RESEARCH ARTICLE

Intention to Quit Tobacco due to Media Advertisements in India: Findings from Global Adult Tobacco Survey 2016-17

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Abstract

Background: Tobacco has been among the most important causes of morbidity and mortality worldwide. In reducing tobacco consumption, media campaigns are crucial in raising awareness and encouraging individuals to quit. The present study aimed to profile participants of GATS-2, including tobacco usage patterns and media exposure, and explore the factors associated with quitting in the presence of media exposure. **Methods:** Secondary data analysis of Global Adult Tobacco Survey-India (2016-17) data was done among current daily cigarette smokers and smokeless tobacco users. The primary independent variable was an intention to quit, while media exposure was the primary independent variable. Respondents were profiled as per various socio-demographic variables, and exposure to media advertisements and intention to quit were assessed using weighted bivariate analysis and multivariate log regression analysis. **Results:** Males, and respondents aged 15 to 45, had more exposure to media and advertisements than female respondents. Cigarette smokers with moderate consumption, better awareness, those who had made any quit attempts in the last 12 months, and moderate to high media exposure depicted better intention to quit. In SLT users, intention to quit depicted significant odds per education level quit attempts and exposure to media and advertisements. **Conclusion:** We report a high intention to quit among those exposed to advertisements. Media campaigns play an important role in promoting tobacco control. There is a need to assess the impact of such advertisements on behavioral aspects. At the same time, comprehensive tobacco control policies should go hand in hand in reducing smoking rates.

Keywords: Tobacco- media- advertisements- disparities- intention to quit

Introduction

Tobacco has been among the most important causes of morbidity and mortality arising from its use among different age groups and genders worldwide [1]. Various smoked and smokeless tobacco products have been described in different cultures and practices for many years. The global age-standardized prevalence of current smoking tobacco use in 2019 among males and females >15 years was around 32.7% and 6·62%, respectively. This high prevalence is attributed to an estimated 7·69 million deaths and 200 million DALYs, around 13·6% of all deaths and 7·89% of all DALYs [2]. There is a similarly high prevalence of smokeless tobacco for males (6.55%) and females (2.87%) globally, with a proportionate impact on DALY and premature mortality [3]. Apart from this data, there is enough scientific evidence to support the theory that a substantial proportion of deaths and disabilities are attributable to tobacco consumption in any form [4–6]. Tobacco doesn't spare users based on region, religion,

caste, and economic status. Many studies in the recent past have indicated that the burden of tobacco diseases is more among underprivileged ones, and control is quite challenging [7].

In reducing tobacco consumption, media campaigns are crucial in raising awareness about the health risks associated with tobacco use, promoting tobacco control, and encouraging individuals to quit. Numerous studies have demonstrated the positive impact of media advertisements on individuals' intention to quit tobacco. A systematic review by Durkin et al. found that exposure to anti-tobacco media campaigns was associated with increased quitting intentions and attempts [8]. To be adequately effective, the content of media advertisements plays a crucial role in influencing individuals' intentions. Studies have shown that advertisements focusing on the health consequences of tobacco use, testimonies from former smokers, and graphic depictions of smoking-related diseases are particularly effective in evoking emotional responses and promoting quitting intentions [8]. Messages highlighting

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the immediate and long-term benefits of quitting also increase intentions. Different media channels have varying degrees of effectiveness in promoting tobacco cessation [9]. Television remains the most commonly used channel for anti-tobacco advertisements, reaching a broad audience and generating significant impact. Print media, radio, and online platforms also contribute to individuals' intention to quit, although to a lesser extent. Combining multiple media channels in comprehensive campaigns has successfully promoted tobacco cessation [9].

The current background suggests a substantial body of evidence supporting the effectiveness of media advertisements in promoting individuals' intention to quit tobacco. However, the effectiveness may vary in message content, leverage to various media channels, and varied socioeconomic and cultural factors prevalent in societies. This calls for a need to study the role of media in different settings with varied socio-cultural backgrounds like India. But considering the widespread prevalence of tobacco usage, the impact of advertisements on the intention to quit tobacco cannot be assessed locally over a small population. The Global Adult Tobacco Survey (GATS) fills this gap by collecting extensive information regarding media coverage and tobacco usage. Thus, the present study aimed to profile participants of GATS-2, including tobacco usage patterns and media exposure, and explore the factors associated with quitting in the presence of media exposure by the participants.

Materials and Methods

Data Source

The data here is secondary data from the most recent round of the Global Adult Tobacco Survey (GATS)-India (Round 2), conducted in 2016-2017 [10]. GATS-India round 2 was a nationally representative survey covering the nationwide population in 30 states and 02 union territories from August 2016 to February 2017. The primary data collecting agency was the Tata Institute of Social Sciences, with able support from international partners. It was a standardized cross-sectional population-based survey with robust questionnaire development, sampling, data collection, and analysis methodology. The survey included a variety of information from the participants ranging from their primary demographic data, including wealth index, to tobacco-related questions which explored variables like frequency of use of tobacco products and their types, source of tobacco products, beliefs related to tobacco, exposure to advertisements to quit tobacco and the intentions participants have regarding quitting tobacco.

Study population

The survey included adult participants >15 years. They were selected using multistage, geographically clustered sampling. The household was a final unit of sampling, from which representative individuals were assigned.

Sample size

The total sample included in the GATS analysis was 74,037. Of these, 9,949 and 15,235 participants were smokers (code: B01) and smokeless tobacco users (C01) [11]. From this subset, we segregated 2,949 and 12,721 participants who were current daily cigarette and smokeless tobacco users and were included in the present study's analysis.

Study variables

All operational definitions used to define variables included in the study and analysis were utilized from GATS [12,13]. Participants who reported smoking cigarettes daily or less than daily but did not use SLT were defined as current cigarette smokers. Similarly, participants who reported using SLT daily or less than daily but who did not smoke were defined as current SLT users. Tobacco users were classified into one of three categories: Current smoker only, current SLT user only, or Never tobacco users (those who had never used either smoked or SLT) [14].

The primary dependent variable was the intention to quit. It was derived from questions D08 (Which of the following best describes your thinking about quitting smoking?) and D16 (Which of the following best describes your thinking about quitting smokeless tobacco?) [11]. Responses such as 'Quit within the next month' and 'Thinking within the next 12 months' were considered 'yes' to quit intentions, while other responses were merged to have a 'no' response. Media exposure was our primary independent variable. For each type of smoked and smokeless tobacco product, respondents were asked whether they had noticed any advertising and promotions in the last 30 days (In the last 30 days, have you noticed information about the dangers of smoking/smokeless tobacco or that encourages quitting in any of the following places? newspapers or in magazines; television; radio; billboards/hoardings; cinemas; internet; public transportation vehicles or stations; public walls; Somewhere else). An answer of "yes" was coded as 1, and "no" was coded as 0. A response of "yes" to any of the advertising or promotions questions was considered to be exposed to such activity, and a tobacco marketing index was created based on the number of categories with exposure (none = 0, low = 1–2, moderate = 3–5, and high = 6–18) [14].

Other covariates were included based on a literature review. We categorized them as gender(male/female), age groups (15-29/30-44/45-59/> 60 years), residence(urban/rural), education(no formal schooling/up to primary education/up to secondary education/higher secondary and above), the average number of times cigarettes smoked; SLT/day(less than 5/5–9/10–14/15–20 times/day), believes that tobacco causes serious illness(no/yes), and 'smoking quit attempt in the past 12 months' (no/yes).

Data analysis: The survey's dataset was imported to STATA 12.0 for further analysis. Various proportions and prevalence of tobacco use among participants were calculated, and their weighted percentages were presented. Cross-tabulation for the association of exposure to advertisements with demographic variables of the surveyed population was presented. Logistic regression models were run to estimate various adjusted odds ratios (aOR) and explore the association of intention

to quit with multiple demographic variables, including exposure to advertisements and its 95% confidence interval. Different commands and variables like *svyset, gatsweight, gatscluster,* and *gatstrata* were used for clustering adjustments and application of weights to the data using STATA.

Results

Around 74037 respondents were included in the second round of the Global Adult Tobacco Survey-India (2016-17). There was a higher representation of current cigarette smokers from the urban areas than the national distribution of the urban-rural proportions (30:70). On the contrary, SLT had a higher expression in the rural areas. A larger proportion of females were current daily SLT users compared to daily cigarette smoking. Further, the daily cigarette smokers were more from the 45-59 age group, and the ≥60 age group had the most miniature representation. Similarly, a higher proportion of daily cigarette smokers had some years of formal education compared to those with no formal schooling in SLT users (Table 1). We further segregated the current daily cigarette smokers and SLT users as per their exposure to media and advertisements (Table 2). Overall, a higher proportion of cigarette smokers depicted exposure than SLT users. Exposure was higher among males for both types of tobacco products. Older people and participants from rural areas were least exposed to the media and advertisements.

Table 3 depicts the proportion of participants who had intentions to quit tobacco as per socio-demographic and tobacco usage characteristics and the effect of media and advertisements on the odds of development of quit intentions among the current daily cigarette smokers and STL users. In the current daily cigarette smokers, the intention to quit was higher in males but depicted lesser odds on regression analysis. Further, the proportion was lowest in the youngest and oldest age groups. Still, the intentions increased with age up to 59 years, with corresponding better odds than the younger age

Table 1. Socio-Demographic Characteristics of the Current Cigarette Smokers and SLT Users who Participated in the Second Round of the Global Adult Tobacco Survey-India.

Characteristics	Current daily cigarette smokers Weighted % (95% CI)	Current daily SLT users Weighted % (95% CI)
Total	N=2949	N=12721
Residence		
Rural	59.2 (55.9-62.4)	75.8 (73.7-77.9)
Urban	40.8 (37.6-44.1)	24.2 (22.1-26.3)
Gender		
Male	90.6 (87.7-92.0)	70.3 (68.9-71.7)
Female	9.4 (7.1-12.3)	29.7 (28.3-31.1)
Age-Group		
15-29 Years	21.4 (22.9-29.0)	22.1 (20.7-23.5)
30-44 Years	22.5 (19.8-25.2)	34.4 (33.1-25.6)
45 -59 years	32.2 (29.0-35.7)	24.5 (23.4-25.7)
>60 years	19.5 (16.6-22.6)	19.1 (17.9-20.3)
Education		
No formal schooling	25.8 (22.9-29.0)	37.5 (36.1-39.0)
Less than primary	22.5 (19.8-25.3)	27.2 (26.0-28.4)
Primary, less than secondary	32.2 (29.0-35.7)	26.5 (25.2-27.8)
Secondary and above	19.5 (16.6-22.6)	8.7 (7.7-9.8)

group. Intentions were better in urban areas and among educated participants but did not depict better odds on regression analysis. Cigarette smokers with moderate consumption, better awareness, those who had made any quit attempts in the last 12 months, and moderate to high media exposure depicted better intention to quit. But the odds were significant only with smoking quit attempts and media exposure. In another group with daily SLT consumption, intention to quit was higher in males, middle-aged participants, and urban areas, with more years of schooling, less frequency of SLT consumption,

Table 2. Exposure to Advertisements by the Current Smokers of Two Rounds of the Global Adult Tobacco Survey, India

Demographic characteristics	Exposure to advertisements									
	Current daily Cigarette smoker (n=2949)					Current daily SLT users (n=12721)				
	None	Low	Moderate	High	p-value	None	Low	Moderate	High	p-value
Overall	2182 (71.2)	425 (12.9)	192	150 (7.1)		10144 (77.1)	1484 (11.8)	709 (7.1)	384 (4.0)	
Gender					<0.001					<0.001
Male	70	13.2	9.3	7.4		73.8	12	9	5.3	
Female	82.8	9.5	4.1	3.6		84.8	11.5	2.7	1.1	
Age groups (in years)					<0.001					<0.001
15-29	65.9	11	15.7	7.4		72.3	13.4	9.7	4.7	
30-44	67.5	15.4	9.5	7.6		75.1	13	7.3	4.7	
45-59	75.2	11.4	5.5	7.9		78.9	11.2	6.4	3.5	
> 60	80.4	12.3	3.5	3.8		83.9	8.8	4.7	2.7	
Residence					<0.001					<0.001
Urban	69.6	16.6	7.9	5.8		71.6	12.6	8.3	7.5	
Rural	72.4	10.3	9.5	7.9		78.8	11.6	6.7	2.9	

Table 3. Multivariable Logistic Regression to Explore the Factors Associated with Intention to Quit Smoking because of Exposure to Advertisements among Current Smokers Aged >15 Years, GATS India, 2016-17.

Variable	Percentage of current daily smoker with quit intentions			Percentage of current SLT Users with quit intentions		
	Unweighted Counts	Weighted % (95% CI)	Adjusted OR (95% CI)	Unweighted Counts	Weighted % (95% CI)	Adjusted OR (95% CI)
Gender						
Male	2620	18.4 (15.8-21.2)	0.6 (0.1-3.2)	7989	19.4 (17.8-21.2)	1
Female	329	14.7 (8.0-25.5)	1	4732	15.2 (13.3-17.3)	1.1 (0.9-1.3)
Age groups						
15-29	564	12.8 (8.6-18.6)	1	2375	19.9 (17.1-23.1)	1
30-44	1247	20.1 (16.4-24.3)	1.9 (1.12-3.2)	5088	20.7 (18.8-22.8)	1.1 (0.9-1.4)
45-59	742	20.3 (15.6-26.1)	2.0 (1.1-3.6)	3195	16.9 (15.0-19.1)	1.0 (0.8-1.3)
> 60	396	16.3 (11.1-23.4)	1.1 (0.5-2.5)	2063	13.2 (10.8-16.0)	0.8 (0.6-1.2)
Residence						
Urban	1071	18.8 (15.1-23.2)	1	2916	20.0 (16.9-23.4)	1
Rural	1878	17.5 (14.4-21.0)	1.3 (0.9-2.0)	9805	17.6 (16.2-23.4)	1.0 (0.8-1.3)
Education						
No formal schooling	558	13.1 (9.2-18.2)	0.6 (0.3-1.3)	4398	13.2 (11.8-14.7)	1
Up to Primary education	827	20.6 (16.0-26.1)	1.2 (0.6-2.1)	3828	18.9 (16.8-21.2)	1.3 (1.1-1.7)
Up to secondary education	1006	17.3 (12.6-23.2)	1.4 (0.8-2.4)	3316	21.5 (19.0-24.2)	1.4 (1.1-1.8)
Higher secondary and above	558	18.0 (15.6-20.7)	1	1172	27.7 (23.0-33.0)	1.9 (1.3-2.6)
Average number of cigarettes smoked; SLT/day						
Less than 5 times/day	1910	16.2 (13.4-19.5)	1	6261	20.1 (18.4-21.9)	1
5–9 times/day	593	20.1 (15.2-26.2)	1.0 (0.6-1.6)	4625	16.2 (14.4-18.2)	1.2 (0.3-4.3)
10–14 times/day	126	29.5 (16.2-47.7)	1.0(0.4-2.8)	1223	16.7 (12.3-22.2)	1.0 (0.2-3.7)
15–20 times/day	320	20.1 (13.5-38.7)	1.5 (0.8-2.7)	590	14.8 (9.8-21.7)	1.1 (0.3-4.3)
Believes that Tobacco Causes Serious Illness						
No	201	15.7 (9.2-25.5)	1	771	16.7 (12.4-22.1)	1
Yes	2705	18.3 (15.7-21.2)	0.9 (0.4-2.0)	11950	18.3 (17.0-19.7)	0.8 (0.6-1.2)
Quit Attempt in the Past 12 Months						
No	2052	12.8 (10.4-15.7)	1	9155	12.2 (10.9-13.7)	1
Yes	896	28.8 (24.0-34.1)	3.1 (2.1-4.5)	3566	31.7 (29.1-34.3)	3.4 (2.5-3.6)
Exposure to advertisement						
None (0)	2182	16.9 (14.2-20.0)		10144	16.2 (14.8-17.7)	1
Low (1-2)	425	15.3 (10.5-21.8)	0.8 (0.5-1.4)	1484	21.3 (18.0-25.1)	1.3 (1.1-1.5)
Moderate (3-5)	192	24.5 (16.7-34.5)	1.9 (1.1-3.4)	709	28.8 (23.1-35.3)	1.7 (1.2-2.3)
High (6-18)	150	26.0 (15.8-39.7)	1.4 (1.1-2.9)	384	28.4 (21.2-36.9)	1.3 (0.8-2.1)

better awareness, positive quit attempts, and higher media exposure. However, regression analysis only depicted significant odds of education, quit attempts, and exposure to media and advertisements.

Discussion

The World Health Organization (WHO) also recognizes the importance of media campaigns in promoting tobacco control [15]. Mass media campaigns, news media, pictorial health warnings, advertising bans, and social media are all effective tools in promoting tobacco control. But media and advertisements are double-edged swords. While exposure to media can also help increase awareness regarding undesirable components and is a health advocacy tool, it may also create brand awareness, increase product appeal, and lure users across all age groups. Using a national survey dataset in India, the present study assesses an association between exposure to media and advertisements and intention to quit among tobacco users. We report certain interesting findings from our analysis. First, more than eight out of every ten current cigarette and smokeless tobacco users had no exposure to media and advertisements related to the dangers of smoking/smokeless tobacco in the last 30 days that led them to think about quitting tobacco, with significant differences across age groups and urban-rural residences. Second, the intention to quit was higher among males but depicted lesser regression odds. Third, the intention to quit was significantly affected by exposure to media and quit attempts in the last 12 months for both cigarettes and SLT users. Lastly, education affected the intention to quit only for SLT, while age affected odds only for cigarette use.

Little exposure to media highlighting the dangers of tobacco that promote quitting tobacco is a cause of concern. In all 22 GATS countries, except Nigeria and

Qatar, television is the media venue where the highest percentages of adults notice anti-cigarette messages in the previous 30 days. Vietnam, Turkey, and Malaysia have the highest percentages for television. Malaysia also has the highest for newspapers/magazines, billboards, and radio. India, too, has the highest exposure to television (36%), followed by newspapers/magazines (25%). Still, the prevalence is mediocre compared to other GATS countries, where prevalence was recorded as high as 86% and 69% [16]. Low exposure can be attributed to many factors of which tobacco industry interference plays a crucial role [17]. The tobacco industry constantly escalates its efforts to restrain mass-media campaigns through litigation strategies. While litigation is a fundamental tool of the tobacco industry, it obligates a financial burden and deflates the campaigns' outcomes. Policymakers should be responsible for anticipating and counterfeiting these challenges as soon as possible [18].

Exposure depicted significant differences across age groups and urban-rural residences. Youth and adults are more likely to recall media more extensively, rate better advertisements as having a more significant impact, and often equate the size of the warning with the magnitude of the risk [19]. An experimental research study conducted in Canada found that increasing the size and quality of advertisements and media enhanced their impact among adult and youth smokers and 'vulnerable' youth non-smokers [20]. Psychological theories also support better recall of larger prints [21]. Current daily cigarette smokers depicted more exposure to media and advertisements than current daily SLT users, commonly in younger age groups. This can be attributed to socio-economic disparities prevalent across the country. It is well known that cigarettes are sold at a higher price in India than SLT products and are thus afforded by better-off people with more access to media sources like cinema, television, and the internet. Also higher level of exposure to media in urban areas is attributed to better education and more access to media. Further, urban areas provide more exposure to media, and a recent meta-analysis demonstrated that longer exposure results in increased quitting intentions [22].

There were higher odds of having positive intentions to quit if the patient was aware of the harmful effects of tobacco. These results are similar to the estimates from another GATS country [23]. Perceived risk is important in predicting health behavior, as hypothesized per the Health Belief Model. The tobacco-related research has corroborated with the conceptual model that better awareness about the harmful effects of tobacco can significantly predict intentions to quit [24]. However, one of our previous analyses has depicted poor awareness regarding the harmful effect of tobacco usage among the Indian population who participated in the same survey, which is one of the major bottlenecks in improving quitting intentions and should be considered [25]. While the cross-sectional nature of our analysis depicts a positive relationship between perceived risk and concurrent plans to quit and quitting behaviors; still, we cannot comment upon the fate of this relationship and the role of other confounders like social networks and socio-demographic

disparities in the longer run. However, different longitudinal studies have depicted a mixed relationship between awareness and intention to quit, calling for further research in this domain [26,27].

We saw a positive impact of moderate to high media exposure on the intentions to quit. In the last few years in India, the size and type of media have changed multiple times, probably leading to lesser wearouts and better effectiveness. The harmful effects of tobacco depicted in the advertisements do have an influence. Still, they are nullified by the counterfeit media content sponsored by the tobacco industry that normalizes tobacco use in any form and lures potential users to try it for once, as seen in previous longitudinal studies [28]. Our analysis suggests that those who buy cigarettes strongly think about quitting due to warnings and media compared to SLT users. Previous studies have shown that different tobacco products are associated with varied intentions to quit. With stress on health warning labels on cigarette packets, some users may be of the opinion that cigarette is the main culprit and tend to consider other tobacco products as less harmful [29]. This also points towards the fact that maybe the healthcare professionals engaged in offering cessation services need to offer their cessation services irrespective of the type of tobacco used and help people quit tobacco use [30].

This study has a few strengths and limitations. Being a national survey with a robust and standardised methodology, the estimates have generalizability and ensure international comparisons. However, the impact of the media and health warnings was assessed through one question, making it subjective and subject to recall bias. It may also be possible that the participant has seen the advertisement, but it has not undergone cognitive processing to leave an effect [31,32]. Further, the present study was a cross-sectional survey. Inherent shortcomings of the cross-sectional study were associated with this, such as the temporality of the association that could not be ascertained. Lastly, many other factors influence the intentions to quit, like social support and peer pressure, that were not recorded during the initial survey and may act as confounders.

This study has a few policy implications and emerging recommendations. Intention to quit cannot be left alone to the users, as they are in need and look for support directly or indirectly. The extent to which campaigns can change the tobacco use behaviour of a population depends on several factors, which can be broadly categorised into reach, impact, and context [33]. Therefore, to achieve maximum effectiveness, governments should impose a strict ban on advertisements promoting tobacco use so that they don't nullify tobacco control efforts. At the same time, it is important to monitor how the media communicates the message in terms of air time, frequency, and content. Public figures should be urged not to participate in tobacco endorsements, as they glamourize tobacco usage. Further, Tailoring media messages to address urban-rural disparities and employing culturally sensitive approaches can enhance the effectiveness of media in reaching diverse populations. Regular follow-up of clients visiting the cessation clinics is essential to improve awareness, which

further helps them to register the message delivered through the advertisement more cognitively. Lastly, the long-term effects of media advertisements on individuals' intention to quit tobacco require sustained exposure to campaigns. Therefore, continuous funding and support for media campaigns are essential for their sustained impact.

To conclude, media campaigns can play an important role in promoting tobacco control by raising awareness about the harms of tobacco use and promoting smoking cessation. We report a high intention to quit among those with high exposure to advertisements. There is a need to assess the impact of such advertisements on people's behavioural aspects. Further qualitative studies may be conducted with targeted populations that are more exposed to such media. At the same time, comprehensive tobacco control policies should go hand in hand in reducing smoking rates.

Author Contribution Statement

JPT, and MV conceptualised the study. MV retrieved the data and did the analysis. MK, MV, and JPT drafted the manuscript, and JPT gave their critical inputs on the manuscript; all the authors read and approved the final version.

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