


Original Research Article

A comparative study on the Waist Hip Ratio and Serum Lipid Profile in Information Technology employees with Non Information Technology Employees

K.V. Vijayakumar¹, T. Rajalakshmi^{2*}

^{1,2}Assistant Professor, Department of Biochemistry, Government Dharmapuri Medical College, Dharmapuri, Tamil Nadu, India

*Corresponding author email: rajalakbio@gmail.com

	International Archives of Integrated Medicine, Vol. 6, Issue 4, April, 2019. Copy right © 2019, IAIM, All Rights Reserved. Available online at http://iaimjournal.com/ ISSN: 2394-0026 (P) ISSN: 2394-0034 (O)
	Received on: 29-03-2019 Accepted on: 03-04-2019 Source of support: Nil Conflict of interest: None declared.
How to cite this article: K.V. Vijayakumar, T. Rajalakshmi. A comparative study on the Waist Hip Ratio and Serum Lipid Profile in Information Technology employees with Non Information Technology Employees. IAIM, 2019; 6(4): 92-99.	

Abstract

Background: In Information Technology (I.T) employees, occupational stress is more common which cause alterations in biochemical parameters and diseases.

Aim: To compare the Waist Hip Ratio (WHR), Body Mass Index (BMI) and serum lipid profile like Total cholesterol, Triglycerides, High Density Lipoprotein (HDL), Low Density Lipoprotein (LDL) and Very Low Density Lipoprotein (VLDL), in I.T employees with non I.T employees.

Materials and methods: This was a comparative study in which employees who were working in I.T Company compared with employees not working in I.T Company. The study included totally 300 subjects of whom 150 were I.T employees and 150 were Non I.T employees. Weight, height, waist and hip measurement were taken. Fasting blood samples were analyzed for Total cholesterol, Triglycerides, HDL, LDL and VLDL. The data were analyzed using SPSS software version 11.5. Results were expressed as mean \pm SD.

Results: BMI and WHR were significantly decreased in I.T employees than in Non I.T employees. There was no significant difference in Total cholesterol, Triglycerides, HDL, LDL and VLDL.

Conclusion: The significant reduction in BMI and WHR in I.T employees may be due to their relaxation exercises in between the working hours, regular physical exercise, periodical health check – up, and life style modification which were not seen in non I.T employees.

Key words

Occupational stress, Information Technology, WHR, Lipid profile, Coping with stress.

Introduction

Stress is a pattern of psychological, behavioral and physiological response of the individual to demands of the physical and social environment that exceeds his ability to cope effectively [1].

“Workplace stress” is the harmful physical and emotional responses that can happen when there is a conflict between job demands on the employee and the amount of control over meeting these demands. In general, the combinations of high demands in a job and a low amount of control over the situation can lead to stress [2]. According to Cartwright, et al. absenteeism, illness, alcoholism, “petty internal politics”, bad or snap decisions, indifference and apathy, lack of motivation or creativity are all by products of over stressed workplace [3].

Occupations particularly in Information Technology (IT) and IT enabled services (ITES), pose a host of new health challenges particularly those related to mental and social health [4]. The term information technology systems as used here includes all computer hardware, software, firmware, networks, and data used for the communication, transmission, processing, manipulation, storage, or protection of information. It is the fact that the life of many employees in this industry is more stressful than others working in other industries. Stress may be due to work timing (shift work), repetitive nature of work, tremendous workload, long working hours etc.

As people work in irregular hours, their regular eating habits are difficult to maintain. Many of them consume more fast foods, yet they don't meet the recommended daily intakes for major nutrients. So shift workers have a higher prevalence of being overweight. Changed eating habits and other life style changes (including reduced exercise), among shift workers may lead to altered nutritional status which in turn leads to

increase in BMI. Working in irregular hours, including night work and shift work has been found to be associated with higher levels of lipid [5].

Non I.T employees in this study were office employees who were working in show room and workshop of Motor Vehicle Company. They used to work for a fixed time, usually 8 hours per day, no shift duty or night duty, take regular and timely food. So, it was assumed that they have less or no stress at workplace. The purpose of the present study was to compare Waist Hip Ratio (WHR), Body Mass Index (BMI) and serum lipid profile like Total cholesterol, Triglycerides, High Density Lipoprotein (HDL), Low Density Lipoprotein (LDL) and Very Low Density Lipoprotein (VLDL) in I.T employees with non I.T employees.

Materials and methods

This was a comparative study between the I.T employees and non I.T employees. Institutional ethical committee clearance was obtained. This present study included totally 300 subjects of which both genders of 150 subjects who were working in the I.T Company with age group between 20 – 50 years. Age and gender matched 150 subjects who were not working in the I.T company were included for comparison. All individuals who were suffering from acute illness were excluded from this study.

After explaining the nature of the study, informed consent from the study subjects was obtained. For all subjects, a complete clinical history was taken. The subject was made to stand. The hip area was palpated for the right iliac crest and a horizontal line marked at the highest point of the iliac crest. The measuring tape was placed around the trunk in a horizontal plane at that level marked on the right side of the trunk. The waist circumference was measured in cm at the end of a normal expiration (The WHO

STEPS protocol). Then, the subject was made to stand erect with feet together and weigh evenly distributed on both feet. Tape should be placed around the point with the maximum circumference over the buttocks and hip circumference was measured in cm. Waist hip ratio (WHR) was calculated by dividing the corresponding values of waist circumference by hip circumference. Height in meter and weight in kilograms are measured. Body mass index (BMI) is calculated by dividing the weight (in Kg) by height (in Meter²).

Fasting blood samples were taken from all the study subjects and the same were subjected for estimation of biochemical lipid profile like Total cholesterol, Triglycerides, High Density Lipoprotein (HDL), Low Density Lipoprotein (LDL) and Very Low Density Lipoprotein (VLDL) by using fully automated analyzer.

Statistical Analysis

The results were analyzed based upon the statistical methods using computerized SPSS program version 11.5. The study subjects were divided into group 1 (I.T employees) and group 2

(Non I.T employees) for the purpose of statistical analysis. Results were expressed as mean ± S.D. The results were analyzed statistically by students unpaired 't' test. The p value < 0.05 was taken as the cut-off level for significance.

Results

The group 1 (I.T employees) contains 150 subjects and group 2 (Non I.T employees) contains 150 subjects. All the study groups are between the 20 – 50 years of age group and have more number of males than females.

Table - 1 and **Figure - 1** showed the total male subjects were slightly higher in I.T employees than in non I.T employees. The total female subjects were slightly higher in non I.T employees than in I.T employees.

Table - 2 and **Figure - 2** showed the age of the study subjects, range from 20 to 50 years with the mean of 28.49 ± 7.9 for I.T employees and 29.41 ± 8.00 for non I.T employees. More number of subjects was seen in the age group of 21 – 30 years than in other age groups.

Table - 1: Age and Sex wise distribution of study subjects in each group.

Study subjects (n= 300)	Males	Females	Age (years) MEAN±SD
Group 1: I.T employees (n = 150)	119	31	28.49 ± 7.9
Group 2: Non I.T employees (n =150)	122	28	29.41 ± 8.00
Total (n = 300)	231	59	28.95 ± 7.96

Figure - 1: Sex wise distributions of study subjects in each group.

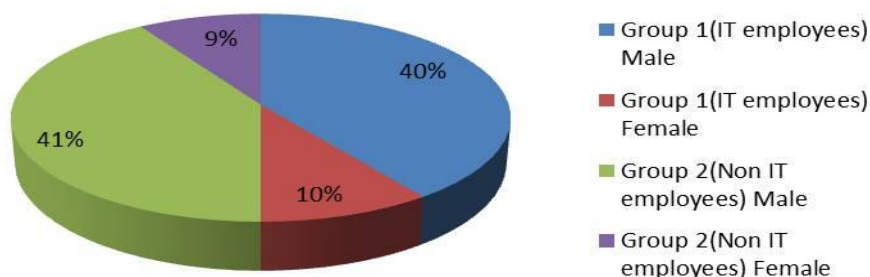


Table - 2: Age wise distribution of study subjects in each group in Numbers.

Group	Age 20 – 30 years	Age 31 – 40 years	Age 41 -50 years
Group1 (I.T employees)	98	34	18
Group2 (Non I.T employees)	95	35	20

Figure - 2: Age wise distribution of the subjects in each group in percentage.

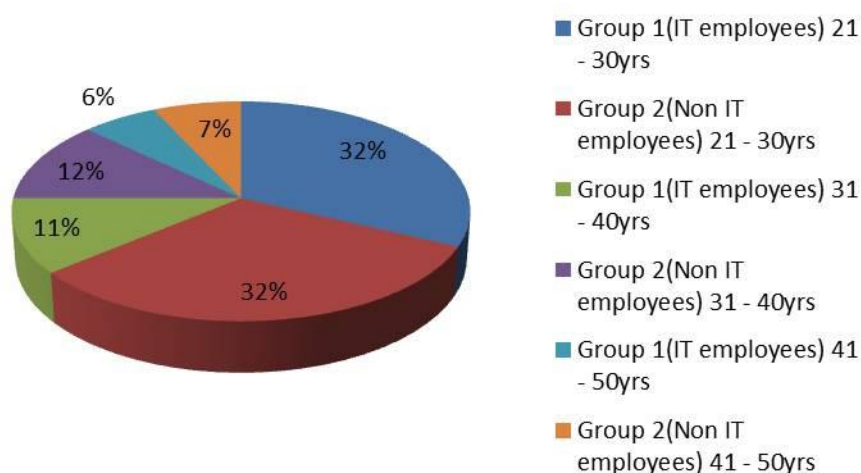


Table - 3: Body Mass Index and Waist – Hip ratio of the subjects in each group.

Variables	Group 1: I.T employees (n = 150) (Mean±SD)	Group 2: Non I.T employees (n=150) (Mean±SD)	p value
Body Mass Index (BMI) (kg/m ²)	22.25 ± 4.09	23.45 ± 4.47	<0.05
Waist Hip Ratio (WHR)	0.84 ± 0.08	0.89 ± 0.06	<0.001

Figure – 3: The mean value of Waist Hip Ratio (WHR) of the subjects in each group.

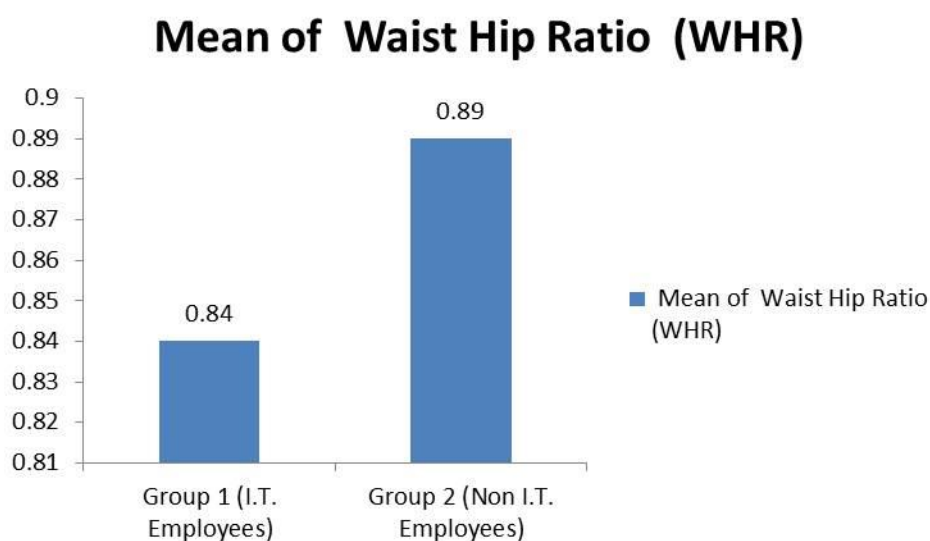


Figure – 4: The mean value of Body Mass Index (BMI) of the subjects in each group.

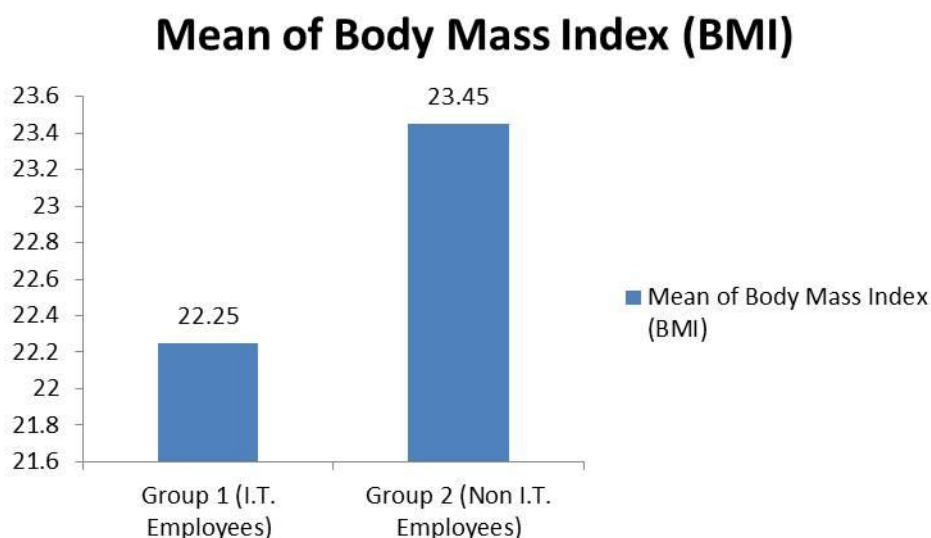


Table 4:- Lipid Profile of the subjects in each group.

VARIABLES	Group 1: I.T employees (n = 150) (Mean±SD)	Group 2: Non I.T employees (n=150) (Mean±SD)	p value
Total Cholesterol (mg/dl)	172.36 ± 42.43	177.29 ± 45.68	>0.05
Triglycerides (mg/dl)	139.63 ± 70.73	144.38 ± 80.36	>0.05
High Density Lipoprotein (HDL) (mg/dl)	43.76 ± 11.21	44.22 ± 12.73	>0.05
Low Density Lipoprotein (LDL) (mg/dl)	100.67 ± 36.06	104.20 ± 41.29	>0.05
Very Low Density Lipoprotein (VLDL) (mg/dl)	27.93 ± 14.15	28.88 ± 16.07	>0.05

Table – 3, Figure – 3, 4 showed that there was a significant raise of Body Mass Index and Waist Hip Ratio in I.T. employees than Non I.T. employees.

Table - 4 showed that there was a decreased serum concentration of Total Cholesterol, Triglycerides, HDL, LDL and VLDL in I.T. employees than Non I.T. employees.

Discussion

Stress can be caused by too much or too little work, time pressures and deadlines, having too many decisions, fatigue from physical strains, excessive travel, long hours of work, to cope with changes at work [6]. According to Geeta Kumari, et al. and many other previous studies, I.T employees are more prone for stress and stress related health disorders with altered biochemical parameters than other employees

[7]. In our study, the I.T employees were more aware about their health. So, they were practicing yoga, meditation and physical exercise regularly. They were doing periodical health check – up. I.T company was also giving adequate relaxation techniques during the work at regular intervals. So, coping with stress may be better in I.T employees than in Non I.T employees.

Jasobanta Sethi, et al. concluded that there was a significant association ($p < 0.001$) was seen among high BMI subjects with their increase scores of occupational stress [8]. The body mass index (BMI) is the standard measure of overweight and obesity. However, more recently, waist to hip ratio (WHR) or waist circumference (WC) as more sensitive measures for visceral obesity have been proposed to be more indicative of cardiovascular risk [9]. Sedentary office workers in a stressful job with high BMI will have more eating behavior, thereby they are

more prone to have a weight gain which leads to obesity [10]. High work stress produces weight loss due to diminished appetite and/or increased physical activity in some individuals, whereas in others, it is associated with weight gain due to increased eating and decreased physical activity [11].

Vedamurthachar, et al. observed that there was a significant reduction in plasma cortisol level after yoga practice [12]. Some other study found that yoga can decrease the oxidative stress [13]. Significant reduction in BMI and waist hip ratio in I.T employees in our study could be due to their regular exercises, practicing yoga and meditation, more health awareness, keeping balanced diet and high socio economic status. Our study results are matched with the study results of McCaffrey, et al. and Murugesan R, et al. who found that yoga practice was effective in reducing body weight [14, 15].

Statistically, there is no significant difference in all the serum lipid profile parameters (Triglycerides, cholesterol, HDL, LDL and VLDL) between the I.T employees and Non I.T employees (p value > 0.05). All the values are within the normal reference range. Our study results are matched with the study results of Maryam Shahnam, et al. who found that there was no significant relationship between stress and blood triglycerides [16].

Kreitzer MJ, et al. found that yoga was effective in reducing stress [17]. Malhotra V, et al. observed that there was a significant reduction in fasting blood glucose, total cholesterol, triglycerides, and LDL and VLDL levels after yoga practice [18]. Elizabeth A. Bachen, et al. observed that elevations in total cholesterol and its HDL and LDL sub fractions during acute stress are caused by accompanying hemoconcentration, whereas concomitant rises in free fatty acids and triglycerides result from the direct metabolic effects of sympathetic activation [19]. Sympathetic nervous system activation may be less during psychological stress in I.T employees who were coping up with stress in our

study. Catecholamines induced lipolysis and release of free fatty acids into the circulation might have decreased. Because of decreased availability of free fatty acids, resynthesis of triglycerides and, subsequently, VLDL production by the liver may be decreased. For a better understanding of the relationship between stress and serum lipid profile, further studies on both human and animal models have to be conducted. Comprehensive clinical trials could be devised, which would test positive correlations between elevated stress scores and serum lipid profile.

Conclusion

Previous studies have shown that the relaxation training and health awareness may decrease the stress related biochemical changes. The occurrence of stress related health disorders and biochemical parameter changes depend on the intensity and duration of stressors and how well the person copes up with the stress. The I.T employees in our study were having more health awareness, regular physical exercise, adequate relaxation training during the work, periodical health check – up, good diet habits, in-campus physical fitness centre, practicing yoga and meditation and life style modifications than Non I.T employees. During coping with stress, there is decreased BMI and WHR in I.T employees. Our study strongly recommends the implementation of adequate relaxation training, periodical health check-up camp, proper diet counselling, life style modification and in-campus physical fitness centre in all working organizations (I.T and Non I.T) which will be very helpful in promoting the health of the employees, their organization and ultimately the development of the nation.

Limitation

- Long term study with assessment of stress level (by standard recommended questionnaire) will give more validated results.

- Inclusion of the samples from various geographical distribution and large sample size will give more information.
- Study with long term follow up will give more information regarding the alteration in biochemical parameters due to prolonged exposure of stressors among the employees.

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