

Effectiveness of Tobacco Control Measures in Reducing Tobacco Use among Adolescents and Young Adults in Anuradhapura, Sri Lanka

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Abstract

Background: Sri Lanka became a signatory to the WHO Framework Convention on Tobacco Control in September 2003 and ratified in November 2003. Aiming to reduce tobacco burden in Sri Lanka, National Authority on Tobacco and Alcohol Act [NATA] No. 27 was authorized in 2006. The objective of this study was to assess the behavioral changes related to tobacco use among adolescents and young adults following the exposure to tobacco control measures implemented by NATA.

Methods: A cross-sectional survey was conducted from October 2011 to November 2011 among adolescent (13-19 years) and young adult (20-39 years) males in Anuradhapura divisional secretary area in Sri Lanka. A self-administered questionnaire and focus group discussions were used for data collection. Confounding factors were controlled by stratification and randomization.

Results: A total of 456 male respondents including 168 (37%) adolescents and 288 (63%) young adults participated in the study. Among the ever smokers 66 (14 %) had already quit smoking while 151 (33%) were current smokers. The majority of the respondents (95.4% of quitters and 88.0% of current smokers) were acquainted with the dangers of smoking through the mass media. Among the current smokers and quitters, the knowledge on health risks of smoking and exposure to secondhand smoke was quite satisfactory. The current smokers as well as the quitters were well aware of the tobacco control measures. Smokers as well as the non-smokers and quitters supported these measures.

Conclusion: Tobacco control measures implemented by NATA had a favorable influence on reducing tobacco burden among adolescents and young adults in Sri Lanka.

Keywords: Tobacco control; Adolescent; Young adults; NATA; Sri Lanka

INTRODUCTION

Over 20,000 people die due to tobacco-related diseases annually in Sri Lanka (1). Tobacco is the second biggest cause of all deaths and disabilities from non-communicable diseases (NCDs) in Sri Lanka as NATA revealed in 2009 (1).

The prevalence of smoking among males is 29.9% and among females is 0.4% in Sri Lanka (2). The prevalence of smoking any tobacco product among male adults over 15 years was 32.4% and among females was 2.1% in Sri Lanka, in 2006 (3). Recent study by Katulanda et al. revealed that the prevalence of smoking among males was 38% and among females was 0.1% (4). The highest prevalence of tobacco smoking (44.6%) was found in 20-29 age group, while the adolescents less than 20 years had the lowest prevalence (15.6%). Moreover, they found that smoking was commonly associated with lower income and lower education (4). Among adolescents aged 13 to 15 years in Sri Lanka, the prevalence of current tobacco use is 15.7% among males and 5.4% among females (5,6).

In Sri Lanka, 65.9% of youth (13-15 years old) are

exposed to secondhand smoke in public places (1). A significant high particulate level due to secondhand smoking in indoor public places was detected in Sri Lanka by Lee et al. (7). Meanwhile, in 2011, it was reported that 35.4% of youth were exposed to secondhand smoke in home (8).

Tobacco cessation interventions

District Tobacco Control Cells (DTCC) program plays a key role in facilitating smoking cessation in Sri Lanka. Community awareness, counselling for behavioural changes and brief advice given by health professionals are the main interventions. Pharmacotherapy and nicotine replacement (gums, patches) are minimally used. How efficacious these interventions in Sri Lanka is a concern due to lack of research evidence.

Tobacco control initiatives in Sri Lanka

Sri Lanka has become a signatory to the World Health Organization Framework Convention on Tobacco Control (WHO FCTC) in September 23rd, 2003 and ratified in November 11th, 2003. Aiming to reduce tobacco induced disease burden in Sri Lanka, National Authority on Tobacco and Alcohol Act [NATA] No. 27 of 2006 was implemented (1).

The tobacco control program in Sri Lanka was implemented

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Received: 3 October 2012; Accepted: 20 November 2012

in line with six policies (MPOWER) recommended in the WHO FCTC (9). MPOWER includes the following activities: (1) Monitor tobacco use and formulate prevention policies, (2) Protect people from tobacco smoke, (3) Offer help to quit tobacco use, (4) Warn about the dangers of tobacco, (5) Enforce bans on tobacco advertising and promotion and (6) Raise taxes on tobacco products.

This study aims to assess the effectiveness of tobacco control measures in reducing tobacco use and tobacco induced disease burden among adolescents and young adults in Sri Lanka.

METHODS

Study Design

This is a cross-sectional survey among male adolescents and young adults aged 13 to 39 years in North Central province of Sri Lanka from October 2011 to November 2011. The study comprised adolescents and young adults, living in Anuradhapura divisional secretary area. Respondents from the urban area were from Anuradhapura municipal area. Respondents from other Grama Sewaka (GS) areas were considered as from rural areas. The study sample was categorized into two groups. Adolescent group was defined as school children of 13 to 19 years of age. Young adults group was defined as technical college students and vocational trainees of 20 to 29 years and employed or unemployed men of 20 to 39 years of age. Sample selection was based on simple random sampling method. Male adolescent students of ages 13 to 19 years were randomly selected from three urban and three rural schools of Anuradhapura divisional secretary area. Young male adults of ages 20 to 29 were randomly selected from the admission registry of the Technical College and from the Vocational Training Centre in Anuradhapura. Employed or unemployed young male adults of ages 20 to 39 years were randomly selected based on district statistics published by the Department of Census and Statistics (10).

With a margin of error of 5% the required minimum sample was estimated as 384 subjects. A sample of 456 respondents was drawn to prevent losses due to non-responses and refusal.

Definitions of the main variables

Ever smoker: subjects who had tried smoking tobacco at least once in their lifetime.

Current smoker: subjects who had smoked any tobacco product either regularly or occasionally in the preceding month of the survey.

Quitters: subjects who had successfully quit tobacco smoking for at least 6 months prior to data collection.

Exclusion criteria

Male adolescents and young adults who were temporarily residing in Anuradhapura district and female subjects (due to low prevalence of smoking among females) were excluded from the study.

Data Collection

A structured pretested self-administered questionnaire was used for data collection. The questionnaire consisted of four parts: (a) socio-demographic data, (b) smoking history, (c) smoking behavior and (d) knowledge, attitudes, beliefs and practices on smoking. Attitudes towards smoking were measured by using a four point Likert scale ranging from

strongly agrees to strongly disagree (11). The questionnaire was in the local language. Data collected by trained enumerators under the supervision of the Principal investigator. The level of addiction to nicotine was measured by using Fagerstrom tolerance questionnaire (12).

Qualitative data was collected through focus group discussions (FGD). The discussion guide to FGDs covered the (a) smoking behavior and history, (b) smoking environment, (c) factors with influence on quitting smoking, (d) awareness of health risks of active and secondhand smoking and (e) awareness and their support for the existing tobacco control measures. 14 FGDs were conducted with each focus group consisted of four to six respondents.

Outcome indicators will be the prevalence of smoking, proportion of smoking cessation and quit attempts, the view on tobacco control policies of the respondents and the influence of tobacco control measures on smoking behavior and quitting among current smokers and quitters.

Data analysis

Data analyzed using Statistical Package of Social Sciences (SPSS Inc., Chicago, IL, USA). Cross sectional comparisons of each category and between urban and rural areas was carried out. Quantitative data obtained from the survey was analyzed descriptively. The odds ratio (OR) was calculated with the 95% confidence interval (CI) for each variable. Qualitative data collected was transcribed and analyzed according to the main themes.

Ethics

Approval was obtained from the relevant institutions to conduct the study. Respondents were informed about the research objectives, methods, and responsibility of the respondents, length of the time involvement, voluntary participation and data management. They were also ensured about the confidentiality of the responses they provide. Verbal consent was obtained from the respondents. All the respondents participated voluntarily.

RESULTS

Demographic features and smoking behavior

Among ever smokers, majority (56; 26%) had started smoking between 16-17 years of age while 22% had started smoking in the ages of 14-15 years. Among the current smokers, 37 respondents (24.5%) had smoked daily during the past month (daily smokers). Most of the smokers (88%) smoke cigarettes, 6% beedi (thin Indian cigarette filled with tobacco flake and wrapped in a tendu or jhinjeri leaf) and 6% other substances. It was found that 2% of the non-smokers and 6% of the quitters were susceptible to smoke during next year (OR=0.33). Table 1 shows the demographic features and smoking behavior of respondents.

Nicotine dependence

As revealed by Fagerstrom nicotine tolerance score, low level of dependence among 70%, medium level of dependence among 18% and high level of dependence among 12% was observed among the 151 current smokers. The respondents "intention to quit" revealed that 44.7% of the current smokers plan to quit smoking during the next month, 17.4% during next six months while 11.4% do not plan to quit at all. Meanwhile, 83.6% of them had previous quit attempts (42% had more than three previous quit attempts) and 16.4% had never tried to quit smoking.

Table 1. Demographic features and smoking behavior of the respondents

Factor and level	Repondents, No.(%)	95% CI
History of smoking		
Never smoker	239 (52.4)	47.7-57.0
Quitter	66 (14.5)	11.3-18.0
Current smoker	151 (33.1)	28.8-37.6
Age		
13-15 years	89 (19.5)	15.9-23.4
16-19 years	79 (17.3)	13.9-21.1
20-29 years	230 (50.4)	45.7-55.1
30-39 years	58 (12.7)	9.8-16.1
Living in		
Urban area	180 (39.5)	34.9-44.1
Rural area	276 (60.5)	55.8-65.0
Employment		
Yes	151 (33.1)	28.8-37.6
No	305 (66.9)	62.3-71.1
Level of education		
Upto grade 8	43 (9.4)	6-12.4
Upto GCE OL ^a	229 (50.2)	45.5-54.9
Upto GCE AL ^b	184 (40.3)	35.8-45.0
Father smokes		
Yes	217 (48.0)	43.2-52.6
No	236 (52.0)	47.3-56.7
Brother smokes		
Yes	73 (17.0)	13.2-20.4
No	365 (83.0)	79.5-86.7

^a GCE OL; General Certificate of Education Ordinary Level

^b GCE AL; General Certificate of Education Advanced Level

Exposure to tobacco control measures

Exposure to advertisements or information on dangers of smoking or encouraging quitting: 63 quitters (95.4%) and 133 current smokers (88.0%) had been exposed to advertisements or information on dangers of smoking or encouraging quitting (OR=8.29) (Table 2). TV was the strongest media which motivated smokers to quit smoking. During the month preceding the survey, 40 quitters (60.6%) and 110 current smokers (72.8%) had often noticed the health warnings on the cigarette packs ($P<0.001$) while these health warnings on the cigarette packs had made them to think of health risks of smoking among 50 quitters (75.7%) and 117 current smokers (77.4%) ($P=0.02$).

Pictorial health warnings about harmful effects of smoking on the cigarette packs: The opinion of 54 quitters (81.8%) and 118 current smokers (78.1%) was that the government should implement pictorial health warnings on cigarette packs in Sri Lanka (OR = 1.06, 95% CI = 0.36-3.57).

Non-exposure to advertisements on promotion of tobacco products: More than two third of the quitters as well as the current smokers were not exposed to tobacco promotion

advertisements on TV ($P=0.82$), radio ($P=0.82$), posters ($P=0.79$), billboards ($P=0.69$) and cinema ($P=0.12$). Meanwhile, 31 quitters (46.9%) and 50 current smokers (33%) had never seen tobacco advertisements during sports events, trade fairs or other community events and all the quitters as well as majority of the current smokers (118) had not noticed competitions or prizes associated with cigarettes during last year ($P=0.13$).

Support for the banning of sponsorship of sports and cultural activities by tobacco industry: 54 quitters (81.8%) and 107 current smokers (70.8%) strongly supported the ban ($P=0.89$).

Opinion about the effectiveness of enforcing ban on tobacco advertising, promotion and sponsorship: The opinion of 49 quitters (74.2%) and 92 current smokers (60.2%) on the effectiveness of enforcing ban on tobacco advertising, promotion and sponsorship was effective ($P=0.51$).

Belief on effectiveness of banning tobacco sales to minors: It was revealed that 38 quitters (57.5%) and 56 current smokers (37%) believed banning tobacco sales to minors was effective ($P=0.51$).

Effectiveness of the government enforcement on smoking ban in public places: 41 quitters (62.1%) and 73 current smokers (48.3%) responded as effective ($P=0.73$).

The opinion on the enforcement of smoking ban in public places: The opinion of most quitters (60; 92%) as well as current smokers (132; 88%) was to increase the law enforcement ($P=0.54$), to increase public awareness on smoking ban ($P=0.22$) and to educate public about the harms of secondhand smoking ($P=0.97$). The overall opinion among 98% of the quitters and 94% of the current smokers were that smoking is bad ($P=0.14$).

Attitudes and beliefs

Positive social aspects of smoking: Comparison of quitters and current smokers showed that the current smokers were more likely to perceive that smoking is a sign of being modern ($P=0.003$), it is acceptable for young men ($P=0.04$) and women ($P=0.01$) to smoke, and smokers have more friends than non-smokers ($P=0.92$).

Negative social effects: The current smokers were more likely to perceive that smoking is not disgusting compared to the quitters ($P=0.001$) while the current smokers were less likely to perceive that Sri Lankan society disapproves smoking compared to quitters ($P=0.02$).

Positive mental aspects of smoking: Compare to quitters, the current smokers were more likely to perceive that smoking makes people relax ($P=0.02$), helps to control body weight ($P<0.001$) and it is safe to smoke one or two years ($P=0.04$).

Negative appearance of smoking: The current smokers were more likely to perceive that smoking does not make young people more mature compared to quitters ($P=0.1$).

Negative physical effects: The current smokers were more likely to perceive that a smoker does not have a harder time in sports compared to quitters ($P=0.05$).

Belief on tobacco industry: Compare to quitters, the current smokers were more likely to perceive that cigarette companies are not lying about the dangers of smoking ($P=0.53$), are not trying to encourage young people to smoke

Table 2. Frequency of exposure to tobacco control measures and behavioral changes among smokers.

Variables	Current smoker (n, 151)	Quitter (n, 66)
Exposure to advertisements or information about dangers of smoking or encouraging quitting	133 (88.0%)	63 (95.4%)
Exposure to health warnings on cigarette packs	110 (72.8%)	40 (60.6%)
Influence of health warnings over cigarette packs on encouraging quitting	117 (77.4%)	50 (75.7%)
Positive opinion about pictorial health warnings on the cigarette pack	118 (78.1%)	54 (81.8%)
Support for the banning of sponsorship of sports and cultural activities by tobacco industry	107 (70.8%)	54 (81.8%)
Opinion about the effectiveness of enforcing ban on tobacco advertising, promotion and sponsorship	92 (60.2%)	49 (74.2%)
Belief on effectiveness of banning tobacco sales to minors	56 (37.0%)	38 (57.5%)
Effectiveness of the government enforcement on smoking ban in public places	73 (48.3%)	41 (62.1%)
Awareness of the risks of lung cancer	98 (65.1%)	51 (77.3%)
Awareness of the risks of pregnancy related complications	104 (68.7%)	48 (72.7%)

($P=0.16$) and are not using pretty young women for tobacco promotions ($P=0.54$).

Knowledge and belief on health risks of smoking

The knowledge about health risks such as lung cancer, stained teeth, premature aging, stroke, impotence in males and pregnancy related complications among the quitters and current smokers were quite satisfactory. Among the current smokers, 34.9% were not aware of the risk of lung cancer following the exposure to secondhand smoke compared to 22.7% of quitters, while 27.3% of quitters as well as 31.3% of current smokers were not aware of the pregnancy related complications following smoking (Table 2).

DISCUSSION

This was a cross sectional study about the effectiveness of tobacco control measures in Sri Lanka among male adolescents and young adults. Since the authorization of NATA in 2006, positive impacts on tobacco use have been emerged in Sri Lanka. Statistics showed that tobacco use among youth males (13-15 years old) has been decreased from 3.0 in 2007 to 1.6 in 2011 (8,13). In addition, among youth; secondhand exposure to tobacco smoke in home has been decreased from 51.3% in 2007 to 35.4% in 2011 (8,13). Nevertheless, only a slight reduction of total cigarette consumption has been found during 2007 to 2011 (from 205 cigarettes per person to 195) (8,13). In this study we found that the prevalence of smoking any tobacco products among males with 13 to 39 years of age was 33% which shows a 5% reduction compared to 38% reported by Katulanda et al. in 2010 (4). Conversely, in a study on 1600 students from junior colleges in Nepal, it was found that the prevalence of current tobacco users was 10.6% (14). Moreover, they found that the majority of the respondents initiated cigarette smoking at the age of 16, similar to our findings (14).

In this study, we found that with implementation of NATA, both quitters and current smokers were quite excellently exposed to health warnings on cigarette packs and advertisements or information about dangers of smoking plus encouraging quitting. TV was the strongest media which served advertisements or information on dangers of smoking or encouraging quitting. Among the current

smokers and quitters the knowledge on health risks of smoking and exposure to secondhand smoke was quite satisfactory.

According to NATA, tobacco industries are required to include graphic pictorial health warnings including lung and oral cancer, dental and periodontal diseases and afflicted children to secondhand smoke on all tobacco packaging (covering at least 50% of the pack) to inform users about the risks and sufferings caused by tobacco. Both current smokers and quitters in our study favored this method of increasing awareness about smoking harms. Correspondingly, in a study of tobacco use in Brazil, Almeida et al. found that 65% of current smokers had considered quitting because of these warning labels (15).

In our study, only about one third of current users believed that banning tobacco sales to minors is effective which was lower than quitters (57.5%). Similarly, in Ghana, Doku et al. found that those who did not advocate banning tobacco sales to minors were more likely to have an intention to smoke (16).

It has been shown previously that knowledge about tobacco health risks is associated with smoking (14,17). In this regard, we found that current smokers had less knowledge on tobacco related health risks compare to quitters. Likewise, Chan et al. found that being a current smoker was inversely associated with a higher knowledge score (18).

In Southeast Asia region, the prevalence of tobacco consumption among youth and adults is high (19). In order to reduce tobacco use in Sri Lanka as a part of this region, comprehensive controlling measures on industries and community should be implemented. In Sri Lanka, NATA is found to be an efficacious program. Recently, a comprehensive review in India was conducted to develop a framework for protecting adolescents and children against tobacco which has been called IMPACT (20). They concluded that different approaches including tax increase on tobacco products, legislation of banning tobacco use in public and work places, effective health warnings, banning of tobacco advertising, promotions and sponsorships, restriction of tobacco access to minors, dissemination of

knowledge about the health consequences of smoking in public and schools are the key components of a successful program and they should be supported by governments (20).

LIMITATIONS

This study was related to one district in Sri Lanka. Females were not studied. Smoking in adolescents could be subjected to under reporting. The findings are only limited to adolescents of 13 to 19 years old and youths of 20 to 39 years old. Collected data are based on self-reports, which might have been biased due to underreporting or over reporting of subjects and their parents' tobacco use. Smoking status declared was not confirmed quantitatively.

CONCLUSION

Tobacco control measures implemented by NATA had a favourable influence in reducing tobacco burden among adolescents and young adults in Sri Lanka.

ACKNOWLEDGMENT

I would like to acknowledge the World Health Organization Sri Lanka Country Office WHO South East Asia Regional Office (SEARO) and WHO Regional Procurement Centre in Malaysia, Dr. Lanka Dissanayake and Dr. Sarath Samarage of WHO Sri Lanka for facilitating to conduct this study.

My special thanks deserve to Dr. Nyo Nyo the Regional Advisor TFI and Dr. Dhinendra Singha, Regional Advisor, Surveillance (Tobacco Control), WHO SEARO, Dr. Fong King, Associate Professor, National Poisons Centre, University Sains Malaysia and Dr. Fahad Hanna, Senior Lecturer and NHMRC Senior Research Fellow, School of Public Health & Preventive Medicine, Monash University, Australia for their technical support.

I sincerely thank Professor Carlo Fonseka the Chairman, National Authority on Tobacco and Alcohol (NATA) Sri Lanka for encouraging conducting the study and briefing about NATA activities.

Finally my thanks deserve to Mr. S.S. Puwanesh, IT specialist, Institute for Health Policy, Sri Lanka for preparing the software for data entry and the study support staff for assisting me to implement the study, data entry and data analysis and preparation of the final report.

Conflict of Interest: None to be declared.

Funding and support: WHO South East Asian Regional Office has supported this study (PO: 200469313 SEA-2011-S14-APW-0028)

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