

Change in Knowledge and Attitude about Tobacco Use after Counselling Among Stone Crusher Workers Of Jaipur City: A Longitudinal Study.

Running Title: Knowledge, Attitude and Counselling of Tobacco use

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Abstract

Background: Tobacco usage is a global epidemic that is gradually worsening with each passing day. Despite of various efforts being taken against tobacco consumption, it is still a major health issue globally, and in India. Hence the present study is an attempt to assess the change in knowledge and attitude of tobacco use among stone crusher workers in and around Jaipur city before and after intervention.

Method: The main study was conducted in two phases. In the first phase the data regarding the demographic and the personal information on tobacco use, knowledge and attitude was collected using pre designed and pre-tested Performa. In the second phase the basic health education and Cognitive- behavioral cessation strategies

were provided to the study subjects. Follow-up was done at intervals of 2 weeks, 4 weeks, 3 months and 6 months. All the techniques were reinforced again at the follow-ups.

Results: Among the total of 2170 study subjects 615 (28.3%) were smokers, 586 (27.0%) consumed smokeless tobacco and 969 (44.7%) used both smoked and smokeless form. Knowledge regarding various effects of tobacco causing heart attack, asthma, gastritis, lung cancer, oral cancer and headache increases significantly from baseline to fourth counselling. Attitude towards harmful effects and rules and regulations for tobacco use, there was significant increase in mean difference (0.000) between baseline data and fourth counselling respectively.

Conclusion: The prevalence of tobacco use is very high among lower socioeconomic strata. Therefore, tobacco awareness programs and tobacco cessation services tailor made for this group must be planned and implemented.

Keywords: Knowledge, attitudes, and practices, tobacco use, stone crusher workers

INTRODUCTION

Tobacco appears to have existed from the dawn of humanity. Tobacco cultivation extends back at least 8000 years, when American Indians propagated two kinds of the plant, *Nicotiana rustica* and *Nicotiana tabacum*, across the southern and northern American continents.¹ By forcing the queen of France, Catherine de Medici, to ingest powdered tobacco, Jean Nicot, a French envoy, was able to cure her of severe migraines. This substantially improved his fame, and the drug was given the generic name "Nicotiana".¹ Portuguese traders introduced tobacco to India in the year 1600.¹

Tobacco usage is a global epidemic that is gradually worsening with each passing day. There are 1.1 billion tobacco smokers in the developing world, and this figure is predicted to rise to 1.6 billion in the next two decades as the tobacco business expands.² According to the Global Youth Tobacco Survey, India (2019), 42.4 percent of males and 14.2 percent of women use tobacco (smoked and/or smokeless tobacco) now.³ Male smoking rates are particularly high in Asian countries, with Indonesian men (76%) listed as the world's top smokers, followed by Indian men (20%).⁴

Tobacco use in India is distinct from that in other countries because of the variety of tobacco types used (cigarettes, "bidis," and other smokeless forms), the potential for increased use among growing socioeconomically mobile populations, and the role of multiple socioeconomic and cultural strata (income, education, caste/tribe status, and so on) as risk determinants.⁵ In India, as in other developing nations, youth and early adulthood (ages 15-24) are the most vulnerable periods for tobacco use.⁶ Tobacco usage begins in most cases before the age of 18, and in other cases as early as the age of ten. Tobacco usage at such a young age is a particularly eye-opening condition for any country, given the significant health consequences that come with it, most notably oral and lung cancer along with cardiovascular and respiratory illness.⁶

Various tobacco control strategies are being implemented successfully around the world, including graphical health warning labels covering the majority of the package, plain packaging, which was first implemented in Australia, complete advertising bans on television, newspapers, and magazines, complete advertising bans on the internet, at the point of sale, and via email, adopting 100 percent smoke-free public places, and raising tobacco product prices, which has resulted in a significant decrease in tobacco consumption. Although there are some other novel ideas like age- of birth cut off to reduce or limit the use, not many countries has adopted this strategy except Australia, Singapore and Finland.⁷ India has played a leadership role in global tobacco control, the government of India enacted various legislations and comprehensive tobacco

control measures, at relatively small-scale preventative policies were introduced between 1975 and 2000,⁸ more comprehensive Cigarette and Other Tobacco Products Act (COTPA; addressing Introduction 4 tobacco use in public places, tobacco advertising, and sale and packaging regulations) was introduced in 2003, and the Framework Convention of Tobacco Control (FCTC) brought into force in 2005.⁸ India promotes various tobacco control strategies including increase pricing and taxation measures, smoke-free policies, tobacco product legislation, appropriate labeling of products (including health warnings), tobacco related education, prohibition of advertising and other promotion methods, provision of cessation programmes, control of illicit tobacco product trade, control of tobacco sale to/by minors, and support for alternative employment strategies for tobacco workers.⁹ Also soon after committing to the FCTC, the Indian Government drew up a National Tobacco Control Programme to help achieve its provisions. The programme aimed to establish tobacco counseling and cessation centres at every community health centre and district hospital, training programmes for teachers, health workers and others, educational interventions for schools and the general population, and mechanisms to monitor enforcement of tobacco control legislation, at the district level. State and national-level monitoring of the initiatives was also planned, as well as research activities regarding alternative livelihood options, establishment of tobacco product testing facilities and production of mass-media awareness campaigns.⁸

Despite of above mentioned efforts being taken, tobacco consumption is a major health issue globally, and in India,⁹ and nearly two-third of the contribution to the net domestic product is by the unorganized sector also known as informal labor which is defined as those not governed either by state regulations or by collective agreements between workers and employers have higher tobacco consumption rates.¹⁰ Physically tedious job that steers workers to consume harmful substances like alcohol and tobacco, migration from rural areas necessitates alterations in social status and living conditions that result in behavioral adaptations to urban life can be leading cause of increase consumption among them.¹¹

Hence the present study is an attempt to assess the change in knowledge and attitude of tobacco use among stone crusher workers in and around Jaipur city before and after intervention.

Materials and Methods

Jaipur, popularly known as the Pink City and a UNESCO World Heritage Site, is the capital and largest city of the Republic of India's Rajasthan state. It was one of the first planned cities of contemporary India, created by Vidyadhar Bhattacharya and encompassing an approximate area of 11,136 sq. km.¹² it was founded in 1727 by Rajput monarch Jai Singh 2.

Geologic succession of Jaipur district is quite wide ranging in terms of age and rocks from Archean to Recent age.¹³ Most of the north eastern part of the district is covered by younger and older alluvium which is predominantly sandy and clayey in nature. In some parts of western Jaipur eloign sand is also present as a thin cover above the alluvium sediments. Some parts in the northeastern region also show presence of Delhi Super Group quartzites, schists, phyllites and marbles. Most of the southern half of the district is occupied by Gneisses and schists of Bhilwara Super Group (geology Department of The Government Of Rajasthan).¹³ Aravili hill chains in the south comprising mainly of stone crusher plants of Jaipur city.

The present study was carried out among these stone crusher workers, covering 30 stone crusher around Jaipur city. A single stage stratified random sampling procedure was used to select subjects as follows, each area was used as strata, and stone crusher from the area were selected randomly. The number and list of workers was obtained from each of the 30 selected stone crusher. The total list of potentially eligible workers served as the sampling frame. Sample size was determined based on prevalence rate of tobacco use (95%) taken from the previous study¹⁴ was estimated to be 2170. All the workers were informed about the study well

in advance so as to attain maximum attendance. Eligible study subjects from each stratum were then selected using simple random sampling technique.

Eligibility criteria

Inclusion criterion

1. Workers present on the day of examination and had completed 15 years of age.
2. Workers who consumed tobacco in any form.

Exclusion criteria

1. Individuals suffering from any systemic diseases and
2. Individuals who are not willing to participate in the study.

Ethical clearance was obtained from the ethical committee of the institute, and the permission to conduct study was obtained from the mine association and owners.

Training and calibrating examiners

Examination of the entire study subject was carried out by single investigator along with a recorder, who was trained and calibrated in the Department of Public Health Dentistry Rajasthan Dental College and Hospital, by a senior faculty member. Training took 2 days, and further 2-3 days for calibration. First, the examination was conducted on the group of 10 participants with a wide range of disease conditions and than twenty preselected individuals were examined twice consistently, with a time interval of at least 30 minutes and the result of both the examination were compared to estimate the extent and nature of diagnostic variability.

Study Tools

Pre- designed and Pre-tested performa was created using Global Tobacco Surveillance system developed by the World Health Organization (WHO), and Centers for Disease Control (CDC).⁴

The main study was conducted in two phases. In the first phase the data regarding the demographic and the personal information on tobacco use, knowledge and attitude was collected. In the second phase the basic health education and Cognitive- behavioral cessation strategies were provided to the study subjects. Under the basic health education pamphlets distribution was done which contained information about ill effects of tobacco use. Verbal information was also provided to all the study subjects. There was discussion with study subjects about barriers in cessation, tobacco quitting methods and knowledge about tobacco cessation centres, the pros and cons of quitting tobacco was done under cognitive behavioral cessation therapy which provided encouragement, support and training on educational and coping skills.

Follow-up was done at intervals of 2 weeks, 4 weeks, 3 months and 6 months. All the techniques were reinforced again at the follow- ups.

Examination procedure

A clean well illuminated and ventilated room with two gates one for entry and one for exit was selected for examination to avoid crowding and noise. The workers were made to sit on a chair at a place with sufficient natural daylight. A table, on which instruments and other armamentaria were arranged, was placed within easy reach of the examiner. Clinical oral examinations were carried out by a single examiner, who was assisted by the recorder while examining the participant and called out the scores for each item of examination clearly, and the recorder then entered it in the pro forma for each participant examined. The recording assistant was allowed to sit close enough to the examiner could see that the findings were being recorded correctly.

Data Analysis

The obtained data was coded and entered in to the Microsoft Excel sheets. The data was then fed into the SPSS (Statistical Package for Social Studies) software Version-20 (SPSS Inc., Chicago, IL, USA) for

analysis. In the software the data was renamed into different variables, based on the questionnaire used in the study and analyzed. Descriptive statistics were used to report frequency distribution of various study variables Means and standard deviations were calculated for continuous variables while percentages and frequencies were generated for categorical variables. Karl Pearson Chi-square test was used for analysis of frequencies of more than one categories .Difference in Mean between the baseline data and counselling group were compared.

Results

The present longitudinal study assess the change in knowledge and attitude of tobacco use among stone crusher workers in and around Jaipur city before and after intervention at (2 weeks, 4 weeks, 3 months and 6 months) respectively. Among total study subjects, 1632 (75.2%), 538 (24.8%) were males and females, making the male to female ratio of 3: 1. The study subject's age ranged from 15 to 40 years and above. Most respondents 894 (41.2%) were 40 years and above. In general, the education level of study subjects was very low, 1541 (71.0%) were illiterate. Maximum workers earned basic pay of 100-500 Rupees/day 1977 (91.3%), Majority of the study subjects 1495 (68.9%) has been working since 15-20 years respectively [Table-1].

Table 1: Socio-demographic Profile of the study Subjects

Variables	N (%)
Gender	
Male	1632 (75.2%)
Female	538 (24.8 %)
Age	
15-20 years	27 (1.2%)
21-35 years	189 (8.7 %)
26-30 years	367 (16.9%)
31-35 years	403 (18.6%)
36-40 years	290 (13.4%)
40 years and more	894 (41.2%)
Education Level	
Illiterate	1541 (71.0%)
Primary	439 (20.2%)
High school	135 (6.2 %)
Senior secondary	10 (0.5 %)
Degree	25 (1.2 %)
Post Graduate	20 (0.9 %)
Income (in Rupees)	
100-500	1977 (91.3%)

500-1000	119 (5.5 %)
More than 1000	74 (3.4%)
Working Experience	
15 - 20 years	1495 (68.9%)
21- 25 years	286 (13.2%)
26- 30 years	82 (3.8 %)
31- 35 years	282 (13.0%)
36- 40 years	20 (0.9%)
More than 40 years	5 (0.2 %)

Among the total of 2170 study subjects 615 (28.3%) were smokers, 586 (27.0%) consumed smokeless tobacco and 969 (44.7%) used both smoked and smokeless form respectively. Tobacco consumption was seen as a deep rooted habit with 737 (34.0%) were consuming since 11-20 years. Among 1584 smokers 1429 (89.9%) smoked it on daily basis. Beedi smoking 1419 (89.6%) was the most popular form of smoking. Among 1555 tobacco chewers 1355 (87.2%) study subject stated that they consumed it on daily basis .Most common area of tobacco placement was found to be buccal vestibule 905 (58.2%).Maximum study subjects 575 (26.5%) spent 11-15 rupees daily on tobacco purchase daily. On studying the reasons of tobacco use it was found that 529 (24.4%) study subjects used it for energy, 94 (4.3%) for proper bowl movement, 139 (6.4%) for pleasure, 243 (11.2%) needed when tense and upset, 482 (22.2%) were addicted to it, 426 (19.6%) had a habit and 257 (11.8%) used it without being aware about it. However, 1657 (76.4%) said that they don't want to quit tobacco. Only 484 (22.3%) said that they were willing to quit tobacco use and even small friction of 29 (1.3%) believed that quitting cost was more [Table-2].

Table 2: Tobacco use and characteristics details of the study Subjects

Variables	N (%)
Tobacco use	2170 (100%)
Form of Tobacco	
Smoke	615 (28.3%)
Smokeless	586 (27.0%)
Both	969 (44.7%)
Consuming Since	
10 years	408 (18.8%)
11-20 years	737 (34.0%)

Variables	N (%)
21-30 years	401 (18.5%)
31-40 years	437 (20.1%)
More than 40 years	187 (8.6 %)
History of Smoking	
Daily	1424(89.9%)
Not Daily	160(10.1%)
Form of smoke tobacco currently consumed	
Manufactured cigarettes	165(10.4%)
Hand rolled cigarettes	1419(89.6%)
History of chewing Tobacco	
Daily	1355(87.2%)
Not daily	1200(12.8%)
Specific area in which tobacco is placed	
Labial vestibule	650(41.8%)
Buccal vestibule	905(58.2%)
Cost of purchase of tobacco (in rupee)	
5-10	571 (26.3%)
11-15	575 (26.5%)
16-20	271 (12.5%)
21- 25	179 (8.2%)
26-30	290 (13.4%)
More than 30	284 (13.1%)
Reasons of tobacco use	
Give energy	529 (24.4%)
Proper bowel movement	94 (4.3%)

Variables	N (%)
Give pleasure	139 (6.4%)
Need when tense and upset	243(11.2%)
Addicted to it	482 (22.2%)
Is habit	426 (19.6%)
Use without being aware about it	257 (11.8%)
Reason for non-quitting	
Not willing	1657(76.4%)
Not aware of quitting method	484(22.3%)
Quitting cost is more	29 (1.3%)

Table-3 Depicts Knowledge of study subjects about various harmful effect of tobacco it was found that there was significant increase in mean difference (0.000) between baseline data and fourth counselling .Regarding various effects of tobacco causing heart attack, asthma, gastritis, lung cancer , oral cancer and headache respectively.

Table-3 Knowledge of study subjects about harmful effect of tobacco.

		Observed N	Mean	Chi-square	P-value
Does tobacco causes heart attack?	Baseline	533 (Yes)	0.25	561.66	0.000*
		1637 (No)			
	First counselling (2 week)	1354 (Yes)	0.66	203.11	
		707 (No)			
	Second counselling (4 week)	1549 (Yes)	0.83	797.72	
		326 (No)			
Third counselling (3 months)	928 (Yes)	0.86	547.87		
	157 (No)				
Fourth counselling (6 months)	801 (Yes)	0.90	571.84		
	88 (No)				
	Baseline	413 (Yes)	0.19	832.41	0.000*
		1757 (No)			

Does tobacco causes asthma?	First counselling (2 week)	1517(Yes) 544 (No)	0.74	459.35	
	Second counselling (4 week)	1690(Yes) 185 (No)	0.90	1208.01	
	Third counselling (3 months)	1005(Yes) 80 (No)	0.93	788.59	
	Fourth counselling (6 months)	861 (Yes) 28 (No)	0.97	780.52	
Does tobacco causes gastritis?	Baseline	398 (Yes) 1772 (No)	0.18	869.98	0.000*
	First counselling (2 week)	1608 (Yes) 453 (No)	0.78	647.27	
	Second counselling (4 week)	1689 (Yes) 186 (No)	0.90	1204.8	
	Third counselling (3 months)	989 (Yes) 96 (No)	0.91	734.97	
	Fourth counselling (6 months)	847 (Yes) 42 (No)	0.95	728.93	
Does tobacco causes Lung cancer?	Baseline	1060 (Yes) 1110 (No)	0.49	1.152	0.000*
	First counselling (2 week)	1523 (Yes) 538 (No)	0.74	470.75	
	Second counselling (4 week)	1601 (Yes) 274 (No)	0.85	939.16	
	Third counselling (3 months)	990 (Yes) 95 (No)	0.91	738.27	
	Fourth counselling (6 months)	854 (Yes) 35 (No)	0.96	754.51	
	Baseline	1654 (Yes)	0.76	596.79	0.000*

Does tobacco causes oral cancer?		516 (No)			
	First counselling (2 week)	1636 (Yes) 425 (No)	0.79	2093.07	
	Second counselling (4 week)	1647 (Yes) 516 (No)	0.88	1073.89	
	Third counselling (3 months)	1636 (Yes) 425 (No)	0.90	696	
	Fourth counselling (6 months)	1647 (Yes) 228 (No)	0.91	584.74	
Does tobacco causes headache?	Baseline	1808 (Yes) 362 (No)	0.17	963.55	0.000*
	First counselling (2 week)	1342 (Yes) 719 (No)	0.65	188.32	
	Second counselling (4 week)	1339 (Yes) 536 (No)	0.71	343.89	
	Third counselling (3 months)	951 (Yes) 134 (No)	0.88	615.19	
	Fourth counselling (6 months)	792 (Yes) 97 (No)	0.89	543.33	

*P-value of < 0.05 was considered as statistically significant

Table- 4 Shows attitude of the study subjects towards harmful effects and rules and regulations for tobacco use. The tables states that there was significant increase in mean difference (0.000) between baseline data and fourth counselling which was done at six month, regarding passive smoking, increasing prices of tobacco products, banning tobacco advertising, pictorial warning on tobacco packages, nicotine addiction and quitting tobacco respectively.

Table-4 Attitude of study subjects about tobacco control issues.

		Observed N	Mean	Chi-square	P-value
Is Passive Smoking	Baseline	757 (Agree) 1413 (Disagree)	0.35	198.31	0.000*
	First counselling (2 week)	1589 (Agree) 472 (Disagree)	0.77	605.38	

harmful?	Second counselling (4 week)	1714 (Agree) 162 (Disagree)	0.91	1282.98	
	Third counselling (3 months)	1016 (Agree) 69 (Disagree)	0.94	826.55	
	Fourth counselling (6 months)	839 (Agree) 50 (Disagree)	0.94	700.24	
Do you agree that prices of tobacco products should be increased?	Baseline	413 (Agree) 1757(Disagree)	0.19	167.18	0.000*
	First counselling (2 week)	1324 (Agree) 737 (Disagree)	0.64	832.41	
	Second counselling (4 week)	1393 (Agree) 482 (Disagree)	0.74	442.65	
	Third counselling (3 months)	941 (Agree) 144 (Disagree)	0.87	585.44	
	Fourth counselling (6 months)	790 (Agree) 99 (Disagree)	0.89	537.09	
Do you agree that tobacco advertising should be completely banned?	Baseline	356 (Agree) 1814 (Disagree)	0.16	979.61	0.000*
	First counselling (2 week)	1077 (Agree) 984 (Disagree)	0.52	4.197	
	Second counselling (4 week)	1192 (Agree) 683 (Disagree)	0.64	138.177	
	Third counselling (3 months)	692 (Agree) 393 (Disagree)	0.64	82.397	
	Fourth counselling (6 months)	703 (Agree) 186 (Disagree)	0.79	300.66	
	Baseline	822 (Agree) 1348 (Disagree)	0.38	127.5	0.000*
	First counselling	1641 (Agree)	0.80	641	

Do you agree that Pictorial warnings should be introduced on tobacco packages?	(2 week)	420 (Disagree)			
	Second counselling (4 week)	1701 (Agree) 174 (Disagree)	0.91	1243	
	Third counselling (3 months)	996 (Agree) 89 (Disagree)	0.92	758	
	Fourth counselling (6 months)	822 (Agree) 67 (Disagree)	0.92	723	
Do you feel that you are addicted to nicotine?	Baseline	409 (Agree) 1761 (Disagree)	0.81	842.35	0.000*
	First counselling (2 week)	1892 (Agree) 169 (Disagree)	0.08	1440.43	
	Second counselling (4 week)	1706 (Agree) 169 (Disagree)	0.09	1259.93	
	Third counselling (3 months)	1031 (Agree) 54 (Disagree)	0.05	879.75	
	Fourth counselling (6 months)	853 (Agree) 36 (Disagree)	0.04	750.83	
Do you feel that you should quit tobacco?	Baseline	413 (Yes) 1757 (No)	0.19	832.41	0.000*
	First counselling (2 week)	1517 (Yes) 544 (No)	0.74	459.35	
	Second counselling (4 week)	1690 (Yes) 185 (No)	0.90	1208.01	
	Third counselling (3 months)	1005 (Yes) 80 (No)	0.93	788.59	
	Fourth counselling (6 months)	861 (Yes) 28 (No)	0.97	780.52	

*P-value of < 0.05 was considered as statistically significant

Discussion

Tobacco use is a major risk factor for a wide range of pathologies, including cardiovascular, respiratory, gastrointestinal manifestation and lung and oral malignant conditions. All of the major forms of tobacco have oral consequences and have been shown to increase the risk of oral diseases. Evidences suggest that the oral diseases are associated with greater amounts of tobacco used and longer duration of use.¹⁵ Most of countries are making tobacco control a priority and saving lives, but there is much more work to be done. Confidence in providing tobacco cessation counselling is a challenge for both dental students and practicing dental professionals.¹⁶

The present study assess the change in knowledge and attitude of tobacco use among stone crusher workers after repeated counselling section.

In our study, there was a significant ($p = 0.00$) increase in the mean knowledge score of study subjects about tobacco use and heart attack in the fourth counselling (0.90) as compared to baseline values (0.25). However in the study conducted by Rahul G et al¹⁷ in 2018 no statistically significant ($p = 0.052$) and much higher mean score was obtained for the study population (1.27) at baseline, (0.96) at last follow-up. Difference can be attributed to the different study location, sampling frames and demographic characteristics of the individuals enrolled.

Knowledge of respondents regarding harmful effects of tobacco causing asthma was found to be (0.19) at baseline. Which was found to be almost equal (0.22) to the previous study conducted by Samal Rabindra Kumar et al.¹⁸

As reflected in the study the tobacco users even in pre-intervention period had a significant ($p = 0.00$) high level of awareness about tobacco causing oral and lung cancer. This further improved with the fourth educational intervention to in the post-intervention period. Another study from rural Kerala has reported almost similar findings.¹⁹

In the present study, only a small proportion of subjects could identify ill effect of second hand smoking (0.35) at baseline which significantly ($p = 0.00$) increased towards the fourth counselling (0.37) which is much higher as compare to the study conducted by Majmudar A et al [20] which showed mean score of (0.18) at baseline which significantly ($p = 0.01$) increased towards last counselling (0.37). It can be due to female consideration while in our study it was mixed population.

Means of study subject attitude towards increasing pricing of tobacco products become more positive towards the fourth counselling. Similar findings were obtained from the study in New York in 2013.²⁰ reflecting tobacco control as a important priority worldwide.

Here was statistically significant improvement in the knowledge of study subjects with regards to certain parameters like, perception of pictorial warnings on tobacco products and banning tobacco advertising. Almost similar findings were obtained from the study conducted by Majmudar A et al.²¹

Not surprisingly, we found that there was significantly highest mean score at pre intervention as compare to post intervention session of study subjects about declining the truth that they are addicted to nicotine .Similar finding was found in the study conducted by Rahul G et al.²²

Only a few (0.19) in the present study, at pre-intervention, were aware about the availability of assistance for quitting tobacco which increase significantly ($p = 0.02$) to fourth counselling (0.97) respectively. Our study results was almost double as compare to the study conducted by Majmudar A et al [20] which showed mean score of (0.08) at baseline which significantly ($p = 0.01$) increased towards last counselling (0.60). The difference can be due to more counselling section in our study.

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