

Sociodemographic Characteristics and Secondhand Smoke Exposure among Women

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Background: Exposure to secondhand cigarette smoke is an important health hazard. This study was designed to assess the sociodemographic risk factors related to women's exposure to secondhand smoke.

Materials and Methods: A case-control analysis of data collected as part of a prospective cohort study was conducted. Participants were 340 female Tehran residents exposed to cigarette smoke. Women consented to participate in this study and completed a questionnaire containing socio-demographic characteristics, household characteristics and smoking status at home through a face-to-face interview. Factors related to women's exposure to secondhand smoke were assessed using the multivariate logistic regression model.

Results: The final multivariate logistic regression model showed that lower levels of education ($p=0.002$) and social class ($p=0.03$) increase the risk of exposure to secondhand smoke in women.

Conclusion: These results support the effect of women's educational level and social class on their exposure to secondhand smoke.

Key words: Secondhand smoke exposure, Women, Characteristics

INTRODUCTION

Tobacco use is a constant threat to the health of women and future generation, affecting a woman's life from birth to fertility, adulthood and menopause (1), and compromising their quality of life (2). Cigarette smoking is the most common type of tobacco use worldwide. The prevalence of smoking has decreased in industrialized countries; however, it is increasing in developing countries like Iran (1). Tobacco use, especially cigarette smoking, passively exposes others to secondhand smoke at home, at work or in public places (3). Previous studies indicate that approximately 43% of non-smokers are exposed to cigarette smoke in various locations (4).

Scientific studies over the past decades have shown numerous hazards of smoke exposure in children and adults (5). Secondhand smoke exposure increases the risk of various diseases including respiratory diseases, asthma, chronic bronchitis, emphysema, cardiovascular disorders, and cancer (6,7).

Exposure to secondhand smoke not only jeopardizes the physical health but also endangers mental health, resulting in lower mood, sleep disorders, and depression (8,9). According to recent reports, more than 250 million women worldwide are passive smokers (10) and in Iran, the rates of current cigarette smoking were 26.1% in men and 3.2% in women (11). A recent study conducted in

Tehran showed that 35.7% of families had at least one smoker member at home (the husband in 97.8% of cases) (12). Thus, women are the minority in terms of smoking in Iran because of cultural barriers. This profile implies that women are the main at risk population for secondhand smoke exposure (13).

Some studies have shown that numerous factors including social class, educational level and smoking status, can affect secondhand smoke exposure in women (11,13). These factors are different in various populations. Recognizing these factors can provide valuable information to design strategies for reduction of secondhand smoke exposure and smoking cessation programs (14).

Considering the lack of a similar study in Iran, this study was designed to determine the risk factors related to secondhand smoke exposure in women.

MATERIALS AND METHODS

Sampling of Participants

The data in the present study were collected as part of a prospective study on the effect of secondhand smoking on breastfeeding. This is a case-control study conducted in 2011. Using the smoking prevalence among men in Iran (26%), obtained from the previous studies (11), a confidence interval of 95%, and power of 80%, a minimum of 170 women were required per group. The study population consisted of all women residing in Tehran. Participants were 340 women referring to five health care centers in southern Tehran.

The inclusion criteria were as follows: age 18-35, Iranian race, non-smoker without substance abuse, resident of Tehran, providing an informed consent and women in the case group had to have exposure to cigarette smoke only. Smoker members in the family with reported usage of other addictive substances or being under smoking cessation treatment were excluded from the study.

A questionnaire consisting of three parts, 12 questions on demographic characteristics, 3 questions on household

characteristics and 10 questions on smoke exposure status was completed thorough face-to-face interview. The questionnaire was derived from the study of Baheiraei et al. with permission of the principal investigator (15). The questionnaire was reviewed by 7 experts of public health to ensure its cultural appropriateness and was validated in a pilot study. An acceptable one-week reliability test with a minimum Kappa coefficient of 0.82 for qualitative variables and minimum Pearson's correlation coefficient of 0.80 for quantitative variables was obtained.

A total of 358 subjects who met the inclusion criteria, were invited to participate and almost all women (340 or 95%) agreed to participate in the study. Prior to participation, all women provided written informed consent. This study was also approved by the Ethics Committee of Tehran University of Medical Sciences. The case group consisted of women who reported daily exposure to at least one cigarette smoke at home, and the control group comprised of women who reported no exposure to cigarette smoke at home.

Factors related to smoke exposure

Factors related to secondhand smoke exposure in women included the socio-demographic characteristics of families (age, level of education, occupation, social class, number of children, income and marital status), household characteristics (crowding index, home size), the place of exposure, the number of smokers in the family, the number of cigarettes smoked per day in presence of women and smoke-free rules at home which were all obtained by the questionnaires and through face-to-face interview.

Social class was assessed using the classification proposed by the United State Library of Congress (16), including four categories based on the occupation of the head of household: upper class (large landowners, industrialists, financiers, and merchants); middle class (managers of private and nationalized companies, teachers, medium-scale landowners, clergy and military officers); working class (skilled and semi-skilled workers in manual occupations: industry, construction, and so forth); and lower class (unemployed or seasonal laborers and

unskilled workers such as porters, street cleaners, street vendors, gardeners, laundry workers, and bakery workers).

The adequacy of family income was assessed in three categories reflecting the family monthly income status according to the classification proposed by Baheiraei et al. (15), including: adequate (satisfied with the monthly income), relatively adequate (fairly satisfied with the income), and inadequate (dissatisfied with the monthly income).

Data analysis

The factors related to smoke exposure of women were evaluated using multivariate logistic regression analysis. All data were analyzed using the Statistical Package for the Social Sciences (SPSS version 16; SPSS Inc., Chicago, IL).

RESULTS

Characteristics of Participants

The mean age of women was 27.3 years (SD = 4.3); they were all married, except for one woman in the case group. In this study, 156 women (91.8%) in the case group and 147 women (86.5%) in the control group were housewives. Three-hundred and twelve households (91.76%) were categorized as highly populated and 130 individuals (76.5%) in the case group and 114 (67.1%) in the control group had a relatively adequate income.

As shown in Table 1, the socio-demographic characteristics of the exposed and non-exposed women were compared. The two groups were similar except for four variables of age, social class and level of education of women and their husbands. Exposed women had a higher mean age and a lower level of education compared to non-exposed women. Forty-three women (25.3%) in the case group were older than 25 years, versus 29 women (17.1%) in the control group ($p = 0.06$). One hundred and twenty-one women (71.2%) in the control group had high school diploma or higher educational levels versus 85 women (50%) in the case group ($p < 0.001$).

The level of education of smoking husbands was lower than non-smoking men, as 100 husbands (58.8%) in the

control group had a high school diploma or higher degrees versus 75 husbands (44.1%) in the case group ($p = 0.02$).

Women's secondhand smoke exposure

Secondhand smoke exposure status of exposed women is presented in Table 2. In 151 families (88.8%) in the case group, the husband was the smoker and in 19 families (11.2%), other family members were smokers. According to findings, all women in the case group had daily exposure to cigarette smoke at home and approximately 17% were exposed to cigarette smoke daily both inside and outside their households. These findings may indicate that women are more often exposed to cigarette smoke at home than in public places.

According to the women's reports, the mean number of cigarettes smoked daily in their presence at home was 6 cigarettes (range = 1-40) and the mean duration of exposure was 30 min (range = 3-200) per day. In 24.8% of households in the exposed group smoking was allowed at home, more than half the households (75.2%) had relative ban of smoking at home (smoking was allowed in the balcony, in staircase and beside the opened window), and no household had absolute restriction of smoking at home.

Factors related to women's secondhand smoke exposure

To evaluate factors related to secondhand smoke exposure in women, the variables including social class, educational level of husbands, women's age and educational level were entered into logistic regression model. The multivariate logistic regression model showed that lower levels of education increased the risk of women's exposure to secondhand cigarette smoke ($p=0.002$). Women with an elementary education were more likely to be exposed to cigarette smoke compared with those who had a high school diploma or higher levels of education (OR = 2.43; 95% CI: 1.19-4.93). Women who had lower levels of social class were exposed to cigarette smoke more often than those of upper social classes ($p=0.03$). Therefore, a higher level of education and social class in women reduced the risk of their exposure to secondhand smoke. The result of multivariate logistic regression analysis is presented in Table 3.

Table 1. Socio-demographic characteristics of participants

Characteristics	Case (n = 170)	Control (n = 170)	P-value*
Woman's age (years)			
≤25	127 (74.7)	141 (82.9)	0.06
>25	43 (25.3)	29 (17.1)	
Husband's age (years)			
<30	46 (27.1)	44 (25.9)	0.41
30-35	80 (47.1)	91 (53.5)	
>35	44 (25.9)	35 (20.6)	
No. of children			
1	92 (54.1)	97 (57.1)	0.58
>1	76 (45.9)	73 (42.9)	
Marital status			
Married	169 (99.4)	170 (100)	1
Divorced	1 (0.6)	0	
Woman's educational level			
Elementary	37 (21.8)	22 (12.9)	<0.001
Intermediate	48 (28.2)	27 (15.9)	
High school diploma and higher	85 (50)	121 (71.2)	
Husband's educational level			
Elementary	24 (14.1)	21 (12.4)	0.02
Intermediate	71 (41.8)	49 (28.8)	
High school diploma and higher	75 (44.1)	100 (58.8)	
Woman's occupational status			
Employed	14 (8.2)	23 (13.5)	0.11
Housewife	156 (91.8)	147 (86.5)	
Adequacy of family income			
Adequate	21 (12.4)	34 (20)	0.11
Relatively adequate	130 (76.5)	114 (67.1)	
Not adequate	19 (11.2)	22 (12.9)	
Social class by husband's occupation			
Lower class	55 (45.3)	34 (14.7)	0.002
Working class	26 (15.3)	20 (11.8)	
Middle class	80 (34.1)	110 (70)	
Upper class	9 (5.3)	6 (3.5)	
Crowding index			
Low (<1)	1 (0.6)	1 (0.6)	0.77
Moderate (1)	11 (6.5)	15 (8.8)	
High (>1)	158 (92.9)	154 (90.6)	
Home size, mean ± SD (m²)			
Range	60.64 ± 20.72 20-145	62.32 ± 21.95 25-170	0.47

Values are presented as *n*(%) unless otherwise indicated.

*Chi-square test and independent t test, significant at $p < 0.1$

Table 2. Smoke exposure status in women.

Factors	N = 170
Source of smoke exposure	
Home	142 (83.5)
Home and other places	28 (16.5)
No. of smokers	
1	160 (94.1)
>1	10 (5.9)
No. of exposures to cigarette smoke per day	
≤10	121 (71.2)
>10	49 (28.8)
Mean exposure duration (min) (range)	29.81 (3–200)
Smoke free rules at home	
Allowed	42 (24.8)
Not allowed, with some exceptions	128 (75.2)
Never allowed	0

Values are presented as *n* (%) unless otherwise indicated.

Table 3. Factors related to secondhand smoke exposure in women: Multivariate logistic regression analysis.

Factors	OR	95% CI	<i>p</i> value
Woman's age (years)			
≤25	0.59	0.34–1.02	0.06
>25	1	–	–
Woman's educational level			
Elementary	2.43	1.19–4.93	0.002
Intermediate	2.22	1.24–3.96	0.007
High school diploma or university education	1	–	–
Husband's educational level			
Elementary	0.9	0.41–1.99	0.8
Intermediate	1.47	0.88–2.46	0.13
High school diploma or university education	1	–	–
Social class by husband's occupation			
Lower class	1.897	1.203–2.43	0.03
Working class	1.714	1.283–2.12	0.02
Middle class	1.602	1.122–1.08	0.02
Upper class	1	–	–

Abbreviation: OR, odds ratio; CI, confidence interval.

DISCUSSION

This study showed that social class and level of education are associated with women's secondhand smoke exposure. Xiao et al. reported that younger women are at a greater risk of exposure to secondhand smoke (17) such a relationship was not found in the present study. In our

study, the smoker members in the households were husbands. This finding showed that smoker men should be the target group for health warnings.

Numerous studies performed in different countries reported conflicting results regarding the relationship between the educational level and smoking status. For

instance, some studies were able to confirm that lower levels of education increase the risk of exposure to secondhand smoke (17,18). In a study in the United States, women were asked about smoking habits. It was found that women reporting high level exposure were more likely to have no college education (19).

In a study conducted by Ma et al. secondhand smoke exposure was significantly associated with educational levels, and participants with graduate degrees were at lower risk of smoke exposure than individuals with lower educational levels (20). In contrast; this finding has not been shown in some other studies (12,21). Shiva and Padyab stated that awareness and insight are more essential than knowledge in adopting an appropriate social behavior, and having knowledge (education) does not necessarily reflect awareness (12).

In the present study, it was shown that a higher level of education and social status in women reduced the risk of their exposure to secondhand smoke. The results of the present study indicated that wives of unemployed or unskilled workers had more exposure to cigarette smoke than those of skilled workers and employers. Shiva and Padyab revealed the lower prevalence of smoking in higher social classes (12). Furthermore, Kelishadi et al. reported poverty to be a risk factor for smoking (22). These results show that families in lower social classes suffer more from the negative effects of secondhand smoke exposure. Thus, an approach of no smoking at home and avoidance of passive smoking is possibly necessary in these households.

Study strengths and limitations

Iran has high tobacco consumption rate because of high smoking rate of about 26% by Iranian men. Women are the minority in terms of smoking in Iran because of cultural barriers: smoking is considered an undesirable practice among women, and it is actually looked upon as a disgraceful behavior in the Iranian society (23). One of the most important strength points of this study was recruiting a large group of non-smoking women in smoking households.

The limitations of this study included relying on subjective questionnaires and not measuring cotinine levels objectively in the laboratory. However, many other studies relying on self-reports about smoke exposure have found an accurate correlation between cotinine levels and self-reports, indicating the suitability of questionnaires as a means of measuring exposure (24,25). In addition, not considering lifestyle and dietary habits is another limitation of this study. Finally, it seems that the generalizability of the study results may be limited because all participants were married in this study. This limitation needs to be addressed in future studies.

This study supports the effect of social class and educational levels on secondhand smoke exposure of women in Tehran. In order to reduce secondhand smoke exposure, its determinant factors should be controlled. Based on the present study results, it seems that improving women's awareness and insight about cigarette smoke exposure can promote health status. Prevention of secondhand cigarette smoke exposure is being emphasized as a crucial factor for social and public health.

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