Tobacco Use and its Relationship with Health Complaints Among Employees of Kermanshah Province, Iran

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ABSTRACT

Background: Identifying the pattern of tobacco use and its related factors in employees is crucial. This study aimed to investigate the pattern of tobacco use and its related factors in employees of Kermanshah Province, Iran.

Methods: In 2012, 7129 employees were investigated in a cross-sectional study using the census method. Data on tobacco use and on several chronic diseases obtained using a standardized questionnaire on noncommunicable diseases risk factors of the World Health Organization through face-to-face interviews. Statistical analysis was performed based on the Chi-square test and multivariate logistic regression.

Results: In general, the prevalence of tobacco use, smoking cigarettes, and smoking waterpipe was 9.9%, 8.9%, and 1.2% among the employees, respectively. Tobacco use was significantly higher in the age group over 40 (14.0%), in male gender (13.3%), in married individuals (10.8%) and in those with diploma and lower degree (16.4%), ($P < 0.001$). At the individual level, the odds ratio of tobacco use was 1.5 (95% confidence interval [CI]: 1.2–1.8) in hypertensive, 1.8 (95% CI: 1.2–2.6) in diabetic employees and 1.7 (95% CI: 1.3–2.3) in those with heart diseases, compared to healthy individuals. After adjusting for age, gender, marital status and educational level, there was not any significant relationship between tobacco use and health complaints and only the demographic variables remained significant.

Conclusions: Preventive public health policies are mandatory especially in younger ages and male employees to promote their knowledge on disadvantages of tobacco use.

Keywords: Cigarette, diabetes, employee, heart diseases, hypertension, tobacco, water-pipe

INTRODUCTION

Tobacco use can be considered one of the main global risk factors leading to the death of nearly 6 million

people every year across the world and causing billions of dollars in economic loss.[1] Tobacco use among employee is important because of its effect on the overall performance and the work environment. Establishing tobacco prevention rules not only reduce the direct use of tobacco but also decreases employee's indirect exposure to the substance, thereby decreasing the incidence of heart diseases and relevant diseases in nonsmokers.[2]

The prevalence and overall status of tobacco use; particularly cigarette smoking, and its gender distribution among the employees working in different countries do not follow a consistent pattern. For example, the rate of cigarette smoking in physicians from different parts of Europe, Africa, America, and Asia was 37%, 29%, 25%, and 17.5%, respectively. In addition, the rate of cigarettes smoking was higher among male employees than among female employees in most studies.[3]

The studies conducted to date in Iran on tobacco use among the employees have been more focused on their cigarette smoking and have less have investigated the pattern of tobacco products such as the water-pipe. Moreover, these other studies have not investigated the overall status of tobacco use and its relationship with relevant factors.[4,5] Understanding the relationship between common diseases in Iran, such as diabetes and heart diseases, and tobacco use among the surveyed employees can be useful. Furthermore, this study aimed to determine the pattern of tobacco use on a larger scale among the employees of Kermanshah Province in Western Iran.

METHODS

Study design and participants

The present cross-sectional study was conducted in 2012 on 7129 employees aged 22–85 employed in Kermanshah Province using the census method. All employees worked in hospitals, insurance organization, telecommunication company, universities, health centers, registry offices, and judiciary. First, we sent an invitation to all organizations to participate voluntarily in this study. Next, between all governmental organizations, the numbers of 7129 employees declared that are ready to participate in this study. Our goal was collecting data based on the census method, but due to the rejection of our invitation from some organs, we investigated the voluntary organs using the census method. Data collected pertained to Kermanshah, Qasr-e Shirin, Ravansar, Javanrood, Harsin, Sonqor, Dalahoo, and Gilan-e Gharb.

Study instruments

The standardized stepwise questionnaire for noncommunicable diseases (NCDs) risk factor surveillance of the World Health Organization (including tobacco use, hypertension [HTN], diabetes, heart diseases, and osteoporosis) was used for the standardization and accurate collection of data on the status of tobacco use and its relationship with other variables in question. The validated Persian questionnaire obtained from Iran's health ministry and since it was used in the study of Meysamie *et al.* in a national study on the pattern of tobacco use in Iranian population[6] we rely on this national study. In addition, the scale score reliability of alpha Cronbach was estimated 0.85 in this study. The health personnel collected the responses through face-to-face interviews. The questionnaire consisted of three parts. The first part included demographic items on age, gender, marital status (single or married) and educational level (with diploma and lower or with higher than diploma education), and the second part included data on tobacco use, containing items about the daily frequency of cigarette smoking (either 1–9 cigarettes, 10–19 or 20 and more), the age of starting smoking, smoking history, the age of quitting, passive smoking at home and in the workplace (at least once a week or more than once a week) and the current status of daily cigarette (factory-rolled cigarettes, hand-rolled cigarettes or cigars) and water-pipe smoking. To assess the current daily status of tobacco use, the variables of smoking cigarettes and smoking waterpipe were combined and the new variable was called general tobacco use. Current use of tobacco and its related components was defined as those who currently used cigarette or water pipe continuously without considering its pattern of use and the daily use was defined as those who used one tobacco product each day of the week.

The other part of the questionnaire included items with yes/no responses about HTN, diabetes, heart diseases, and osteoporosis, for example, "Has any physician or health personnel ever warned you about the risk of developing one of the discussed conditions or not?." To categorize the people as hypertensive, a mean systolic blood pressure of ≥140 mmHg and/or a diastolic blood pressure of ≥90 mmHg or those who reported the use of antihypertensive treatment during the previous 2 weeks were considered to have HTN. In addition, diabetes was defined as having diabetes diagnosed by a physician or health personnel during last year with yes/no responses and/or those who reported the use of antidiabetic medications during the previous 2 weeks.[7]

The present study observed the principles of research ethics for questioning and data collection. After the research proposal was approved by the Ethics Committee of Kermanshah University of Medical Sciences, depending on the respondent's gender, female or male researchers visited the study subjects' workplace and delivered the questionnaires to fill out after obtaining their consent to participate in the study and fully explaining the study objectives and ensuring them of the confidentiality of their data. To increase the accuracy of responses and

freedom from job preoccupations, it was coordinated with each relevant department's authority to provide the respondents with questionnaires during hours in which administrative visitors were scarce.

Statistical analysis

Data collected were entered into SPSS-20 (Chicago, IL, USA). The independent *t*-test was then used to evaluate the relationship between qualitative and quantitative variables and the Chi-square test was used to assess the relationship between the qualitative variables. The odds ratio (OR) measure was used to investigate the relationship between tobacco use and the subjects' health complaints. In the hypotheses testing, $P < 0.05$ was considered significant.

Study project number and ethical approval code of study were 91255 and KUMS.ARBC.1394.245, respectively.

RESULTS

The mean and standard deviation (±SD) age of the 7129 Kermanshah Province office workers was 41.5 ± 8.5, 73.2% of whom were male, 84.1% were married and 63.1% had higher than diploma education. Overall, the daily frequency of cigarette smoking was 1–9 in 47.9% of the subjects ($n = 284$), 10–19 in 26.1% ($n = 155$) and 20 or more in 26% ($n = 154$). The mean and ± SD age of starting smoking was 23.5 ± 7.5 in male and 21 ± 1.4 in female gender, but the difference was not significant between the groups ($P = 0.6$). In addition, 4% of the subjects ($n = 279$) used to smoke in the past, including 5.5% of the men ($n = 277$) and only 0.2% of the women ($n = 2$); ($P < 0.001$). The mean and SD age of quitting smoking was 35.5 ± 9.6 in men and 27 ± 11.31 in women, but the difference was not significant between the groups ($P = 0.2$). In terms of exposure to secondhand smoke at home, 1% of the subjects ($n = 69$) were exposed to it at least once a week and 3.7% ($n = 263$) more than once a week. The rate of exposure to secondhand smoke was higher in the workplace, and 1.1% of the subjects ($n = 75$) were exposed to their colleagues' secondhand smoke at least once a week and 5.9% ($n = 416$) more than once a week.

The prevalence of tobacco use was 9.9% among the subjects studied, with the rate being significantly higher in the age group over 40 (14.0%) than in the age group of 40 and below (5.1%), in men (13.3%) than in women (0.6%), in married individuals (10.8%) than in singles (5.2%) and in individuals without higher than diploma education (16.4%) than in those with university education (6.1%); ($P < 0.001$). Although the daily tobacco use was more in the age group over 40 (94.7%, $P = 0.24$), males (94.2%, $P = 0.21$), singles (94.3%, $P = 0.99$), and those with diploma and lower education (96%, $P = 0.01$), the relationships were not significant except

in the relationship between daily tobacco use and having diploma and lower education [Table 1].

The rate of current cigarette smoking was 8.9% among the subjects studied, with the rate being significantly higher in the age group over 40 (13.4%) than in the age group of 40 and below (3.4%), in men (12%) than in women (0.3%), in married individuals (9.8%) than in singles (3.7%), and in individuals with diploma and lower education (15.0%) than in those with higher than diploma education (5.3%); ($P < 0.001$). Although no significant relationships were observed between daily smoking and demographic variables, the frequency of daily smoking was higher in age groups higher than 40 (95.3%, $P = 0.8$), males (95.6%, $P = 0.16$), singles (100%, $P = 0.24$), and employees with diploma and lower education (96.6%, $P = 0.1$) than in their counterpart groups [Table 2].

The prevalence of current waterpipe smoking was 1.2% among the subjects studied, with the rate being significantly higher in the age group of 40 and below (1.8%) than in the age group over 40 (0.7%, $P < 0.001$), in men (1.5%) than in women (0.3%, $P < 0.001$), and in individuals with diploma and lower education (1.7%) than in those with higher than diploma education (0.9%); ($P = 0.007$). Although the prevalence of daily waterpipe smoking was higher among single individuals (1.6%) compared to married ones (1.1%), the difference was not significant ($P = 0.18$). In age groups ≤ 40 years (83.0%, $P = 0.28$), married participants (79.6%, $P = 0.99$) and employees with diploma and lower education (87.2%, $P = 0.06$), the frequency of daily waterpipe use was higher than their

Table 1: Current and daily tobacco use in the employees of Kermanshah Province, Iran

Variables	Current tobacco use *n* (%)		*P*	Daily tobacco use *n* (%)		*P*
	No	Yes		No	Yes	
Age groups (years)						
≤40	3047 (94.9)	163 (5.1)	<0.001	12 (7.9)	139 (92.1)	0.24
>40	3298 (86.0)	537 (14.0)		28 (5.3)	497 (94.7)	
Gender						
Male	4483 (86.7)	689 (13.3)	<0.001	39 (5.8)	633 (94.2)	0.21
Female	1862 (99.4)	11 (0.6)		1 (25.0)	3 (75.0)	
Marital status						
Single	1058 (94.8)	58 (5.2)	<0.001	3 (5.7)	50 (94.3)	0.99
Married	5287 (89.2)	642 (10.8)		37 (5.9)	586 (94.1)	
Educational level			<0.001			
Diploma and lower	2178 (83.6)	428 (16.4)		17 (4.0)	403 (96.0)	0.01
Higher than diploma	4167 (93.9)	272 (6.1)		23 (9.0)	233 (91.0)	
Total	6345 (90.1)	700 (9.9)		40 (5.9)	636 (94.1)	

counterpart groups, but their relationships were not significant [Table 3].

In terms of the relationship between tobacco use and the subjects' health complaints, the OR of tobacco use was found significantly higher in individuals with HTN, diabetes and heart diseases than in the healthy subjects; more precisely, the OR of tobacco use was

1.5 (95% CI: 1.2–1.8) in hypertensive subjects, 1.8 (95% CI: 1.2–2.6) in individuals who had diabetes and 1.7 (95% CI: 1.3–2.3) in those with heart diseases compared to the healthy subjects. Although there was no relationship between tobacco use and the development of osteoporosis, the rate of tobacco use increased in individuals with osteoporosis compared to the healthy subjects [Table 4].

After adjusting for age, gender, marital status, and educational status, there was not any significant relationship between health complaints and tobacco use while age groups, gender, and educational status remained significant. The OR of tobacco use in employees >40 years was 2.2 (95% CI: 1.8–2.7), in male gender was 22.0 (95% CI: 12.0–40.5), and in employees with diploma and lower education was 2.1 [95% CI: 1.8–2.5; Table 5].

DISCUSSION

Tobacco use (smoking cigarettes and water-pipe) and cigarette smoking, taken separately, were observed in one-tenth of the employees studied, with the rate being higher in the age group over 40 and among the men compared to the others. Tobacco use was significantly higher among the employees who had HTN, diabetes and heart diseases.

In this study, the prevalence of tobacco use (cigarettes and water-pipe) and cigarette smoking was 9.9 and 8.9% among the employees studied. According to the latest studies conducted among Iranians, about 15% of the entire population and 16% of the medical staff tend to use tobacco.[6,8] The small difference in the results obtained by the present study and the state of tobacco use among the general public might be due to the higher levels of knowledge among the employees about health issues as more than 60% of the people surveyed had a university education. In a study conducted on employees of Bonab in Northwestern Iran, 19.5% smoked cigarettes, the higher prevalence of which might be due to the particular sample studied, in which health personnel, who are often less likely to smoke cigarettes, were not surveyed at all.[4] In another study conducted in 2010 on the health personnel employed in Kermanshah, 12% smoked, which is similar to our results.[9] The global prevalence of tobacco use does not appear to follow a consistent pattern; for example, the rate was higher in Pakistani workers (37.5%), in Poland (27%), and in Finland (18.6%), but in studies conducted in China and Malaysia, the rate was 10%, which is almost similar to the results obtained by the present study.[10-14] The different patterns emerged might be attributed to the type of employees surveyed, the cultural differences and also tobacco prevention rules in the workplace – the latter of which might have even caused underreporting on the part of the employees in an effort to avoid risking their jobs.[2,15]

Table 2: Current and daily smoking use in the employees of Kermanshah Province, Iran

Variables	Current smoking use n (%)		P	Daily smoking use n (%)		P
	No	Yes		No	Yes	
Age groups (years)						
≤40	3100 (96.6)	110 (3.4)	<0.001	4 (3.7)	104 (96.3)	0.8
>40	3320 (86.6)	514 (13.4)		24 (4.7)	487 (95.3)	
Gender						
Male	4553 (88.0)	619 (12.0)	<0.001	27 (4.4)	588 (95.6)	0.16
Female	1867 (99.8)	5 (0.3)		1 (25.0)	3 (75.0)	
Marital status						
Single	1075 (96.3)	41 (3.7)	<0.001	0 (0.0)	40 (100.0)	0.24
Married	5345 (90.2)	583 (9.8)		28 (4.8)	551 (95.2)	
Educational level						
Diploma and lower	2215 (85.0)	390 (15.0)	<0.001	13 (3.4)	373 (96.6)	0.1
Higher than diploma	4205 (94.7)	234 (5.3)		15 (6.4)	218 (93.6)	
Total	6420 (91.1)	624 (8.9)		28 (4.5)	591 (95.5)	

Table 3: Current and daily water-pipe use in the employees of Kermanshah Province, Iran

Variables	Current water-pipe use n (%)		P	Daily water-pipe use n (%)		P
	No	Yes		No	Yes	
Age groups (years)						
≤40	3145 (98.2)	59 (1.8)	<0.001	8 (17.0)	39 (83.0)	0.28
>40	3805 (99.3)	27 (0.7)		5 (31.2)	11 (68.8)	
Gender						
Male	5086 (98.5)	80 (1.5)	<0.001	13 (20.6)	50 (79.4)	*
Female	1864 (99.7)	6 (0.3)		-	-	
Marital status						
Single	1096 (98.4)	18 (1.6)	0.18	3 (21.4)	11 (78.6)	0.99
Married	5854 (98.9)	68 (1.1)		10 (20.4)	39 (79.6)	
Educational level						
Diploma and lower	2559 (98.3)	44 (1.7)	0.007	5 (12.8)	34 (87.2)	0.06
Higher than diploma	4391 (99.1)	42 (0.9)		8 (33.3)	16 (66.7)	
Total	6950 (98.8)	86 (1.2)		13 (20.6)	50 (79.4)	

*=This value wasn't provided due to the absence of daily water-pipe smoking in the female group

Table 4: Relationships between current tobacco use and health complaints in employees of Kermanshah Province, Iran

Variables	Current tobacco use n (%)		P
	No	Yes	
HTN			
No	5106 (90.9)	512 (9.1)	<0.001
Yes	1210 (86.9)	182 (13.1)	
Diabetes			
No	6149 (90.3)	662 (9.7)	0.02
Yes	186 (83.4)	37 (16.6)	
Heart disease			
No	6060 (90.3)	648 (9.7)	0.001
Yes	277 (84.2)	52 (15.8)	
Osteoporosis			
No	6215 (90.1)	682 (9.9)	0.3
Yes	112 (87.5)	16 (12.5)	

HTN=Hypertension

Table 5: Crude and adjusted odds ratio of desired variables in employees of Kermanshah Province, Iran

Variables	95% CI	
	Crude ORs	Adjusted OR
Age groups (years)		
≤40	1	1
>40	3.0 (2.5-3.6)	2.2 (1.8-2.7)
Gender		
Male	26.0 (14.3-47.3)	22.0 (12.0-40.5)
Female	1	1
Marital status		
Single	1	1
Married	2.2 (1.7-2.9)	1.4 (1.0-2.0)
Educational level		
Diploma and lower	3.0 (2.5-3.5)	2.1 (1.8-2.5)
Higher than diploma	1	1
HTN		
No	1	1
Yes	1.5 (1.2-1.8)	0.9 (0.7-1.1)
Diabetes		
No	1	1
Yes	1.8 (1.2-2.6)	1.2 (0.8-1.8)
Heart disease		
No	1	1
Yes	1.7 (1.3-2.3)	1.3 (0.9-1.8)

HTN=Hypertension, ORs=Odds ratios, CI=Confidence interval

In this study, the rate of tobacco use was higher among individuals over 40 compared to the younger individuals. Studies conducted by Fasoro et al.[11] and Veeranki et al.[16] also showed a higher tendency to smoke cigarettes in the employees over 40, which is in line with the present findings. Smith et al. also found a direct relationship between employee's increase in age and increase in smoking, except for those over the age of 60.[17] In terms of the age pattern, tobacco use might be said to follow an increasing trend with the increase in age among Iranians just as among people of many other countries, although the pattern is starker among those over the age of 40, which is also true for the present study.[6]

The prevalence of cigarette smoking among Iranians is higher than water-pipe smoking and is higher among men (24.6%) than among women (3.3%);[18] In the present study, 12% of the men and 0.3% of the women smoked, based on which the tobacco use pattern observed in the majority of the Iranian society can also be attributed to the employees employed in Kermanshah Province, in which the tendency to smoke is higher in men than in women. As already mentioned, due to the differences in the education levels of the employees and the general public, and also given the former's greater knowledge about health issues, the lower levels of tobacco use among the male and female employees surveyed compared to the entire population of the country seems reasonable. Cigarette smoking is a stigma for Iranian women, making under-reporting in their case very likely. Confirming this argument, a study conducted in one region of Iran compared tobacco use among women through both self-reports and biochemical measurements (based on serum levels) and found a significant difference between the actual prevalence of tobacco use in the two groups (1.3% vs. 6.7%, in respective order).[19] In research conducted on Malaysian workers, the rate of cigarette smoking in men and women was 26.5 and 0.5%, respectively. Given that both Iran and Malaysia are Muslim countries and also that tobacco use is not common among the women in these countries, it can be inferred that the prevalence of tobacco use is similar among Iranian and Malaysian women.[11]

The results of this study showed that in individual analysis the tobacco use was significantly higher among the employees who suffered from diabetes and heart diseases while after adjusting for demographic variables this relationships wasn't significant; the OR of tobacco use was 1.8 in the diabetic and 1.7 in individuals with heart diseases compared to the healthy subjects. A link was shown in several studies between tobacco use and the risk of diabetes and heart diseases.[20-22] In a study conducted to determine the incidence of cardiovascular diseases in Swedish employees, an almost similar finding showed that the risk of developing cardiovascular diseases is 1.8 times greater in smokers compared to nonsmokers, and their death is thus more likely too.[23] In a prospective study conducted on 25,464 Japanese employees, a direct relationship was seen between the dose of cigarettes smoked per day and the hazard of cardiovascular diseases; this link was found to be so strong that smoking even 1–10 cigarettes/day increased the risk of cardiovascular diseases among the employees.[24] In general, according to

the latest studies conducted on the risk factors of NCD in a sample of employees in Kermanshah, tobacco use and other risk factors of diabetes and heart diseases were substandard, just as in other groups in the society, which necessitates further attention, as quitting smoking can prevent the development of cardiovascular diseases in the employees,[9,7]

The first strength of this study was its large sample size, which can be said to have covered samples from all the classes of employees in Kermanshah Province. In addition, given the possibility of the employee's leave on missions, the authorities were informed in advance of the researcher's plan for visit so as to maximize participation rates. Using the standardized stepwise protocol for NCD risk factor surveillance of the World Health Organization as the study's method of data collection is another point of strength that confirms the validity and reliability of the results.

Being a statistical report on cigarette smoking and diseases among the employees, a limitation of the present study was the possibility of the employees, especially the female employees, having under-reported and created a social desirability bias for fear of losing their job position. This limitation should be minimized in future studies, or the exact prevalence of tobacco use should be measured through clinical trials.

CONCLUSIONS

The prevalence of tobacco use (smoking cigarettes and water-pipe) and each one taken separately, i.e., smoking cigarettes and smoking waterpipe, was lower in the employees surveyed compared to the several studies conducted on Iranian employees and across the world. The health complaints were no significant in relation with tobacco use. Preventive public health policies are mandatory especially in younger ages and male employees to promote their knowledge on disadvantages of tobacco use.

Conflicts of interest
There are no conflicts of interest.

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