

Psychological Barriers to Tobacco Cessation in Indian Buprenorphine-Naloxone Maintained Patients: A Pilot Study

Piyali Mandal, Raka Jain, Sonali Jhanjee, V. Sreenivas

ABSTRACT

Context: The prevalence of smoking in opioid agonist treatment programmes remains high, leading to significant tobacco related health hazards and mortality. This is the first study from India addressing tobacco cessation and related barriers among recipients of buprenorphine-naloxone maintenance treatment. **Aims:** The purpose of the study was to investigate Indian buprenorphine-naloxone maintained patients' willingness to quit tobacco use, to determine its possible association with demographic, agonist maintenance treatment, tobacco use related variables and personal health and risk perceptions related to health hazards associated with tobacco use. **Settings and Design:** The study was cross-sectional, observational. It was conducted in the out-patient department of a national level de-addiction centre in India. **Materials and Methods:** Fifty-five males on buprenorphine-naloxone treatment were assessed using Tobacco Use Characteristics, Fagerstrom Test for Nicotine Dependence (FTND and FTND-ST), Readiness to Change questionnaire (RCQ), Smoker's Perceived Health Risk Evaluation (SPHERE), Importance of Intervention scale and a semi-structured questionnaire. **Statistical Analysis:** Descriptive statistics, Kruskal-Wallis Chi-square test, Spearman rank order correlation, paired-t test, ANOVA (STATA 9.2 statistical package). **Results:** Around 65.4% of the subjects were smokers, 9% were using smokeless tobacco only whereas 25.6% were using both. Mean duration of tobacco use was 20 ± 1.5 years. Only 20% had past quit attempts. Only 24% were in action phase of change. Personal health and risk perceptions were poor and only 61.62% considered intervention tobacco smoking cessation important. **Conclusions:** Higher severity of nicotine dependence, low perception of harm from tobacco warrant immediate attention and need for on-site treatment opportunity.

Key words: Buprenorphine-naloxone maintenance treatment, health and risk perception, tobacco cessation

INTRODUCTION

Growing public awareness of the public health issues of tobacco consumption particularly in the form of

smoking has led to the development WHO-Framework of Convention on Tobacco Control (WHO-FCTC) and various prevention, awareness building and treatment programs are being implemented worldwide. These measures are expected to bring down tobacco use among general population. However, smoking rates for patients with a substance use disorder remain high and stable.^[1] Studies suggest that smoking rates are almost three times higher in opiate dependent persons in methadone maintenance treatment (MMT) programmes as compared to the general population.^[2,3] The rate is even higher (85-98%) among patients on agonist

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Department of Psychiatry and National, Drug Dependence Treatment Center, All India Institute of Medical Sciences, New Delhi, India

Address for correspondence: Dr. Raka Jain

Department of Psychiatry and National, Drug Dependence Treatment Center, All India Institute of Medical Sciences, New Delhi - 110 608, India. E-mail: rakajain2009@gmail.com

maintenance treatment.^[1,2,4,5] Importantly, smokers usually underestimate their personal susceptibility of tobacco related health hazards^[6,7] leading to continued use of tobacco causing high morbidity and mortality in the drug using population including those in treatment. The mortality rate is twice the rate expected in general population.^[8] Therefore, it is imperative to study tobacco use in this population so that treatment needs can be addressed adequately.

Unfortunately, little attention is being paid to the issue of tobacco use among opioid users till date. In US national evaluations of methadone maintenance treatment programmes, little to no mention is made of monitoring or treating cigarette use among patients.^[9] Olsen *et al.*, in a relatively recent study reported that, nicotine dependence rarely receives attention in methadone programmes.^[10] Despite preliminary evidence that smoking cessation counselling can be provided without necessarily leading to a relapse with other substances,^[11] such beliefs continue to persist and represent an important treatment barrier.^[12,13] The current study is the first study from India which aims to address the pattern of tobacco use among opioid dependent patients on buprenorphine-naloxone maintenance treatment, their willingness to quit tobacco and to determine its possible association with various demographic, agonist maintenance treatment and tobacco use related variables. Relation between willingness to quit tobacco and perceived personal health and risk perceptions related to health hazards associated with tobacco use has been specifically emphasized.

MATERIAL AND METHODS

Study design and universe

This study has a cross-sectional design and was conducted at the out-patient department of a national level drug dependence treatment centre. The centre offers free-of-cost agonist as well as antagonist maintenance therapy to opioid dependent patients.^[14]

Sample

Fifty-five male opioid dependent subjects aged between 18-60 years maintained on bi-weekly dispensing regimen of buprenorphine-naloxone maintenance treatment for more than 12 weeks, who were current tobacco users (subjects using tobacco in any form over last one month and testing positive for urinary cotinine) formed the sample of the study. Buprenorphine compliance was confirmed by self-report, urine screening and patient's treatment records. Patients with a monthly attendance of more >80% were considered compliant.

Subjects having current or past psychiatric comorbidities or dependence on drugs other than

opioid and nicotine (assessed by clinical history and urine screening for other drugs of abuse by thin layer chromatography), history of in-patient treatment in last 8 weeks (confirmed from medical records) or currently on any tobacco cessation therapy were excluded.

Data collection

Data collection for each participant was completed in single session. The subjects were assessed for:

- a. Socio-demographics,
- b. Pattern of tobacco use,
- c. Willingness to quit tobacco and
- d. Perceived personal health and personal risks associated with tobacco use.

Instruments

1. Tobacco Use Characteristics^[4]: This consists of seven questions on tobacco use which were adapted from the Behavioral Risk Factor Surveillance System,^[15] The Youth Risk Behavior Survey,^[16] and the Mayo Nicotine Dependence Centre Questionnaire by Richter and colleagues. These tobacco questions have high validity.^[4]
2. Fagerstrom Test for Nicotine Dependence (FTND)^[17]: It is a standard instrument to measure the severity of nicotine dependence. FTND has reliable psychometric property^[17] and is widely used.
3. Fagerstrom Test for Nicotine Dependence for smokeless tobacco user, FTND-ST^[18]: This validated questionnaire measures severity of nicotine dependence in smokeless tobacco users. The coefficient alpha is comparable to other nicotine dependence measures.
4. Readiness to change questionnaire, RCQ^[19]: This scale assesses the stages of change as in the trans-theoretical model.^[20] Individuals not willing to quit in next 6 months were allocated to pre-contemplation stage and those considering so were included in contemplation stage and individuals who already started reducing tobacco use were allocated in action stage.
5. Smokers' Perceived Health Risk Evaluation, SPHERE^[21]: SPHERE has two subscales with 3 items each. In the subscale named 'Smoking Related Health' (SRH), the smokers are asked to rate their health relative to the health of an average smoker, ex-smoker their age, and non-smoker of their age, on a scale from 1 (much worse) to 5 (much better). The other subscale, 'Smoking Related Risk' (SRR) assess perceived likelihood of developing smoking-related illnesses like cancer, coronary heart disease and chronic lung disease with continued smoking, on a scale anchored at 0 (no chance) to 100 (certain). It has reliable psychometric properties and has been used and validated in smokers in methadone maintenance programme.^[21]

6. Perceived importance of intervention^[21]: This Likert scale assesses perceived importance of intervention. Responses range from 'not important' (1) to 'extremely important' (6).
7. Semi-structured questionnaire: The socio-demographic, substance use, medical and psychiatric diagnoses, dependence on substances other than opioid and nicotine and tobacco use pattern at the initiation of maintenance treatment, buprenorphine/buprenorphine-naloxone maintenance treatment details were noted in the proforma after being additionally confirmed from medical records. Multiple choice questions were asked regarding past quit attempts, reasons for relapse and choice of intervention. Smokeless tobacco users were asked to name the possible health risks associated with tobacco use.

There was no loss of data and all the observations were available for analysis. All instruments used in the study were translated into local language and back translated. Ethical clearance was obtained from institution ethics committee.

Data analysis

Data was analysed using STATA 9.2 Statistical package. Descriptive statistics were used to analyse the profile of the participant. To explore association between various socio-demographic and maintenance treatment related variables with tobacco use related variables, non-parametric test (Kruskal-Wallis Chi-square) and Spearman's rank correlation were chosen. Paired t-test was used to compare quantity of past and current tobacco use. Intergroup comparisons were done using analysis of variance (ANOVA) with Tukey's post-hoc test.

RESULTS

Sample characteristics

All patients were males and the mean age of the sample was 37.8 (Standard Deviation, SD \pm 7.2) years and belonged to nuclear family. The majorities were past heroin users (96.36%). Most subjects had also used alcohol (83.64%) and cannabinoids (70.91%) in the past. All the subjects were on bi-weekly dispensing regime of buprenorphine naloxone and mean dose was 9.67 \pm 2.06 (SD) mg per day. Mean duration of maintenance was 73.11 (53.13 \pm SD) weeks (median 56.3 weeks).

Tobacco use pattern

Mean age of starting any kind of tobacco product was 15.6 \pm 4.7 years. Mean duration of nicotine dependence is 20 \pm 1.5 years. The mean FTND score for smokers was 5 \pm 1.7 (N = 50), indicative of medium dependence and mean FTND-ST score for smokeless tobacco users was 5.6 \pm 3.2 (N = 19). Lower age of initiation of any kind of

tobacco use was found to be significantly associated with higher nicotine dependence (Pearson product-moment correlation, P < 0.05). Fifty-eight percent of the study population reported decrease in tobacco consumption after entering into buprenorphine maintenance treatment. A significant decrease was found in the number of both cigarette (P = 0.003) and bidi (P < 0.001, paired t-test) by paired t-test. Actual decrease cannot be quantified in three subjects as they started smokeless tobacco use after stoppage of smoking or reduction in smoking.

Detail of sample characteristics and tobacco use is given in Table 1.

Past quit attempts and current willingness to quit

Past quit attempts were attributed mostly to external factors like, family pressure or physician's advice. Mean duration of abstinence was 4 \pm 1.3 weeks. Withdrawal symptoms and peer pressure were the most common reason for relapse among subjects with past quit attempts. None of the quit attempts were self-motivated. Medical assistance was never sought.

Socio-demographic, maintenance treatment variables and (P > 0.05) tobacco use related variables (P > 0.05) did not differ among the pre-contemplators (P > 0.05), contemplators (P > 0.05) and subjects in action stage (P > 0.05, ANOVA, with Tukey's post-hoc analysis).

Table 1: Profile of patients

Socio-demographic characteristics	Frequency (N-55)	%
Age in years		
18-30	9	16.4
31-45	39	70.9
46-60	7	12.7
Religion		
Hindu	46	83.65
Muslim	9	16.36
Educational background		
Illiterate	5	9.09
High school or less	45	81.72
Graduate & above	5	9.09
Employment status		
Unemployed	2	3.64
Employed	52	94.55
Part-time	2	3.64
Full-time	34	61.82
Self-employed	16	29.09
Student	1	1.82
Weeks in BPN maintenance treatment		
12-52	21	38.2
53-104	18	32.7
>104	16	29.1
Stabilized dosage of BPN (mg)		
6-8	18	34.4
8-10	23	40.2
12-14	14	25.4

Table 2 depicts detail of current tobacco use pattern, past quit attempts and current willingness to quit.

Perceived personal health and perceived personal susceptibility to health- risks and willingness to quit

Sixty-one percent of the smokers reported their health ‘as good as average smoker their age’ while 63.9% reported their health is ‘as good as ex-smokers’ [Figure 1]. No intergroup difference in perceived smoking related personal health was found among pre-contemplators, contemplators and subjects in action stage of change (ANOVA, $P > 0.05$). Perceived personal susceptibility (smoking related risk) to developing smoking related health hazards like cancer, coronary heart disease, and chronic lung disease with continued smoking was also poor among the participants [Figure 2]. Total duration of tobacco use and severity of dependence were not associated with smoking related health perception scores ($P > 0.05$) and smoking related personal risk perception score for any of the disease conditions (Kruskal-Wallis chi square test) like cancer ($P > 0.05$) and coronary artery disease ($P > 0.05$) or chronic lung disease ($P > 0.05$).

Perceived importance of intervention and choice of intervention

Response pattern for perceived importance of

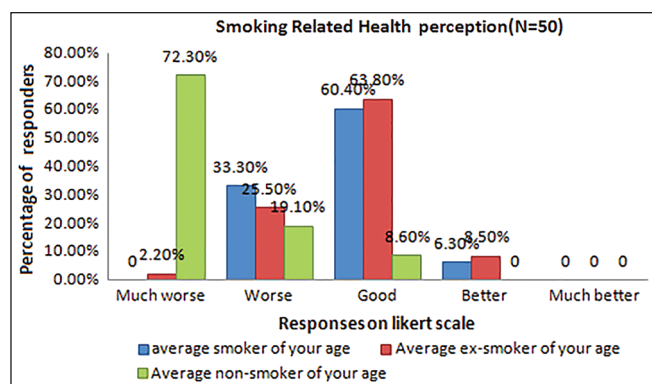


Figure 1: Response pattern to Smoking Related Health (SRH) questionnaire

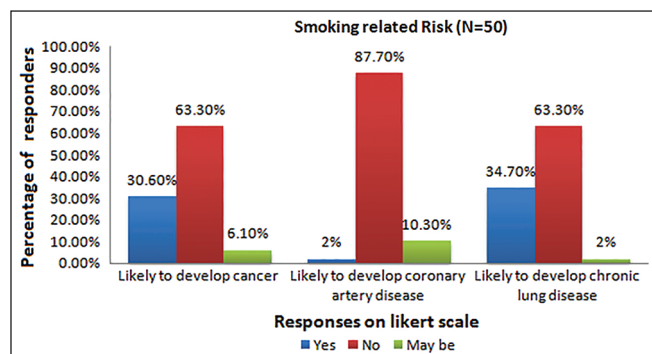


Figure 2: Response pattern to Smoking Related Risk (SRR) questionnaire

intervention and choice of intervention is given in Table 3. Although no difference was found (ANOVA, with Tukey’s post-hoc analysis) in perceived importance of intervention among subjects with different levels of education, an increasing trend of importance of intervention was noticed with increasing levels of education which was statistically non-significant. No significant intergroup difference in perceived importance of intervention found among smoker, smokeless tobacco user or subjects using both (ANOVA, with Tukey’s post-hoc analysis). A positive correlation was observed between the perceived importance of intervention with perceived personal risk of developing chronic lung disease (Spearman rank order correlation, $P < 0.05$).

DISCUSSION

In the current study population, tobacco use pattern differed markedly from patterns found in the general Indian population. In India, smokeless tobacco use predominates but in this study, the percentage of smokers was higher.^[22] However, among the various

Table 2: Pattern of tobacco use, past quit attempts and current willingness to quit

Current tobacco use	Frequency/No.	%
Type of tobacco		
Cigarettes / Bidi	36	65.4
Smokeless tobacco (ST)	5	9
Both	14	25.6
Mean number of cigarette used/day (N=6)	8	
Mean number of bidi used/day (N=48)	15	
Mean number of SLT pouch used/day (N=19)	5	
Reported change in tobacco use during maintenance treatment (N=55)		
Yes	32	58.18
No	21	38.18
May be	2	3.64
Current willingness to quit (RCQ) (N=55)		
Pre-contemplation	21	38.18
Contemplation	21	38.18
Action	13	23.64

Table 3: Perceived importance of intervention for tobacco cessation and choice of intervention

3.1. Perceives importance of intervention	Frequency	%
Responses		
Not important	13	23.6
May be important	8	14.78
Important	18	32.59
Very important	13	23.6
Extremely important	3	5.43
3.2 Choice of intervention		
Advice and guidance only	27	49.1
Something which reduces craving	18	32.7
Something with similar effects with that of tobacco	9	16.4
Something to increase motivation	1	1.8

forms of tobacco, bidi continues to be the commonest form of smoking and Khaini and gutkha were used by the smokeless tobacco users, matching the national pattern. The commonest age of tobacco initiation again matches with national data.^[22,23]

Similar studies in methadone maintenance programs have a higher prevalence of smokers, who smoked more, and were more interested in quitting^[3,24-26] as found in this population. Less number of past quit attempts and absence of long term abstinence among these subjects, in spite of long duration of tobacco use, are also very much similar with findings from past studies^[4,7,27-29] in methadone clinics. Possible reason for low quit rates may be due to the fact that none of our patients were ever previously treated with prescription medication for smoking cessation. However, difficulty in quitting may also be due to greater nicotine dependence, and interactions of nicotine and opioids via dopamine in brain reward pathways that influence motivation to quit. Although experimental studies suggest that single doses of opioid agents like methadone and buprenorphine may increase cigarette smoking in opioid-dependent individuals for short duration^[30,31] the effects of long-term methadone maintenance treatment on smoking behaviour are less clear. There is some support for an association between cigarette smoking and methadone dose in that methadone patients who exhibited higher smoking rates are significantly more likely to report problems of not feeling 'held' by their methadone dose and to experience a higher level of anxiety.^[32] More adequate methadone dosing would probably reduce such effects. However, initiation of methadone maintenance treatment has been associated with self-reported positive changes in smoking behaviour.^[33] A similar positive change in terms of reduction in tobacco consumption is also found in the current study population. However, it would be wise not to attribute this reported decrease to buprenorphine treatment alone. In fact, with currently available data on buprenorphine –nicotine interaction, no causality of any kind can be established. Psychological factors and lifestyle changes associated with buprenorphine maintenance also could explain the current findings.

Despite the well-established health risks of smoking,^[34] evidence indicates that smokers endorse a set of risk-minimizing beliefs regarding their own perceived risk thereby viewing themselves as exempt from the well-documented health risks of smoking.^[35] However, researchers have reported conflicting results regarding the direction and magnitude of smokers' biases in evaluating smoking-related health risks, as well as the tendency for smokers to underestimate their own personal risk for developing smoking-related health problems. In the current study, validated instrument

(SPHERE) has been used to measure smoking related health and risk perception. The original study^[21] which validated and used this instrument (SPHERE) on smokers in MMT, used the word 'smoker' but in the current study it is modified as 'who is also opioid dependent and currently on BPN' for further clarity. This is contrary to the results in studies on methadone maintained subjects where the subjects reported high ratings of personalized risk perception.^[2,36]

Tendency to perceive better personal health and minimize personal risk perception of developing diseases associated with continued tobacco use might be due to the fact that majority of the individuals believe that they have reduced their tobacco use and consider current pattern safer and also believe that whatever damage had been done cannot be reversed and their health can be no worse than ex-smoker.

Amongst all the given choices, majority of the study population opted for 'advice and guidance' only as the choice of intervention and did not demand any pharmacological intervention for tobacco cessation. This is contrary to the findings from methadone clinics where the smokers were willing to enrol in on-site smoking cessation treatment.^[24-26] This may be possibly due to the fact they already have reduced their tobacco use after entering into the maintenance treatment and therefore did not feel the need for any intervention. Lack of awareness or knowledge about the existing pharmacotherapy for tobacco cessation may be another reason. However, undermining the seriousness of the health hazards associated with continued use of tobacco still remains a possibility. Significant positive correlation of importance of intervention with risk of developing chronic lung disease may be due to higher awareness regarding this hazard.

This study has several limitations. It has relatively small sample size compared to previous similar studies. The subjects represent a special population who had never sought treatment for tobacco cessation. The findings could differ in treatment seeking population. Longitudinal studies including behavioural and biochemical verification of smoking could provide better insight to the ongoing factors acting as barriers to tobacco cessation. However, this study provides important baseline information for planning an acceptable on-site treatment facility for tobacco cessation for opioid dependent individuals.

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