



RESEARCH ARTICLE

Prevalence and Associated Factors of Using Tobacco Products (E- Cigarettes, Conventional Cigarettes and Water Pipe) among Healthcare Workers at the Prince Mohammed Bin Abdulaziz Hospital in Riyadh, Saudi Arabia, 2018-2019

Sumaya Shaikh^{1*} and Ghadeer S Aljuraiban²

¹Department of Family Medicine, Prince Mohammed bin Abdulaziz Hospital, Saudi Arabia

²Department of Community Health Sciences, King Saud University, Saudi Arabia

*Corresponding author: Sumaya Shaikh, Department of Family Medicine, Prince Mohammed bin Abdulaziz Hospital, Riyadh 14221, Saudi Arabia, Tel: 00966544545400



Abstract

Background/Aim: Few studies have been published on the prevalence of smoking among healthcare workers and smoking triggers. This study sought to determine smoking prevalence and identify factors associated with the initiation of smoking.

Methods: The pre-designed questionnaire in this cross-sectional study on healthcare workers at Prince Mohammed bin Abdulaziz Hospital in Riyadh, Saudi Arabia included items on demographics, smoking habits and smoking history, factors associated with smoking, and beliefs about smoking.

Results: The study sample comprised 343 healthcare workers, of whom 117 (34.1%) were current and past smokers. The most common reason for smoking was stress relief (n = 78, 22.7%). In the 12 months before the survey, 48 respondents (14.0%) tried to quit smoking. Ninety-two (26.8%) stated that their workplace forbids smoking; however, 95 (27.7%) would smoke in the gardens and 59 (17.2%), in smoking-designated areas. Around half of the respondents (n = 161, 46.9%) said their co-workers also smoke. Smoking was significantly correlated with male gender, tight work schedules, obesity, high monthly income, and co-workers who also smoked.

Conclusion: More than One-third of our surveyed healthcare professionals smoke. Tendency to smoke is higher among workers who have tight work schedules and co-workers who also smoke. Smoking policies and strict no smoking rules are failing to deter individuals from smoking.

Keywords

Healthcare workers, Prevalence, Smoking, Tobacco products, Saudi Arabia

Introduction

Tobacco smoking is a major public health concern. The global smoking prevalence is about 12%, which translates into over one billion tobacco smokers [1]. The annual worldwide mortality rate secondary to tobacco smoking was projected to reach 7 million by 2030, and rates can be higher in low- and middle-income countries [1]. Smoking prevalence in Middle Eastern and African countries is increasing [2]. In Saudi Arabia, the prevalence ranges from 2.4% to 52.3%, depending on region [3].

Although conventional cigarettes remained the most common form of tobacco smoking, prevalence of waterpipe smoking (hookah, hubbly-bubbly, and narghile smoking) has increased in the past decade [4-6]. Electronic cigarettes (e-cigarettes or vapes), which are battery-powered devices that convert nicotine into vapor, have become increasingly common and popular among youth [7-9]. Studies have reported varying prevalence's of waterpipe smoking: 4%-12% in the Arab Gulf region, 6% in Pakistan, 9%-12% in Syria, and 11% in Australia [10,11].

The prevalence of e-cigarettes has risen in many countries; a study conducted among 27,460 Europeans from 28 countries in 2014 reported a prevalence of 31.1% [12-14]. In 2014, a survey including 480 university students in Riyadh city showed that 51.1% of smokers were e-cigarette users [15,16].

Studies on tobacco smoking among healthcare professionals in Saudi Arabia found prevalence's of 14.8%-25.3%, with hospital medical residents having the highest prevalence (25.3%), followed by primary health care physicians (20.5%), and medical consultants (18.6%); and higher among males than females (19.3% versus 9.4%) [17]. Few studies, however, address the safety of e-cigarettes and their effectiveness as a smoking cessation aid [18,19]. Limited studies identified potential risk factors for tobacco smoking among healthcare workers including age, gender, nationality, level of education, place of work, place of birth, and parental smoking [17-29].

Despite several studies in Saudi Arabia on the prevalence of smoking among different populations, few studies have investigated the prevalence of tobacco products among healthcare workers and factors associated with smoking initiation. Our study sought to determine the prevalence of various tobacco products (conventional cigarettes, e-cigarettes, and waterpipes), and identify smoking triggers.

Methods

The present cross-sectional study between January 2018 and January 2019 determined the prevalence of tobacco users among healthcare workers at Prince Mohammed bin Abdulaziz Hospital in Riyadh city, Saudi Arabia. The target population was healthcare workers involved in direct patient care (doctors, nurses, pharmacists, and technicians/technologists) of any age, gender, and nationality. Thus, we excluded receptionists, housekeepers, administrative staff, and other workers.

The base population of healthcare workers at the hospital numbered approximately 1,430. To achieve 80% power with a 95% confidence level and a level of significance set at $p < 0.5$, the power analysis calculated that a sample of 303 participants would be needed. We used a proportionate sampling technique for recruiting participants; a random sampling technique accounted for the size of each group in the overall study sample (71% were nurses; 20%, doctors; 5%, technicians/technologists; and 4%, pharmacists) so that the study sample reflected this distribution.

The present study was conducted via modified, self-administered, validated paper questionnaire in the English language based on the validated Global Adult Tobacco Survey (GATS) questions to the selected participants. We had first piloted the modified questionnaire on 36 participants to ensure construct and content validity. The questionnaire had a Cronbach's

alpha of 0.80. Data variables included demographics (age, gender, marital status, occupation, nationality, education level, monthly income, working hours); smoking habits and smoking status (type of tobacco product smoked, smoking frequency, place of smoking, age of smoking onset); and peer pressure, social pressure, lifestyles, and smoking beliefs (stress relief and social acceptance). All participants gave their informed consent. We distributed the questionnaires to the study participants in-person after explaining the purpose of the study.

Data were encoded and analyzed using version 23.0 of the Statistical Package for the Social Sciences (SPSS; SPSS Inc., IBM, Armonk, New York, USA). Results are presented as means and Standard Deviations (SDs) for categorical variables and as numbers and frequencies (percentages) for continuous variables. The Pearson chi-square test determined the association between categorical variables and the independent *t*-test, continuous variables. A *p*-value of ≤ 0.05 was considered statistically significant. The Institutional Review Board, King Fahad Medical City, Riyadh, Saudi Arabia approved the present study.

Results

Sociodemographic characteristics and history of smoking

The study sample comprised 343 healthcare workers (61.5% were Saudis): 101 (29.4%) were doctors; 133 (38.8%), nurses; 19 (5.5%), pharmacists; 21 (6.1%), technicians; 23 (6.7%), physiotherapists; and 46 (13.5%), others (Table 1). The gender distribution was nearly equal: 168 (49.0%) males and 175 (51.0%) females. Half of the respondents were married ($n = 172$, 50.1%), 194 (56.6%) had fixed work schedules, and 250 (72.9%) were 26-35 years old. Nearly half of the respondents had 2-5 years of work experience ($n = 146$, 42.6%), 150 (43.7%) had a normal body mass index (BMI), and 248 (72.3%) had a bachelor's degree.

Table 2 lists the smoking details and history of smoking of the 343 respondents. Of the 117 (34.1%) current and past smokers, 105 currently smoke. Sixty-nine participants began smoking one year before the study. Thirty-five (10.2%) said they usually smoke at home. The most common reason for smoking was stress relief ($n = 78$, 22.7%) followed by a relaxed feeling when smoking ($n = 76$, 22.2%). In the 12 months before the survey, 48 respondents (14.0%) had tried to quit smoking. Ninety-two (26.8%) said that smoking was forbidden at their workplace, however, 95 (27.7%) would smoke in the gardens and 59 (17.2%), in smoking designated areas in the workplace. Nearly half of the respondents ($n = 161$, 46.9%) said that their co-workers also smoked. The majority (203, 59.2%) said that their workplace forbids smoking in all indoor areas; however, 67 (19.5%) reported smoking in an indoor

Table 1: Demographic characteristics of the study sample (n = 343).

Demographic variables	n	%
Gender		
Male	168	49.0
Female	175	51.0
Marital status		
Single	165	48.1
Married	172	50.1
Divorced	5	1.5
Widowed	1	0.3
Age groups (yrs)		
< 25	41	12.0
26-35	250	72.9
36-45	38	11.1
> 45	14	4.1
Nationality		
Saudi	211	61.5
Non-Saudi	132	38.5
BMI (n = 308)		
Underweight	9	2.6
Normal	150	43.7
Overweight	111	32.4
Obese	38	11.1
Work experience (yrs)		
≤ 1	48	14.0
2-5	146	42.6
6-9	93	27.1
> 9	56	16.3
Profession/Occupation, (n = 308)		
Doctor	101	29.4
Nurse	133	38.8
Pharmacist	19	5.5
Technician	21	6.1
Physiotherapist	23	6.7
other	46	13.5
Education		
Diploma	11	3.2
Bachelor's degree	248	72.3
Master's degree	37	10.8
PhD	26	7.6
Postgraduate fellow	7	2.0
Unspecified	14	4.1
Monthly income, in Saudi riyals (SAR)		
< 8,000	98	28.6
8,000-15,000	117	34.1
16,000-23,000	69	20.1
> 23,000	24	7.0
Unspecified	35	10.2
Chronic illness, yes	36	10.5

work area in the last 30 days. Nearly all respondents (318, 92.7%) drank caffeinated beverages, 296 (86.3%) drank coffee or tea, and 131 (38.2%) drank caffeinated drinks once or twice a day.

Table 2: Smoking history and other characteristics (n = 343 respondents).

Smoking details	n	%
Smokers, current and past		
Yes	117	34.1
No	226	65.9
Currently smokes	105	30.6
Daily	55	16.0
Less than daily	50	14.6
Smoked daily in the past, yes	78	22.7
Smoked tobacco in the past	99	28.9
Daily	63	18.4
Less than daily	36	10.5
No. of conventional cigarettes smoked daily		
1	15	4.4
2	3	0.9
3	10	2.9
4	1	0.3
No. of conventional cigarettes smoked weekly		
1	8	2.3
2	2	0.6
3	2	0.6
4	1	0.3
5	5	1.5
Shisha smoking		
Daily	8	2.3
Once a week	10	2.9
Three times a week	1	0.3
Waterpipe smoking		
Daily	5	1.5
Once a week	5	1.5
E-cigarette smoking		
Daily	5	1.5
Once a week	2	0.6
No. of years since they began smoking	69	20.1
1	13	3.8
2	12	3.5
3	2	0.6
4	1	0.3
5		
Common places to smoke		
Home	35	10.2
Work	9	2.6
A friend's house	22	6.4
Social events	11	3.2
Public places	29	8.5
Reasons for smoking		
Pleasure	67	19.5
Tastes good	44	12.8
Gives a relaxed feeling	76	22.2
Increases focus and concentration	64	18.7
Relieves stress	78	22.7
Decreases appetite (for weight loss)	37	10.8

Reasons for not smoking		
Bad taste in mouth	44	12.8
Tried to stop smoking in the past 12 months, yes	48	14.0
Visited a doctor in the past 12 months, yes	31	9.0
Was advised by a doctor to quit smoking, yes	32	9.3
Thinks that smoking is cool, yes	46	13.4
Smokes at workplace, yes		
In the work area itself	16	4.7
In common areas	10	2.9
In smoking designated areas	59	17.2
In garden	95	27.7
Smoking not allowed at workplace	92	26.8
Co-workers also smoke		
Most or all	56	16.3
Some	161	46.9
None	29	8.5
Don't know	93	27.1
Was not working when smoking	3	0.9
No response	1	0.3
Smoking at home		
Daily	53	15.5
Weekly	23	6.7
Monthly	9	2.6
Less than monthly	34	9.9
Never	189	55.1
Do not know	35	10.2
Works outside of the home, yes	267	77.8
Works indoors or outdoors		
Indoors	239	69.7
Outdoors	30	8.7
Both	62	18.1
No response	12	3.5
Indoor smoking policy at work		
Allowed anywhere	13	3.8
Allowed only in some indoor areas	31	9.0
Not allowed in any indoor area	203	59.2
There is no policy	24	7.0
Do not know	72	21.0
Smoked in an indoor work area in the last 30 days, yes	67	19.5
Drinks caffeinated beverages, yes	318	92.7
Preferred caffeinated beverage		
Coffee/tea	296	86.3
Energy booster (5 hours energy)	5	1.5
Energy drink	9	2.6
Other	8	2.3
Weekly consumption of caffeine		
Less than once a week	33	9.6
Every other day	69	20.1
1-2 times a day	131	38.2
3 or more times a day	85	24.8
Does not drink caffeinated drinks	25	7.3

Table 3: Comparison of all variables between smokers and non-smokers (chi-square test).

Variables	Smokers (n = 117)	Non-smokers (n = 226)	p-values
Gender			
Male	93 (79.5%)	75 (33.2%)	< 0.001
Female	24 (20.5%)	151 (66.8%)	
Marital status			
Single	60 (51.3%)	105 (46.5%)	0.400
Married	54 (46.2%)	118 (52.2%)	
Divorced	2 (1.7%)	3 (1.3%)	
Widowed	1 (0.9%)	0	
(Empty cell)			
Work schedules			
Fixed	53 (45.3%)	141 (62.4%)	0.010
Shift	51 (43.6%)	68 (30.1%)	
On call	13 (11.1%)	17 (7.5%)	
Age group, yrs			
< 25	14 (12.0%)	27 (11.9%)	0.915
26-35	87 (74.4%)	163 (72.1%)	
36-45	11 (9.4%)	27 (11.9%)	
> 45	5 (4.3%)	9 (4.0%)	
Nationality			
Saudi	87 (74.4%)	124 (54.9%)	< 0.001
Non-Saudi	30 (25.6%)	102 (45.1%)	
Work experience, yrs			
< 1	22 (18.8%)	26 (11.5%)	0.27
2-5	50 (42.7%)	96 (42.5%)	
6-9	28 (23.9%)	65 (28.8%)	
> 9	17 (14.5%)	39 (17.3%)	
(Empty cell)			
BMI (n = 308)			
Underweight	4 (3.4%)	5 (2.2%)	0.110
Normal	43 (36.8%)	107 (47.3%)	
Overweight	43 (36.8%)	68 (30.1%)	
Obese	18 (15.4%)	20 (8.8%)	
Occupation (n = 308)			
Doctor	42 (35.9%)	59 (26.1%)	0.013
Nurse	30 (25.6%)	103 (45.6%)	
Pharmacist	7 (6.0%)	12 (5.3%)	
Technician	11 (9.4%)	10 (4.4%)	
Physiotherapist	11 (9.4%)	12 (5.3%)	
Other	15 (12.8%)	26 (11.5%)	
(Empty cell)			
Education (n = 329)			
Diploma	7 (6.0%)	4 (1.8%)	0.439
Bachelor's	82 (70.1%)	166 (73.5%)	
Master's	12 (10.3%)	25 (11.1%)	
Doctoral	8 (6.8%)	18 (8.0%)	
Postgraduate fellow	3 (2.6%)	4 (1.8%)	
(Empty cell)			
Monthly income in SAR (n = 308)			
< 8,000	16 (13.7%)	82 (36.3%)	< 0.001
8,000-15,000	52 (44.4%)	65 (28.8%)	
16,000-23,000	34 (29.1%)	35 (15.5%)	
> 23,000	9 (7.7%)	15 (6.6%)	
(Empty cell)			

Chronic illness			
Yes	19 (16.2%)	17 (7.5%)	0.084
No	207 (91.6%)	100 (85.5%)	
Works at least 10 hours a week	92 (78.6%)	176 (77.9%)	0.897
Smoking not allowed in the workplace	31 (26.5%)	61 (27.0%)	0.922
Co-workers also smoke			
Most	36 (30.8%)	20 (8.8%)	< 0.001
Some	59 (50.4%)	102 (45.1%)	
None	4 (3.4%)	25 (11.1%)	
Do not know	17 (14.5%)	76 (33.6%)	
Works outside of the home	95 (81.2%)	172 (76.1%)	0.509
Indoor smoking policy at work			
Allowed anywhere	10 (8.5%)	3 (1.3%)	0.001
Allowed in some indoor areas	16 (13.7%)	15 (6.6%)	
Not allowed in any indoor area	61 (52.1%)	142 (62.8%)	
There is no policy	4 (3.4%)	20 (8.8%)	
Do not know	25 (21.4%)	44 (19.5%)	
Consumes caffeinated drinks	109 (93.2%)	209 (92.5%)	0.817

Comparison between smokers and non-smokers

Males smoked significantly more than females ($p < 0.001$; Table 3). Respondents who were on shifts and on call smoked more than those on fixed work schedules ($p < 0.05$). Saudi nationals smoked significantly more than non-Saudis ($p < 0.001$). More doctors smoked than not ($p < 0.05$). Significantly more smokers had a monthly income of SAR8000-23,000 than of $< SAR8,000$ ($p < 0.001$). Significantly more smokers worked where smoking is allowed everywhere or at least in some indoor areas ($p < 0.001$). Differences in smoking versus non-smoking frequencies were non-significant concerning marital status, age group, years of work experience, BMI, education, chronic illness, long working hours, smoking forbidden in the workplace, working outside of home, and drinking caffeinated drinks.

Smoking correlated significantly with male gender, tight work schedules, Saudi nationality, obesity, higher monthly income, perception that smoking is cool, and co-workers who also smoked (data not shown). Among the respondents who did smoke, variables significantly correlated with pleasure in smoking, feeling relaxed while smoking, increased focus and concentration, and relief of stress.

Discussion

The present study found a smoking prevalence of 34.1% among healthcare workers in a Saudi Arabian hospital. This rate is higher than that reported by oth-

er studies in Saudi Arabia [3,13,17,18]. Despite the introduction of e-cigarettes, the most common form of smoking is still conventional cigarettes, which has a convenience advantage over the traditional use of waterpipes. Less than 10% of the respondents smoked a waterpipe or engaged in shisha smoking, similar to previously reported rates from the Arab Gulf region but lower than prevalences reported for Syria, Australia, and Lebanon [10,11]. Use of e-cigarettes was even lower than conventional cigarettes and waterpipes. We had expected the rate of e-cigarette use to be substantially higher since the use of e-cigarettes has begun to be more popular among Saudi students, and by extension, other social groups [15,16].

In comparison to a local study by Mahfouz, et al. [17], our study found a higher prevalence of smoking among doctors (18.6% to 25.3% versus our rate of 35.9%), while another study reported even higher rates ($> 25%$) in Italy, France, and Japan [24]. Cattaruzza and West suggest that doctors smoke because they disregard the harmful effects of smoking (“fatalistic attitude”) or they do not see smoking cessation as a priority [24]. Other probable reasons include insufficient knowledge of smoking cessation therapies and of the laws regarding tobacco use [25].

Smoking was significantly correlated with male gender in the present study. This is true in most countries where males predominantly smoke more than females [17]. Our results showed that smoking is significantly correlated with obesity; however, among 117 smokers, only 18 were obese and male. It may be that individuals who have high salaries understandably have the means to indulge in smoking [22]. Tight work schedules were also significantly related to smoking, confirming results of previous studies [23]. In particular those who work night shifts, like nurses, doctors, and call-center employees, have a tendency to develop unhealthy lifestyles and behaviors [28,29]. One of the most significant smoking triggers was peer influence. Our study found a strong association of a person starting and continuing to smoke with co-workers who smoke and peer pressure, compatible to previous studies [19-21]. This occurred despite warnings and workplace restrictions on smoking.

A strength of our study is that it identifies several issues that make it a valuable contribution to the literature, such as considering triggers like peer pressure, stress, and even work schedules, that may address and curb smoking among healthcare workers in the workplace. Our study highlights the pressing need to implement smoking cessation programs at the workplace while considering the main associated factors identified in our study for a healthier lifestyle. The bottom line is that healthcare professionals know and understand the ill effects of smoking, and they should be the front liners for disseminating information on non-smoking.

The main limitation was study design; a causal relationship cannot be inferred. Additionally, the study sample included a single workplace in Riyadh and was not representative of the general population. A third limitation was the self-recorded weight and height of participants, which is a possible source of error.

Conclusion

More than One-third of healthcare professionals in the present study smoke. Tight work schedules and peer influence (having co-workers who smoke) are significant triggers to begin and continue smoking, especially among males. Smoking policies and strict no smoking rules in the workplace are failing to deter individuals from smoking, thus smoking cessation programs and methods to improve employee health should be implemented. These findings can serve as guidelines for planning and implementing healthy workplace policies in hospitals.

Acknowledgments

This research project was supported by a grant from the Research Center of the Female Scientific and Medical Colleges, Deanship of Scientific Research, King Saud University.

Conflicts of Interest

The author declares no conflicts of interest.

References

- WHO report on the global tobacco epidemic, 2019 (2017) World Health Organization.
- Ng M, Freeman MK, Fleming TD, Robinson M, Dwyer-Lindgren L, et al. (2014) Smoking prevalence and cigarette consumption in 187 countries, 1980-2012. *JAMA* 311: 183-192.
- Maziak W (2011) The global epidemic of waterpipe smoking. *Addict Behav* 36: 1-5.
- Kuschner WG, Reddy S, Mehrotra N, Paintal HS (2011) Electronic cigarettes and thirdhand tobacco smoke: two emerging health care challenges for the primary care provider. *Int J Gen Med* 4: 115-120.
- Electronic Nicotine Delivery Systems and Electronic non-nicotine Delivery Systems. World Health Organization.
- Singh T, Arrazola RA, Corey CG, Husten CG, Neff LJ, et al. (2016) Tobacco Use Among Middle and High School Students--United States, 2011-2015. *MMWR Morb Mortal Wkly Rep* 65: 361-367.
- Dutra LM, Glantz SA (2014) Electronic cigarettes and conventional cigarette use among U.S. adolescents: a cross-sectional study. *JAMA Pediatr* 168: 610-617.
- Lee S, Kimm H, Yun JE, Jee SH (2011) Public health challenges of electronic cigarettes in South Korea. *J Prev Med Public Health* 44: 235-241.
- WHO report of Global Tobacco Epidemic (2019) World Health Organization.
- Akl EA, Gunukula SK, Aleem S, Obeid R, Jaoude PA, et al. (2011) The prevalence of waterpipe tobacco smoking among the general and specific populations: a systematic review. *BMC Public Health* 11: 244.
- Abdulghani HM, Alrowais NA, Alhaqwi AI, Alrasheedi A, Al-zahir M, et al. (2013) Cigarette smoking among female students in five medical and non-medical colleges. *Int J Gen Med* 6: 719-727.
- Borgan SM, Jassim G, Marhoon ZA, Almuqamam MA, Ebrahim MA, et al. (2014) Prevalence of tobacco smoking among health-care physicians in Bahrain. *BMC Public Health* 14: 931.
- Alsuwailam AS, AlShehri MK, Al-Sadhan S (2014) Smoking among dental students at King Saud University: Consumption patterns and risk factors. *Saudi Dent J* 26: 88-95.
- Farsalinos KE, Poulas K, Voudris V, Le Houezec J (2016) Electronic cigarette use in the European Union: analysis of a representative sample of 27,460 Europeans from 28 countries. *Addiction* 111: 2032-2040.
- Karbouji MA, Abduldaem AM, Allogmani AM, Alharbi AS, Alnozha O, et al. (2018) Awareness and attitude toward smoking e-cigarettes (vape) among smokers in Saudi Arabia 2017. *Egyptian J Hosp Med* 70: 1346-1351.
- Awan K (2016) Experimentation and correlates of electronic nicotine delivery system (electronic cigarettes) among university students – a cross-sectional study. *Saudi Dent J* 28: 91-95.
- Mahfouz AA, Shatoor AS, Al-Ghamdi BR, Hassanein MA, Nahar S, et al. (2013) Tobacco use among healthcare workers in Southwestern Saudi Arabia. *Bio Med Res Int* 2013: 960292.
- Bassiony MM (2009) Smoking in Saudi Arabia. *Saudi Med J* 30: 876-881.
- Khuder SA, Price JH, Jordan T, Khuder SS, Silvestri K (2008) Cigarette smoking among adolescents in Northwest Ohio: correlates of prevalence and age at onset. *Int J Environ Res Public Health* 5: 278-289.
- Smith BN, Bean MK, Mitchell KS, Speizer IS, Fries EA (2006) Psychosocial factors associated with non-smoking adolescents' intentions to smoke. *Health Educ Res* 22: 238-247.
- Gilman SE, Rende R, Boergers J, Abrams DB, Buka SL, et al. (2009) Parental smoking and adolescent smoking initiation: an intergenerational perspective on tobacco control. *Pediatrics* 123: 274-281.
- Yang T, Wu J, Rockett IR, Abdullah AS, Beard J, et al. (2009) Smoking patterns among Chinese rural-urban migrant workers. *Public Health* 123: 743-749.
- Cui X, Rockett IR, Yang T, Cao R (2012) Work stress, life stress, and smoking among rural-urban migrant workers in China. *BMC Public Health* 12: 979.
- Cattaruzza MS, West R (2013) Why do doctors and medical students smoke when they must know how harmful it is? *Eur J Public Health* 23: 188-189.
- Uysal MA, Dilmen N, Karasulu L, Demir T (2007) Smoking habits among physicians in Istanbul and their attitudes regarding anti-smoking legislation. *Tuberk Toraks* 55: 350-355.
- Husky MM, Mazure CM, Paliwal P, McKee SA (2008) Gender differences in the comorbidity of smoking behavior and major depression. *Drug Alcohol Depend* 93: 176-179.
- Tsai YW, Tsai TI, Yang CL, Kuo KN (2008) Gender differences in smoking behaviors in an Asian population. *J Womens Health (Larchmt)* 17: 971-978.
- Bushnell PT, Colombi A, Caruso CC, Tak S (2010) Work schedules and health behavior outcomes at a large manufacturer. *Ind Health* 48: 395-405.
- van Amelsvoort LG, Jansen NW, Kant I (2006) Smoking among shift workers: More than a confounding factor. *Chronobiol Int* 23: 1105-1113.