

Pattern of current tobacco use among the Saudi adult population: results of the national Survey of Risk Factors of Non-Communicable Diseases

Abdelshakour M. Abdalla (1)

Lamiaa Z. Abuzaid (2)

Waleed S. Al-Hussain (3)

Nasser A. Al-Hamdan (1)

Abdalla A. Saeed (1)

Ahmed A. Bahnassy (1)

(1) King Saud Bin Abdulaziz University for Health Sciences, Department of Community Medicine, Faculty of Medicine, King Fahad Medical City, PO Box 59046, Riyadh 11525, Saudi Arabia

(2) Department of Public Health, Community & Occupational Medicine, and Environmental Health, Faculty of Medicine, Suez Canal University, Ismailia, Egypt.

(3) Internship, King Fahad Medical City, PO Box 59046, Riyadh 11525, Saudi Arabia

Correspondence:

Dr. Abdelshakour M. Abdalla

King Saud Bin Abdulaziz University for Health Sciences,
Department of Community Medicine, Faculty of Medicine,
King Fahad Medical City, PO Box 59046, Riyadh 11525,
Saudi Arabia

Tel. 0501225427

Email: Abdallaali63@hotmail.com

Abstract

Objective: The aim of this study is to describe the tobacco use status and determine the prevalence and pattern of current tobacco smoking among adult Saudi population to provide baseline data that may assist national health policies to control tobacco use in Saudi Arabia

Methods: 4,751 Saudis aged 15-64 years were analyzed, for pattern of tobacco use, from a national cross-sectional survey of non-communicable disease (NCD) risk factors. Data were collected using the standardized stepwise approach for NCD risk factor surveillance, of the World Health Organization (WHO).

Results: According to this study, most current tobacco users are tobacco smokers (92%). The overall prevalence of current tobacco smokers is 12.9% (611) of the total participants, with significantly higher proportion of male smokers than females (24.7% of males and 1.4% of females). Most current smokers are daily smokers (86%), of these 72.5% use manufactured cigarettes, with significantly more proportion of males than of females. The prevalence of current use of smokeless tobacco among the participants was estimated at 1.1% and more common among males than females, 1.7% and 0.5% respectively. But there was no significant difference.

In all the smoking status categories, the proportion of male tobacco users is significantly higher than female tobacco users even among the former smokers

Univariate analysis shows that smoking prevalence was higher among males, age group 25-34, northern and eastern regions, educated people, and among those in certain occupations: unemployment and nongovernmental employee, and participants with income equal or more than 15000 Saudi Riyals per Month.

Using logistic model, significant predictors for current smoking were: Male, younger adults, being in the eastern or northern regions, and being unemployed.

Conclusion: Unlike adult females, tobacco smoking was prevalent among adult males in Kingdom of Saudi Arabia. Significant predictors for current smoking were: Male sex, younger adults, being in the eastern or northern regions, and being unemployed.

Further explanatory research, considering gender differences and other socio-demographic subcategories in tobacco use is recommended to develop an effective anti-smoking intervention program.

Key words: Tobacco use, Pattern, Adults, Saudi Arabia

Introduction

Tobacco use is a major cause of morbidity and mortality all over the world, with more burdens in the developing countries. There is evidence that tobacco use is a main risk factor of the non-communicable diseases, which are steadily increasing all over the world, and contributed to 36 million deaths in 2008 (1,2).

The 1.3 billion adult world smokers in 2003 are predicted to rise up to 1.7 billion between 2020 and 2025 if the high level of tobacco use remains constant (3,4). The mortality rate is expected to increase from 5.4 million to 8.3 million a year in 2030, and 80% of these deaths are expected to be in developing countries (5, 6).

Tobacco consumption reasons are different in different subgroups.

This is why the tobacco industry takes into consideration the specific differences in their target groups according to sex, age group, ethnicity, and class, in efforts to broaden tobacco sales and promote tobacco use. Also there is evidence that tobacco smoking affects different subgroups differently. Therefore various subgroups need specific tobacco control measures to be effective (4). This emphasizes the importance of properly and appropriately studying the patterns of tobacco use according to the various subgroups in Saudi Arabia and other communities. This will enable the authorities to plan and implement intervention strategies.

Several studies were conducted in the Kingdom of Saudi Arabia (KSA) among different sectors of the communities. Those include students, health professionals and others. The prevalence among adults ranged from 11.6 to 52.3 % (median 22.6 %) (7). The only national study among Saudi adults reported that 19.1% of them were current smokers (8).

The aim of this study is to describe the tobacco use status and determine the prevalence and pattern of current tobacco smoking among adult Saudi population to provide baseline data that may assist national health policies to control tobacco use in Saudi Arabia.

Subjects and Methods

This is a cross-sectional community based study covering the whole of the Kingdom of Saudi Arabia to estimate the prevalence of some of the risk factors of non communicable diseases, including tobacco smoking. The WHO STEPwise approach to Surveillance (STEPS) of NCD risk factors was the basis for conducting the survey and collecting data (9, 10).

Study population:

The study population was all Saudi population of all the 20 health regions of the country, of persons aged 15 - 64 years.

Sampling:

A multistage stratified cluster random sampling technique was used to recruit the study subjects. Stratification was based on age (five 10 year age groups) and gender (2 groups) in all the health regions of the country. Based upon proposed methodology of the WHO STEPwise approach a sample size of 196 was calculated for each of these ten strata. To adjust for regional variation, the sample size was inflated to 5,000. A list of all Primary Health Care Centers (PHCCs) in each region was prepared and 10% of these PHCCs were randomly chosen, and were allocated a regional sample proportionate to the size of their catchment population in sampled PHCCs. To identify the households a map of the health center coverage area was used to choose the houses. Each house was assigned a number and a simple random draw was made. Within identified households, a list of all individuals aged 15-64 years was made and the study subject was selected using Kish method.

Data collection:

Tool used:

Data was collected using the WHO STEPwise approach which includes a questionnaire, physical measurements plus biochemical measurements covering tobacco use and other risk factors for the chronic diseases. Data on tobacco use addressed in this communication included current tobacco use. The questionnaire used for data collection was translated into Arabic by a team of physicians, and was back translated to ensure the accuracy of translation. Arabic instrument was pretested on 51 eligible respondents for wording and understanding of the questions, and necessary adjustments were made in the instrument in light of the pretest. The questionnaire includes socio-demographic data, tobacco consumption and data on other diseases and risk factors. The identified subject was interviewed using a questionnaire after obtaining consent. This communication deals only with current tobacco use and includes socio-demographic data.

Data collectors:

Data was collected by 54 males and 54 female data collectors, who work in teams. Each field team was made up of four persons a male data collector, a female data collector, a driver and a female assistant. Data collection teams were supervised by a hierarchy of local supervisor, regional coordinators and national coordinator.

Training of data collectors:

All individuals involved in data collection attended a comprehensive training workshop that included interview techniques, data collection tools, practical applications and field guidelines.

The following definitions were used to describe smoking status:

Tobacco: means any product obtained from leaf of Nicotina Tobacum plant.

Never smoker: Participant who never experimented with tobacco smoking

Ever smoker: Participant who had ever smoked any of tobacco products in the past. Ever smokers are further classified as current smokers and ex smokers.

A current smoker: is someone who at the time of the survey smokes any tobacco product and ex-smoker is someone who doesn't smoke at time of the survey.

The group of current smokers can be further divided into two categories:

Daily smoker: someone who smokes a tobacco product at least once a day (regular smoker) and occasional smoker who smokes but not on a daily basis (irregularly smoker).

Data management and analysis:

Questionnaires collected from the field were reviewed by team leaders assigned to each team before submitting them to the headquarters for data entry. Double entry of the questionnaires was performed using EPI-INFO 2000 software and EpiData software developed by the Menzes centre for validation. After data entry, data cleaning was conducted. New variables were defined by adopting the standard Steps variables (STEPS Data Management Manual, Draft version v1.5, October 2003). Data analysis was conducted for 4,751 participants using SPSS software.

Statistical Analysis:

Descriptive statistics, Chi square test, t-test, Mann Whitney test and ANOVA or Kruskal Wallis were used as appropriate after checking for normality. Level of significance level was set to be < 0.05 throughout the study. The data were processed in SPSS version 17.

Ethical clearance and confidentiality:

The protocol and the instrument of the surveillance were approved by the Ministry of Health, Center of Biomedical Ethics and the concerned authorities in the Kingdom. Informed consent of all subjects was obtained. Confidentiality of data was assured and that data will be used only for the stated purpose of the survey. Further details of the method used and sampling procedures can be found in Saudi Arabia STEPwise document (9, 10).

Results

A total of 4,883 people participated in the study with 97.7% response rate. Final analysis included 4,751 participants after 132 records were excluded because of major deficiencies in the data. There were no significant differences in the socio-demographic characteristics of the excluded participants compared to the included participants.

About 49% of the participants were males. Approximately half of the participants were of age 25 to 44 years (48.2%) and more than half of the participants had attained primary level of education or less (52.2%). About a third of participants have less than 3000 Saudi Riyals as house hold monthly estimated earnings. The overall prevalence of current smoked tobacco was 12.9% with significant gender differences (24.7% males compared to 1.4% females; p

< 0.001). There were also significant age, geographical and sociodemographic differences as shown in Table 1. Current smoking was significantly more in age group 25 - 34 years, among higher income earners, residents of the eastern and northern regions, among the unemployed and non-government employees, and among participants with vocational training. Current tobacco smokers are divided into further categories; regular smokers (daily smokers) and occasional smokers. Most current smokers in this study are daily smokers (86%), and only 14% are occasional smokers (Table 2). About three-quarters (72.5%) of daily smokers use manufactured cigarettes with significantly more proportion of males than females (73%, and 53% respectively).

In all the smoking status categories, the proportion of male tobacco users is significantly higher than female tobacco users (Table 2).

The prevalence of current use of smokeless tobacco among the participants was estimated at 1.1% and was more common among males than females, 1.7% and 0.5% respectively. But there was no significant difference. These results are shown in Table 2.

All significant risk factors in univariate analysis were included in a multiple logistic model for predictors of current smoking (Table 3). Significant predictors for current smoking were: Male sex (odds ratio (OR) = 21.037), Younger adults (OR = 1.189), being in the eastern or northern regions (OR = 1.461), and being unemployed (OR = 1.037).

Discussion

This study found that the overall prevalence of current tobacco smokers is 12.9% (24.7% males and 1.4% females) of the total participants. Most current smokers are daily smokers (86%). Smoked tobacco products were the most preferred types for 92% of adult smokers and the rest (8%) preferred smokeless tobacco products. For smoked products 72.5% of smokers prefer manufactured cigarettes.

The prevalence of the current smoking in this study was within the reported ranges in the previous studies in Saudi Arabia, from 11.6-52.3%, but less than the median (22.6%). While the prevalence among males was consistent with the median of the previous studies (26.5%), in females it was obviously less than the median of the previous studies (9%) (7). Studies in other countries such as Iran in agreement with our findings reported prevalence of current smoking as 12.5% (23.4% males and 1.4% females) (11). Lower prevalence was reported from Nigeria, Ghana and Ethiopia (8.0, 8.8%, and 8.3% respectively), while higher prevalence was reported from Libya (27.26%) and Kenya (22.9%,) (6,12,13).

For both types, smoked and smokeless tobacco products, male users were significantly more than females, in agreement with all previous studies in the Kingdom and almost all other communities. (7, 11-16). Underreported

Table 1: Frequency of current tobacco smoking according to participants socio-demographic characteristics

Variable	Total n (%)	Current smoker's n (%)	P-value
Sex			
Male	2335 (49.1%)	577 (24.7%)	< 0.001
Female	2416 (50.9%)	34 (1.4%)	
Total	4751	611 (12.9%)	
Highest level of education			
Illiterate	1255 (26.5%)	68 (5.4%)	< 0.001
Primary school completed	1220 (25.7%)	179 (14.7%)	
Intermediate school	753 (15.9%)	137 (18.2%)	
Secondary school completed	787 (16.6%)	119 (15.0%)	
College/University completed	607 (12.8%)	83 (13.7%)	
Vocational Training	120 (2.5%)	25 (20.8%)	
Total	4742 (100%)	611 (12.9%)	
Age Group			
15-24 yrs	1074 (22.6%)	148 (13.8%)	0.018
25-34 yrs	1128 (23.7%)	163 (14.5%)	
35-44 yrs	1165 (24.5%)	155 (13.3%)	
45-54 yrs	841 (17.7%)	95 (11.3%)	
55-64 yrs	543 (11.4%)	50 (9.2%)	
Total	4751 (100%)	611 (12.9%)	
Main Employment			
Government employee	1368 (28.8%)	294 (21.5%)	< 0.001
Non-government employee	454 (9.6%)	123 (27.1%)	
Self-employed	647 (13.6%)	67 (10.4%)	
Student	1759 (37.1%)	24 (1.4%)	
Retired	307 (6.5%)	44 (14.3%)	
Unemployed	210 (4.4%)	59 (28%)	
Total	4745 (100%)	611 (12.9%)	
Estimated household earning			
LT 3000	1492 (33.1%)	177 (11.9%)	0.019
3000-<7000	1011 (22.4%)	126 (12.5%)	
7000-<10000	1329 (29.5%)	203 (15.3%)	
10000- <15000	443 (9.8%)	48 (10.8%)	
>=15000	229 (5.1%)	37 (16.2%)	
Total	4504 (100%)	591 (13.1%)	
Regions			
Central Region	1133 (23.8%)	129 (11.4%)	0.005
Eastern Region	706 (14.9%)	110 (15.6%)	
Northern Region	455 (9.6%)	70 (15.4%)	
Southern Region	1000 (21.0%)	105 (10.5%)	
Western Region	1457 (30.7)	197 (13.5%)	
Total	4751 (100%)	611 (100%)	

Note: There are very few missed data on three variables, income 5%, employment 0.12% and level of education 0.18%

Table 2: shows the smoking status according to the gender

Smoking status	Total	Men	Women	P- value
	No (%)	No (%)	No (%)	
Current daily smokers (Regular)	528 (11.1)	499 (21.4)	29 (1.2)	<0.001
Current occasional smokers	83 (1.7)	78 (3.3)	5 (0.2)	<0.001
Total Current tobacco smokers	611 (12.9)	577 (24.7)	34 (1.4)	<0.001
Current using Smokeless tobacco	53 (1.1)	40 (1.7)	13 (0.5)	0.365
Total Current tobacco users	664 (14.0)	617 (26.4)	47 (1.9)	<0.001
Former daily smokers	585 (12.7)	556 (25.2%)	29 (1.2%)	<0.001
Former used Smokeless tobacco	40 (0.9)	29 (1.3)	11 (0.5)	0.002

Table 3: Multiple logistic regression analysis for predictors of smoking

Variables entered: Age, gender, education, occupation, region, income

	B	S.E.	Wald	df	Sig.	OR*	95.0% C.I.#. for OR	
							Lower	Upper
Region (Eastern/North)	.379	.140	7.302	1	0.007	1.461	1.110	1.924
Gender/Male	3.046	.191	254.469	1	<0.001	21.039	14.470	30.590
Age (25 -34 Years)	.173	.037	22.137	1	<0.001	1.189	1.107	1.279
Occupation (Unemployed)	.036	.021	3.113	1	0.048	1.037	.996	1.080
Constant	-2.602-	.243	114.484	1	.000	.074		

OR* = Odds Ratio

C. I.#. = Confidence Interval

tobacco smoking could not be excluded in this study, especially among females, because tobacco consumption is a stigma for women in Saudi Arabia where smoking is socially unacceptable among females.

In addition to gender, age was also associated with smoking with younger adults having a significantly higher prevalence. This agrees with findings of other studies (12,15) but also disagrees with others (17).

Other factors associated with smoking in our study include employment and geographical location. Some studies support the current findings that the higher prevalence rate of tobacco smoking was among the unemployed (18). The study done in sub-Saharan Africa among 14 nations, support the opposite position that the unemployed smoked less (12). Saudi Arabia is a rich country; even unemployed persons seem to have enough money to buy cigarettes, mostly from other family members, unlike those in sub-Saharan Africa.

Residents of the northern and eastern regions in our study showed a significantly higher smoking prevalence than the other regions. The Northern region is on the border with Jordan and Syria, while the eastern region is on the border with Bahrain, which has a higher adult smoking prevalence (19).

These differences in smoking prevalence according to sociodemographic characteristics may be due to varying sampling procedures, definition of smoking uses, bias in reporting, in addition to real cultural, traditional differences and population characteristics.

Limitations

Estimates for tobacco smoking were based on self-reports and not biochemical tests, so underreport of tobacco smoking was suspected in this study, especially among females.

Conclusion

Unlike adult females, tobacco smoking was highly prevalent among adult males and significant predictors for current smoking were, male sex, younger adults, being in the eastern or northern regions, and being unemployed. Smoking is the most common method of consuming tobacco and cigarette was the most common tobacco product smoked.

Further explanatory research, considering gender differences and finding why females significantly are smoking less was recommended, to control the male smoking epidemic.

This study increases our understanding about the prevalence and correlates of tobacco smoking among adults in Saudi Arabia. This may contribute to the development of an effective smoking cessation and prevention program.

References

1. World Health Organization. World Health Statistics 2011. Geneva: WHO; 2011
2. U.S. Department of Health and Human Services. The Health Consequences of Smoking: A Report of the Surgeon General. Atlanta: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2004 [accessed 2011 Mar 11]. http://www.thriveri.org/documents/4g_health_consequences_smoking.pdf
3. Guindon GE, Boisclair D. Past, current, and future trends in tobacco use. Washington DC: World Bank, 2003. Available at: <http://www.1.worldbank.org/tobacco/publications.asp>
4. WHO (2007). Gender and Tobacco Control: A Policy Brief, Geneva Available at: www.who.int/tobacco/resources/publications/general/policy_brief.pdf.
5. Mathers CD, Loncar D (2006). Projections of global mortality and burden of disease from 2002 to 2030. *PLoS Med.*, 3: 442.
6. World Health Organization. World Health Statistics 2008. Geneva: WHO; 2008
7. Bassiony MM. Smoking in Saudi Arabia. *Saudi Med J.* 2009; 30 (7):876-881
8. Al-Nozha MM, Arafah MR, Al-Mazrou YY, Al-Maatouq MA, Khan NB, Khalil MZ, Al-Khadra AH, Al-Marzouki K, Abdullah MA, Al-Harhi SS, Al-Shahid MS, Nouh MS, Al-Mobeireek A. Coronary artery disease, in Saudi Arabia. *Saudi Med J.* 2004 Sep;25(9):1165-1171
9. Bonita R, de Courten M, Dwyer T, Jamorzik K, Winkelmann R, "Surveillance of risk factors for Non Communicable diseases," The WHO Stepwise approach: WHO, 2001.
10. <http://www.who.int/chp/steps/2005/SaudiArabiaSTEPSReportEN.pdf>.
11. Alipasha Alipasha Meysamie, Reza Ghaletaki, Mehrdad Haghazali, Fereshteh Asgari, Armin Rashidi, Omid Khalilzadeh, Alireza Esteghamati, Mehrshad Abbasi. Pattern of tobacco use among the Iranian adult population: results of the national Survey of Risk Factors of Non-Communicable Diseases. *Tob Control* 2010;19:125-128 <http://www.dph.gov.my/ncd/surveillance/index.php?>
12. Pampel F. Tobacco use in sub-Saharan Africa: Estimates from the demographic health surveys. *Soc. Sci. Med.* 2008; 66: 1772-1783.
13. R.K.Pal and Ali Grera. Coronary Artery Disease in Africa: Community based study of Risk Factors. : *BJMP* 2010;3(2):326 (from the journal 6-10)
14. MOH. NCD Surveillance 2005/06: Report on NCD risk factor in Malaysia. Ministry of Health, Malaysia. Available from URL here. (accessed 13 February 2008)
15. Jarallah JS, al-Rubeaan KA, al-Nuaim AR, al-Ruhaily AA, Kalantan KA. Prevalence and determinants of smoking in three regions of Saudi Arabia.. *Tob Control.* 1999; 8(1):53-56.
16. Sarraf-Zadegan N, Boshtam m. Tobacco use among Iranian men, women, and adolescents. *Eur J public Health* 2004; 14:76-78)
17. Sibai AM and Hwalla N. WHO STEPS Chronic Disease Risk Factor Surveillance: Data Book for. Lebanon, 2009. American University of Beirut, 2010.
18. Hammarström A, Janlert U. Unemployment. An important predictor for future smoking: a 14-year follow-up study of school leavers. *Scand J Public Health.* 2003;31(3):229-32.
19. Maziak W, Nakkash R, Bahelah R, Hussein A, Fanous N, Eissenberg T. Tobacco in the Arab world: old and new epidemics amidst policy paralysis. *Health Policy Plan.* 2014 Sep;29(6):784-94.