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RESEARCH

Evaluation of attitude, behavior, knowledge, and smoking rates among youngsters from Southern India: a survey-based study from Andhra Pradesh

Shilpa Garg[1], Raman Garipelly[1], Anantha Naik Nagappa[2], Uday Venkat Mateti[1,2]

ABSTRACT

Introduction: India accounts for 274.9 million global tobacco users and approximately 120 million tobacco smokers. It is predicted that tobacco deaths in India may exceed 1.5 million annually by 2020. Considering the hazardous impact of smoking upon the health of an individual, we conducted this investigation to evaluate the magnitude of this increasingly distressing public health concern among youngsters enrolled in university courses at various educational institutes in the state of Andhra Pradesh, India. **Methodology:** A cross-sectional questionnaire based study was conducted among youngsters at various educational institutions in Andhra Pradesh, India. The structured questionnaire was developed to assess the number of youngsters habituated to smoking and to know their attitude, knowledge, and behavioral responses toward smoking tobacco. **Results:** A total of 4394 responses were collected from Andhra Pradesh. The mean age of the respondents was 20.4 ± 2.9 years and 67.6% were males. The overall smoking rate was found to be 41.03%. Of the total respondents, 1254 (28.5%) were enrolled in pre-university course, whereas graduates and postgraduates constituted 2348 (53.4%) and 792 (18.0%), respectively. A majority of smokers (72.6%) and nonsmokers (91.6%) stated that people adapt to smoking as a fashionable trend, while only a meager (12.1%) respondents thought stress as a stimulant to resort to smoking habits. 44.9% respondents felt smoking cigarettes in a group increased interaction among their peers; 81.1% confessed to initiation of smoking during their teenage years; About 66.8% admitted to smoking up to 5 cigarettes/day, while 76.2% were aware of the fact nicotine in cigarettes causes addiction. Of the suggested measures to quit smoking, 64.9% of the respondents recommended prohibition of smoking at public places, 66.1% advised cigarettes to be made expensive, 87.2% sought counseling by a physician or a pharmacist as a valuable resource to help youngsters curb their smoking habits and 77.1% thought the use of e-cigarettes could be a potential alternative measure to avoid tobacco smoking. **Conclusion:** A high percentage of youngsters admitting to smoking cigarettes as demonstrated from our survey highlights a poor indicator of national health status. Perhaps, it also reflects a failure of state government policies aimed to prevent tobacco use. The need to formulate stringent policies to guide youngsters to understand the deleterious effects of tobacco, including but not limited to, advertisements, banners, setting up of de-addiction and counseling centers, national wide campaign and broadcasting should be done.

Key words: Education, India, smoking, students

Introduction

Tobacco consumption, in the form of direct and secondhand smoke accounts for nearly 6 million deaths worldwide annually and is increasingly becoming a serious public health concern. It is a potential risk factor for 6 out of the 8 leading causes of deaths worldwide [1]. Chronic abuse of tobacco in any form accounts for 1 out of 10 adult deaths with one person dying every 6 seconds. In spite of its deleterious effects on life and health, tobacco remains one of the most common forms of drug abuse. Of the 1 billion estimated smokers across the globe, more than 80% reside in developing or under-developed nations [2]. According to the World Health Organization (WHO), India accounts for 12% of the global smokers (approximately 120 million) with the highest number of cigarette smokers recorded in the state of Jammu and Kashmir [3,4]. It is predicted that tobacco deaths in India may exceed 1.5 million annually by 2020. Considering the hazardous impact of smoking upon the health of an individual, the present study was conducted to evaluate the magnitude of this increasingly distressing public health concern among youngsters enrolled in university courses at various educational institutes in the state of Andhra Pradesh, India. The data on behavior of smoking pattern and the knowledge and attitude

[1]Department of Pharmacy Practice and Pharm D, St. Peter's Institute of Pharmaceutical Sciences, Kakatiya University, Warangal, Andhra Pradesh, [2]Department of Pharmacy Management, Manipal College of Pharmaceutical Sciences, Manipal University, Manipal, Karnataka, India

Corresponding Author:
Uday Venkat Mateti, E-mail: udayvenkatmateti@gmail.com

of youngsters toward smoking and its hazardous effects are presented in this paper.

Methodology

Study protocol and population

A cross-sectional questionnaire survey was conducted over a period of 13 months from November 1, 2011 to November 31, 2012 at various educational institutions in Andhra Pradesh, India. The study population included students enrolled in various university courses and were segregated into preuniversity course (PUC), graduate and post graduation categories. The legal and ethical considerations for the study were sought from the Institutional Ethical Committee at the St. Peter's Institute of Pharmaceutical Sciences, Vidyanagar, Hanamkonda, Warangal prior to the commencement of the survey. A well-structured and self-administered questionnaire with both, open- and close-ended questions was developed for the purpose of collection and assessment of data on behavior, knowledge, and attitude of youngsters toward smoking tobacco. Demographic data, including age, and gender, educational qualification, address, etc., were also recorded.

Data collection

Data collection was primarily done over the internet and manual survey. All the youngsters were surveyed using a self-administered questionnaire, which included questions based on behavior, knowledge and attitude toward smoking and also on the measures they would suggest to make youngsters avoid/quit smoking. Data were primarily collected from the students who are actively using their e-mail accounts, by providing them with the link to online questionnaire and were requested to respond. The paper forms were also taken to different colleges personally by field supervisors and were handed over to the students to express their views on smoking practice. The students were clearly explained about the main objective of the study and were assured that their responses would remain highly confidential. The forms were also distributed randomly to students who attended college technical fests and national conferences, which were held during the survey period. Youngsters who were unable to understand the questionnaire were explained in local language. For some of the interested youngsters who were working as employees, the paper forms were provided during their leisure and collected at the end of the day. The social networking sites were also used in order to circulate the questionnaire. All respondents were assured of anonymity about their responses. The questions included the number of cigarettes smoked per day, best time when they feel to smoke, history of smoking, source of their first cigarette, reasons for adoption and addiction, impact of friends on their smoking behavior, awareness regarding hazardous effects of smoking and passive smoking, attitude of smokers and nonsmokers toward smokers, suggested measures to quit smoking tobacco, if any.

Content validity

Prior to survey initiation, a pilot study with the designed questionnaire was conducted. The questionnaire was piloted and evaluated for its content using the method developed by Lynn [5]. An expert committee was established to evaluate the content. The committee was provided with a copy of the questionnaire, and objectives of the study with rationale for each question phrased. Following review, few changes were incorporated as suggested by the panel experts. The final questionnaire was classified into 4 major groups: attitude based questions; behavior-based questions; knowledge-based questions, and finally the suggested measures to avoid/quit smoking.

Data management and analysis

The data collected following the survey was reviewed by field supervisors and entered into Microsoft© Excel. Data cleaning and editing were performed on a timely basis. To ensure adequate accuracy and reliability of the data, stringent quality assurance measures were followed at various stages of data handling. Percentages and proportions were calculated wherever appropriate. Percentage value was rounded off to first decimal digit.

Results

The baseline demographic characteristics of the study respondents are presented in Table 1. The mean age of the respondents was 20.4 ± 2.9 years and 67.6% were males. The overall smoking rate was found to be 41.03%, with highest prevalence observed amongst the male population 1621 (54.5%) in contrast to a tenth of the female population 182 (12.8%) admitting to smoking cigarette. Of the total respondents, 1254 (28.5%) were enrolled in PUC, whereas graduates and postgraduates constituted 2348 (53.4%) and 792 (18.0%), respectively.

Response of the study groups to attitude-, behavior-, and knowledge-based questions are summarized

Table 1: Demographic characteristics of the respondents included in the survey (*n*=4394)

Characteristics	Number of respondents (%)
Mean age±SD (years)	20.4±2.9
Male gender, *n* (%)	2973 (67.6)
Course enrolment, *n* (%)	
PUC	1254 (28.5)
Graduate	2348 (53.4)
Postgraduate	792 (18.0)
Region, *n* (%)	
Urban	3216 (73.2)
Rural	1178 (26.8)
Smokers, *n* (%)	1803 (41.03)

PUC: Pre-university course

Table 2: Response of the study group to attitude-, behavior- and knowledge-based questions

Questions	PUC		Graduates		Postgraduates	
	N=1254 (28.5)		*N*=2348 (53.4)		*N*=792 (18.0)	
	S	NS	S	NS	S	NS
	N=276 (22.01)	*N*=978 (77.99%)	*N*=1267 (53.97%)	*N*=1081 (46.03%)	*N*=260 (32.83%)	*N*=532 (67.17%)
Questions assessing attitude of respondents						
Possible reasons to adopt smoking?						
Fashion	221 (80.1)	893 (91.3)	902 (71.2)	983 (90.9)	187 (71.9)	497 (93.5)
Mental stress	48 (17.4)	85 (8.7)	271 (21.4)	58 (5.4)	56 (21.5)	14 (02.6)
Other reasons	7 (2.5)	-	94 (07.4)	40 (3.7)	17 (6.6)	21 (03.9)
Response when you see someone smoking?						
Support them	207 (7)	11 (01.1)	527 (41.6)	-	-	-
Oppose them	16 (5.78)	159 (16.2)	53 (4.1)	231 (21.4)	-	-
Scold them	-	57 (05.8)	-	94 (8.7)	-	-
None	53 (19.2)	751 (76.8)	687 (54.2)	756 (69.9)	260 (100)	532 (100)
Is peer pressure a reason to smoke?						
Agree	225 (81.5)	-	1241 (97.9)	26 (2.4)	221 (85.0)	-
Disagree	51 (18.5)	978 (100)	26 (02.1)	1055 (97.6)	39 (15.0)	532 (100)
Smoking increases peer interaction?						
Agree	203 (73.6)	217 (22.2)	1267 (100)	47 (4.3)	242 (93.1)	-
Disagree	73 (26.4)	761 (77.8)	-	1034 (95.7)	18 (6.9)	532 (100)
Questions evaluating behavior of respondents						
Age of initiation of smoking						
Before teenage (≤12 years)	11 (4.0)	124 (9.8)	21 (8.1)	11 (4.0)	124 (9.8)	21 (8.1)
During teenage (13-19 years)	265 (96.0)	995 (78.5)	202 (77.7)	265 (96.0)	995 (78.5)	202 (77.7)
≥20 years	-	148 (11.7)	37 (14.2)	-	148 (11.7)	37 (14.2)
Source of your first cigarette?						
Parents	-	6 (0.5)	-	-	6 (0.5)	-
Relatives (including siblings)	34 (12.3)	116 (9.1)	28 (10.8)	34 (12.3)	116 (9.1)	28 (10.8)
Friends	224 (81.2)	882 (69.6)	91 (35.0)	224 (81.2)	882 (69.6)	91 (35.0)
Not sure (self)	18 (6.5)	263 (20.8)	141 (54.2)	18 (6.5)	263 (20.8)	141 (54.2)
Cigarettes smoked per day?						
<2	203 (73.6)	144 (11.4)	6 (2.3)	203 (73.6)	144 (11.4)	6 (2.3)
2-5	71 (25.7)	897 (70.8)	236 (90.8)	71 (25.7)	897 (70.8)	236 (90.8)
>5	2 (0.7)	226 (17.8)	18 (6.9)	2 (0.7)	226 (17.8)	18 (6.9)
Choose the best time when you feel to smoke						
Morning	27 (9.8)	97 (7.6)	17 (6.5)	27 (9.8)	97 (7.6)	17 (6.5)
Noon	36 (13.0)	342 (27.0)	37 (14.2)	36 (13.0)	342 (27.0)	37 (14.2)
Evening	172 (62.3)	519 (41.0)	159 (61.2)	172 (62.3)	519 (41.0)	159 (61.2)
Before bedtime	41 (14.9)	309 (24.4)	47 (18.1)	41 (14.9)	309 (24.4)	47 (18.1)
Years of smoking?						
<7 years	276 (100)	1188 (93.8)	163 (62.7)	276 (100)	1188 (93.8)	163 (62.7)
>7 years	-	79 (6.2)	97 (37.3)	-	79 (6.2)	97 (37.3)
Questions evaluating knowledge of respondents						
Smoking causes addiction?						
Agree	78 (28.3)	762 (77.9)	861 (67.9)	794 (73.5)	158 (60.8)	419 (78.7)
Disagree	198 (71.7)	216 (22.1)	406 (32.1)	287 (26.5)	102 (39.2)	113 (21.3)

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Table 2: Contd...

Questions	PUC		Graduates		Postgraduates	
	N=1254 (28.5)		*N*=2348 (53.4)		*N*=792 (18.0)	
	S	NS	S	NS	S	NS
	N=276 (22.01)	*N*=978 (77.99%)	*N*=1267 (53.97%)	*N*=1081 (46.03%)	*N*=260 (32.83%)	*N*=532 (67.17%)
Smoking initiates hypersensitivity/allergic reactions like cough etc.						
Agree	168 (60.9)	893 (91.3)	405 (32.0)	872 (80.7)	158 (60.8)	532 (100)
Disagree	108 (39.1)	85 (08.7)	862 (68.0)	209 (19.3)	102 (39.2)	-
Smoking poses increase risk to stroke						
Aware	38 (13.8)	673 (68.8)	139 (11.0)	727 (67.3)	96 (36.9)	374 (70.3)
Unaware	238 (86.2)	305 (31.2)	1128 (89.0)	354 (32.7)	164 (63.1)	158 (29.7)
Passive smoking is injurious						
Aware	104 (37.7)	631 (64.5)	589 (46.5)	761 (70.4)	109 (41.9)	408 (76.7)
Unaware	172 (62.3)	347 (35.5)	678 (53.5)	320 (29.6)	151 (58.1)	124 (23.3)

Data in parenthesis indicates percentage. PUC: Pre university course, S: Smoker, NS: Nonsmoker

in Table 2. A majority of smokers 1310 (72.6%) and nonsmokers 2373 (91.6%) stated that people adopt to smoking as a fashionable trend in contrast to a meager 532 (12.1%) respondents that thought people resorted to smoking as a stress suppressant. Almost less than half the respondents 1976 (44.9%) felt smoking cigarettes in a group increased interaction among their peers. Majority of the respondents 1462 (81.1%) confessed to initiation of smoking during their teenage years. An alarming group of respondents 1204 (66.8%) admitted to smoking up to 5 cigarettes in a day yet majority of the smokers 1097 (60.8%) and nonsmokers 1975 (76.2%) were aware of the fact nicotine in cigarettes causes addiction, only one-third of the respondents 1366 (31.1%) were unaware of its adverse systemic effects.

Responses of the study groups suggesting measures to quit smoking are presented in Table 3. Majority of respondents 2582 (64.9%) recommended prohibition of smoking at public places. Among surveyed population, 2903 (66.1%) advised cigarettes should be made expensive to prevent youngsters from buying them which would subsequently decrease the rate of smoking among them. Most respondents 3832 (87.2%) sought counseling by a physician or a pharmacist as a valuable resource to help youngsters curb their smoking habits. Furthermore, the use of e-cigarettes has been suggested as an alternative measure to avoid tobacco smoking by a majority of interviewers 3386 (77.1%).

Discussion

The reported prevalence of smoking in Andhra Pradesh in the year 2003 was estimated to be 35.4%. National statistics revealed 47% men and 14% of women aged 15 years or above either smoked or chewed tobacco [3]. Our study focused on determining the rate of smoking among a cohort of youngsters studying at various institutes. The results of our survey demonstrated 41.03% of the participating youngsters admitting to smoking cigarettes. These numbers reflect a poor indicator of state health and a progressive increase from the national statistics as reported in the year 2003 [3].

Attitude of smokers and nonsmokers

The study revealed attraction of the younger generation of the nation to smoking tobacco. The remarks that smoking is a fashionable act are disturbing and measures to discourage this should be undertaken. Efforts should be made to dissipate the belief that smoking is a part of life. Most smokers believed smoking increases their friend circle, which is another disappointing trend and needs to be discouraged. Majority of youngsters reported to not act while they come across an individual who is smoking. The attitude of not taking any adequate measures including but not limited to, counseling, educating and making the smoker understand and perceive about the deleterious effects of tobacco is concerning and could lead to disasters in health outcomes with an increase in the morbidity and overall mortality rates.

Behavioral perception of the smokers

Our study findings reveal the teenage sub group to be the most critical period where larger part of the youngsters adopted smoking. This reflects monitoring and counseling of the students at this stage of life regarding the harmful effects of smoking tobacco on the overall health of an individual may contribute to a decrease in smoking pattern and prevalence rates. The study population declared peer influence as a major contributory factor for smoking, thus implying that smoke adoption/initiation is similar to a chain like reaction. Optimistically, it can be hypothetically said that if at least one smoker in the peer circle is made to quit smoking tobacco,

Table 3: Responses for suggested measures to quit smoking by the study population

Questions	PUC		Graduates		Postgraduates	
	N=1254 (28.5)		*N*=2348 (53.4)		*N*=792 (18.0)	
	S	NS	S	NS	S	NS
	N=276 (22.01%)	*N*=978 (77.99%)	*N*=1267 (53.97%)	*N*=1081 (46.03%)	*N*=260 (32.83%)	*N*=532 (67.17%)
Statutory warning on cigarette packets should be made conspicuous						
Agree	132 (47.8)	919 (94.0)	257 (20.3)	396 (36.6)	23 (8.8)	154 (28.9)
Disagree	144 (52.2)	59 (6.0)	1010 (79.7)	685 (63.4)	237 (91.2)	378 (71.1)
Smoking in public places to be prohibited						
Agree	46 (16.6)	978 (100)	129 (10.2)	914 (84.6)	36 (13.8)	479 (90.1)
Disagree	230 (83.4)	-	1138 (89.8)	167 (15.4)	224 (86.2)	53 (09.9)
Cigarettes packets should be made more expensive to prevent youngsters from buying						
Agree	38 (13.8)	978 (100)	468 (36.9)	832 (76.9)	74 (28.5)	513 (96.4)
Disagree	238 (86.2)	-	799 (63.1)	249 (23.1)	186 (71.5)	19 (3.6)
Parents and teachers can play a role to help youngsters quit smoking						
Agree	17 (6.2)	762 (77.9)	16 (01.3)	461 (42.6)	31 (11.9)	164 (30.8)
Disagree	259 (93.8)	216 (22.1)	1251 (98.7)	620 (57.4)	229 (88.1)	368 (69.2)
Social celebrities play a role in increasing and decreasing smoking						
Agree	219 (79.3)	714 (73.1)	789 (62.3)	826 (76.4)	146 (56.2)	367 (69.0)
Disagree	57 (20.7)	264 (26.9)	478 (37.7)	255 (23.6)	114 (43.8)	165 (31.0)
Counseling by physicians/clinical pharmacists can help youngsters to quit smoking						
Agree	227 (82.2)	941 (96.2)	974 (76.9)	1012 (93.6)	197 (75.8)	481 (90.4)
Disagree	49 (17.8)	37 (3.8)	293 (23.1)	69 (6.4)	63 (24.2)	51 (9.6)
e-cigars useful in helping to quit smoking						
Agree	219 (79.3)	906 (92.6)	784 (61.9)	931 (86.1)	109 (41.9)	437 (82.1)
Disagree	57 (20.7)	72 (7.4)	483 (38.1)	150 (13.9)	151 (58.1)	95 (17.9)

Data in parenthesis indicates percentage. PUC: Preuniversity course, S: Smoker, NS: Nonsmoker

there exists a promising possibility that others in the group might eventually quit too.

Knowledge on the effects of smoking

Most student respondents were aware of injurious effects posed by smoking cigarettes; however, preferred to continue to smoke. The patterns of responses regarding the knowledge of the hazardous effects of smoking varied between the students of PUC, graduates and the postgraduates. Though scientifically proven that nicotine in cigarettes causes addiction [6], distressingly, 71.7% of the PUC respondents were not aware of this fact whereas an opposite trend was observed among the graduates and the postgraduates. While Jindal et. al. showed significant respiratory and cardiovascular morbidity associated with smoking [7], other clinical studies showed association of psychiatric and neurologic disorders are associated with smoking [8,9]; however in our study, the responses disclosed the lack of awareness of the youngsters toward this. A study conducted by Dworetzky et. al. on young adult women found current smokers to be 2-3 times more likely to suffer a seizure than nonsmokers and has proved smoking as an independent established risk factor to cause seizures [10]. Perhaps passive smoking also has been implicated in decrease quality of life and health related complications [11,12]. As per WHO report 2011, in India, more than one-quarter of all adults working indoors are exposed to secondhand smoke [13]. Frequent exposure to tobacco smoke, has been found to nearly double the risk of having a heart attack. Each year, exposure to secondhand smoke kills 600,000 people, with more than 80% owing to cardiovascular diseases alone, as reported by Oberg et. al. [14]. Due to incomplete and insufficient information, students should receive exclusive counseling regarding smoking and its harmful effects, ultimately helping them to overcome misbelieves and attractions towards smoking. A survey conducted in 1991 on college students has shown most to be unaware of the hazardous effects of smoking [15].

Suggested measures to avoid/quit smoking

Most study respondents reported that statutory warning imprinted on the packet of cigarette was not a deterrent to help them quit smoking. The study population acceded that prohibition of smoking will help reduce the incidence and prevalence of smoking and requested to formulate stringent provisions against smoking in public places. While the critical suggestion to make cigarettes expensive was not welcomed by the smokers, the nonsmoking respondents sought this as a definitive measure that may help people quit smoking in concordance with few studies that confirmed a hike in price of 10% or more per cigar would decrease consumption by up to 8% [1,2]. Moreover, majority respondents agreed the influential role of social celebrities and advertisements on the impact of smoking practice among youngsters. While most of the respondents felt no parental and/or faculty role could help in quit smoking, physician's intervention/advice was accepted as a useful tool to be considered to quit smoking owing to respect for people from the medical fraternity. Likewise, a survey among educated individuals indicated that clinical pharmacists are equally respected as much as physicians [16] and hence can also play a role in helping youngsters in educating about the effects of smoking. Diversified opinions were observed on the use of e-cigarettes as an alternative for smoking. While nonsmokers encouraged the use of e-cigarettes as they perceived it could help them escape from the deadly effects of active as well as passive smoking, a cohort of smokers rejected using them due to various reasons including high cost of e-cigarettes, in ability to charge the batteries when at home owing to parental fear, while some respondents were apprehensive as they thought e-cigarettes were more harmful and its potential to help people quit smoking has not been scientifically demonstrated [17].

Limitations

Even though we employed a large population for our survey-based study, the sample size to represent the entire southern part of India to generalize with the results generated cannot be done with certainty. Moreover, one to one interaction with the respondents was not feasible owing to the large investment in time. To avoid complexity in results, occasional smokers were taken under the category of smokers, which could serve as a potential bias in the results obtained. Assessment of quitting rates or quit attempts were also not taken into account.

Conclusion

A high percentage of youngsters admitting to smoking cigarettes as demonstrated from our survey highlights a poor indicator of national health status. Perhaps, it also reflects a failure of state government policies aimed to prevent tobacco use. Results from our survey serve as an efficient tool to identify the burden of tobacco consumption among young individuals. The need to formulate stringent policies to guide youngsters to understand the deleterious effects of tobacco, including but not limited to, advertisements, banners, setting up of de-addiction and counseling centers, national wide campaign and broadcasting, should be conducted. Further, research aimed at estimating the medical and economic burden of tobacco consumption and smoking is warranted to assess its grave impact on health care.

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Author's Contributions

All the authors contributed the idea of research and study design. SG and RG were responsible for were responsible for data acquisition, data analysis, interpretation of results and manuscript preparation. The later authors ANN and UVM were responsible for critical appraisal and final approval of the manuscript.

Competing Interest

Nil

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