

# Evaluation of the relationship between stress and smoking patterns among the citizens of Hail City, Kingdom of Saudi Arabia

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## Abstract

**Background:** Tobacco is considered the most important preventable cause of deaths worldwide; the current situation is severe, particularly in developing countries. Tobacco smoking is global public health anxiety leading to pulmonary disease, various cancers, including those of the respiratory, digestive, and genitourinary systems, and definite types of leukaemia and premature death. In recent years, smoking cigarettes or other tobacco-related products is a significant public health issue in Saudi Arabia, particularly among adolescents. Therefore, our present study aimed to evaluate the relationship between stress and smoking patterns among Hail city citizens. **Materials and Methods:** This cross-sectional descriptive-analytical study was conducted at the Department of Physiology, Hail University, Kingdom of Saudi Arabia. A questionnaire was designed to obtain important information regarding stress, demographic, and behavioural factors, including the Perceived Stress Scale (PSS). **Results:** A total number of 2000 adult male from different regions of Saudi participated in this study. The cross-sectional descriptive analysis showed a strong relationship between perceived stress and smoking behaviour. A higher frequency of smoking was observed among smokers in student, employed and married group of participants. The maximum academic pressure, high job strain and financial problems were directly associated with heavy smokers participants. **Conclusion:** Our present study has established a strong link between stress and smoking this highlight the necessity to formulate outreach programs on these lines, which will help our youth, abstain from such harmful addiction to smoking.

**Keywords:** Perceived Stress, Smoking, Tobacco, Lifestyle

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## INTRODUCTION

Worldwide, tobacco is the only legally sold product scientifically known to cause morbidity and mortality in one-half of its regular users. Thus, of the estimated 1.3 billion people in the world who smoke, nearly 650 million will die prematurely as a consequence.<sup>1,2</sup> Throughout the world; tobacco smoking is becoming a rapidly increasing problem of a public health concern. It has also been estimated that approximately a third of the

world's population, aged 15 years above, are smokers<sup>2</sup>. Globally, the tobacco smoking epidemic is on the rise, particularly in developing countries. College life is a critical transition period during which young adults tend to explore tobacco use. Some surveys have reported that cigarette smoking prevalence continues to rise among college students.<sup>3-5</sup> As expected, an increasing trend is anticipated among college-going students, as this will be related to the alleviation of peer pressure, academic-related problems, examination stress, social acceptance, the desire to attain a high personality profile, lower educational level of family members and their history of smoking.<sup>6-8</sup> Stress and its consequences on health have been an important research topic over the last decades. Perceived stress is an important factor in the onset, course and progression of various diseases, e.g., anxiety, cardiovascular and respiratory diseases, depression, and it has been related to higher overall mortality.<sup>9</sup> On the other hand, perceived stress is also linked to a decline in life satisfaction. The popular Perceived Stress Scale (PSS) by

Cohen is a well-established self-report measure based on stress's psychological conceptualization.<sup>10</sup> The scale assesses the degree to which life has been experienced as overloaded, uncontrollable and unpredictable in the past month. The literature lacks studies investigating age differences of perceived stress associated with smoking behaviour and nicotine related symptomatology. Therefore, the overall study aimed to evaluate the relationship between perceived stress and smoking behaviours and nicotine-related symptomatology and determine if these relationships varied by any other parameters. The relationship between perceived stress and sociodemographic variables will also be explored. There is no research study regarding the prevalence of smoking and its predictors among Hail city citizens, though some studies conducted among school adolescents. Thus, the present study's purpose was to evaluate the prevalence of smoking behaviours and their related factors among Hail city citizens. We hypothesized that perceived stress would positively associate smoking behaviours, such as the number of cigarettes smoked per day, with a stronger association in younger males than adult. We also hypothesized that perceived stress would positively associate with smoking-related symptomatology, such as nicotine withdrawal, nicotine dependence, and smoking urges, with a stronger association in younger males than

adult. Lastly, we hypothesized a positive correlation between perceived stress and certain sociodemographic variables, namely lower-income and minority status. Those individuals would consume an increased number of cigarettes per day.

## MATERIAL AND METHODS

**Study Design:** This cross-sectional descriptive-analytical study was conducted at the Department of Physiology, Hail University, Kingdom of Saudi Arabia. This was a cross-sectional study carried during the period of June 2020 to December 2020. **Selection of Subjects:** This study has enrolled 2000 participants in the age group of 11 to 70 years. The age-matched control and smoker groups were selected based on inclusion and exclusion criteria. An informed consent form was obtained from all the participants. **Data Collection:** Residents of Hail City invited to participate in the study by filling an anonymous self-administered questionnaire; this also included the Perceived Stress Scale (PSS).<sup>10</sup> The entire questionnaires were in English and Arabic language.

**Statistical Analysis:** The collected data was converted into a computer-based spreadsheet; SPSS version 16 was used. Statistical analysis was carried out with the help of the chi-square test for statistically significance (P-value P<0.5).

## RESULTS

A total of 2000 participants were enrolled in this study; an almost identical number of responses were recorded. Observation Table 1 shows the socio-demographic characteristic features of the participants. A specially designed demographic data sheet including age, education, employment and marital status, frequency of cigarette smoking was used in this study.

**Table 1:** Characteristic demographic features of subjects involved in this study.

Demographic Parameters		Control Group	Smokers Group
<b>Age</b>	11-20	163	149
	21-30	294	314
	31-40	281	267
	41-50	125	173
	51-60	81	74
	61-70	56	23
<b>Gender</b>	Male	1000	1000
<b>Education</b>	Primary School	27	11
	Secondary School	49	58
	University/College Level	551	627
	Masters/Super Specialization/Ph.D.	373	304
<b>Marital Status</b>	Single	629	553
	Married	318	387
	Divorced	33	42
	Widowed	20	18
<b>Region</b>	Eastern	142	136
	Western	169	184
	Southern	157	129
	Northern	315	330
<b>Employment</b>	Central	217	221
	Student	617	639
	Employed	266	281

	Unemployed	61	57
	Retired	56	23
<b>Monthly income</b>	SAR 9999 or less	89	47
	SAR 10,000-14,999	227	261
	SAR 16,000 or more	67	53
<b>Physical Activity</b>	Yes	161	178
	No	839	822
<b>Co-morbidities</b>	Hypertension	83	67
	Diabetes Mellitus	35	42

Data is presented as ±SEM

Participants' mean age was 34.7 years, and all the participants were male. Most of the male participants were single (62.9%), student (61.7%). Results presented in Table 2 exhibits the relationship between the perceived stress and frequency of cigarette smoking. Our second hypothesis was corroborated with the result, as the relationship between stress and cigarette smoking was found to be significant.

**Table 2: Comparison of Perceived Stress Levels among control and smokers group**

Perceived Stress Levels	Control Group	Smokers Group
<b>Below Average Stress</b>	147	429
<b>Above Average Stress</b>	853	571
<b>Total</b>	1000	1000

Data is presented as ±SEM

In recent years, smoking cigarettes or other tobacco-related products is a significant public health issue in Saudi Arabia, particularly among adolescents. In the analysis of the perceived stress levels in the different groups of participants, we have taken the help of a two-way ANOVA test. But our results could not establish statistical significance.

**Table 3: Comparison of life changing events involving the Control and Smokers Group**

Parameters	Duration	Control Group	Smokers Group
<b>Life Changing Events</b>	Within last 1 year	124.51±22.63	189.53±27.16*
	Earlier to last 1 year	529.26±57.27	721.38±62.72
<b>Stressful Life Events</b>	Within last 1 year	4.66±1.25	16.73±0.87*
	Earlier to last 1 year	21.09±3.34	34.87±5.72**

\*P>0.05 (S) and \*\*P<0.05 (NS) S – Significant and NS – Non-Significant

The segregation of the participants according to life-changing and stressful events faced by them within the span of last year or earlier to this one year, these events significantly established the relationship between stress and cigarette smoking patterns.

**Table 4: Comparison of anthropometrics among Control and Smokers Group**

Anthropometric Parameters	Control Group	Smokers Group
Height (cm)	164±7.28	175±5.69*
Weight (kg)	71.35±10.2	72.54±12.5***
BMI (kg/m <sup>2</sup> )	24.3±2.18	25.1±5.92*
Overweight	129±24.3	281±47.2*
Obesity	462±31.2	627±84.5**
Smoking Frequency (per day)		
≤5 Cigarettes	327.28±31.29	377.28±45.26*
≤10 Cigarettes	186.27±42.38	267.81±52.49*
≤15 Cigarettes	89.75±5.42	189.24±34.78***

\*P<0.001, \*\*P<0.05, \*\*\*P<0.5

In this study, we observed that cigarette smoking behaviour directly associated with increased body weight and BMI. The participants with a cigarette smoking frequency of five cigarettes per day shown less BMI than those with over ten cigarettes per day (p<0.001). This study had few limitations; one of them was participants of this study were not representing the whole community. We have purposely excluded the female participants for overcoming some administrative and social difficulties related to female participation.

## DISCUSSION

Globally, tobacco is a leading cause of preventable deaths, mainly in high-income countries, now a day becoming increasingly prevalent in low-income countries.<sup>1</sup> By 2030, approximately 70% of deaths are attributable to smoking worldwide.<sup>2</sup> The adverse health consequences of smoking are significant and have been well researched and documented. Our findings from the present study highlight the positive relationship between

the perceived stress and frequency of cigarette smoking. Academic and Occupational stress casts imminent effects on the physical, mental and behavioural health of every individual of any institutions and organizations. Smoking being a candid abettor further maligns the situation, ensuing a vicious cycle. Modifiable factors like smoking and non-modifiable aggravators such as age must be promptly addressed to break this detrimental play of cause and effects. It is opined to hold counselling sessions and smoking cessation programs at all age groups.<sup>3-6</sup>

However, our present study could not establish a statistically significant relationship between perceived stress levels and participants from two different groups. Most of the studies from Saudi Arabia evaluated the socio-demographic and epidemiologic factors rather than stress and behavioural parameters that lead to the initiation of tobacco smoking.<sup>5-8</sup> Therefore, the present study focused on the assessment of stress, behavioural, social, and occupational factors that might contribute to the commencing of tobacco smoking in individuals. In general, stress is a global phenomenon, and every individual will experience it. Stress can occur from both positive and negative experiences, and it can have physical, emotional, intellectual, social, and spiritual consequences. Stress is the human body's reaction to initiate the change, which requires a response from the body. These changes can be emotional, psychological and physical and can originate from the surrounding environment or mere thoughts.<sup>8-11</sup> Perceived stress is different. It is more about personal feelings about the lack of control and unpredictability than the actual stressors. Perceived work stress is a severe health issue. It can result in headaches, pain, fatigue and tension.<sup>12-14</sup> The findings of this study would definitely highlight the need for future biochemical and haematological studies investigating in-depth the association between stress and tobacco smoking.

## CONCLUSION

The present observations and information from our study would aid in the development and improvement of social support interventions, particularly in making the tailored made guidelines to every adult individuals and socially disadvantaged populations, also advising tips for healthier lifestyles that promote the stress coping skills and its management.

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