapy group it was 51.1%, 50.1%, 44.5%, 41.8%, 40.3%, 36.4%, and 32.3%, respectively.

**Conclusions.** Present study showed that tobacco users in the age group of 30-40 years are more interested to quit tobacco. A significant number of tobacco users (24%) continuously abstain from using tobacco for more than two years. Our results suggest that those using pharmacotherapy for tobacco cessation achieve a higher rate of abstinence. A 10-minute behavioural counselling was also found to be effective in reducing and/or quitting tobacco use. [*Indian J Chest Dis Allied Sci* 2019;61:31-37]

**Key words:** Tobacco cessation, Counselling, Pharmacotherapy, Abstinence rate.

## Introduction

The number of smokers worldwide has increased from 721 million in 1980 to 967 million in 2012, and the number of cigarettes smoked increased from 4.96 trillion to 6.25 trillion because of population growth.<sup>1</sup> Addiction to tobacco is so strong that it becomes difficult for tobacco users to quit.<sup>2,3</sup> More than half a trillion dollars of economic damage worldwide each year was attributable to tobacco use.<sup>4</sup> This serious scenario is present in all the economies, especially in the middle and low income countries.<sup>5</sup> India accounted for 267 million tobacco users.<sup>6</sup> Serious problems like heart attack, emphysema, chronic obstructive pulmonary disease (COPD) and cancer of many organs, like throat, mouth, lungs, and pancreas may occur in tobacco users.<sup>7-10</sup> The measures, such as raising taxes, ban on tobacco use in public places and other stricter laws are

required to stop the use of tobacco, but at the same time proper facility/measures should be made available to help people come out of nicotine addiction. Tobacco cessation clinic, telephone-based counselling, and tobacco quitting medication have shown remarkable positive results. Considering that tobacco users need support for quitting due to the addictiveness of tobacco products, our institution started a Tobacco Cessation Centre (TCC) in the year 2001. The present study focuses on the outcomes of tobacco users registered at the TCC, their socio-economic profile, demographical status, and effect of pharmacotherapy and behavioural counselling during the last 15 years.

## Material and Methods

Tobacco Cessation Center (TCC) was started at Vallabhbhai Patel Chest Institute, University of Delhi, Delhi, India in the year 2001. Initially the services were available only once in

[Received: April 2, 2018; accepted after revision: December 3, 2018]

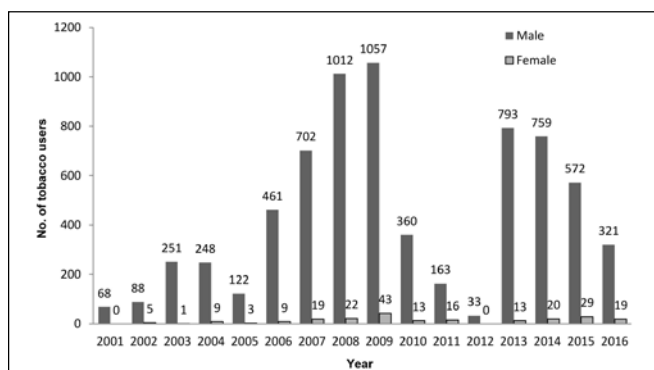
**Correspondence and reprint requests:** Dr Raj Kumar, Professor, Department of Pulmonary Medicine and Head, National Centre of Respiratory Allergy and Immunology (NCRAAI), Vallabhbhai Patel Chest Institute, University of Delhi, Delhi, India; E-mail: rajkumarvpci@gmail.com

a week, later on twice a week, and currently these services are available on all working days from 9:00 AM to 5:00 PM.

All tobacco users registered at TCC of Vallabhbhai Patel Chest Institute, Delhi, India, over a period of 15 years (2001-2016), those willing to quit tobacco (some of them self-motivated or advised by the physicians, friends and family member, through posters, banners) were included in the study. All subjects were asked to fill a simple questionnaire (*Appendix-I*) that includes details of tobacco use before behavioural counselling. Fagerstorm test with six questions was performed to assess the nicotine dependency.<sup>11</sup> The level of nicotine dependence was considered low for individuals with scores 0-4, average with scores 5-7, and high with scores above 7 in Fagerstrom test. The level of carboxyhaemoglobin (CoHb) was measured by Pico+ Smokerlyzer machine (Bedfont, England). Intervention strategies of RAJKUMAR (R=Reaching to the subjects, A=Assess the stage of change, J=Judge the severity, K=Know the risky situations, U=Use coping skills, M=Medication required or not, A=Arrange follow up, R=Re-evaluation by phone calls) were applied (*Appendix-II*). Subjects were followed up prospectively for one year and included in the study. Later on, 354 subjects were contacted through telephone-based calls, and divided in pharmacotherapy (n=137) and non-pharmacotherapy group (n=217). In pharmacotherapy group, Bupropion SR (150mg), Varenicline (0.5mg and 1mg), Nicotine patch (21mg, 14mg and 7mg), Nicotine gum (2mg and 4mg) were prescribed, depending on individual's nicotine dependency. The study is approved by the Institutional Ethical Committee.

## Results

Out of a total of 7231 tobacco users registered at TCC, 5438 (75.2%) were from Delhi; followed by 1070 (14.8%) from Uttar Pradesh, 448 (6.2%) from Haryana, 108 (1.5%) from Bihar, 29 (0.4%) from Rajasthan and Uttarakhand, 22 (0.3%) from Madhya Pradesh and 116 (1.6%) from rest of India. People were coming to TCC not only from all the states of India but also from other Asian countries including Bangladesh, Afghanistan, and Nepal for tobacco cessation. The year-wise distribution of subjects (males and females) registered at TCC for tobacco cessation is presented in figure 1.



**Figure 1.** Year-wise distribution of male and female tobacco users registered at TCC, VPCI for tobacco cessation

The mean ( $\pm$ SD) age of the tobacco users in the present study was  $42.2 \pm 14.9$  years. Maximum numbers of subjects 1690 (23.4%) were in the age group of 30-40 years, followed by 1573 (21.7%) in 20-30 years, 1553 (21.5%) in 40-50 years, 1148 (15.9%) in 50-60 years, 780 (10.8%) in 60-70 years, 263 (3.6%) above the age of 70 years and 224 (3.1%) below the age of 20 years. We observed that tobacco users in the age group of 30-40 years were more active to quit their habit. The decision to quit may be the realisation of its harmful effects as well as family concerns. Our study found that individuals below the age of 20, do not realise the harmful effects of tobacco and continue the same till they realise its adverse effects; and above the age of 60, people were not aware that they can still quit their smoking and other forms of tobacco use. Also one more perception by those aged >60 years is that their body is decaying due to old age and there is no need to quit tobacco as they have finished their duty and responsibility. Regular follow-up calls were made to the registered subjects to prevent relapse and to assess the effect of counselling. More than 5000 calls were made between January 2013 to December 2016.

In the present study, we found that most of the subjects (4259, 58.9%) started use of tobacco between the age of 11-20 years, with a mean age of 19.5 years, and nearly 3% of the subjects started using tobacco at a tender age of less than 10 years; 2147 (29.7%) of the subjects started taking tobacco between 21-30 years, whereas 441 (6.1%) subjects started using tobacco between 31-40 years. Rest 144 (2%) of tobacco users started tobacco after the age of 40 years.

Another important finding of the present study is that very few females were coming to TCC to quit their habit of tobacco use (Figure 1), possibly due to social stigma, lack of awareness about tobacco quit facility and household works.

Most of the subjects belonged to Hindu community (6219, 88.1%), followed by Muslims (791, 11.2%) and 47 (0.7%) belonged to other communities in the present study. It has been observed that number of married subjects were four times higher (5856, 83%) than the unmarried subjects reporting to TCC; possible reason may be the responsibility towards family or the married tobacco users want to quit for their spouse and or kids. Number of widowed and divorced subjects was 27 (0.4%). An urban preponderance at TCC was observed (5718, 81%), that can be attributed to the location of the TCC (Figure 2). As most tobacco users are without any significant co-morbidity, rural inhabitants are not likely to travel longer distances to seek tobacco cessation treatment.

We observed that fairly educated people, who were aware of the harmful effects of tobacco use, take up this deadly habit, as 40.1% had studied more than intermediate [XIIth Standard] level, 47.6% had schooling below the XIIth Standard and only 12.3% tobacco users were illiterate. During counselling when asked to name the diseases that may occur due to tobacco use, subjects with higher education were able to identify the diseases compared to those who were either illiterate or less educated. In the present study,

we found that the use of tobacco was more prevalent among businessmen (24.6%) and those in private sector service (19.6%) compared to others (12.4% in labour sector, 11.3% students, 9.9% professionals, such as doctors, engineers, lawyers, chartered accountants etc, 8.3% retired employee, 5.8% unemployed and 4.9% in Government service).

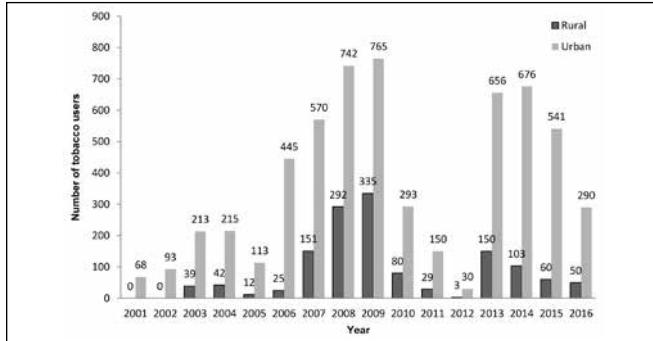


Figure 2. Area-wise distribution of tobacco users registered at TCC, VPCI.

As smokeless forms of tobacco are more in use in rural areas, we observed cigarette smoking in more than half of the study subjects (4251; 58.8%), smokeless tobacco users (1803; 24.9%), and 1177 (16.3%) using both the types). Smokeless tobacco users used tobacco products, like *khaini*, *gutka*, *pan masala*, *pan*, *tobacco paste* etc, while smokers were using mainly *cigarettes* and *bidis*. During the study, it has been observed that 3049 (42.2%) of the tobacco users were taking alcohol once a week.

Nicotine dependency is a strong predictor of the difficulty to quit tobacco use. In the present study Fagerstrom score was observed to be above 7 (high score) in 1453 (20.1%), 5-7 (average score) in 2292 (31.7%), 1-4 (low score) in 1706 (23.6%) and 0 point in 1222 (16.9%) of the study subjects. In the present study 31.6% subjects have already made at least one month quitting attempt, prior to coming to TCC.

### Abstinence Rate

A total of 515 subjects were given pharmacotherapy, including NRT (Nicotine patch, Nicotine gum) and non-NRT (Bupropion, Varenicline). In non-NRT group, 88 tobacco users were on Bupropion, 12 on Varenicline and in NRT group (231) were given nicotine gum and 184 were given nicotine patches. Quit status of tobacco users registered at TCC, VPCI from 2001 to 2016 of both the groups is presented in table 1.

Abstinence rate at 1, 3, 6, 9, 12, 18 and 24 months was observed to be 51.1%, 50.4%, 44.5%, 41.8%, 40.3%, 36.4%, and 32.3%, respectively in pharmacotherapy group (n=137) (Table 2) and 55.3%, 46.1%, 35%, 23.9%, 22.4%, 22% and 18.3%, respectively in non-pharmacotherapy group (n=217) (Table 2).

### Discussion

Uses of tobacco is a serious health concern for all countries.<sup>4</sup> A latest survey of GATS 2016 (Global Adult Tobacco Survey) revealed that, every fifth adult uses smokeless tobacco and

every tenth adult smokes tobacco, whereas 3.2 crore adults resort to dual use of tobacco.<sup>6</sup> An estimated one million people die every year due to tobacco related diseases in India. In order to reduce the impact of tobacco related morbidity and mortality, several plans are being launched by the Ministry of Health and Family Welfare, Government of India. With the support of the World Health Organization (WHO) India Country office, 13 TCCs were started in the year 2002 in India.<sup>12</sup> To provide long-term tobacco cessation interventions the number of TCCs was increased subsequently to 19. The TCC at VPCI was upgraded as Regional Resource Centre for Tobacco Cessation.

Tobacco consumption is basically divided in the three categories, viz. smokeless (*Khaini*, *Guthka*, *Zarda*, *Pan*, etc), smoking (*Bidi*, *Cigarette*, *Hukka*, *Chhutta*, etc) and both. GATS-2016 report found that 24.1% of tobacco users were smokers, 62.2% used smokeless form and 13.7% used both the forms in India.<sup>6</sup> However, we observed that 58.8% were smokers, 24.9% used smokeless tobacco and 16.3% used tobacco in both the forms. The difference may be due to the fact that the data released by the GATS is based on 267 million tobacco users of India whereas our data is based on only 7231 registered tobacco users at TCC, VPCI. Globally, smoking is prevalent among 47% men and 12% women, with the highest rate of smoking among men in Asia (67% in China, 65% in Korea, and 53% in Japan).<sup>13</sup>

Data from the WHO regional office for South-East Asia showed a low percentage of female tobacco users (7.8%) attending 19 TCCs in India.<sup>14</sup> We also observed a similar pattern at TCC, VPCI in the present study. The GATS 2016 data showed that 42.4% of males and 12.8% of females, constituting 28.6% of the adult population, used tobacco in one or the other form in India.<sup>6</sup> This difference was also observed by us at TCC, VPCI in the present study. It is also observed in the present study that women who sought treatment at the TCC were comparatively older than the men, less educated and with low monthly income.

In the present study, nearly 83% married people used tobacco in any of the three forms, 16.4% unmarried and 0.4% divorced/separated or widowed were using tobacco. Almost similar findings were reported by other TCCs in India.<sup>14</sup> However, TCC at St John's Medical College Hospital, Bangalore reported a higher percentage of married tobacco users (88.8%).<sup>14</sup> The difference may be due to the age, people getting married after the age of 24-25 years. In the present study, the reason attributed to the higher number of married people is the continuous motivation from their spouse and children and awareness of harmful effect of tobacco use.

In the present study, education level of the study population was not found to be an important factor among the tobacco users who want to quit, as only 12% were illiterate and they were unaware of side effects of smoking and were reluctant to come to TCCs. Other studies in the metropolitan cities of Delhi and Kolkata found inverse educational gradients for tobacco use,

Table 1. Quitting status of tobacco users in non-pharmacotherapy and pharmacotherapy groups.

Year	Total No. of Subjects Registered	1 Month	2 Months	3 Months	6 Months	9 Months	12 Months	15 Months	18 Months	>24 months	Telephone to Persons*	Contact Made
<b>Non-pharmacotherapy Group</b>												
2001	63	0	0	0	0	0	0	0	0	0	10	0
2002	77	1	1	1	1	1	1	1	1	1	33	1
2003	192	1	1	1	1	1	1	1	1	1	62	4
2004	212	1	1	1	1	1	0	0	0	0	42	2
2005	113	0	0	0	0	0	0	0	0	0	15	0
2006	470	0	0	0	0	0	0	0	0	0	33	4
2007	689	1	1	1	1	1	1	1	1	1	77	5
2008	1000	1	1	1	1	1	1	1	0	0	104	7
2009	1077	14	14	14	12	12	12	10	10	10	308	35
2010	368	3	3	3	3	1	1	1	1	1	53	8
2011	178	3	3	3	3	3	3	3	3	3	31	8
2012	33	1	1	1	0	0	0	0	0	0	33	6
2013	707	4	4	3	3	2	2	2	2	0	144	13
2014	737	49	39	36	28	21	19	14	12	NA	153	48
2015	491	37	33	33	20	5	5	NA	NA	NA	414	64
2016	139	4	2	2	2	NA	NA	NA	NA	NA	42	12
<b>Total (A)</b>	<b>6542</b>	<b>120</b>	<b>104</b>	<b>100</b>	<b>76</b>	<b>49</b>	<b>46</b>	<b>34</b>	<b>31</b>	<b>17</b>	<b>1554</b>	<b>217</b>
<b>Pharmacotherapy Group</b>												
2001	05	0	0	0	0	0	0	0	0	0	10	0
2002	16	1	1	1	1	1	1	1	1	1	33	1
2003	60	1	1	1	1	1	1	1	1	1	62	2
2004	45	2	2	2	2	2	2	1	1	1	42	2
2005	12	0	0	0	0	0	0	0	0	0	15	0
2006	0	0	0	0	0	0	0	0	0	0	33	0
2007	32	2	2	2	2	2	2	1	1	1	77	4
2008	34	4	4	4	3	3	2	2	2	2	104	6
2009	23	7	7	7	6	6	6	5	5	5	308	16
2010	05	8	8	8	7	6	6	6	6	6	53	11
2011	01	1	1	1	1	1	1	1	1	1	31	4
2012	0	0	0	1	0	0	0	0	0	0	33	0
2013	99	11	11	11	9	6	6	5	5	3	144	19
2014	46	12	12	12	12	12	11	9	9	NA	153	23
2015	110	19	18	18	16	16	16	NA	NA	NA	414	46
2016	27	2	1	1	1	NA	NA	NA	NA	NA	42	3
<b>Total (B)</b>	<b>515</b>	<b>70</b>	<b>68</b>	<b>69</b>	<b>61</b>	<b>56</b>	<b>54</b>	<b>32</b>	<b>32</b>	<b>21</b>	<b>1554</b>	<b>137</b>
<b>Total (A+B)</b>	<b>7057</b>	<b>190</b>	<b>172</b>	<b>169</b>	<b>137</b>	<b>105</b>	<b>100</b>	<b>66</b>	<b>63</b>	<b>38</b>	<b>NA</b>	<b>354</b>
<b>Percentage</b>	<b>NA</b>	<b>53.7</b>	<b>45.6</b>	<b>47.7</b>	<b>38.7</b>	<b>31.0</b>	<b>29.5</b>	<b>28.8</b>	<b>27.5</b>	<b>24.0</b>	<b>NA</b>	<b>NA</b>

\* Telephone to the persons for pharmacotherapy and non-pharmacotherapy are common

NA=Not applicable

Table 2. Abstinence rate of tobacco users in non-pharmacotherapy and pharmacotherapy groups.

Abstinence Rate	Subjects (%)	Abstinence Rate	Subjects (%)
<b>Non-pharmacotherapy Group</b>		<b>Pharmacotherapy Group</b>	
1 month abstinence rate (n=217)	120 (55.3%)	1 month abstinence rate (n=137)	70 (51.1%)
3 month abstinence rate (n=217)	100 (46.1%)	3 month abstinence rate (n=137)	69 (50.4%)
6 month abstinence rate (n=217)	76 (35.0%)	6 month abstinence rate (n=137)	61 (44.5%)
9 month abstinence rate (n=205)	49 (23.9%)	9 month abstinence rate (n=134)	56 (41.8%)
12 month abstinence rate (n=205)	46 (22.4%)	12 month abstinence rate (n=134)	54 (40.3%)
18 month abstinence rate (n=141)	31 (22.0%)	18 month abstinence rate (n=88)	32 (36.4%)
24 month abstinence rate (n=93)	17 (18.3%)	24 month abstinence rate (n=65)	21 (32.3%)

with the highest tobacco users among the illiterates.<sup>15</sup> In a study by Kumar *et al*,<sup>16</sup> the prevalence of smoking among students of University of Delhi was 23.6% for boys and 3.9% for girls, cigarette (97.6%) being the most common, 70% used tobacco for fun and pleasure, 23.2% used it due to peer pressure.

There is a strong association between heavy alcohol use and cigarette smoking, as approximately 80% of alcohol dependent patients are reported to smoke cigarettes.<sup>17,18</sup> Despite a decline in smoking in the US population, in general, a recent study from Health Maintenance Organization, USA, demonstrates that more than 60% were active smokers, use of alcohol was estimated to be 10 times more common among smokers than non-smokers.<sup>19</sup> In addition, nicotine dependence appears to be more severe in smokers who have a history of alcohol dependence.<sup>20</sup> We observed that 42.2% of the tobacco users use alcohol at least once a week with a reported increase in smoking and chewing tobacco after taking alcohol.

Review of the literature suggest varying abstinence rates in different studies. A cessation programme at a specialist clinic in Sweden, with an average of 10 treatment sessions with nicotine replacement therapy (NRT) as a recommended part of the programme, showed an abstinence rate of 40% for tobacco cessation, and after 5–7 years it was 18% with continuous abstinence.<sup>20</sup> The majority of smokers quit and relapsed a number of times before they achieve sustained abstinence.<sup>21,22</sup> The estimated annual incidence of the relapse of smoking after one-year of abstinence is 2% to 15% in retrospective studies (with recall problems) and about 10% in prospective studies.<sup>23</sup> An earlier study published from TCC, VPCI at Delhi,<sup>24</sup> found continuous abstinence rate in the counselling group at 1, 3, 6, and 12 months of 17%, 17%, 16%, and 15%, respectively, whereas in the medication group the rate was 60%, 58%, 54%, and 53%, respectively.<sup>24</sup> However, Kennedy *et al*<sup>25</sup> reported continuous abstinence rate at 1, 3, and 6 months as 43.8%, 31.3%, and 25.0%, respectively in the pharmacotherapy group. In the present study, the abstinence rate could be different if all the subjects were contacted, as the registered tobacco users contact details were from the year 2001, most of them could not be contacted on phone due to non-reachability, switched-off, network busy, contact number or any of the other reasons. In the present study, 12 subjects were died due to lung diseases. Review of the literature suggest that the abstinence rate in pharmacotherapy group was higher than the non-pharmacotherapy group.

The limitation of the study is due to change in registered contact/telephone number of the subjects, the data analysis was done on a limited number of subjects.

## Conclusions

Overall, 24% tobacco users successfully quit after one or more counselling and follow-up sessions for more than two years. The abstinence rate in non-pharmacotherapy and pharmacotherapy group at 24 months was 18.3% and

32.3%, respectively. The study also observed that more than 25% of tobacco users had previously attempted to quit for at least one month prior coming to the TCC, reflecting their willingness to quit. Tobacco users in the age of 30-40 years were more active to quit tobacco. The demographical profile reveal that whether it is rural area or urban area, tobacco use has been observed to be common among the youth and teenagers and continue their habit till old ages. Women too consume tobacco but their number is less compared to men and feel some hesitation to visit tobacco cessation clinics. Most common age to start tobacco has been observed to be between 11 to 20 years. Smoking was the most popular form of tobacco use. Alcohol use among the tobacco users is common. Majority of the tobacco users want to quit with help from tobacco cessation clinic, which should be focused to provide better intervention. A 10-minute behavioural counselling is also effective in reducing, quitting tobacco use. Promoting pharmacotherapy in tobacco cessation programme achieves higher rate of abstinence.

## References

1. Ng M, Freeman MK, Fleming TD, Robinson M, Dwyer-Lindgren L, Thomson B, *et al*. Smoking prevalence and cigarette consumption in 187 Countries, 1980-2012. *JAMA* 2014;311: 183–92.
2. Benowitz N. Clinical pharmacology of nicotine: implications for understanding, preventing, and treating tobacco addiction. *Clin Phar Ther* 2008;83:531–41.
3. World Health Organization. Tobacco free initiatives-About smoking cessation. Available at URL: <http://www.who.int/tobacco/research/cessation/about/en>. Accessed on August 29, 2016.
4. World Health Organization. *WHO Report on the Global Tobacco Epidemic, 2013*. Geneva: World Health Organization; 2013. Available at URL: <http://www.who.int/tobacco/globalreport/2013/en/>. Accessed on August 29, 2016.
5. World Health Organization. WHO worldwide current situation of national quit-line services. In: *Developing and Improving National Toll-free Tobacco Quit Line services- A World Health Organization manual*. Geneva: World Health Organization;2011:12–14.
6. GATS. *GATS India Report 2016-2017*. Mumbai: Tata Institute of Social Sciences (TISS) and New Delhi: Ministry of Health and Family Welfare, 2016.
7. US Department of Health and Human Services. *The Health Consequences of Involuntary Exposure to Tobacco Smoke: A Report of the Surgeon General*. Atlanta, GA: US Department of Health and Human Services, Centers for Disease Control and Prevention, Coordinating Center for Health Promotion, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health; 2006: p.709.
8. Sopori M. Effects of cigarette smoke on the immune system. *Nat Rev Immunol* 2002;2:372–7.
9. Foulds J, Ramstrom L, Burke M, Fagerstrom K. Effect of smokeless tobacco (snus) on smoking and public health in Sweden. *Tob Control* 2003;12:349–59.
10. Centers for Disease Control and Prevention. Health Effects of Cigarette Smoking. Available at URL: [https://www.cdc.gov/tobacco/data\\_statistics/fact\\_sheets/health\\_effects/effects\\_cig\\_smoking/index.htm](https://www.cdc.gov/tobacco/data_statistics/fact_sheets/health_effects/effects_cig_smoking/index.htm). Accessed on August 23, 2016.
11. Heatherton TF, Kozlowski LT, Frecker RC, Fagerstrom KO. The Fagerstrom Test for Nicotine Dependence: a revision of the Fagerstrom Tolerance Questionnaire. *Br J Addict* 1991; 86:1119–27.
12. Varghese C, Kaur J, Desai NG, Murthy P, Malhotra S, Subbakrishna DK, *et al*. Initiating tobacco cessation services in

India: challenges and opportunities. *WHO-SEAJ of Public Health* 2012;1:159-68.

13. Centers for Disease Control and Prevention. Tobacco information and prevention source (TIPS). Available at URL: [https://www.cdc.gov/tobacco/data\\_statistics/mmwr/bytopic/global\\_data/archive/index.htm](https://www.cdc.gov/tobacco/data_statistics/mmwr/bytopic/global_data/archive/index.htm). Accessed on August 29, 2016.
14. Murthy P, Saddichha S. Tobacco cessation services in India: recent developments and the need for expansion. *Indian J Cancer* 2010;47(Suppl.):69-74.
15. Sorensen G, Gupta PC, Pednekar MS. Social disparities in tobacco use in Mumbai, India: the roles of occupation, education, and gender. *Am J Public Health* 2005;95:1003-8.
16. Kumar R, Kushwah AK, Prakash S, Vijayan VK. A study of tobacco consumption among college students of University of Delhi, Delhi, India. *Indian J Prev Soc Med* 2010;41:198-202.
17. Burling TA, Ziff DC. Tobacco smoking: a comparison between alcohol and drug abuse inpatients. *J Addict Behav* 1988;13:185-90.
18. Miller NS, Gold MS. Comorbid cigarette and alcohol addiction: epidemiology and treatment. *J Addict Dis* 1998;17:55-66.
19. Marks JL, Hill EM, Pomerleau CS, Mudd SA, Blow FC. Nicotine dependence and withdrawal in alcoholic and nonalcoholic

eversmokers. *J Subst Abuse Treat* 1997;14:521-7.

20. Galanti M, Holm Ivarsson B, Helgason A, Gilljam H. Smoking cessation: gender on the agenda. *Drugs: Education, Prevention and Policy* 2002;9:71-84.
21. Alpert HR, Connolly GN, Biener L. A prospective cohort study challenging the effectiveness of population-based medical intervention for smoking cessation. *Tob Control* 2013;22:32-37.
22. US Surgeon General. *The health benefits of smoking cessation in a report of the Surgeon General*. Rockville: U.S. Department of Health and Human Services; 1990.
23. Fiore MC, Jaén CR, Baker TB, Bailey WC, Benowitz NL, Curry SJ, et al. Treating tobacco use and dependence: 2008 update. *Clinical Practice Guideline*. Rockville: U.S. Department of Health and Human Service. Public Health Service; 2008.
24. Kumar R, Kushwah AS, Mahakud GC, Prakash S, Vijayan VK. Smoking cessation interventions and continuous abstinence rate at one year. *Indian J Chest Dis Allied Sci* 2007;49:201-7.
25. Kennedy DT, Giles JT, Chang ZG, Small RE, Edwards JH. Results of a smoking cessation clinic in community pharmacy practice. *J Am Pharmaceut Assoc* 2002;42:51-56.

## Appendix I

# Questionnaire form filled at the time of registering tobacco users at TCC, VPCI.

**TOBACCO CESSATION CLINIC - INTAKE AND FOLLOW-UP FORM**  
 Note: This is the minimum required information for the database. Each centre is encouraged to maintain a detailed clinical record for each client

Centre  Centre Code  Client No.

Date

1. Name : \_\_\_\_\_
2. Age : \_\_\_\_\_
3. Gender : Male  Female
4. Address : \_\_\_\_\_  
Ph. No. \_\_\_\_\_
5. Education (Number of years of formal education) \_\_\_\_\_
6. Marital status : Unmarried  Married  Widowed   
Separated or Divorced  Not Applicable
7. Income (per month) : Rs. \_\_\_\_\_
8. Occupation : Professional and Semiprofessional  Skilled, Semi Skilled & Unskilled worker   
Unemployed  Retired   
Students  Other / Not classified \_\_\_\_\_
9. Details of tobacco use :

Type of tobacco use	Age at starting tobacco use	Sachet / Cigarette years (Number of cigarettes/bidis/sachets of tobacco used per day X No. of years of regular tobacco use)	Average number of cigarettes / sachets amount of tobacco chewed per day in the last one month
Smokeless			
1.			
2.			
3.			
Smoking			
1.			
2.			
3.			

11. Expense per month on tobacco (Average month last year) Rs. \_\_\_\_\_
12. Alcohol use in the last 1 year : Daily Drinking  Regular Drinking (3 or more times a week)   
Social Drinking (<3 times / week)  None
13. Average units per drinking day (30 mL spirit/60 mL wine/½ mug beer = 1 Unit): \_\_\_\_\_ Units
14. Other substance use : Yes  No  If yes specify substance : \_\_\_\_\_
15. Number of previous attempts at quitting which lasted for at least one month \_\_\_\_\_

16. Severity of tobacco use (applicable for the last one month):
  1. How soon after you wake up, do you smoke your first cigarette/bid/your first packet?   
3 - Within 5 min. 2 - 6 to 30 min. 1 - 31 to 60 min. 0 - more than 60 min.
  2. Do you find it difficult to refrain from smoking/chewing in places where it is forbidden? (Such as religious places/classroom/hospital etc.) 1 - Yes 0 - No
  3. Which cigarette or tobacco would you hate most to give up?   
1 - the first one in the morning 0 - any other
  4. Do your smoke or use tobacco if you are in bed most of the day? 1 - Yes 0 - No
  5. How many cigarettes/bidis/packets do you use in a day?   
31 or more - 3 21 to 30 - 2 11 to 20 - 1 10 or less - 0
  6. Do you smoke/chew more frequently during the first hours after waking than during the rest of the day? 1 - Yes 0 - No

Severity Score (Sum of items 1 to 6) \_\_\_\_\_
7. How long do you keep the beetel quid/khaini/ghutka etc. in your mouth in a day? (In hours)
17. Tobacco use in first - degree relatives : Smoking  Smokeless  Both  None
18. History & symptoms suggestive of : HTN (Yes, No)  Diabetes (Yes, No)   
Heart Attack (Yes, No)  Stroke (Yes, No)   
Asthma/Bronchitis (Yes, No)  Cancer (Yes, No)   
Sexual dysfunction (Yes, No)

Physical Examination

19. Weight \_\_\_\_\_ Kg 20. Height \_\_\_\_\_ cm 21. Pulse \_\_\_\_\_ 22. BP : Systolic \_\_\_\_\_ Diastolic \_\_\_\_\_
23. Oral cavity : Leukoplakia Yes  No  Erythroplakia Yes  No   
Sub mucous fibrosis Yes  No  Dental carries Yes  No
24. Significant current co-morbid disorder : a) \_\_\_\_\_  
b) \_\_\_\_\_  
c) \_\_\_\_\_
25. Intervention : Behavioural counselling  Behavioural counselling + Medication   
Behavioural counselling + NRT  Behavioural counselling + NRT + Medication
26. Follow up

	Date	No change (or <50% reduction from baseline)	Reduced use (50% or greater reduction from baseline)	Stopped use	Lost to follow-up	Cotinine test (+ve or -ve) or not done
2 weeks						
4 weeks						
6 weeks						
3 months						
6 months						

27. Any other remarks : \_\_\_\_\_  
\_\_\_\_\_

Note: HTN = Hypertension, BP = Blood pressure, NRT = Nicotine replacement therapy

## Appendix II

**After our experience, intervention strategies RAJKUMAR has been adopted. It is the acronym which includes scientific essentials of tobacco cessation treatment plan which is as follows:**

Initials	Component Description
R	<b>Reaching:</b> Reaching to the subject is the criteria to motivate tobacco users to come for tobacco cessation and follow-up, which is done by distributing pamphlets, showing educational video, visiting physicians at TCC for awareness and conducting other educational activities
A	<b>Assess:</b> Assessing the stage of changes is to determine the willingness of tobacco users to quit, which is pre-contemplation, contemplation, preparation, action and maintenance
J	<b>Judge:</b> Judging the severity is done by using Fagerstrom test for nicotine dependency score (FTND), which comprises of six questions. <i>(The six questions are: 1. How soon after you wake up do you smoke your first cigarette; 2. Do you find it difficult to refrain from smoking in places where it is forbidden (e.g. in church, at the library, cinema, etc.); 3. Which cigarette would you hate to give up?; 4. How many cigarettes/day do you smoke?; 5. Do you smoke more frequently during the first hours after waking than during the rest of the day? and 6. Do you smoke if you are so ill and in the bed most of the day?).</i> The level of nicotine dependence considered low for individuals with scores 0-4, average with scores 5-7, and high with scores above 7 in Fagerstrom test
K	<b>Know:</b> Know the risky situation is the next step after judging the severity. The risky situations are being asked by the tobacco users, which could coping with stress, good and bad moods, alcohol and social events, making excuses to smoke/chew, being with people who consume tobacco, habits and routines and other place or situations where the urge for tobacco increases or trigger
U	<b>Use:</b> Use the coping skills are being applied on tobacco users. The coping skills are the techniques through which a tobacco user can control the urges or cravings for tobacco.
M	<b>Medication:</b> Medication required or not, is to identify whether tobacco cessation medication is required or not for a particular tobacco user. Those willing for tobacco cessation medication or highly dependent on tobacco were prescribed for medication. In medication, Nicotine Replacement Therapy (NRT), non-NRT or combinations of both were prescribed as required. Bupropion and Varenicline were used as first-line medications in non-NRT whereas nicotine gum, nicotine pastille, nicotine lozenge or nicotine patches in the NRT list of medications. Dosages were prescribed according to the tobacco dependence
A	<b>Arrange:</b> Arranging the follow-up of the tobacco users were done on 2 weeks, 1 months, 3 months, 6 months, 9 months, 12 months, 18 months and 24 months
R	<b>Re-evaluation:</b> Re-evaluation is done by making phone calls to the respective tobacco users to know the present stage of changes