The influence of occupational stress factors on nicotine dependence among students of health and nonhealth care professional colleges

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ABSTRACT

Objectives: To study the relationship between perceived job stress measured using Effort-Reward Imbalance (ERI) scale and nicotine dependence using Fagerström Test for Nicotine Dependence (FTND) scale among students of health and nonhealth care professional colleges.

Materials and Methods: A descriptive cross-sectional study was carried on convenient sample of 408 health and nonhealth care professional who were current smokers. Nicotine dependence was measured using the FTND. The extent of the stress factors experienced at work was assessed using the ERI. Chi-square test and logistic regression were used for the statistical analysis.

Results: Occupational stress factors are actually associated with higher levels of nicotine dependence (odds ratio = 4.523). The degree of nicotine dependence and stress imbalance was found to be more among health care professional students as compared to nonhealth care professional students (P < 0.05). Being religious was found to have a significant effect in reducing nicotine dependence. Conclusion: Being religious, having low occupational stress and being nonhealth care professional have a significant effect on the prevention of nicotine dependence.

Key words: Effort-Reward Imbalance, Fagerström Test for Nicotine Dependence, health and nonhealth care, professional students, job stress, nicotine dependence

INTRODUCTION

“Tobacco is an only legally available product that kills people.”1 Tobacco use is a risk factor for 6 of the 8 leading causes of death.2 Every 6 s, 1 person dies as the result of tobacco consumption in the world.3 If the current trends continue and necessary actions are not taken tobacco-induced attributable deaths are projected to rise from 5.4 million in 2004 to 8.3 million in 2030.4

Tobacco dependence is a multi-dimensional addiction that is determined by individual, genetic, psychosocial, and behavioral aspects of dependence on smoking or nicotine.5 Nicotine dependence has been found to be an important predictor of successful cessation of smoking among smokers. So, it is important to measure the various aspects of nicotine dependence. “Fagerström Test for Nicotine Dependence” (FTND) is an internationally recognized and statistically validated instrument for assessing the degree of nicotine dependence in smokers.6,7 Psychosocial factors such as work stress have an influence on the initiation and extent of smoking. This may be attributable to the effect of job stress on nicotine dependence. Thus by measuring job stress it is possible to identify risk group and further to intervene using measures targeted at that particular group. "Effort-Reward Imbalance" is an instrument that measures the imbalance between the rewards received and the efforts put in at work. It is a well-validated instrument and is associated with increased nicotine dependence.8

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A prior permission was obtained from concerned college authorities. From each college, 68 students were selected by convenient sampling technique. Those participating remained anonymous.

The questionnaire was distributed to study subjects during their free time. The purpose of the study and all the terms used in the questionnaire were explained to the students. The students were also ensured complete confidentiality and anonymity of the participants 25 min were given to each person to fill the questionnaire. Such filled questionnaires were collected on the same day.

**Statistical analysis**

For the purpose of statistical analysis data was dichotomized as health (Nursing, Dental, and Pharmacy) and nonhealth care professional students (Diploma, Engineering, B.Ed).

The individual items of the FTND were combined into a sum score for the multivariate analysis. Scores of 1-3 represent smokers with low nicotine dependence; scores of 4-5 represent a moderate dependence and scores of 6-10 represents high dependence on nicotine. In order to compare workers with low nicotine dependence to those with heavy dependence, the FTND sum score was dichotomized at the value of 5 for the logistic regression.  

The ERI analysis was conducted as follows: An effort-reward ratio was then computed using a standardized syntax. Values over 1 indicate an imbalance between effort and reward.

The differences among variables were assessed by the Chi-square test. A logistic regression model was calculated using all sociodemographic variables. Statistical data were analyzed using SPSS version 20.0 (Chicago, USA).

**RESULTS**

**Descriptive statistics**

A total of 392 currently smoking participants completed the questionnaire. The mean age of study sample was 22.1 ± 3.2 years (males 72% and females 38%). The study sample consisted of 52.1% health professionals and 47.9% nonhealth professionals.

The mean value of FTND score was 3.25 (range 1-5) suggesting moderate nicotine dependence. The degree of nicotine dependence was found to be significantly higher for medical profession students as compared to nonhealth care professional students ($P < 0.05$) [Figure 1].

Results of ERI-S show that 17.2% of study participants do not experience an imbalance between effort and reward (up to a value of 0.99). The ERI was found to be more in nonhealth care professionals (78.3%) which was found to
be statistically significant ($P < 0.05$). The mean value of the effort-reward ratio is 1.88.

**Multivariate analysis**

The results of the logistic regression are shown in Table 1.

The ERI was found to be associated with nicotine dependence (odds ratio [OR] = 4.523; $P = 0.023$). The amount of explained variance in this model is 23.1% (Nagelkerke Pseudo-$R^2$). The specificity of the model is 64.6%, and the sensitivity is 57.4%.

The model also demonstrates that being religious and being nonhealth care professional have a significant effect on the prevention of nicotine dependence (Table 1).

**DISCUSSION**

The present study was conducted to study the relationship between perceived job stress measured using ERI-S and nicotine dependence using FTND scale among the students of health and nonhealth care professional colleges.

This study used a convenience sampling technique, to ensure equal representation of health and nonhealth care professionals as the intention was to explore perceptions by these professionals.

In this study, only young adults were included because of the potential impact of nicotine dependence on this age group and the idea of the possible relationship between reducing job stress and successful smoking cessation.

The results of our study revealed that an ERI at work are strongly associated with increased nicotine dependence (OR = 4.53) which was in concordance to study done by Kouvonen et al.$^{14}$ This may be attributable to the effect of job stress on nicotine dependence. That is, high levels of job stress could produce and/or maintain high levels of nicotine dependence among smokers, and could result in difficulty in smoking cessation.

The logistic regressions in our study also indicate that not being religious as significant risk factors for nicotine dependence which was in concordance to Blay et al.,$^{15}$ who found that religious affiliation is associated with a decrease in the frequency of tobacco usage.

An health care professional students were associated with high nicotine dependence and ERI as compared to nonhealth care professionals. The health care professional students were found to be 1.186 times the risk of having nicotine dependence as compared to nonhealth care professional students. This could be due to fact that health care professionals were exposed to a high level of psychological job demand and regarded tobacco smoking as a way of stress management would not look for other measures to reduce their stress. Moreover, this might emphasize the relationship between psychological job demand and nicotine dependence.

This study has some limitations, such as the convenient sampling method and limited information about the professional backgrounds and working conditions of individuals.

However, strength of our study remains in the fact that it provides an overview on relationship between perceived job stress and nicotine dependence among health and nonhealth care professional students for the first time and can prove to be a benchmark for future comparisons by the public health personnel and decision makers.

**CONCLUSION**

A possible relationship exists between job stress and nicotine dependence both in health care and nonhealth care professional students. Thus, workplace smoking cessation programs should take account of the influence of job stress on nicotine dependence, and measures to curb nicotine dependence resulting from coping with job stress should be introduced into the programs.

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**Table 1: Results of the logistic regression model, nicotine dependence and ERI (n = 392)**

| Variable                                      | B     | SE    | Wald  | df | Significant | OR    | 95% CI for Exp(B) |
|------------------------------------------------|-------|-------|-------|----|-------------|-------|-----------------|
| ERI (no effort-reward imbalance/effort reward imbalance*) | 1.509 | 1.131 | 1.782 | 1  | 0.023       | 4.523 | 0.489-41.478    |
| Religion (religious/not religious*)           | -0.216| 1.103 | 0.038 | 1  | 0.045       | 0.806 | 0.093-6.998     |
| Profession (health care/nonhealth care*)      | 0.371 | 1.303 | 0.027 | 1  | 0.064       | 1.186 | 0.092-15.255    |
| Sex (female/male*)                            | -0.785| 1.703 | 0.212 | 1  | 0.645       | 0.456 | 0.021-12.839    |

*Reference group: B – Regression coefficient; SE – Standard error; OR – Odds ratio; CI – Confidence interval; ERI – Effort-Reward Imbalance
The stress management would be a useful element of smoking cessation programs that should target both health and nonhealth care professionals who smoke and are dependent on tobacco. Cessation programs among these adults can be made effective by helping them learn appropriate methods for managing psychological demands, or their administrators might assist them by relieving them of their perceived psychological demands.

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**Conflicts of interest**
There are no conflicts of interest.

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