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Impact of Body Mass Index and Blood Pressure on Perceived Stress and Professional Life Stress in Information Technology Workers in Mangalore, Karnataka, India.

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ABSTRACT

Work place stress is one of the most important problems experienced by all professionals irrespective of their nature of work. Software industry is affected greatly by the challenges and professionals serving these organizations are often observed under huge stress. This might lead to various health hazards. The present study investigates the impact of body mass index and blood pressure on perceived stress and professional life stress in information technology workers among software professionals in Mangalore city. A total of 100 software employees were included in this study. Based on the Body mass index the subjects were grouped into normal group (n=50) and obese groups (n=50). In the obese group a significant increase ($P<0.001$) was observed in perceived stress and professional stress score. Further, A significant ($P<0.001$) increase in the systolic blood pressure and non-significant increase in the diastolic was observed in the obese group. Programs designed to prevent hypertension in the workplace should therefore focus not only on the working environment but also on the way individuals perceive and cope with stress insofar as this influences behaviors directly predisposing to hypertension.

Keywords: Obesity, Body Mass Index, Blood pressure, Perceived stress, Professional stress

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INTRODUCTION

The information technology (IT) services in India have been attracting attention from international media and business interests. The nature of work in the software industry has undergone drastic changes over the last century. A software professional tends to be high-pressure. Stress is high in software profession because of their work load, target, achievements and night shift[1]. Workers who are stressed are more likely to be unhealthy, poorly motivated and less productive at work [2] Stress at work can be a real problem to the organization as well as for its workers [3].

The Perceived Stress Scale (PSS) is one of the most widely used instruments for measuring psychological perceived stress [4] The PSS measures the degree to which situations in one's life are perceived as stressfull [4]. It is more strongly related to life event impact scores as opposed to the number of stressful events, thereby representing one's appraisal of the events as being stressful[4]. Studies have supported the validity and reliability of the PSS in a variety of samples [5,6, 7]. A standardized questionnaire for professional life stress score used By David Fontana is a valuable tool to measure stress levels among working professionals in various studies[8].

Physical inactivity is a major risk factor for developing coronary artery disease, obesity, blood pressure, and diabetes [9]. Modern life style has proven to be the stimulus for the growth of heart diseases among the young professionals. Obesity is a chronic medical condition characterized by an excessive accumulation of fat on the body that causes a generalized increase in body mass. In the era of globalization, social competition is so strong that it leads to depression and stress [10, 11]. Body mass index is a reflection of weight and height. There are contradictions in studies exploring the associations between body mass index (BMI) and experienced stress [12, 13].

Hypertension is a modern day's epidemic and it is becoming a public health emergency worldwide, especially in the developing countries and has been estimated that cardiovascular disease will be the major cause of morbidity and mortality in these countries by the year 2020[14, 15]. They account for nearly a third of all deaths worldwide. It is further more common amongst people from upper social class because of the presence of multiple factors such as sedentary jobs, lack of physical activity, rich diet, alcohol intake, obesity. People in this group often experience the mental stress. Hence any preventive measures intervention that can prevent or reduce hypertension should be viewed as promoting cardiovascular health of individuals.

India being a forerunner in the information technology industry with lakhs involved as software professionals. There is an urgent need to understand the dynamics of the software professional's stress and its associated health problems so as to prevent it from assuming epidemic proportion. The present study focuses the impact of obesity on blood pressure and the severity of stress among the professionals in software companies.

MATERIALS AND METHOD

The present study is a cross-sectional descriptive study. The study was carried out in the workplace and the subjects were the healthy IT workers in Mangalore. All consenting healthy workers were enrolled for the study. All hypertensive staff with reported history of secondary hypertension was excluded from the study. A total of 100 subjects were included in this study. Participants were explained the purpose, procedure and the confidentiality prior to their written informed consent. Institutional ethical committee clearance was obtained before commencement of the study. Demographic characteristics profile was collected from the subjects by using a structured questionnaire. The blood pressure of each subject was measured using sphygmomanometer. The blood pressure of the subjects was measured on two different occasions at least 5 minutes apart and the average was used for all the subjects. Hypertension was defined as a systolic blood pressure of ≥ 140 mmHg and/or a diastolic blood pressure of ≥ 90 mmHg. Body weight was determined with a standardised weighing. Subjects were weighed barefooted in light clothing, and the same weighing scale was used for all the subjects and readings were expressed to the nearest 0.5 kg. The body mass index (BMI) (kg/m^2) was used to define obesity. The BMI (kg/m^2) was classified as follows: BMI 18.5–24.9 (Normal weight), BMI 25.0–30.0 (obese). Based on the BMI the employees were categorized into two groups as normal group (n =50) and obese group (n=50); n refers to the number of subjects in each group.

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Measures used

Professional life stress scale (PLSS)

PLSS is a screening tool developed by David Fontana in 1989[8]. It contains 22 questions which screens for professional stress by assessing various domains of profession. The scoring range is between 0 and 60. The PLSS score was interpreted as follows:

Score (0-15): Mild Stress; Stress isn't a problem in the life.
Score(16-30):Moderate range of stress for a busy professional person. It's nevertheless well worth looking at how it can reasonably be reduced.
Score(31-45): High Stress is clearly a problem, and the need for remedial action.
Score (45-60): High stress is a major problem, and something must be done without delay. They might be nearing the stage of exhaustion in the general adaptability syndrome.

Perceived stress scale (PSS)

Perceived Stress was assessed by each participant through perceived stress scale which was developed by Cohen[7]. The PSS measures the degree to which individuals perceived their daily life as being stressful during the last month with a 5-point Likert scale (0 = never and 4 = very often). Total scores can range from 0 to 40. Higher scores on the PSS represent higher levels of perceived stress.

Statistical Analysis

The data collected was entered in SPSS software and analyzed by pearson's chi square test , correlation coefficient & descriptive analysis . P value less than 0.05 was considered significant .

RESULTS

Figure 1: Percentage distribution of perceived stress in normal group and obese group; n=50 in each group

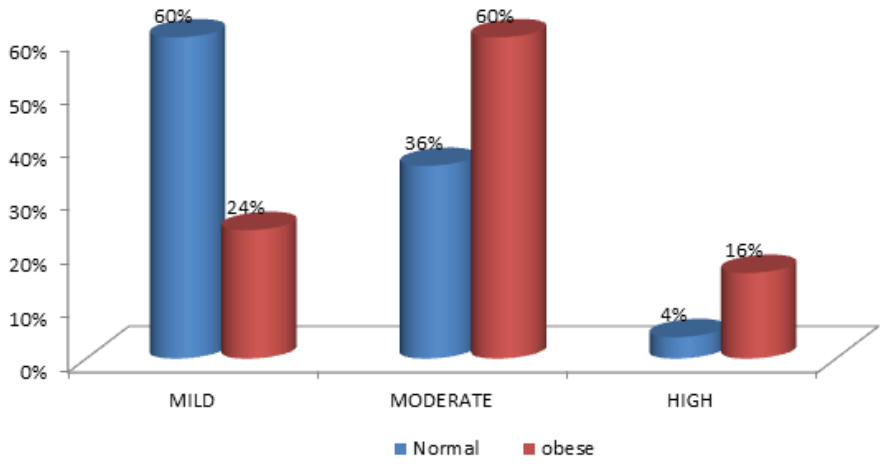

Table 1: Perceived stress score in normal group and obese group n=50 in each group. Values represented as Mean ±SD

GROUPS	PSS Mean Score	MILD	MODERATE	HIGH
NORMAL	13.46±7.15	(n=30) 7.866±4.70	(n=18) 20.94±1.62	(n=2) 27.0±1.41
OBESE	21.0±8.21***	(n=12) 7.833±2.20	(n=30) 23.4±0.81**	(n=8) 31.75±2.76**

P<0.001 ***Normal group versus obese group

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Figure 2: Percentage distribution of professional stress score in normal group and obese group n=50 in each group

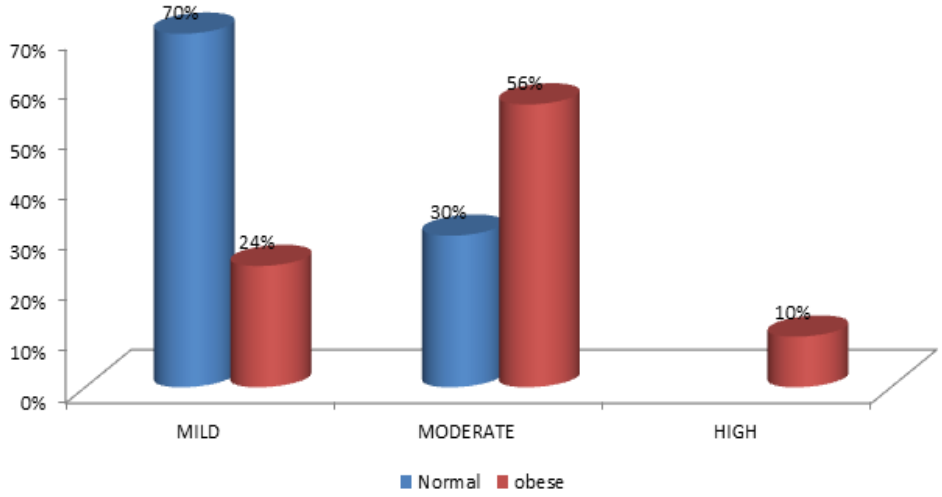

Table2: Professional life stress score in normal group and obese group, Values are represented as Mean ±SD; n=50 in each group

GROUPS	PLSS Mean Score	MILD	MODERATE	HIGH
NORMAL	14.18±5.88	(n=35) 10.57±1.6	(n=15) 22.60±2.44	NIL
OBESE	23.9±8.5***	(n=12) 12.5±0.9*	(n=28) 24.17±2.80*	(n=10) 36.8±3.84

P<0.001 ***Normal group versus obese group

Table 3: Comparison of Blood Pressure between Normal group and Obese group

Group	BLOOD PRESSURE (mm Hg)	
	SYSTOLIC	DIASTOLIC
Normal	122±5.01	80±0.05
obese	140±4.25**	84±5.32

P<0.001 ***Normal group versus obese group

Perceived stress scale

In the normal group 60% of the employees were in mild category of stress and 36% had Moderate degree of Stress. Further 4% of the participants had High degree of stress. (Fig 1).Prevalence of mild stress in the obese group was 24% and 60% were in the moderate stress category and 16% of the obese had high stress The mean of total perceived stress (table:1) showed a significant (P<0.001) increase in the obese group compared to the normal group.

Professional life stress scale

In the normal group70% of the employees were in mild category of stress and30% had Moderate degree of Stress. None of the participants had high degree of stress In the obese group 24% had mild degree of stress and 56% had moderate degree of stress and 10% of the participants had High degree of stress. The mean of total professional stress (table:2) showed a significant increase in the obese group compared to the normal group. (P<0.001). A significant (P<0.001) increase in the systolic blood pressure (table 3) was observed in the obese group when compared to the normal group. Further, a non-significant increase in the diastolic pressure was observed in the obese group subjects.

DISCUSSION

Occupational stress is one of the most common forms of stress in developing countries as the socioeconomic status, social inequalities. According to the increasing financial burden to support families; health disorders neglected due to job conditions and work conflicts. In the present study the perceived stress and professional stress was well correlated with the increasing body mass index. The hypothalamic-pituitary-adrenal (HPA) axis plays a central role in the regulation of energy metabolism through the actions of the glucocorticoids [16]. Stress may contribute to HPA axis dysregulation and might lead to the tendency to overeat, which in turn contributes to obesity. Food intake is rewarded during periods of stress because eating becomes associated, through negative feedback, with a reduction of central corticotropin-releasing factor (CRF) activation, a core component of the stress response[17]. Dysregulation of the HPA axis has been well documented in individuals exposed to chronic stress[16]. Although we cannot establish causal pathways from this cross-sectional analysis, it is possible that higher stress levels caused altered HPA axis function, which in turn contributed to increases in BMI.

A key component of obesity is intra-abdominal accumulation of fat, which is responsible for a great portion of the increased cardiovascular risk associated with obesity [18]. Several studies have well correlated the association of BMI and blood pressure [19, 20]. The results of the present study are in accordance with the previous reports. Physical inactivity might decreases the production of Nitric Oxide by the abnormal endothelium, which leads to changes in vessel diameter that might lead to vascular structural changes which result in hypertension .The results from this study might be limited to a localized region of Mangalore and cannot be directly compared with results from other parts of India considering the diversity in culture and other factors within the country. Identification of factors contributing to stress along with effective counselling will have a greater impact on mental and physical health of industrial workers. Prevention of blood pressure and obesity by regular health checkups, good exercise including healthy diet should be a major concern.

REFERENCES

[1] Chaly PE, Anand SPJ, Reddy, VCS Nijesh, Srinidhi JE. Int J Med and Dent Sci 2014; 3: 440-450.
[2] van der Hulst, Monique and Sabine Geurts. Work Stress 2001;15 (3): 227-240.
[3] Lund Thomas, Merete Labriola, Karl Bang Christensen et al. British Med J 2006;25(332) :449-452
[4] Hughes RB, Taylor HB, Robinson-Whelen S, Nosek MA. Women's Health Issues 2005;15(1):14–20.
[5] Reis RS, Hino AA, Anez CR. J Health Psychol 2010;15(1):107–114.
[6] Erci B. Dergisi Ataturk Univ Hemşirelik Yuksekokulu Dergisi 2006;9(1):58–63.
[7] Cohen, S. and Williamson, G. Perceived Stress in a Probability Sample of the United States. Spacapan, S. and Oskamp, S. (Eds.) The SocialPsychology of Health. Newbury Park, CA: Sage, 198
[8] David Fontana. 1989. Professional stress test scale UK. Managing Stress, The British Psychological Society and Routledge Ltd.
[9] Nocon M, Hiemann T, Müller-Riemenschneider F, Thalau F, Roll S, Willich SN. Eur J Cardiovasc Prev Rehabil 2008; 15: 239–246.
[10] Misra A, Pandey RM, Devi J R, Khannav N, Sharma R. Int obes Relat Metab Disord 2001; 25: 1722-9
[11] Mishra A. Khurana L. J Clin Endocriol Metab. 2008; 93: 59-30
[12] Saat NZM, Ishak I, Lubis SH, Wen SH, Suriyanee Mohd SNL, Zakaria NS, Ee TX, et.al. ASEAN Journal of Psychiatry. 2010; 11(2).
[13] Chitnis P, Rane N, Vij V, Gupta VK. International Journal of Pharmacy and Biological Sciences 2013; 3(1): 355-359.
[14] Chockalingam A, Balaguer-Vinto I (eds). Impending global pandemic of cardiovascular diseases: challenges and opportunities for the prevention and control of cardiovascular diseases in developing countries and economiesin transition. World Heart Federation. Barcelona: Prous Science 1999.
[15] Reddy KS, Yusuf S. Circulation Feb 1998;97:596–601.
[16] Habib KE, Gold PW, Chrousos GP. Endocrinol Metab Clin North Am. 2001;30:695-728
[17] Gluck ME, Geliebter A, Hung J, Yahav E. Psychosom Med 2004;66:876–81.
[18] Folsom AR, Li Y, Rao X, Cen R, Zhang K, Liu X, He L, Irving S, Dennis BH. J Clin Epidemiol 1994;47:173–181
[19] Jones DW, Kim JS, Andrew ME, Kim SJ, Hong YP. J Hypertens 1994;12:1433–1437.
[20] Walker ARP, Walker BF, Manetsi B, Molefe O, Walker AJ, Vorster HH. Int J Vitam Nutr Res 1990;61:244–250.