Assessing the outcome and influencing factors of a behavioral tobacco cessation intervention within a workplace setting: A mixed methods study

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ABSTRACT

INTRODUCTION India has 267 million adult tobacco users, the majority of whom are part of the economically productive workforce. Workplaces are ideal settings to influence tobacco use behavior. A 6-month tobacco cessation program was implemented in five workplaces in Maharashtra, India. The study aimed to describe 6-month tobacco cessation outcomes and to identify promoters and barriers for implementing the program.

METHODS This is an explanatory mixed methods study. Quantitative part involved analysis of routinely collected program data from January 2016 to June 2017 to describe the sociodemographic characteristics, tobacco use patterns and 6-month cessation outcomes. Qualitative part consisted of one-to-one interviews with employees who had enrolled for cessation services (n=16) and one group interview with the counseling service providers (n=5).

RESULTS A total of 331 current tobacco users voluntarily enrolled in this program and used predominantly (78%) smokeless tobacco. The self-reported 7-day point prevalence abstinence at the end of six months was 66%. Employees who used smokeless forms of tobacco, had low levels of nicotine dependence, and attended 4 or more counseling sessions, were more likely to quit tobacco use. Support from the management and multiple counseling sessions were described as promoters. Peer pressure, work stress, and inability to quit without medication were the major barriers. Formulating tobacco-free workplace policy was suggested for reducing tobacco use at workplaces.

CONCLUSIONS The core activities of the program, which included awareness sessions, individual counseling sessions and repeated follow-up sessions as well as support received from the workplace management, played a major role in achieving good cessation outcomes.

INTRODUCTION

The epidemic of tobacco use is one of the greatest threats to global health today. Tobacco use is one of the main risk factors for a number of chronic diseases such as cancers, lung diseases, and cardiovascular diseases[1]. Worldwide, it is estimated that about six million people die prematurely every year, and if the current trends continue, about one billion people will die prematurely during this century as a result of tobacco use. Of these deaths, 80% will occur in low- and middle-income countries[1].

India is the second largest consumer of tobacco[2]. According to Global Adult Tobacco Survey-2 (GATS-2), 267 million adults (who form a major part of the workforce) in the country consumed tobacco in some form[3,4]. Here, tobacco is consumed in two forms (smoking and smokeless) with the prevalence of smokeless tobacco (21.4%) double that of the smoking (10.7%)[3,5].

The International Classification of Diseases (ICD-10) recognizes 'tobacco dependence' as a disease[6]. Global evidence shows that about 40% of current smokers attempt to quit each year on their own, and of these only about 4% to 6% are successful[7]. In India, according to GATS-2, 55% of smokers and 50% of smokeless tobacco users wanted to quit tobacco-use[3]. Therefore, providing tobacco cessation services

in India is recommended as a priority health intervention[8].

Recent evidence provides stronger support for counseling (both when used alone and with other medical therapies) as an effective tobacco cessation strategy[9]. However, very little is known about the effectiveness of these interventions in people who use smokeless tobacco, the most prevalent form of tobacco use in India[10,11].

Workplaces are ideal to reach a large number of people and influence their tobacco use behavior[12]. Workers spend most of their interactive hours in a day at the workplace[13]. A previous study from Maharashtra showed that tobacco cessation services provided at workplaces achieved better outcomes than clinic-based cessation services[14]. Therefore, in India, it is crucial to design and implement workplace tobacco cessation interventions.

LifeFirst, a collaborative initiative of two Non-Governmental Organizations – Narotam Sekhsaria Foundation (NSF) and Salaam Bombay Foundation (SBF) – provides tobacco cessation services at workplaces. We undertook an operational research study which was conducted under programmatic conditions in five different workplaces in Maharashtra. The study had two objectives: First, to describe the sociodemographic characteristics, tobacco use pattern, level of adherence to the cessation protocol and tobacco cessation rates of employees who enrolled in the LifeFirst cessation program from January 2016 to June 2017. Second, to understand the facilitators and challenges faced by the employees for quitting tobacco use and by the counsellors in providing cessation services at workplaces.

METHODS

Study Design

We used an explanatory mixed method design where the quantitative data collection (a cohort study) was followed by qualitative data collection.

Study setting

General setting

The study was conducted in the state of Maharashtra. It is India's second-most populous state and also the most industrialized state of the country contributing 13% of the national industrial output[15]. Of all adult inhabitants in Maharashtra, 27% are tobacco users, of whom 91% use smokeless tobacco[16].

Specific setting

LifeFirst cessation services were provided in five workplaces selected purposively. A few workplaces in Maharashtra were approached and those which agreed to implement this program were selected.

LifeFirst protocol

LifeFirst follows a standard protocol, based on the American Cancer Society's guideline[17] and WHO's 5As and 5Rs package[18] with minor local adaptations. At the outset, awareness sessions are conducted for all the employees to sensitize them about the harms of tobacco use and to encourage the tobacco users to enroll for cessation services. Subsequently, individual counseling sessions are conducted for all the enrolled current tobacco users. During the first session, a counsellor asks about patterns and frequency of tobacco use, assesses nicotine dependence using the Fagerström scale for smokers[19] and smokeless tobacco users[20], encourages the user to quit, charts out their treatment plan and suggests different coping techniques. With the help of behavior modification techniques and motivational interviewing, the counsellor assists them for a successful quit attempt. After the first counseling session, each employee attends five follow-up counseling sessions at 15 days, one month, two months, four months and six months from the date of enrolment. The program is provided within the working hours in the workplace. The LifeFirst protocol and its activities are given in Table 1.

The self-reported tobacco use status is recorded and 7-day Point Prevalence Abstinence (PPA)[21,22] is calculated at each follow-up. The operational definitions related to the study populations and their cessation outcomes are given in Table 2.

Study population

The study population included employees who were current tobacco users and who voluntarily enrolled in the LifeFirst workplace tobacco cessation services from January 2016 to June 2017.

The qualitative data was collected from five counsellors and 16 employees who had enrolled in this program. These employees were purposefully selected based on whether they were using (n=7) or not using (n=9) tobacco at six months.

Data variables, sources of data and data collection

Quantitative part

Data of all the employees who enrolled in the program from January 2016 to June 2017 were collected using a counseling intake sheet and follow-up sheets after obtaining written informed consent. This was entered into Microsoft Excel and maintained as a database.

Qualitative part

All interviews were conducted in a language which was understood by the participants by GM (female) with mentorship from AD. Both these authors are well qualified in qualitative research.

Interviews with employees enrolled in counseling services

To understand 'facilitators' and 'challenges' in stopping tobacco use at the workplace from employees' point of view, phone one-to-one interviews were conducted using an interview guide (Supplementary file), after obtaining informed consent, until saturation was attained. The average

Table 1. LifeFirst workplace tobacco cessation protocol and activities implemented in five workplaces of Maharashtra from January 2016 to June 2017

Awareness →	Registration →	Counseling →	Follow-up
Conducted in groups for all the employees. The following topics were covered during the awareness session: • Types of tobacco: smoking and smokeless • Long- and short- term ill effects of tobacco • Health, financial and social benefits of quitting • Health effects of smokeless tobacco • Symptoms of pre-cancerous lesions and oral cancer • LifeFirst program counseling services PowerPoint presentations or flip charts and videos in Hindi, English or local language were used as per the employee group. Education material/leaflet containing tobacco related facts, health effects and benefits of quitting was also distributed.	The employees who were current tobacco users were encouraged to voluntarily register for the cessation services.	Individual face-to-face counseling sessions. A written informed consent was obtained. An intake sheet was filled in and personal details, such as name, age, department, contact number and information regarding tobacco use, were recorded. Nicotine dependence was assessed, and based on the score counseling was tailored. Motivational interviewing and behavior modification techniques were used for counseling. Counseling was conducted in Hindi, English or local language as per the employee group.	Five face-to-face follow-up sessions were conducted for six months at intervals of 15 days, 1 month, 2 months, 4 months and 6 months after enrolment. During the working hours within the workplace. At each successful follow-up session, the tobacco use was recorded on the follow-up sheet.

duration of the interview was about 15 minutes and all interviews were audio-recorded.

Interviews with counseling service providers

We conducted one group interview with all five counsellors of the program to know 'for' and 'against' factors in provision of cessation services after obtaining written consent. The interview was conducted in SBF office and was audio-recorded. Participant validation was done at the end of group interview for credibility.

Statistical analysis

Quantitative

We have summarized the sociodemographic characteristics, tobacco use patterns, levels of adherence and cessation outcomes in numbers and proportions. The association between sociodemographic characteristics, tobacco use pattern, dependence, adherence to protocols and cessation outcomes was assessed and expressed as risk ratios and adjusted risk ratios with 95% confidence intervals. We have used log binominal models to assess the adjusted risk ratios. Data analysis was conducted using Stata Version 15.0 (StataCorp, College Station, Texas, USA).

Qualitative

Transcripts were prepared on the day of the interviews using the audio recordings. A summative content analysis of the group interviews and one-to-one interviews was conducted. The unit of analysis was participants' statements. Statements with similar meanings were grouped together to form categories and subcategories up to the point where further collapsing caused loss of relevant information. To reduce individual subjectivity and improve credibility of the coding process, four investigators were involved in the analysis. GM did the initial coding and categorization which was reviewed by AD, HG and MT. The qualitative findings were reported in accordance with COREQ guidelines[23].

RESULTS

Quantitative

Between January 2016 and June 2017, 331 employees voluntarily enrolled in the cessation services. This included

Table 2. Operational and cessation outcome definitions used during implementation of LifeFirst workplace tobacco cessation program in five workplaces of Maharashtra from January 2016 to June 2017

Term	Operational definitions
General	
Employee	A person employed in a workplace for daily wage or salary
Permanent employee	Employee on the payroll of the workplace. They usually include supervisory staff involved in planning and implementation
Management employee	Employee who is responsible for overall functioning of an organization and are the decision makers
Contractual employee	People taken up for specific tasks for a specified period
Current user	Employee who has consumed any form and quantity of tobacco in the last 30 days
7-day Point Prevalence Abstinence	Proportion of tobacco users who have not consumed tobacco in any form in the last seven days
Successful follow-up	If the counsellor was able to interact with the employee on the day of the visit
Unsuccessful follow-up	If the employee was absent during the follow-up visit or has left the job
Tobacco cessation outcome	
Not using	Employee has not used any form of tobacco in the last 7 days
Reduced	Employee has reduced the quantity or frequency of tobacco use compared to the 1st session
No change	Employee has not made any change in the quantity or frequency of tobacco use compared to the 1st session
Relapse	Employee had made a quit attempt but restarted tobacco use
Increased	Employee has increased the quantity or frequency of tobacco use compared to the 1st session
Left the job	Employee has left the workplace
Withdrawn from service	Employee has opted out of the tobacco cessation service
Lost to follow-up	Employee was not available for the last two follow-up sessions
Absent	Employee was not available for the last follow-up session

259 (78%) employees who used smokeless tobacco, 38 (12%) who smoked and 34 (10%) who used both forms of tobacco. Their sociodemographic details disaggregated by their type of tobacco use are given in Table 3.

All enrolled employees were males. The majority were in the aged 25–44 years, had contractual employment, and were married.

Among the employees who used smokeless tobacco, tobacco-lime mixture was the most commonly used product (71%) followed by kharra (a local product which is a combination of tobacco, areca nut, lime, and catechu that is used predominantly in Eastern Maharashtra)[24] (21%) and gutkha (20%). Among the smokers, cigarette was the most commonly used product (65%) followed by bidis (37%). Several tobacco users reported using more than one smoking or smokeless tobacco product. The contractual employees used predominantly smokeless (82%) form of tobacco when compared to permanent employees who predominantly smoked (71%).

The tobacco use pattern is presented in Table 4.

Among the 331 enrolled tobacco users, 323 (98%) were using tobacco daily. Most smokers (75%) had low nicotine dependence[19]. In employees using smokeless forms of tobacco, nearly half (53%) had medium nicotine dependence. Prior to enrolment, 142 (43%) had made at least one attempt in the last 12 months to quit tobacco but were not successful. After enrolment, 263 (79%) of the enrolled employees attended at least 4 sessions.

Of all the enrolled employees, 16 (5%) left their job after enrollment. Of the remaining 315 employees, at six months, 208 (66%) self-reported that they have not used tobacco in the last seven days, 41(12%) had reduced their tobacco use, 68 (16%) were either lost to follow-up or their outcomes could not be assessed, and 11 (3%) had relapsed.

The crude and adjusted relative risks for the associations between sociodemographic factors and cessation outcome (7-day PPA) are given in Table 5.

In adjusted analysis, adherence to counseling sessions was strongly associated with quitting. The other factors that were associated with quitting were age <25 years and low nicotine

Table 3. Sociodemographic characteristics of current tobacco users who enrolled in workplace tobacco cessation services at five workplaces under LifeFirst program in Maharashtra, from January 2016 to June 2017 (N=331)

Characteristics	Total		Smokeless		Smoking		Both	
	n	%	n	%*	n	%*	n	%*
Total number of employees enrolled	331	100	259	78	38	12	34	10
Age (years)								
15–24	36	11	23	64	6	17	7	19
25–34	144	44	110	76	20	14	14	10
35–44	103	31	86	83	7	7	10	10
≥45	48	14	40	83	5	10	3	7
Employment type								
Permanent	21	6	6	29	15	71	0	0
Contractual	310	94	253	82	23	7	34	11
Education level								
No formal schooling	37	11	26	70	2	5	9	24
Primary school completed	66	20	56	85	7	11	3	5
Less than secondary school	49	15	45	92	1	2	3	6
Secondary school completed	73	22	63	86	5	7	5	7
Higher secondary school completed	61	18	45	74	3	5	13	21
College completed	27	8	21	78	6	22	0	0
Postgraduate degree completed	18	5	3	17	14	78	1	6
Marital status								
Single	31	9	20	65	9	29	2	6
Married	300	91	239	80	29	10	32	11

* Row percentage.

dependence. Smokers were less likely to quit when compared to those using smokeless forms.

Qualitative

Employee interviews

The major facilitators within the workplace for tobacco cessation in employees were: support from the workplace 'management', such as having 'no-tobacco use rule' within the workplace, ensuring that tobacco products are not carried by the employees by having security checks at the entrances, reinforcement of messages to quit tobacco during safety meetings by the supervisor.

'We have received very good support from the company. The company has stopped the consumption of tobacco. All the packets are thrown away at the gate.'

'Our supervisors keep telling us about the ill effects of tobacco at safety meetings.'

Awareness sessions regarding harms of tobacco use and counseling sessions conducted by the LifeFirst program were considered as facilitators by the employees.

'Sir [LifeFirst counselor] had informed us about ill effects of tobacco and showed us a video and after seeing that I did not feel like smoking.'

The major workplace related barrier for tobacco cessation described by the employees were peers who consumed tobacco, considered as a barrier because they not only consume tobacco but also offer tobacco to others.

'I am trying my level best to quit. If someone offers me, then only I eat. I have stopped keeping it [smokeless tobacco product] in my pocket.'

'There were many people who used to eat tobacco and after seeing them I also felt like eating.'

Lack of provision of medicines was considered as a barrier by a few employees because they perceived that medicines would have helped them to quit.

'Without taking anything [medicine], the habit will not go away.'

Last barrier reported was working in night shifts as some employees consumed tobacco to remain awake during night shift.

'During night shift, I used to feel sleepy and therefore used to eat kharra [local smokeless product]. After eating that my sleep used to go away.'

A few suggestions provided by the employees for preventing tobacco use at workplaces by the employees were that the management should formulate tobacco-free

Table 4. Tobacco use patterns and cessation outcome of current tobacco users who enrolled in workplace tobacco cessation services at five workplaces under LifeFirst program in Maharashtra, January 2016 to June 2017 (N=331)

Characteristics	Values	
Age of initiation (years), mean ± SD	22.81 ± 7.95	
	n	%
Type of tobacco use		
Smokeless	259	78
Smoking	38	12
Both	34	10
Tobacco use		
Daily	323	98
Less than daily	8	2
Fagerström scale tobacco dependence		
Smoking		
Low	54	75
Medium	14	19
High	4	6
Smokeless		
Low	104	35
Medium	154	53
High	22	8
Missing	13	4
Past quit attempts		
0	163	49
1	90	27
2–3	46	14
≥4	6	2
Unknown	2	1
Missing	24	7
Counselling sessions attended		
1	13	4
2	23	7
3	32	10
4	50	15
5	86	26
6	127	38
Outcome at end of 6 months		
Not using	208	63
Reduced	41	12
Lost to follow-up	35	11
Absent	17	5
Left the job	16	5
Relapse	11	3
Increased	2	0.6
No change	1	0.4

workplace policy, conduct security-checks at the entrance gate to stop people from using tobacco, provide information about ill effects of tobacco during the safety talks/meetings, provide support to those who are trying to stop tobacco, recognize or reward those who have quit completely and medicines or tablets should be provided to support them in quitting.

'Tobacco should be completely banned from the company.'

'There should be rules and people must be informed.'

'If we can get something which can help to quit tobacco, any tablet.'

Counsellor interview

Initial support and facilitation from the management in organizing the awareness program and encouragement given to the employees for joining the cessation services was considered as a facilitator for implementing the program by the counselors.

'They supported us by giving a dedicated space for counseling, gave us phone, and sent reminder emails. They took the initiative of conducting floor walks, gathering the employees, making them available. This system where the HR took initiative really worked.'

Counselors also considered integrating tobacco cessation messages into the workplace's internal programs or activities as an opportunity and a facilitating factor.

'In a company, health camp is conducted every year. We integrated our activities with the health checkup. We could reach all the employees.'

The challenges faced by the counsellors were related to the process components of the program protocol. The first challenge reported by the counsellors was enrolment of all the tobacco users for the tobacco cessation program. This was due to misconceptions regarding the term counseling. Employees associated counseling with mental health in a negative sense.

'Whenever we used the term "counseling", this term only used to block the employees.'

'They feel that I don't have any psychiatric problem for which I require counseling.'

Hierarchy within the workplace was also one of the reasons.

'Management staff feels that I am a management employee how I can join a program where the lower staff has already joined the program ... what will my colleagues say about me.'

The social image of the employees within the workplace acted as one of the reasons for tobacco users not enrolling into the program.

'So, if someone comes to the counseling room then people start thinking what has happened.'

'None of the females enrolled because of social stigma. There were few females who smoked but did not enroll in the program.'

The second challenge reported by the counsellors was that insufficient time was given to the employees by their supervisors for attending the counseling sessions. Unavailability of employees for the follow-up sessions was considered a challenge. Most of the contractual employees

Table 5. Factors associated with the 7-day PPA at six months among remaining employees from those enrolled in workplace tobacco cessation services at five workplaces under LifeFirst program in Maharashtra from January 2016 to June 2017 (N=315)

	Total	n	%	Crude RR	95% CI	Adjusted RR	95% CI	p
Total	315	208	66					
Age (years)								
15–24	33	24	73	1.09	0.90–1.32	**1.3**	**1.13–1.49**	**<0.001**
25–34	137	91	66	Ref.		Ref.		
35–44	97	56	58	0.87	0.72–1.04	0.83	0.69–1.00	0.053
≥45	48	37	77	1.16	0.95–1.41	1.08	0.94–1.24	0.266
Education level								
No formal schooling	34	25	74	1.04	0.77–1.40	1.11	0.94–1.31	0.197
Primary school completed	65	41	63	0.89	0.73–1.08	1.03	0.84–1.25	0.764
Less than secondary school	45	28	62	0.88	0.75–1.02	0.94	0.83–1.08	0.436
Secondary school completed	68	48	71	Ref.		Ref.		
Higher secondary school completed	59	33	56	0.79	0.63–0.98	0.95	0.71–1.26	0.728
College completed	26	19	73	1.03	0.72–1.48	1.18	0.99–1.41	0.052
Postgraduate degree completed	18	14	78	1.1	0.83–1.44	1.19	0.91–1.55	0.183
Type of employment								
Permanent	21	13	62	Ref.		Ref.		
Contractual	294	195	66	1.07	0.89–1.28	0.89	0.69–1.13	0.344
Marital status								
Single	27	16	59	0.88	0.77–1.02	0.88	0.74–1.04	0.140
Married	288	192	67	Ref.		Ref.		
Type of tobacco								
Smokeless	246	168	68	Ref.				
Smoking	38	23	61	0.88	0.72–1.09	**0.69**	**0.57–0.82**	**<0.001**
Both	31	17	55	0.8	0.52–1.24	0.97	0.76–1.23	0.825
Tobacco dependence at baseline								
Low	129	94	73	1.13	1.05–1.21	**1.2**	**1.10–1.30**	**<0.001**
Medium	148	95	64	Ref.				
High	25	11	44	0.68	0.36–1.29	0.7	0.39–1.27	0.252
Missing	13	8	62	0.95	0.78–1.17	1.15	0.99–1.35	0.066
Past quit attempts								
0	155	103	66	Ref.				
1	83	58	70	1.05	0.86–1.27	0.94	0.80–1.12	0.541
≥2	51	33	65	0.97	0.71–1.31	0.98	0.80–1.20	0.920
Unknown	26	14	54	**0.81**	**0.68–0.95**	0.84	0.66–1.07	0.181
Counseling sessions attended								
<4	57	16	28	Ref.				
4	45	28	62	**2.21**	**1.43–3.43**	**2.21**	**1.33–3.65**	**0.002**
5	86	60	70	**2.48**	**1.67–3.68**	**2.53**	**1.74–3.68**	**<0.001**
6	127	104	82	**2.91**	**1.93–4.40**	**3.00**	**2.09–4.30**	**<0.001**

PPA: point prevalence abstinence. RR: risk ratio.

worked in production units or in places where the work could not be stopped, and therefore they could not leave their workstations. Some employees who wanted to attend the sessions were unable to do so because of their busy schedule. Some employees worked in night shifts and therefore their availability for follow-up sessions was difficult.

'They cannot switch off the machine, so we have to wait till their work is completed.'

'If the management staff is willing to come for the counseling session but is busy with meetings, trainings etc., it becomes impossible for them to attend the session. Work is important for them.'

Waning support from the management over a period of time was considered as a barrier in implementing the complete program.

'Initial reminders from the management supported but later on that support faded ... so if it could have been continuous ... .'

The counselors mentioned that few action steps were taken by them to overcome few of these challenges during implementation. They conducted awareness and counseling sessions at the shop floor where the employees could not leave their workstations. A few of them conducted meetings and coordinated with the supervisors to change the shifts of the employees due for counseling sessions. Appointment system was used – mutually convenient time was fixed by the counsellor and employee for counseling sessions. They also reported that program activities were integrated with company activities like annual medical check-up, safety talks etc.

Advocacy and support for 'management' to formulate and implement tobacco-free workplace was suggested by the service providers as one of the solutions for addressing these barriers.

'If policy comes, the person who eats will also start thinking that I will have to quit.'

They also suggested that management should ensure continuous support to the employees for availing the cessation services and attending the follow-up counseling services on the designated date and time.

'The company and their management should provide time for the employees if the service providers come in the company.'

Lastly, they said that the cessation services should be repackaged to include more services such as 'stress management' and linkages for medical therapy to clients who are not responding to counseling.

'The program should give them a holistic treatment where along with cessation we provide stress management workshops, general workshop... .'

DISCUSSION

During the program, 331 employees voluntarily enrolled in LifeFirst. High cessation rates were achieved with high adherence to follow-up counseling sessions. Support received from the management of workplace through repeated reminders from the supervisors, security checks, making employees available for counseling/awareness sessions were important facilitators and implementation of workplace tobacco-free policy was recommended.

The major strength of this study is the use of a mixed methods study design. For the quantitative part, we used data collected under routine programmatic settings without any exclusion. The analysis of previously collected programmatic data ensured that the study did not induce any improvements in the performance of the program. Therefore, the study findings reflect what has happened at the field level. The qualitative part of the study supplemented the quantitative findings and increased the understanding of several other practical issues. The study findings have the following implications.

First, the quantitative part of the study indicates that only males and predominantly contractual workers enrolled in the program. However, the qualitative part of the study revealed that there was a misconception with the term 'counseling' and misunderstanding among permanent employees, that the tobacco cessation services were predominantly for lower level/contractual staff. The specific reason mentioned by a counselor for non-participation of female tobacco users was fear of disclosure of their tobacco use status. These findings imply that while implementing such interventions the abovementioned enrolment-related barriers should be addressed.

Second, there was a dose response relationship with those who attended more sessions achieving higher cessation outcomes. However, there were challenges in getting them to attend all the counseling sessions with less than half attending all the six counseling sessions. Support from the management and additional actions taken by the counselors to ensure that the employees were available for maximum follow-up sessions were crucial.

Third, the 6-month cessation outcomes achieved under this program were higher than those reported elsewhere (6% to 40%) in other settings in India[12,25,26]. The major reasons for this are standard counseling protocol with one initial enrollment counseling followed by five individual face-to-face follow-up sessions over six months; ensuring compliance in attending the counseling sessions; support from management; and relatively lower levels of nicotine dependence in those who enrolled in our services. Association between low nicotine dependence at enrollment and high quit rate has been shown in previous studies[27]. Another Cochrane review concludes that providing intensive counseling support in the form of additional sessions improves cessation outcomes, which was also seen among employees who attended more sessions[28].

Last reason for high cessation outcomes is higher proportion of smokeless tobacco users in our study population. A Cochrane systematic review shows that tobacco cessation services based on behavior change communication, such as counseling, help people quit smoking at workplaces[29]. However, there is no evidence of the effectiveness of the counseling services on smokeless

forms of tobacco. Our study shows higher quit rates in smokeless users than in those who used smoked forms of tobacco. Therefore, this is new information and needs to be confirmed in larger studies.

In addition, previous studies also show education, age of starting tobacco use, gender, and frequency of tobacco use, to be associated with high quit rate[10,30].

Lastly, though the cessation outcomes were good and better than other studies, there was still scope for improvement in creating a facilitating environment for quitting tobacco use at the workplace. The study provides some suggestions from the employees' and the counsellors' perspectives on how to support employees in their quitting process further. Of these suggestions, we feel the suggestion pertaining to formulation of 'tobacco free' workplace policy to be the most pertinent and will achieve maximum effect on reducing the prevalence of tobacco use among employees.

The study also brings forth practical suggestions and action steps that are to be taken for smooth and successful implementation of a workplace tobacco cessation program. These can be incorporated into the existing guidelines[17] (which currently focus on tobacco smoking and are suited more for developing countries) so that they can be implemented globally. Tobacco cessation for employees can be supported by government schemes or insurance policies which are currently non-existent.

Limitations

There are limitations in the study. First, the 6-month cessation outcomes were based on employee's self-report about their own tobacco use status. Biochemical validation was not possible due to budget restraints. Social desirability bias and pressure from the management may have played a role in this. Since there were no incentives or disincentives for wrong self-reporting, we feel the errors (if any) are likely to be minimal and random. Assessing the accuracy of self-reported outcome in this setting is an area for future research. Second, the qualitative interviews were done by the Investigator 1 who was a part of the LifeFirst tobacco cessation service. Therefore, the employees and other counsellors may not have given an honest/critical feedback about the deficiencies/inefficiencies of this program. Hence, the study may have missed some criticisms about the services. Third, 'support from the management' was identified as a critical factor for designing and implementing the tobacco cessation services at workplaces. However, we missed including persons from 'Management' in our qualitative research. As a result, we are unable to provide their perspectives about implementing workplace tobacco cessation services.

CONCLUSIONS

Good cessation outcomes were achieved by providing a counseling-based, on-site cessation service in workplaces. Multiple, face-to-face counseling sessions and support received from management played a major role. Tobacco cessation interventions are feasible in different workplace settings and should be promoted as a part of creating tobacco-free workplaces and integrated into other workplace initiatives.

REFERENCES

1. World Health Organization. WHO Report on the Global Tobacco Epidemic, 2008: The MPOWER package. 2008. Accessed April 5, 2021. https://apps.who.int/iris/bitstream/handle/10665/43818/9789241596282_eng.pdf?sequence=1
2. Reddy KS, Gupta PC, eds. Report on Tobacco Control in India. Ministry of Health and Family Welfare, Government of India. November 25, 2004. Accessed April 5, 2021. https://www.who.int/fctc/reporting/Annex6_Report_on_Tobacco_Control_in_India_2004.pdf
3. Tata Institute of Social Sciences, Mumbai and Ministry of Health and Family Welfare, Government of India. Global Adult Tobacco Survey GATS 2 India 2016-17. 2018. Accessed April 5, 2021. https://ntcp.nhp.gov.in/assets/document/surveys-reports-publications/Global-Adult-Tobacco-Survey-Second-Round-India-2016-2017.pdf
4. Census of India. Provisional Population Totals. Government of India; 2011. INDIA Series 1. Paper 1 of 2011. Accessed July 12, 2018. http://censusindia.gov.in/2011-prov-results/data_files/india/paper_contentsetc.pdf
5. Bhan N, Karan A, Srivastava S, Selvaraj S, Subramanian SV, Millett C. Have Socioeconomic Inequalities in Tobacco Use in India Increased Over Time? Trends From the National Sample Surveys (2000–2012). Nicotine Tob Res. 2016;18(8):1711-1718. doi:10.1093/ntr/ntw092
6. World Health Organization. The ICD-10 Classification of Mental and Behavioural Disorders: Clinical Descriptions and Diagnostic Guidelines. World Health Organization; 1992. Accessed April 5, 2021. https://apps.who.int/iris/bitstream/handle/10665/37958/9241544228_eng.pdf?sequence=8&isAllowed=y
7. Hughes JR. Motivating and helping smokers to stop smoking. J Gen Intern Med. 2003;18(12):1053-1057. doi:10.1111/j.1525-1497.2003.20640.x
8. Thankappan KR. Tobacco cessation in India: a priority health intervention. Indian J Med Res. 2014;139(4):484-486. Accessed April 5, 2021. https://www.ijmr.org.in/temp/IndianJMedRes1394484-4149243_113132.pdf
9. The Clinical Practice Guideline Treating Tobacco Use and Dependence 2008 Update Panel, Liaisons, and Staff. A clinical practice guideline for treating tobacco use and dependence: 2008 update. A U.S. Public Health Service report. Am J Prev Med. 2008;35(2):158-176. doi:10.1016/j.amepre.2008.04.009
10. Srivastava S, Malhotra S, Harries AD, Lal P, Arora M. Correlates of tobacco quit attempts and cessation in the adult population of India: secondary analysis of the Global Adult Tobacco Survey, 2009-10. BMC Public Health. 2013;13:263. doi:10.1186/1471-2458-13-263
11. Varghese C, Kaur J, Desai NG, et al. Initiating tobacco cessation services in India: challenges and opportunities. WHO South East Asia J Public Health. 2012;1(2):159-168. doi:10.4103/2224-3151.206929
12. Pimple S, Pednekar M, Mazumdar P, Goswami S, Shastri

S. Predictors of Quitting Tobacco - Results of a Worksite Tobacco Cessation Service Program Among Factory Workers in Mumbai, India. Asian Pac J Cancer Prev. 2012;13(2):533-538. doi:10.7314/apjcp.2012.13.2.533
13. Smedslund G, Fisher KJ, Boles SM, Lichtenstein E. The effectiveness of workplace smoking cessation programmes: a meta-analysis of recent studies. Tob Control. 2004;13(2):197-204. doi:10.1136/tc.2002.002915
14. Ransing RS, Patil DB, Desai MB, Modak A. Outcome of tobacco cessation in workplace and clinic settings: A comparative study. J Int Soc Prev Community Dent. 2016;6(5):487-492. doi:10.4103/2231-0762.192946
15. Economy of Maharashtra. Wikipedia. Updated May 25, 2021. Accessed July 10, 2018. https://en.wikipedia.org/wiki/Economy_of_Maharashtra
16. World Health Organization. Global Adult Tobacco Survey (GATS): Fact Sheet, Maharashtraa 2016-17. Accessed June 13, 2018. https://tmc.gov.in/images/act/Maharashtra-GATS2-Factsheet-Countryspecific-latest-v13.pdf
17. Global Smokefree Partnership. Smokefree-in-a-Box: A Guide for Companies Going Smokefree. 2008. Accessed April 5, 2021. https://www.cancer.org/content/dam/cancer-org/smoke-free-worksites/smokefree-in-a-box-english.pdf
18. World Health Organization. Toolkit for delivering the 5A's and 5R's brief tobacco interventions in primary care. World Health Organization; 2014. Accessed April 5, 2021. https://apps.who.int/iris/bitstream/handle/10665/112835/9789241506953_eng.pdf?sequence=1
19. Fagerstrom KO, Heatherton TF, Kozlowski LT. Nicotine addiction and its assessment. Ear Nose Throat J. 1990;69(11):763-765.
20. Directorate General of Health Services, Ministry of Health and Family Welfare, Government of India. Manual for Tobacco Cessation. Directorate General of Health Services, Ministry of Health and Family Welfare, Government of India; 2005. http://nimhans.ac.in/cam/sites/default/files/Publications/Cancer_resource_Manual_4_Tobacco_New.pdf
21. Velicer WF, Prochaska JO. A comparison of four self-report smoking cessation outcome measures. Addict Behav. 2004;29(1):51-60. doi:10.1016/s0306-4603(03)00084-4
22. Velicer WF, Prochaska JO, Rossi JS, Snow MG. Assessing outcome in smoking cessation studies. Psychol Bull. 1992;111(1):23-41. doi:10.1037/0033-2909.111.1.23
23. Tong A, Sainsbury P, Craig J. Consolidated criteria for reporting qualitative research (COREQ): a 32-item checklist for interviews and focus groups. Int J Qual Health Care. 2007;19(6):349-357. doi:10.1093/intqhc/mzm042
24. Bhisey RA. Chemistry and toxicology of smokeless tobacco. Indian J Cancer. 2012;49(4):364-372. doi:10.4103/0019-509X.107735
25. Savant SC, Hegde-Shetiya S, Agarwal D, Shirhatti R, Shetty D. Effectiveness of Individual and Group Counseling for Cessation of Tobacco Habit Amongst Industrial Workers in Pimpri, Pune – An Interventional Study. Asian Pac J Cancer Prev. 2013;14(2):1133-1139. doi:10.7314/apjcp.2013.14.2.1133
26. Mishra GA, Majmudar PV, Gupta SD, Rane PS, Uplap PA, Shastri SS. Workplace tobacco cessation program in India: A success story. Indian J Occup Environ Med. 2009;13(3):146-153. doi:10.4103/0019-5278.58919
27. Lindberg A, Niska B, Stridsman C, Eklund BM, Eriksson B, Hedman L. Low nicotine dependence and high self-efficacy can predict smoking cessation independent of the presence of chronic obstructive pulmonary disease: a three year follow up of a population-based study. Tob Induc Dis. 2015;13(August):1-8. doi:10.1186/s12971-015-0055-6
28. Lancaster T, Stead LF. Individual behavioural counselling for smoking cessation. Cochrane Database Syst Rev. 2017;(3):CD001292. doi:10.1002/14651858.CD001292.pub3
29. Cahill K, Lancaster T. Workplace interventions for smoking cessation. Cochrane Database Syst Rev. 2014;(2):CD003440. doi:10.1002/14651858.CD003440.pub4
30. Gaikwad R, Bhowate R, Bajad P, et al. Potential Predictor of Tobacco Cessation among Factory Workers: A Baseline Data of Worksite Tobacco Cessation Programs in the Central Part of India. J Contemp Dent Pract. 2017;18(11):1071-1077. doi:10.5005/jp-journals-10024-2178

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The authors have each completed and submitted an ICMJE form for disclosure of potential conflicts of interest. The authors declare that they have no competing interests, financial or otherwise, related to the current work. G. Mandal reports that he is a full-time employee of Salaam Bombay Foundation and participation in the Structured Operational Research and Training Initiative (SORT IT). H. A. Gupte reports that he is a full-time employee of the Narotam Sekhsaria Foundation, and grants from the Clinton Global Initiative the Tobacco free workplace programme as a part of the Worksite Challenge.

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