STRESS LEVEL AND SMOKING STATUS IN CENTRAL IRAN: ISFAHAN HEALTHY HEART PROGRAM

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Abstract

BACKGROUND: Individuals are faced with numerous stressful life events which can negatively influence mental health. Many individuals use smoking as a means of confronting stress. Given the relatively high prevalence of smoking in central Iran, the present study was conducted to compare stress levels in smokers, non-smokers and those who had quit smoking.

METHODS: This study was conducted as part of Isfahan Cardiovascular Research Program on 9752 individuals in the cities of Isfahan, Arak, and Najafabad in 2008. Sampling was performed using multi-stage cluster randomization method. Data on age, sex, demographic characteristics, and smoking status was collected through interviews. Stress level detected by General Health questionnaire. Logistic regression and chi- squere test was used for data analyzing.

RESULTS: In the present study, 30% of non-smokers, 32.1% ex- smoker and 36.9% of smokers had GHQ of 4 and higher (P = 0.01). In regression analysis, the final model which was controlled for age, sex, socioeconomic statues (including place of residence, marital status and education level) showed that the odds ratio of stress in smokers and ex- smoker was significantly higher than in non-smokers (OR = 1.66 and OR = 1.12, respectively).

CONCLUSION: Since in conducted studies, mental problems and stresses have had an important role in people's smoking, it seems suitable to use the results of this study to present intervention for correct methods of coping with stress towards reducing the prevalence of smoking in the community.

Introduction

People are faced with numerous stressful events in life. Stress is defined as conditions which are followed by tension, mental disturbance, dissatisfaction and sadness of an individual and will lead to disability and even death if they continue.[1]

Mental stress has been associated with a 1.5-2.5 times increase in mortality in the community and based on existing evidence, such increase in mortality can be explained due to the relationship between stress and unhealthy life resulting from it.[2] Unhealthy lifestyle includes unhealthy nutrition, inadequate physical activity, smoking and inability to cope with stress.[3]

Stressful events in life can have profoundly negative effects on an individual's mental health and may result in unhealthy behaviour and abnormality. It is not surprising that many individuals use smoking as a means to cope with stress, as nicotine in cigarettes temporarily reduces stress.[4] Several studies have investigated the link between smoking and stress. A study conducted by Strine and colleagues showed that mental stress leads to increased prevalence of chronic diseases due to higher rate of risky health behaviors such as smoking.[5] Another study demonstrated the relationship between daily smoking and compromised mental health, including depression and anxiety.[6] Also, a study in central Iran has shown that stress is associated with other components of unhealthy lifestyle, including smoking.[7] Considering the

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relatively high prevalence of smoking, which was reported to be 11% in a study in the central part of Iran,[8] and the limited number of studies on the relationship between mental stress and smoking status in the Iranian society, this study was conducted to compare stress levels in smokers, non-smokers, and new smoking quitters. This could offer future strategies for stress reduction and consequently reduction of the prevalence of smoking in the community.

Materials and Methods

The present study was conducted as part of Isfahan Healthy Heart Program (IHHP). Details of this program including sample size, data entry and data analysis have been published in a publication by Sarrafzadegan and colleagues.[9] Multi-stage cluster randomization method was used for sampling and the population under study in the three cities of Isfahan, Najafabad and Arak were divided into urban and rural areas according to a general census conducted in 2008. These three cities were selected as intervention and control cities, due to their consistent populations and smaller number of migrants compared to the capital and other Iranian cities. Nearly 5-10% of this population were included in the study. Sample size was 9572 people who were classified based on age, sex, place of residence, marital status and level of education. Only participants who had lived in their respective areas for at least 10 years were included. Exclusion criteria include pregnancy, mental retardation and physical disabilities. Written informed consent was obtained from all participants after thoroughly briefing them about the stages of the study. Relevant information was obtained by trained health technicians by calling on the subjects at their homes.

Demographic factors; The demographic characteristics of participants was obtained in categories of age groups (19-24, 25-34, 35-44 years, 45-54, and above 55 years), sex (male, female), marital status (married and unmarried: single, divorced, separated), education level (0-5, 6-12, and above 12 years) and place of residence (urban, rural).

Indicators; One of the indicators studied was the subjects' smoking status. The subjects were placed in 3 groups, namely current smokers, non-smokers and ex-smokers.

Individuals smoking at least one cigarette per day were considered as current smokers, those who had quit smoking prior to the study were considered as ex-smokers, and those who did not smoke were considered as non-smokers.[10]

The standard GHQ12 for assessment of general health is completed by the respondents themselves. We used this questionnaire to assess the level of stress. This questionnaire consists of twelve 4-choice questions. To determine an individual's stress score in the preceding month based on the GHQ scoring method, those who chose (a) or (b) were given a score of 0, and those who chose (c) and (d) were given a score of 1. Scores of 4 and higher were considered as high GHQ, i.e. high stress.[11] It must be noted that this questionnaire has been designed for subjects aged 12 years and higher and its reliability and validity has been assessed in an Iranian study.[12]

Statistical Analysis; The data were analyzed with $SPSS_{15}$ and P values under the 0.05 were considered statistically significant. The data, including age, sex, place of residence, level of education and smoking status were depicted in percentages and compared using the chi square test. Logistic regression analysis was used to assess relative risk and confidence interval for stress level according to smoking status. Independent variables included smokers, non-smokers, ex-smokers, age groups, sex, place of residence, marital status and level of education. Stress level was the dependent variable.

Results

In this study, the percentage of women with high stress level (GHQ of 4 and higher) was overall higher than the percentage of men with high stress level, i.e. 39.6% vs. 28.8%. 34.6% of city residents and 38.5% of unmarried individuals had high stress levels.

The percentage of GHQ of 4 and higher was 37.7%, 32.1% and 28.7% in individuals with 0-5, 6-12 and more than 12 years of education. In general, in the studied population, 30% of non-smokers, 32.1% of ex-smokers, and 36.9% of smokers had GHQ of 4 and higher. Other demographic characteristics of the studied population are presented in Table 1.

Table 2 shows the comparison of GHQ 4 and higher in smokers and non-smokers; the relative risk of high stress in smokers was 1.13 as high as in non-smokers (CI = 1.004-1.29). Also the relative risk of high stress in ex-smokers was 1.05 times as high as non-smokers (CI = 1.002-1.20). After matching the variables for age and sex, the relative risk of stress in smokers and ex-smokers compared to non-smokers remained significantly higher (OR = 1.67 and OR = 1.13, respectively).

In the final model, the effect of socioeconomic factors including place of residence, marital status and level of education was also assessed. The relative risk of stress in smokers and ex-smokers compared to non-smokers remained significantly higher (OR = 1.66 and OR = 1.12, respectively).

Table 1. Demographic characteristics of study subjects

		Low stress	**High stress**	**P**
Age	19-24 years	1241(66%)	641(34%)	
	25-34 years	1952 (67.1%)	959(32.9%)	
	35-44 years	1269 (67.1%)	622(32.9%)	0.004
	45-54 years	778 (66.4%)	393(33.6%)	
	≥ 55 years	1046 (60.4%)	645(38.1%)	
Sex	Woman	2887 (60.4%)	1889(39.6%)	0.001
	Men	3402 (71.2%)	1375(28.8%)	
Place of residence	Rural	4365(65.4%)	2311(34.6%)	0.108
	Urban	1924(66.9%)	953(33.1%)	
Marital statues	Unmarried	4977 (67.1%)	2240(32.9%)	< 0.0001
	Married	1310 (61.5%)	821(38.5%)	
Educational level	0-5 years	2677 (62.3%)	1619(37.7%)	
	6-12 years	2699 (67.9%)	127(32.1%)	< 0.0001
	≥ 12 years	901(71.3%)	363(28.7%)	
Smoking status	Non smoker	5478(70.0%)	2348(30.0%)	
	Ex-smoker	295(67.8%)	140(32.1%)	0.010
	Smoker	811(63.1%)	474(36.9%)	

Table 2. Association of smoking statues with stress level

Smoking status	**Crude**		**Adjusted (age, sex)**		**Adjusted (all factors)***	
	OR	CI %95	OR	CI %95	OR	CI %95
Non-smoker	1	(Ref)	1	(Ref)	1	(Ref)
Smoker	1.13	(1.004,1.29)	1.67	(1.46,1.92)	1.66	(1.44,1.90)
Ex-smoker	1.05	(1.002,1.20)	1.13	(1.07,1.41)	1.12	(1.06,1.40)

*All factors including; age, sex, marital status, residency, and educational level

Discussion

This study was conducted to investigate the levels of stress in smokers, non-smokers and ex-smokers. The level of stress varied according to smoking status in study participants. 30% of non-smokers, 32.1% of ex-smokers and 36.9% of smokers had GHQ of 4 and higher. In regression analysis, the final model which matched the effect of age, sex, and socioeconomic factors including place of residence, marital status and level of education, the relative risk of stress in smokers and ex-smokers was significantly higher than in non-smokers. As in earlier studies, the results of this study showed that smokers have higher stress levels than non-smokers and ex-smokers. Results of a study conducted by Pedersone and colleagues involving 1552 Canadian adolescents demonstrated that smokers recount more stressful life events than non-smokers.[13] Also a study conducted by McKenna H in 2003 showed although stress is a factor that may trigger smoking, the level of stress in individuals has a more important role in continuation of smoking.[14] Another study performed on students of Arak University of Medical Sciences demonstrated that students who smoked had experienced more stressful events in their lives, and this had increased their tendency to smoke.[15] Also, cigarette smokers believe that smoking brings them tranquillity and causes reduction of stressful tension. The authors believ that in the Iranian community, smoking is used as a means of coping with stress and individuals smoke to reduce mental stress. In this community, cigarette smoking is a behaviour copied from western countries, where people may smoke to improve performance and feel peaceful.[16] Based on natural and experimental findings, stress not only triggers smoking, but can amplify the urge for smoking in the individuals.[17, 18]

In the present study, the numerical value of relative stress in smokers was higher than ex-smokers. A study conducted by Dube and colleagues in 2007 to assess stress levels in cigarette smokers and ex-smokers demonstrated that stress levels in ex-smokers are lower than in smokers.[19] Results of the present study are consistent with those of Dube. et al. It seems that the mental health of those who quit smoking is restored to a great extent, on a part with improvement of physical effects of smoking. Many studies have addressed the pathophysiological link between stress level and cigarette smoking from two perspectives. Firstly, stress increases the probability of becoming a smoker, secondly and with a reverse mechanism; cigarette smoking can induce mental stress by modifying the manner by which neurotransmitters are produced in the brain.[20]

Conclusion

The results of this study demonstrated higher stress levels in smokers. Since studies have confirmed that mental stress play a significant role in beginning to smoke, it seems suitable that a more sensible approach be adopted towards developing interventions aimed at reducing stress in the community, and that ways of solving the problem, controlling stress and improving the quality of life along with stress reduction be given serious consideration, so that we can witness a reduction in the prevalence of smoking in the community.

Conflict of Interests

Authors have no conflict of interests.

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