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Prevalence of tobacco use among teachers and effect of training in quitting of tobacco use: A quasi–experimental study

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Abstract

Background: Tobacco use is one of the biggest public health issue**.** Smoking causes many serious diseases including cancer and strokes, and it shortens the life expectancy. Smokers have a greater risk of cancer than nonsmokers. Thus, smoking prevention should be aimed at young people. Teachers are respected people and they have a great responsibility for tobacco control. The teachers are also role models for students and key figures in tobacco prevention programmes.

Aims and objectives

- To assess prevalence of tobacco use among the teachers and effect of training in quitting tobacco use.
- To find out the level of nicotine dependence and it correlates among Teacher

Material and methods: A quasi-experimental study was conducted among 625 teachers using a predesigned questionnaire which consists of 31 questions related to demographic details, smoking habits, Fagerstrom Test for Nicotine Dependence (FTND), Smoking Decisional Balance Scale (SDBS), and information about Stage of Change. The data collection was done using face to face interview. The collected data were entered in the MS excel sheets. A descriptive statistical analysis was performed using IBM SPSS 25 ver software.

Results: A Total of 624 teachers participated in the study, among those 508 were males and 118 were females. The median age of the teachers was 35.49±8.84. The teachers' mean score for the pre-test of FTND was 7.7±3.03, and their mean score for the post-test was 4.85±2.01. Post-test scores were remarkably lower than the pre-test scores. It was found that teachers' mean scores for SDBS were different before and after training. After training, anti-smoking attitudes increased (pros-cons scores: pre-test3.03±4.68, post test:−12.85±6.48). The training helped the the entire group to make progress in the process change.

Conclusion: After training on "the health effects of smoking", teachers' anti-smoking attitudes rose on the smoking decision balance scale, their nicotine dependency was reduced, and they were able to move forward in a positive direction.

Keywords: Interventions, smoking; teacher, tobacco, transtheoretical model

Introduction

Tobacco is a commercial plant grown for its leaves, which are dried and fermented before preparing any tobacco products. Tobacco contains nicotine, an ingredient that can lead to addiction, which is why so many people who use tobacco find it difficult to quit. There are also many other potentially harmful chemicals found in tobacco or created during burning. India is the 2nd largest producer and exporter after China and Brazil respectively [1]. Tobacco constitutes a major part in economy. Indian tobacco accounts for 10% of the plantation area and 9% of the total commercial plant production. Smoked tobacco products include cigarettes, cigars and bidis. Some people also smoke loose tobacco in a pipe or hookah (water pipe). Chewed tobacco products include chewing tobacco, snuff, dip, and snus; snuff can also be sniffed. The two most commonly used SLT (smokeless tobacco) products among adults in India are khaini—mixture of tobacco and lime used by 11.2% adults (17.9% men and 4.2% women), and gutka—mixture of tobacco, lime and areca nut used by 6.8% adults (10.8% men and 2.7% women).

Tobacco use is one of the biggest public health issues. Roughly, there are 1.3 billion smokers worldwide, which include one third of the world population aged over 15. It is indicated if the current Smoking behaviors remain unchanged, this rate will reach two billion by the year 2030 [2]. Smoking causes many serious diseases including cancer and strokes, and it shortens the life expectancy (3). Risk of cancer in smokers is 23 times greater than non-smokers. Tobacco endemic is a leading cause of death, illness, cancer, and impoverishment, resulting in nearly 8.3 million fatalities annually (4). Over 90% of these deaths are caused directly by tobacco use whilst about 10% are the results of non-smokers being exposed to second-hand smoke [5].

Need of the study: As there is lot of evidence showing tobacco ill effect on health of smokers but there are only few studies assessing the willingness of quitting tobacco habit among smokers who are teacher by their profession.

Aim of the study: To assess prevalence of tobacco use among the teachers and effect of training in quitting tobacco use.

Materials and method

Design

The present study is quasi-experimental study determines the frequency of tobacco use and assessing the dependency of tobacco. Pre-test and post-test were used first with the selected group.

Study population

The research sample was gathered from 30 schools and colleges. A total of 624 teachers who were smoker agreed to participate in the study.

Inclusion

The research included teachers who were physically present in the schools on the day data collection

Exclusion

who were on career leave or sick leave, or based in another region) and not agreed to participate in the research

Instruments

A pre-structured questionnaire comprises of sociodemographic characteristics, smoking habits, Fagerstrom Test for Nicotine Dependence (FTND), Smoking Decisional Balance Scale (SDBS) and the Stage of Change assessed.

Intervention

To collect data, face-to-face interviews were conducted with the teachers in the classroom at the time assigned by school administrators. The teachers were informed about the purpose of study. Then data was collected with data collection tools.

The smoking teachers were trained for a period of one month i.e. October 1 2021, 30 October 2021 the "ill effects of smoking on general health". The training will be given only once for each participant training. Each training session is 65 minutes long, 20 minutes for data collection and 45 minutes lecture about the "ill effects of smoking general health". The training programme covers the smoking rates in India and in the world, effects of smoking on health, diseases and physical harms caused by smoking, time of habit formation reasons to start smoking and keep on smoking, tobacco control measures, quitting smoking and its beneficial effects on health, tobacco cessation centers and their contact addresses.

The Fagerstrom Test for Nicotine Dependence, Smoking Decisional Balance Scale and the Stage of Change scales were administered before and 1week after training.

Study out come

It was expected that after training there would be reduction in teachers' levels of nicotine dependency, increase in their awareness about the harms of smoking and progress in their change process.

Stages of change

The five stages of change in smoking behavior were examined by the staging algorithm developed by Prochaska and DiClemente [6]. Change process questions help indicate behavior change not only related to smoking, but also to breast cancer, nourishment, exercise [19]. The change process that a person goes through includes five stages [7]: pre-contemplation, contemplation, preparation, action, and maintenance. Pre-contemplation is a stage in which people do not think of quitting smoking. Contemplation is a stage in which people think of quitting smoking in the next six months. Preparation is a stage in which people thought of quitting smoking in the last month or tried to quit smoking at least once. Action is the stage in which people have not smoked for the last six month. Maintenance is a stage in which people have not smoked for more than six months [6]

Smoking decisional balance scale

The Smoking Decisional Balance Scale (SDBS) was developed by Velicer *et al*. The SDBS focus on the cognitive and motivational aspects of human decision making. Decisional balance refers to a smoker's relative weighing of the advantages and disadvantages (or pros and cons) of continued smoking [20]. As people progress from "not intending to change" to "maintaining change", perceptions of the pros of smoking decrease and perceptions of the cons of smoking increase [8]. Velicer *et al*. divided these aspects into two categories: the 'pros of smoking' and the 'cons of smoking.' Each category is determined according to a 12-item scale. The items scores were calculated by a five-point Likert scale that ranked between 1 (not important) and 5 (extremely important). The overall balance score was obtained by subtracting the total cons score from the total pros score, the positive scores indicated a balance in favour of the pros of smoking, while negative scores indicated that the cons of smoking outweighed pros. Also, it measures smoker's opinion on quitting [9].

Fagerstrom test for nicotine dependence

The Fagerstrom Test for Nicotine Dependence (FTND) was developed in 1978 by Fagerstrom to examine nicotine dependency using self-assessment methods [10]. The FTND is composed of 6 questions. If the total test score is above 4, it indicates a probability of dependence. The five degrees of nicotine dependency according to the test scores include very low dependency (0–2), low dependency (3–4), medium dependency (5), high dependency (6, 7), and very high dependency (8–10) [11, 12].

Data analysis

The Statistical Package for the Social Sciences (SPSS) version 26 was used. T-tests and chi-square tests were used to compare teachers' mean scores for each scale before and after training. The significance level was $p<0.05$. power of the study is 80%.

Results

In the present study Teachers' (n=624) median age was 37.49±7.84 years. Majority of the teachers (60.9%) were under the age of 39 and 87.3% of the teachers had undergraduate education. It was found that 45.8% of the

teachers never smoked, and 27.8% (n=624) smoked regularly. The median age when they began smoking was 17.91±3.61 (from 7 to 32), and the ordinary years of without stopping smoking were 17.68±7.20 (from13 to 36). Of the teachers, 42.7% stated they were exposed to passive smoke, 10.2% stated they smoked at domestically.

The Fagerstrom Test was administered to examine the teachers' dependence on nicotine, Teacher's nicotine dependency is described in TABLE 1. Prior to training 39.4% of the teachers were highly addicted smokers, following training 39.4% had extremely low levels of nicotine. This difference is statistically significant ($\chi 2=127.525$, $p<0.001$). Prior to training the mean nicotine-dependence test was 5.71±2.03, following training the mean NBT score was 3.25±2.07. The difference in the mean scores prior to and following training is statistically significant ($t = -11.036$, $p<0.001$). The set-aside size was found to be 1.2 with regard to the difference in the mean scores prior to and following training.

Socio-demographic variables and mean NBT scores of teachers were compared. It was found that following training the mean NBT score was 1.00±1.48 for women and 3.21±1.59 for men. The difference in the mean scores according the gender was statistically significant ($t=-2.818$, $p=0.005$). Stages of change in smoking behavior of teachers are shown in TABLE 2. Prior to training 375 teachers were ever thought about quitting smoking, following the training 385 participants never thought about quitting smoking. Prior to training 227 were thinking seriously about quitting smoking in the next six months, Following training 396 participants were thinking seriously about quitting smoking in the next six months

The teachers' smoking behavioral change process was evaluated. Prior to training, 164 were in the pre-contemplation stage, 106 of the total participants were in the contemplation stage, and 355were in the preparation stage. Following training, 99 were in the pre-contemplation stage, 150 were in the contemplation stage, 375 were in the preparation stage, and 1.1% (6) were in the action stage. Chi-square test was utilized to contemplate the differences in the change process. The difference is statistically is significant ($\chi 2$pre-contemplation = 56.376, $p < 0.001$; $\chi 2$contemplation = 59.379, $p < 0.001$; $\chi 2$preparation=63.391, $p<0.001$; $\chi 2$action = 1.506, $p<0.001$) (Table 2). Prior to training, the pros of smoking score was 36.54±2.86, following training it was 34.57±4.00. The difference is statistically significant ($t=7.666$, $p<0.001$). Prior to training, the cons of smoking attain was 40.18 ± 3.86, following training cons score was 45.80±3.7 The difference is statistically significant *st=25.393, $p<0.001$). The pros-cons score was 3.64±4.68 before training and 45.80±3.73 after training. The difference is statistically significant ($t=-25.393$, $p<0.001$). The pros-cons score was –3.64 ± 4.68 before training and −11.25 ± 5.48 after training. The difference is statistically significant ($t=22.195$, $p<0.001$) (Table 3). The effect size for the pros-cons score is 1.33.

Discussion

The QUASI –EXPERIMENTAL STUDY was conducted to assess teachers behavior towards smoking before and after training on ill effects of smoking on health. The Stage of Change and Smoking Decisional Balance Scale were used in this study. Research sample included teachers who worked in the schools and colleges in Andhra Pradesh. According to this study, one of three teachers was a smoker.it was found that smoking behavior did start at earlier ages, and that the teachers had smoked for 17.68±7.20 years on average [13]. The teachers' attitudes towards smoking effect adolescents' decision to start smoking [14]. That is why teachers have a great responsibility to prevent youth from smoking. A third of the teachers were highly addicted before training compared to only one-tenth of them highly addicted after training (Table 1). After training, their nicotine dependence score was reduced from 5.71±2.03 to 3.25±2.07. The nicotine dependency score before training was higher than the scores reported by other studies [11, 15]. The effect of the training may help to explain the reduction in the nicotine addiction levels.

Male teachers had higher levels of nicotine dependence than female teachers ($p<0.05$). The literature also provides evidence that, compared to women, men smoked more cigarettes daily, had smoked longer and had higher levels of nicotine addiction So, gender is a determinant factor in smoking behaviours. The reduction in addiction scores of male participants in particular showed the effectiveness of training (16, 17, 18).

The training enabled the participants to move to the stages of pre-contemplation and contemplation, and thus to make a remarkably positive change. At the end of training, a quarter of the teachers were in the stage of contemplation. The literature suggests that this rate is usually one-tenth after training. So, after the training, the number of people in the contemplation stage doubled [18].

At the end of this study teachers' perception of 'cons' increased as expected. The literature provides evidence that there was a decrease in the perceived 'pros of smoking' and an increase in the perceived 'cons of smoking' of the participants after training. Furthermore, the teachers' awareness about the harmful nature of smoking increased. This was an intended result of the training sessions. As negative attitudes towards smoking increase, behavioural change happens more easily [9].

Table 1: Distribution of teachers' nicotine addiction test items before and after training (n=624)

Nicotine dependence	Before training		After training	
	Number	%	Number	%
How many cigarettes a day do you smoke?				
10 or less	260	41.8	40	6.4
11–20	140	22.9	167	26.7
21–30	48	7.6	258	41.2
31 or more	173	27.6	159	25

How soon after waking do you smoke your first cigarette?				
Within 5 minutes	161	25.9	45	7.1
6–30 minutes	282	45.3	262	42.1
31–60 minutes	99	15.9	172	27.6
After 61 minutes	80	12.9	150	24.1
Do you find it difficult refrain from smoking in places where it is forbidden? E.g. bus, library etc.				
Yes	267	42.9	172	27.6
No	356	57.1	451	72.4
Which cigarette would you hate to give up?				
The first in the morning	300	48.2	202	32.4
Any other	323	51.8	422	67.6
Do you smoke more frequently in the morning?				
Yes	300	48.2	198	31.8
No	323	51.8	425	68.2
Do you smoke even if you are sick in the bed most of the day?				
Yes	271	43.5	245	39.4
No	352	56.5	440	70.6
Total	624	100	624	100
Dependence level				
Very Low	59	9.4		
Low	117	18.8	198	31.8
Moderate	92	14.7	100	15.9
High	245	39.4	67	10.6
Very High	109	17.6	15	2.4
	$\chi2 = 127.525$, $p<0.001$			

Table 2: Distribution of teachers' answers to the questions about change process before and after training (n =624)

Questions about change process	Before training		After training	
	Number	%	Number	%
Have you ever thought about quitting smoking?				
Yes	375	38.2	389	62.4
No	385	61.8	234	37.6
Do you think seriously about quitting smoking in the next six months?				
Yes	227	36.5	396	63.5
No	396	63.5	227	36.5
Do you think seriously about quitting smoking next month?				
Yes	165	26.5	302	48.5
No	458	73.5	319	51.2
Did you try to quit smoking in the last six months?				
Yes	209	33.5	341	54.7
No	414	66.5	282	45.3
Do you currently smoke cigarettes?				
Yes	624	100	605	97.1
No	0	0	13	2.9
Stages of change				
Pre-contemplation	164	26.3	151	24.2
	$\chi2 = 56.376$, $p<0.001$			
Contemplation	104	16.8	150	24.1
	$\chi2 = 59.379$, $p<0.001$			
Preparation	355	56.9	375	60.1
	$\chi2 = 63.391$, $p<0.001$			
Action	00	00	00	00
	$\chi2 = 1.506$, $p<0.001$			

Table 3: Mean scores of decisional balance scale for smoking of teachers before and after training (n = 624)

Smoking decisional balance scale items	Before training	After training
	mean ± SD	mean ± SD
Smoking cigarettes is pleasurable	5.57±0.56	3.24±0.75
After not smoking, for a while a cigarette makes me feel great	5.07±0.56	3.35±0.65
Sometimes smoking or getting cigarettes is an inconvenience	4.67±0.60	3.20±0.75
I feel I am a slave to my smoking habit	6.59±0.52	3.10±0.55
I am relaxed and therefore more pleasant when I am smoking	5.51±0.52	3.42±2.34
Other smokers will be jealous if I quit	3.40±0.65	3.10±0.59
I like the image of a cigarette smoker	4.29±0.68	2.88±0.56

My smoking can affect the health of others	2.02±0.72	3.40±0.73
I would be more energetic right now if I did not smoke	2.96±0.72	3.46±0.69
When I smoke I feel more accepted by family or friends who smoke	3.48±0.58	3.38±0.83
If I try to stop smoking I will probably be irritable and difficult to be around	2.79±0.96	3.17±0.81
Others close to me would suffer if I became ill from smoking	4.90±0.91	4.32±0.82
My family and friends like me better when I am happily smoking than when I am miserably trying to quit	2.04±0.82	2.41±1.04
Because I continue to smoke, some people I know think I lack character to quit	1.15±0.75	3.42±0.72
Smoking cigarettes is hazardous to my health	5.07±0.70	4.62±0.69
I am embarrassed that I have to smoke	2.78±0.78	3.10±0.86
My cigarette smoke bothers other people	3.53±0.74	3.78±0.79
People think I am foolish for ignoring warnings about cigarette smoking	2.33±0.87	2.90±0.82
I like myself better when I smoke	3.08±0.81	2.97±1.02.
Smoking helps me concentrate and do better work	3.23±0.67	3.27±0.94
Smoking cigarettes relieves tension	3.35±0.64	3.35±0.64
People close to me disapprove of my smoking	3.79±0.82	3.29±0.72
I am foolish to ignore the warning about cigarettes	2.61±0.80	3.07±0.75
By continuing to smoke I feel I am making my own decisions	36.54±2.86	34.57±4.00
Pros of smoking	36.54±2.86	34.57±4.00
	t = 7.666, p<0.001	
Cons of smoking	32.18±3.86	40.80±3.73
	t = −25.393, p<0.001	
Pros-cons score	−3.64±4.68	−11.25±5.48
	t = 22.195, p<0.001	

Conclusion

Based on the Trans theoretical Model, the dentist health practioner teachers about the ill effects of smoking. They assisted teachers to become aware of the harms of smoking, decrease their levels of nicotine addiction and commence determined behavioral change. Thus, the training was helpful and effective.

It is recommended that students and teachers, as students' role models, organize training sessions about the ill effects of smoking on health in a reliable and valid theoretical framework. Training sessions can be planned according to the participant's stage of change, and the results of this training can be used in the teacher training programmes to further theoretical arguments and develop initiation strategies. It is possible to organize regular training sessions about the ill effects of smoking by nurses in health institutions or at schools. The observation and evaluation process should be of significant duration to obtain effective results.

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