A study on anthropometric measurements, Nutritional status and Body composition of the Night shift BPO executives

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ABSTRACT

A study was taken up to assess the anthropometric measurements, nutritional status and body composition of fifty eight samples working in the night shift at a BPO. Twenty four hour dietary recall was used as a tool to assess the nutritional status while bioelectrical impedance was used to assess the body composition of the subjects in the study. The results of this study revealed that subjects have a poor nutritional status as compared to the RDA given by the ICMR, the anthropometric measurements showed that the males have a higher BMI than the females and so the males working in the night shift are obese, while the body composition showed that the males have a higher body fat and the skeletal muscles were observed to be low in the both the gender. Statistical analysis of the results showed that there is a very significant correlation between the anthropometric measurements and body composition of the subjects as evidenced by the pearson's correlation at 0.05 and 0.01 level of significance (2- tailed).

Key words: Night shift, anthropometric measurements, nutritional status, body composition.

INTRODUCTION

A BPO is the delegation of one or more information technology intensive business process to an external provider that in turn administers and manages the selected process. Globally, as different processes of a business started being outsourced, the term Business Process Outsourcing (BPO) has gathered popularity. At present India has emerged as the global back office and customer service centre. In spite of competition from other developing countries, India remains the prominent location for outsourced business activities[1].

Coffee is leading worldwide beverage after water. It is a brewed beverage prepared from roasted or baked seeds of several species of an evergreen shrub of the genus coffea. Effects of coffee on human health has been a subject of many studies; however, results are varied in terms of coffee's relative benefits[2].

The US Food and Drug Administration (FDA) stated that the average amount of caffeine consumed approximately 300 mg per person per day - the equivalent to between two and four cups of coffee. This is considered to be a moderate caffeine intake, which according to many studies, can promote a variety of health benefits.

Studies till today reveal that the nutritional status of the BPO executives is not very well balanced and they do suffer from various health and nutritional issues. Highly-caffeinated drinks are a staple of BPO workers' diets, a UP study revealed. In their study, 2/3 of young workers drink coffee daily, but call centre workers drink more coffee than the non-call centre counterparts (2.3 cups a day for call centre workers v/s 1.7 cups for the latter). More call centre workers also consume tea (1/4 of respondents), compared to non-call centre workers (only 1/5).

The study also revealed that half of young workers drink soda daily, at an average of 1.5 bottles/cans a day, regardless of group. However, energy drinks are not as popular: only 15% of young workers drink energy drinks daily[3].

Another study revealed that less than half of call center workers (47%) regularly eat 3 meals a day. The study also revealed that compared to other workers, more female call center workers skip meals--40% skip breakfast, 20% skip lunch, and 16% skip dinner[3].

Bioelectrical Impedance (BI) is considered one of the most accurate and accessible methods of screening body fat. Muscles, blood vessels and bones are body tissues having a high water content that conduct electricity easily. Body fat is tissue that has little electric conductivity. The Body Composition Monitor sends an extremely weak electrical current (0.5mA), through your body to determine the amount of fat tissue. The weak electrical current is no t felt while operating the Body Composition Monitor. The body fat percentage is calculated by a formula that includes five factors; electrical resistance, height, weight, age and gender.

Research has shown that body composition is directly related to health. A normal balance of body fat is associated with good health and longevity. Excess fat in relation to lean body mass, altered body composition, can greatly increase your risks for cardiovascular disease diabetes, and more. BIA allows for early detection of an improper balance in your body composition, which fosters earlier intervention and prevention. BIA also provides a measurement of fluid and body mass that can be a critical assessment tool for your current state of health[4]

So the present study was designed to assess the anthropometric measurements, nutritional status and body composition of the night shift BPO workers, with the following objectives:
1) To assess the nutritional status by Anthropometric measurements and Body composition.
2) To assess the nutritional status by 24 hour Diet recall method.
3) To correlate anthropometric measurements with the Body composition of the subjects.

MATERIALS AND METHOD

A total of 58 subjects selected for the study were night shift BPO working executives at a BPO located in Andheri east, Mumbai between the age group of 25- 40 years, out of which 34 were Males and 24 females.

The tool used for the study was questionnaire, which was filled in by the subjects. It included the demographic details of the subjects such as age, gender, marital status, state, monthly income, number of family members, working hours and shift timings, anthropometric measurements (i.e.) height, weight, BMI, waist circumference, hip circumference and waist to hip ratio.

Twenty four hour dietary recall method was used for nutritional assessment. From the record of food intake during 24 hrs, actual amounts of raw food consumed were derived and thus nutritive value of the diet was calculated using the nutritive value of the Indian foods of ICMR.

The body composition of the subjects was obtained with the help of a body composition analyser: Omron Karada scan body composition monitor HBF-375..

Statistical Analysis:

The data was classified and coded and with the help of a statistician, following statistical analysis was done; Means ,averages, frequency and standard deviation were calculated for background information, lifestyle of the subjects and various variables in the study. 2- way ANOVA table and pearson correlation at 0.05 and 0.01 level of significance (2- tailed)., was used to understand various correlations in the study. The study was approved by Seva mandal educational trust, a respective ethical committee.

RESULTS AND DISCUSSION

Demographic Details

The subjects included in the study were 90% Maharashtrian and the rest 10% percent were from other states who fall in the age group of 25- 40 years. Maximum (36%) subjects had a monthly income of 10,000 to 15,000 and minimum (16%) had more than 25,000 rupees monthly income.

Anthropometric measurements were divided into 2 categories of male and female. The mean height of male was 169.2 cm, while the mean height of female was 158.5 cm. It was seen that the BMI in male was higher 25.5 kg/ m^2 as compared to females 23.7 kg/ m^2 when compared with the Asian cut offs[5]. The mean waist to hip ratio was seen normal in both males and females.

The nutritional status of the subjects was collected with the help of 24 hour dietary recall method, Table 1 shows the entire nutritional status in comparison to the normal RDA values.

Table: 1
24 Hour dietary recall of the night shift BPO executives

Gender	Energy Kcal	Protein gm	Carbohydrate gm	Fat gm	Caffeine mg	Calcium mg
Male	1488.4± 391.9	37.55 ±11.06038	308.071 ± 82.8707	49.72 ±17.6719	269.54 ±91.826	611.142 ± 481.92
RDA	2320	60	254	25	200-300	600
Female	1212.9± 334.74	32.664 ±10.99383	272.398 ± 110.5709	37.87 ± 8.32	307.667 ± 82.790	563.34 ± 55.345
RDA	1900	55	300	20	200-300	600

Source of RDA: Indian council of Medical Research (ICMR)

Correlation of BMI with Anthropometric measurements of Night shift employees Male and Female:

Body mass index was seen to be significantly correlated with the anthropometric measurements with the help of pearson correlation (2- tailed) at 0.01 level of significance. Table no: 2 shows a very positive significant correlation of weight, hip circumference, waist circumference with BMI in both the gender so, as these variables increase the BMI in male and female increased. The positive significant correlation could be because the BPO executives at night work without sound sleep and by sitting for longer duration and without any movement after meals and more coffee consumption tend to put on weight.

Table: 2
Correlation of BMI with Anthropometric measurements of Night shift employees Male and Female

Anthropometric measurements		Male	Female
Height	Pearson correlation Sig (2-tailed)	.037 .834	-.335 .109
Weight	Pearson correlation Sig (2-tailed)	.929[**] .000	.951[**] .000
Waist circumference	Pearson correlation Sig (2-tailed)	.734[**] .000	.825[**] .000
Hip circumference	Pearson correlation Sig (2-tailed)	.644[**] .000	.825[**] .000
WHR	Pearson correlation Sig (2-tailed)	.513[**] .002	.635[**] .001

** Correlation is significant at the 0.01 level (2-tailed).

Body composition of the BPO executives:

Body composition of the subjects was obtained with the help of the Bioelectrical impedance. It was observed from the results that the mean Body fat of the males was very high 25.9 % ± 7.03 and of females was 31.92 % ± 6.29 as compared to the normal range (20%) for males and less than 30% in females. The mean subcutaneous was 21.87% ± 8.53 in males and 25.78% ± 6.12 in females, while it was also observed that both the gender had low skeletal muscle values than the normal values. The mean visceral fat level was Normal in both males 9.41± 5.56 and in females it was 5.5 ± 4.36. Also the mean resting metabolism was observed to be 1531.5± 232.4 in males and 1245.67 ± 179.88 in females. The correlation of anthropometric measurements with body composition in both the gender was done, table 3 and table 4 showed the positive and negative significance between the correlation of anthropometric measurements and body composition in the study.

Correlation of Anthropometric measurements and Body composition in Males:

Table: 3
Correlation of Anthropometric measurements and Body composition in Males

Anthropometric Measurements		Body fat	Subcutaneous Fat	Skeletal muscle	Visceral fat	Resting metabolism
Height	Pearson Correlation	-.290*	-.142	-.166	-.203	.139
	Sig. (2-tailed)	.017	.248	.175	.097	.259
Weight	Pearson Correlation	.573**	.558**	-.297*	.806**	.644**
	Sig. (2-tailed)	.000	.000	.014	.000	.000
BMI	Pearson Correlation	.687**	.579**	-.251*	.907**	.652**
	Sig. (2-tailed)	.000	.000	.039	.000	.000
Waist circumference	Pearson Correlation	.629**	.323**	.230	.659**	.589**
	Sig. (2-tailed)	.000	.007	.059	.000	.000
Hip circumference	Pearson Correlation	.515**	.229	.195	.603**	.630**
	Sig. (2-tailed)	.000	.061	.111	.000	.000
WHR	Pearson Correlation	.488**	.327**	.154	.424**	.229
	Sig. (2-tailed)	.000	.006	.210	.000	.061

Correlation of anthropometric measurements with Body composition in Females:

Table: 4
Correlation of anthropometric measurements with Body composition in Females

Anthropometric measurements		Body fat	Subcutaneous Fat	Skeletal muscle	Visceral Fat	Resting Metabolism
Height	Pearson Correlation	-.430*	-.258	.021	-.430*	.049
	Sig. (2-tailed)	.014	.153	.910	.014	.790
Weight	Pearson Correlation	.786**	.743**	.605**	.851**	.996**
	Sig. (2-tailed)	.000	.000	.000	.000	.000
BMI	Pearson Correlation	.882**	.776**	.570**	.962**	.911**
	Sig. (2-tailed)	.000	.000	.001	.000	.000
Waist circumference	Pearson Correlation	.796**	.648**	.603**	.812**	.818**
	Sig. (2-tailed)	.000	.000	.000	.000	.000
Hip circumference	Pearson Correlation	.521**	.589**	.764**	.728**	.843**
	Sig. (2-tailed)	.002	.000	.000	.000	.000
WHR	Pearson Correlation	.545**	.192	-.175	.218	.079
	Sig. (2-tailed)	.001	.291	.339	.231	.665

** Correlation is significant at the 0.01 level (2-tailed).

*Correlation is significant at the 0.05 level (2-tailed).

SUMMARY AND CONCLUSION

The present study was undertaken to assess the anthropometric measurements and nutritional status and body composition of the night shift BPO executives. On the basis of the results obtained it can be concluded that the Body mass index of the night shift executives was higher as compared to the normal BMI of the Asian cut offs. The mean waist to hip ratio of the subjects was seen to be normal. Mean energy, protein, carbohydrates, fat, caffeine and calcium was observed to be lower than the RDA in the night shift executives. It was found that the mean calcium was seen to be lower in the females than the males.

Correlation of BMI with the anthropometric measurements was seen to be positively significant in the both the gender.

The body composition of the subjects was seen to be significant in the study. Thus it can be concluded that the night shift BPO executives have a very significant correlation between the anthropometric measurements and body composition. Thus it can be said that the subjects had a negative body composition in the night shift.

Thus it can be concluded from the above results that the BPO workers in the night have a higher BMI because of which they are at a higher risk of heart diseases, Blood pressure, diabetes mellitus and every co- morbidity of obesity. Their nutritional values are also very low as obtained from the 24 hour dietary recall, they ingest caffeine in the form of coffee in a moderate to high dosage.

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