



Original Research Article

Perceived Stress Level in Regularly Exercising and Sedentary Undergraduate Medical Students

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ABSTRACT

Introduction: Stress may have adverse effect on bodily mechanisms and cause ill health. Therefore it is essential to identify the subjects at stress and find remedial measures to control stress in them. The present study assessed the stress level and influence of regular exercise on stress level in young adults

Materials and Methods: This was a cross sectional study done in 84 undergraduate medical students. In them stress level was measured us by Sheldon Cohen's "Perceived Stress Scale". Subjects who were taking part in structured exercise programme from the past one year were considered as exercising. Accordingly subjects were grouped as Group A (exercising) and Group B (sedentary). Based on the stress score subjects were categorized as with average, moderate and severe stress.

Frequency of subjects with 3 different level of stress in group A and group B was compared using Chi-square test. $p < 0.05$ was taken as significant.

Result: Mean perceived stress score was significantly lower in group A compared to group B ($p = 0.0006$). In Group a frequency of subjects with average stress score was higher compared to Group B ($p < 0.0001$). Frequency of subjects with high stress score was higher in Group B compared to Group A ($p = 0.0003$).

Conclusion: High perceived stress persists in large proportion of undergraduate medical students. Structured physical activity program may lower perceived stress.

Key words: perceived stress, sedentary, exercise, low stress score.

INTRODUCTION

Stress is defined as an organism's total response to environmental demands or pressures. Stress in humans results from interactions between persons and their environment that are perceived as straining or exceeding their adaptive capacities and threatening their well-being. Several studies in the past have comprehensively reported

the deleterious effect of stress on bodily mechanisms and its potential in incurring ill health. Acute stress might induce short-lasting rises in arterial pressure and heart rate, [1] impair endothelial function [2] and reduce the threshold for arrhythmia and sudden death. [3] Chronic stress is reported to have several adverse effects on health of an

individual such as hypertension, ^[4] elevated cortisol levels ^[5] and unhealthy behaviors. ^[6]

Recent studies on university students have reported that university students, often experience undue amounts of stress, which can have negative academic, emotional and health outcomes. ^[7] They face multiple stressors such as academic overload, constant pressure to succeed, competition with peers and in some countries financial burden as well as concerns about the future. ^[8] Voltmer et al. have reported a decrease in quality of health and an increase in risk patterns, indicating a need for prevention and health promotion focusing on individual behavior. ^[9] These observations elsewhere in the world warrants estimating the stress level in different student population and alternatively find any remedial measures which may ameliorate the stress level. Thus the objective of this study was to assess the perceived stress in medical students and to find the influence of regular exercise on level of perceived stress in them.

MATERIALS AND METHODS

This was a cross sectional study done in medical students. It was done after obtaining the institutional ethics committee approval and informed consent from the study participants.

Study participants

In a batch of 100 medical students, 84 students who met the inclusion and exclusion criteria were taken as study participants. Among the 84 students based on the personal interview, students taking part in the structured exercise programme were identified. Accordingly study participants who were on regular exercise were allotted to exercising group (Group A; n= 30) and who were not indulged in any structured physical activity constituted non-exercising group (Group B, n = 54).

Inclusion criteria: Study subjects were aged between 18-23 years, of either sex, who were apparently healthy.

Exclusion criteria: chronic smokers, alcoholics, known cases of diabetes, dyslipidemia or on any ailment or medication may affect perceived stress score.

Study Protocol

All the study procedures were carried out between 4-6 pm in all the study subjects. In all the subjects body mass index, waist circumference, pulse rate and perceived stress level was measured. Their age and gender was noted. Their pattern of diet was noted. Exercising subjects /group (group A) was defined as subjects who were taking part in structured exercise programme- sports/yoga/brisk walk regularly at least from the past one year. Perceived stress was defined as per the guidelines described in "Perceived Stress Scale" by Sheldon Cohen. Stress score less than 13 on this scale was considered as free from stress. ^[10,11] The diet pattern was assessed by a questionnaire based on Dietetics. ^[12]

Procedures

Perceived stress scale (PSS): All the subjects were administered PSS, a widely used psychological tool for measurement of perception of stress. The questions in the PSS are of general nature, relatively free of content specific to any sub-population group and enquire about feelings and thoughts to measure the "degree to which situations in one's life is appraised as stressful" especially, over last 1 month. Items are designed to tap how unpredictable, uncontrollable, and overloaded respondents find their lives. It comprises of 10 items, four of which are reverse-scored, measured on a 5-point scale from 0 to 4. PSS scores are obtained by reversing responses (e.g., 0 = 4, 1 = 3, 2 = 2, 3 = 1 and 4 = 0) to the four positively stated items (items 4, 5, 7, and 8)

and then summing across all scale items. Total score ranges from 0 to 40. Stress score less than 13 on this scale was considered as average/free from stress. 14-19 score was considered moderate and more than 19 was considered as high perceived stress. [10,11]

Body mass index: In all the study participants, height and weight was measured accurately. Body mass index was calculated dividing weight in kilograms by height in meters squared.

Waist circumference: waist circumference was measured at the level of the umbilicus in expiratory position with a standard measuring tape.

Pulse rate: Pulse rate was measured by counting radial pulse for one minute.

Statistical analysis: Unpaired t test was applied to unpaired data of independent

observations made in two separate groups. Fisher's Exact Test was used to compare the frequency of subjects between two groups. Level of significance was measured using two tailed test. P value less than 0.05 was considered significant.

RESULT

Data on continuous variables is presented as mean± SD. Frequency of subjects is presented in numbers. Comparison of data on age, diet score, body mass index and waist circumference and pulse rate between exercise (group A) and non-exercise group (group B) is presented in **table 1**. Data on comparison of frequency of subjects with different level of perceived stress in group A and group B is presented in **table 2**.

Table1. Comparison of baseline characteristics of study subjects in Exercise and non-exercise groups (values are mean ± SD; n = sample size)

Baseline characteristics	Exercise group (Group A, n = 30)	Non-Exercise group (Group B, n = 54)	t value	p value
Age	19.86 ± 1.13	19.59 ± 0.68	1.379	0.171
Body mass index (kg/m ²)	23.17 ± 4.37	23.09 ± 4.51	0.078	0.93
Waist circumference (cm)	84.21 ± 11.41	82.51 ± 12.88	0.602	0.548
Diet score	33.0 ± 6.80	32.37 ± 5.34	0.468	0.640
Pulse rate (beats/minute)	85.46 ± 8.73	82.94 ± 13.71	0.908	0.366

Table2. Comparison of frequency of subjects with different stress level between Exercise group (group A) and Non-exercise group (group B).

Stress level	Group A (n =30)	Group B (n = 54)	Relative risk	p-value
Average stress*	10	0	3.571	< 0.0001
Moderate stress**	11	19	1.042	NS
High stress ***	9	35	0.389	0.0003

*Cohen's stress scale score:less than 13;
 ** Cohen's stress scale score between 13-19
 *** Cohen's stress scale score 20 and more than 20
 NS = Non-significant; n = sample size

In a total of 84 students studied, exercise group comprised of 30 medical students (Group A) and non-exercising group consist of 54 medical students (group B). Group A was comparable to group B with regard to gender distribution (Group A: males = 16, females=14; Group B: males = 24, females = 30; odds ratio = 0.7, p > 0.49). There was no significant difference in age, diet score, body mass index and waist

circumference and pulse rate between group A and group B (table 1)

Mean Perceived stress score was significantly lower in group a compared to group B (17.20 ± 5.96 vs. 21.51 ± 4.94; t = 3.559, p = 0.0006). Based on the Cohens stress scale study subjects were identified as at average stress (free from stress), moderate stress and high stress level. In Group A frequency of subjects with average stress score was significantly higher compared to

Group B. Frequency of subjects with high stress score was significantly higher in Group B compared to Group A. There was no statistically significant difference in frequency of subjects with moderate stress score in Group A compared to Group B (table 2).

DISCUSSION

The data analysis on perceived stress employing Cohen's perceived stress scale estimated 52.38% of undergraduate students experience high stress. The Perceived Stress Scale (PSS) is the most widely used psychological instrument for measuring the perception of stress. It is a measure of the degree to which situations in one's life are appraised as stressful. The transition from childhood to young adulthood, often marked by beginning college, may be a particularly stressful time.^[13]

Medical undergraduate students, surpassing adolescence moving into adult hood, phase educational and career challenges. Phasing these challenges coupled with surpassing childhood to young adulthood might have caused higher stress. However prevalence of subjects with high stress was significantly higher in sedentary group compared to exercise group (table 2). This observation suggests that life style may be a major determinant of perceived stress. Alternatively life style modification may play a role in management of stress.

In the present study exercise group had significantly higher prevalence of "average" stress (very low level of stress) compared to sedentary group. Similarly mean perceived stress score of exercise group was significantly lower compared to sedentary group. Breathing techniques such as Sudarshana Kriya, are recommended for relaxation, stress management, control of psychophysiological states and to improve organ function.^[14] At the same time research has demonstrated many physical

and psychological benefits of exercise including reduced risks of cardiovascular disease, hypertension, diabetes, cancer and obesity as well as psychological disturbances such as depression, anxiety and stress disorders.^[15-18]

Similarly, the experimental studies on aerobic exercise training programme of 10 weeks showed significant decline in perceived stress in female non-athlete university students aged between 20-26 years in Iran.^[19] Thus our study findings along with the findings of various studies on the influence of various types of stress reducing programs demonstrates the beneficial effect of exercise in reduction of perceived stress.

However based on our study finding it could be concluded that, high perceived stress persists in large proportion of undergraduate medical students. Structured physical activity program may lower perceived stress.

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