ORIGINAL ARTICLE

Exposure of the Adult Pakistani Population to Second-Hand Smoke — An insight from Global Adult Tobacco Survey of Pakistan 2014

Sumera Naz, Saima Naz, Muhammad Arif Nadeem Saqib, Ibrar Rafique, Faiza Bashir

Abstract

Objective: About one-third of the world population is exposed to second hand smoke (SHS) with estimated 600,000 annual deaths. The objective of this article is to determine the exposure of adult Pakistani population to SHS and its association with different demographic variables based on data of Global Adult Tobacco Survey (GATS) conducted in 2014 in Pakistan.

Methods: Secondary analysis of Global Adult Tobacco Survey (GATS) data was done which is a global standard used for systematically monitoring use of both smoked and smokeless tobacco products. GATS Pakistan was a nationally representative survey, conducted in all four provinces among adult males and females aged15 years and above. Using multistage stratified cluster sampling technique a total of 9,856 households were selected and finally 7,831 individuals were enrolled.

Results: At homes around 43.3% individuals were exposed to SHS. Univariate analysis revealed that overall males (Odds Ratio, OR: 1.17 CI: 1.04-1.30, p=0.006) and less educated (OR: 1.30, CI: 1.16-1.46, p=0.000) group were at higher odds of being exposed to SHS at homes. Over all exposure to second hand smoke at home was also significantly high among urban residents (p = 0.000). Among nonsmokers age group 15 -35 years (odds ratio, 1.24 CI:1.09-1.04, P=0.01) and less educated group (OR 1.24, CI: 1.09-1.40, p=0.001) were at higher odds of being exposed to SHS at home

At indoor workplaces, overall 69.1% and among non-smokers, 65.3% individuals were exposed to SHS. Univariate analysis has shown that less educated group (OR: 1.525, CI: 1.012-2.298, p=0.043) was at higher odds of being exposed to SHS at indoor workplaces.

Among various public places exposure of participants to SHS was highest (86%) at restaurants, followed by public transport (74%), marriage halls (65%), universities (46%), health care facilities (35%) and least at schools (20%).

Conclusion: : Less educated males were more exposed to second-hand smoke both at work places and public places; therefore to start with interventions, work places and public places should be a priority as at home results could be confounded by self-smoking as well.

Keywords: Second hand smoke, exposure, GATS Pakistan, indoor smoking policies. (JPMA 68: S-13 (Suppl. 2); 2018)

Introduction

About one third of the world population is exposed to second hand smoke with an approximate 600,000 annual deaths and among these 31% deaths are in children and 64% in women.[1] It was estimated that worldwide around 40% children, 33% of male non-smokers and 35% of female non-smokers were exposed to second-hand smoke resulting around 1% of the global burden of disease.[2] Exposure varies in different geological regions from 13% in Africa to more than 50% in Western Pacific Europe. This variation is directly related to active smoking rates and legislation in that region.[3] It is estimated that every year from 2005-2009 among adult non-smokers in United States second hand smoke caused nearly 34,000 heart disease deaths and 7,300 lung cancer deaths.[4] Second hand smoke is also imposing economic burden not only on the affected person but also on the countries. Prevalence of tobacco smoking is increasing both in developing and underdeveloped countries resulting in increased morbidity in terms of disability adjusted life years (DALYs). In low-income countries of Southeast Asia and in the Eastern Mediterranean Region DALYs attributed to smoking are higher as compared to developed countries of Europe.[5]

According to the findings of Global adult tobacco survey (GATS) of Pakistan 2014, 12.4% of Pakistani population uses smoked tobacco products.[6] According to Pakistan Health Education Survey, 55% of the households have at least one smoker[7] and most of these smokers pose risk of exposure to SHS to other members of family as due to the cultural norms SHS is tolerated in homes. Trend of using shisha (water-pipe) smoking is exponentially raised in Pakistan in public cafés and restaurants. Pakistan Health Research Council in a national study concluded that prevalence of shisha smoking among college university and madrasa

Pakistan Health Research Council, Islamabad.

Correspondence: Muhammad Arif Nadeem Saqib. Email: arif289@gmail.com

students is 20%.[8] In respect of the health risks posed by SHS, the World Health Organization has encouraged countries to adopt smoke free policies as part of the Framework Convention on Tobacco Control (FCTC), which was also ratified by Pakistan. In 2002 ordinance of prohibition of smoking and protection of nonsmokers was approved and in section 3 of this ordinance all public and private offices, workplaces and educational institutes should be 100% smoke free and this ban intends to protect non-smokers from the harmful effects of SHS. Regarding the implementation of this law no published data is available from Pakistan.

In Pakistan lot of published work is available on smoked tobacco products and effect of SHS on health but pattern of exposure to SHS is not well studied. The objective of this paper is to describe the pattern of exposure to second-hand smoke along with risk factors or determinants in adult population of Pakistan using data of Global adult tobacco survey (GATS) of Pakistan.

Methodology

Data of the cross sectional Global Adult Tobacco Survey (GATS) was analyzed. This survey was conducted in Pakistan in 2014.[9,10] The survey data was released for the general researchers by Center for Disease Control (CDC) (Data set is available at CDC Website (https://www.cdc.gov) and no prior permission is required for data use).

A total of 9,856 households were sampled using multi-stage stratified cluster technique, one individual was randomly selected from each participating household and finally 7,831 individuals were enrolled. Field interviewers collected data on Urdu translated version of standardized GATS household questionnaire using electronic data collection devices PDA (Personal Digital Assistant). From the randomly selected one respondent of each household questions were asked about background characteristics, tobacco use (smoking and smokeless), cessation, secondhand smoke exposure, tobacco purchase patterns and price, exposure to tobacco advertising and promotion, as well as knowledge, attitudes and perceptions towards tobacco use.

Study variables: Exposure to SHS was assessed at home, workplace and public places. At home, exposure was taken positive if the respondent's answer for "how often does anyone smoke inside your home" was either daily, weekly, monthly or less than monthly.

To calculate exposure at workplace only those respondents were included who work outside their home whether it is indoor or mix i.e. both indoors and outdoors. Exposure was recorded as positive if answer for question "During the past 30 days, did anyone smoke in indoor areas where you work?" was "yes".

To determine the exposure to SHS at public places respondents were asked whether they had visited any (government buildings/offices, private building/offices, healthcare facilities, restaurants, marriage halls, public transportation, universities, schools and educational institutes) in past 30 days. Those who answer "yes" were included and exposure in this group was taken positive if the respondent had seen people smoking at any of the public places where he/she had visited in last 30 days.

Smoking status of the respondents was assessed by the question: "'Do you currently smoke tobacco on a daily basis, less than daily, or not at all?" Respondents who reply 'not at all' were classified as non-smokers, while those who answer 'daily' or 'less than daily' were classified as smokers. Sociodemographic characteristics included were gender (male or female) and age (15-35,>35 years), residence (urban, rural) and education (less than primary, above primary).

Statistical Analysis

For the current study, data was analyzed by using IBM-SPSS Statistics 20. For quantitative variables like age, mean ± SD was calculated. For determining the association of SHS exposure at home and indoor workplaces with socio-demographic factors like age, gender, education level and residence, odds ratios were calculated followed by Chi square test. For gender wise exposure to SHS exposure at various public places odds ratios were calculated and Chi square test was applied. P-value <0.05 was considered significant in all cases. Frequency and percentages were calculated for existence of smoking policy at indoor workplaces.

Results

The GATS survey included 7831 participants, of them 48.49% were urban and 51.51% were rural residents. Mean age of participants was 35.6± 15.2 years, mean age of urban residents was 35.53±14.84 years and of rural residents was 35.84±15.65 years. Among study participants, 48.3% were males (mean age 36.36±15.7 years) and 51.7% were females (mean age 35.06±14.7 years).

Overall, 48.3% (56.3 million) and among non-smokers, 43.3% (44.0 million), individuals were exposed to SHS at homes. Univariate analysis had revealed that overall, males (OR: 1.167 CI: 1.044-1.304, p=0.006) and less educated (OR: 1.302, CI: 1.159-1.464, p=0.000) group was

Table-1: Univariate analysis of demographic variables associated with exposure to SHS at home; GATS Pakistan, 2014.

Demographic Characteristics	Overall				Non-smokers			
	SHS Exposure %	OR	95%CI	P-value	SHS Exposure %	OR	95%CI	P-value
Gender								
Male	63.8	1.167	1.044-1.304		53.9	0.800	0.709-0.903	0.000
Female	60.1			0.006	59.4			
Age (years)								
15-35	61.6	0.973	0.870-1.088		59.2	1.241	1.098-1.402	0.001
Above 35	62.3			0.627	53.9			
Residence								
Urban	59.1	0.805	0.721-0.900		54.8	0.84	0.745-0.946	0.004
Rural	64.2			0.000	59.1			
Education level								
Primary or less	64.0	1.302	1.159-1.464	0.000	59	1.239	1.093-1.404	0.001
Above primary	57.7				53.7			

Table-2: Univariate analysis of demographic variables associated with exposure to SHS at indoor workplaces ; GATS Pakistan, 2014.

Demographic Characteristics	Overall				Non-smokers			
	SHS Exposure %	OR	95%CI	P-value	SHS Exposure %	OR	95%CI	P-value
Gender								
Male	91.6	0.894	0.351-2.278	0.814	90.3	0.843	0.328-2.167	0.723
Female	92.4				91.7			
Age (years)								
15-35	91.2	0.883	0.587-1.330		90.6	1.058	0.670-1.671	0.807
Above 35	92.2			0.552	90.1			
Residence								
Urban	91.4	0.917	0.604-1.391		90.1	0.911	0.573-1.450	0.695
Rural	92.0			0.683	90.9			
Education level								
Primary or less	93.2	1.525	1.012-2.298		91.5	1.298	0.826-2.040	0.258
Above primary	90.0			0.043	89.3			

Table-3: Bivarant analysis of gender wise exposure to second hand smoke at various public places: GATS Pakistan, 2014.

Public place	Exposure to SHS	Gender wise exposure to SHS		Odds ratio	95% CI	P-value
	Exposed/total (%)	Exposed males % (n)	Exposed females % (n)			
Government buildings	874/1377 (64%)	86.5 (756)	13.5 (118)	2.645	2.013-3.476	0.000
Private buildings	1349/1740 (76%)	83.2 (1122)	16.8 (227)	1.910	1.469-2.485	0.000
Health care facilities	1009/2857 (35%)	56.3 (568)	43.7 (441)	1.661	1.423-1.939	0.000
Restaurants	1333/1557 (86%)	95.5 (1273)	4.5 (60)	7.940	5.366-11.749	0.000
Marriage halls	348/533 (65%)	71.2 (272)	21.8 (76)	6.158	4.159-9.117	0.000
Public transportation	2980/4012 (74%)	67.3 (2007)	32.7 (973)	3.424	2.954-3.967	0.000
Universities	87/190 (46%)	75.9 (66)	24.1 (21)	1.549	0.816-2.937	0.179
Schools and educational facilities	140/701 (20%)	72.9 (102)	27.1 (38)	2.096	1.394-3.153	0.000

at higher odds of being exposed to SHS at homes. Exposure to second hand smoke at home is also significantly high among urban residents (p = 0.000). Among non-smokers, individuals aged 15-35 years (OR: 1.241, CI: 1.098-1.402, p=0.001) and less educated (OR: 1.239, CI: 1.093-1.404, p=0.001) were at higher odds of being exposed to SHS. Although male gender and urban residence have significant p value but are at lower odds of being exposed to SHS (Table-1).

At indoor workplaces, overall 69.1% and among non-smokers, 65.3% were exposed to SHS. Univariate

Table-4: Status of indoor smoking policies at workplace among participants working at indoor work places: GATS Pakistan, 2014.

Category	Response	Frequency	Un weighted percent	Weighted percent
No ban on indoor smoking	Allowed anywhere	612	33.1	36.1
Partial ban	Allowed only in some indoor areas	228	12.3	12.7
Complete ban	Not allowed in any indoor areas	548	29.6	27.5
No policy	There is no policy	370	20.0	19.6
Refusal	Don't know	81	4.4	3.6
	Refused	10	0.5	0.5

analysis showed that demographic characteristics had no effect on overall SHS exposure except education, less educated group (OR: 1.525, CI: 1.012-2.298, p=0.043) was at higher odds of being exposed to SHS at indoor workplaces. Among non-smokers, SHS was not significantly associated with demographic characteristics (Table-2).

Exposure of participants to SHS at various public places was highest (86.0%) at restaurants followed by private buildings (76.0%), public transport (74.0%) marriage halls (65.0%) government buildings (64.0%) while was least at schools (20.0%). Univariate analysis revealed that at all workplaces except universities; males were more exposed to SHS with significant p vales of 0.000. Males were most exposed to SHS at restaurants with highest odds (OR 7.940, CI:5.366-11.749, p value 0.000) followed by marriage halls (OR: 6.16, CI:4.16-9.12, p= 0.000), Government bulidings (OR: 2.65, CI:2.01-3.48, p= 0.000), pivate buildings (OR: 1.91, CI:1.47-2.49, p= 0.000), and least at health care facilities (OR: 1.66, CI:1.42-1.94, p= 0.000) (Table-3).

Regarding existence of smoking policy at indoor workplaces, majority (36.1%) of the respondents reported that smoking is allowed anywhere at their workplaces and 19.6% had reported that no policy existed at their indoor workplaces about smoking (Table-4).

Discussion

Secondary analysis of GATS data was done to determine self-reported exposure to SHS at homes, workplaces and public places among a nationally representative sample of Pakistani adults. Findings of the present study revealed that 65.1% nonsmokers were exposed to SHS. These findings are comparable to the findings of Global Health Professional Survey of Pakistan conducted in 2011 in which 60.4% non-smokers were exposed to SHS.[11]

About 48.3% adult Pakistanis and 43.3% non-smokers were exposed to SHS at their homes however according to the findings of Global Youth Tobacco Survey (GYTS) Pakistan-2013 around 21% students of aged 13-15 years were exposed to SHS at home.[12] Exposure of the adults aged >15 to SHS is almost double as compare to youth aged 13-15 years. Exposure to SHS at home in India was also 48%.[13] This is the alarming situation that despite of the half prevalence of smoking compared to India, exposure to SHS is almost same in both countries. High exposure to SHS at home in Pakistan can be explained by the fact that in Pakistan focus and priority of tobacco control policies and cell is yet not on smoke free homes, people are unaware about the adverse health effects of SHS and due to cultural norms of country adult smokers usually smoke at home. According to the findings of Pakistan Health education survey 1999, about 55% of households in Pakistan had at least one smoker[7] and these smokers are threat to their families for exposure to SHS. It is desperately required to encourage the voluntary adoption of smoke-free home rules and for this strategies should be developed and implemented which will not only reduce exposure of SHS in the general population but will also help to fully protect all non-smokers from the adverse health effects of SHS exposure. Recent studies also suggested that smoke-free home is associated with increased smoking cessation.[14] When compared with other countries in the region, exposure to SHS at home in china is (67.3%), Vietnam (67.7%), Philippines (44.8%),Thailand (39.1%), Russia (33.2%) and 17.3% in Mexico.[15]

Findings of this study revealed that among Pakistani citizens 69.1% adults were exposed to second hand smoke at workplaces (72.5% males and 37.3% females) and among nonsmokers 65.3% were exposed. In India exposure to SHS at workplace is only 29.9%.[13] According to GATS report of China 63.3% adults were exposed to SHS at their indoor workplaces[16] while in Bangladesh 63.0% adults were exposed to SHS at their indoor workplaces.[17] These surveys shows that exposure to SHS at work places is highest in Pakistan followed by China, Bangladesh and India. This is probably due to lack of implementation of smoke free policies in Pakistan.

The analysis revealed that 29.6% respondents who work

at indoor workplace informed that there was complete ban on indoor smoking at workplace. In China complete ban was reported by 31.6% respondents[16] and this is the reason the exposure to SHS at work places is high. Partial ban at their workplaces in Pakistan was reported by 12.3% respondents which is lower when compared with China (31.3%),[16] followed by India (27.9%).[13] According to 20% of the respondents who work at indoor workplace in Pakistan there is no policy for smoking at indoor workplace and according to 33.1% respondents smoking was allowed anywhere at their indoor workplace. Again according to GATS India only 9.4% respondents[13] reported either absence of smoking policies at indoor workplaces. When compared with our neighboring countries Pakistan is at top regarding absence of policies for smoking at indoor workplace and at lowest regarding complete ban on smoking at indoor workplace, these two factors leads to raised exposure of Pakistanis to SHS at their indoor workplaces. Polices are there but needs to be implemented because workplace smoking ban can exponentially reduce the exposure to SHS.

Strengths and Limitations

Strength of the study is that this is first nationally representative data on exposure of second hand smoke in Pakistani population and highlighted that implementation of policies for smoking at indoor workplaces needs to be improved. While limitation of the study is that confounding variables for SHS exposure are not evaluated.

Conclusion

Less educated males are more exposed to second-hand smoke both at work places and public places; therefore to start with interventions, work places and public places should be a priority as at home results could be confounded by self-smoking as well.

References

1. World Health Organization. WHO report on the global tobacco epidemic, 2009: implementing smoke-free environments. World Health Organization, 2009, Geneva
2. US Department of Health and Human Services, The health consequences of involuntary exposure to tobacco smoke. A report of the Surgeon General 2006. U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, Coordinating Center for Health Promotion, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, Washington.
3. Taylor R, Najafi F, Dobson A. Meta-analysis of studies of passive smoking and lung cancer: effects of study type and continent. Int J Epidemiol 2007; 36: 1048-59
4. Singh RJ, Lal PG. Second-hand smoke: a neglected public health challenge. Indian J Public Health. 2011; 55: 192-8.
5. Oberg M, Jaakkola MS, Woodward A, Peruga A, Pru¨ss-Ustu¨n A. Worldwide burden of disease from exposure to secondhand smoke: a retrospective analysis of data from 192 countries, Lancet 2011; 377: 139-46.
6. Global Youth Tobacco Survey Pakistan fact sheets; [Home page of WHO] [Online] 2017 May 3rd last updated [Cited 2017August 21]. Available from URL: http://www.who.int/tobacco/surveillance/survey/gats/pakfactsheet.pdf?ua=1.
7. Pakistan Health Education Survey.
8. Sultana Habibullah JA, Ijaz-ul-Haq Taseer, Rabail Javed, Sumera Naz, Ghazala Moihyuddin Arain, Tasleem Akhtar, Misbah-ul-Islam. Prevalence of Shisha Smoking in College, University and Madarsa Students Aged 20-25 Years in Pakistan. Pak J Med Res. 2013; 52: 3-7.
9. Global Adult Tobacco Survey. Pakistan Health Research Council. World Health Organization.
10. Saqib MAN, Rafique I, Qureshi H, Munir MA, Bashir R, Arif BW, et al. Burden of Tobacco in Pakistan-Findings from Global Adult Tobacco Survey 2014. Nicotine & Tobacco Research. 2017. Page 1-6.
11. Global Health Professional Survey of Pakistan , 2011.
12. Global Youth Tobacco Survey country reports of Pakistan; [Home page of WHO] [Online] 2017 May 3rd last updated [Cited 2017August 22]. Available from URL: http://www.who.int/tobacco/surveillance/survey/gats/pak/en/.
13. Global Adult Tobacco Survey 2009-10. Ministry of Health and Family Welfare, Government of India, New Delhi, 2010.
14. Tsai YW, Wen YW, Tsai CR, Tsai TI. Peer pressure, psychological distress and the urge to smoke. Int J Environ Res Public Health 2009; 6: 1799-811.
15. Brian A King,Sara A Mirza,1 Stephen D Babb. A cross-country comparison of secondhand smoke exposure among adults: findings from the Global Adult Tobacco Survey (GATS). Tob Control 2013 22: e5 originally published online September 27, 2012.
16. Global adult Tobacco Survey Data : China [Home page of WHO] [Online] 2012 April 2nd last updated [cited 2017August 2nd]. Available from URL: http://www.who.int/tobacco/surveillance/survey/gats/china/en/.
17. Global Adult Tobacco Survey data. Bangladesh. [Home page of WHO] [Online] 2015 August 7th last updated [Cited 2017 August 2nd]. Available from URL: http://www.who.int/tobacco/surveillance/survey/gats/bangladesh/en/.