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Effect of Circadian Oscillation during Food Deprivation on Agility in Obese Men

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Abstract

The purpose of the study was to find out the effect of circadian oscillation during food deprivation on agility among obese men. To achieve the purpose of the present study, sixty obese men from Islamiah College, Vaniyambadi, Tamilnadu, India were selected as subjects at random and their ages ranged from 18 to 25 years. The subjects were divided into four equal groups of fifteen subjects each. Group I acted as Experimental Group I (Food Deprivation Training), Group II acted as Experimental Group II (Physical training), Group III acted as Experimental Group III (Food Deprivation & Physical training) and Group IV acted as Control Group. Pre test was conducted for agility. This initial test scores formed as pre test scores of the subjects. Experimental Group I was exposed to food deprivation training, Experimental Group II was exposed to physical training, Experimental Group III was exposed to food deprivation & physical training and Control Group was not exposed to any experimental training other than their regular daily activities. The duration of experimental period was 120 days. After the experimental treatment, all the sixty subjects were tested on agility. This final test scores formed as post test scores of the subjects. The pre test and post test scores were subjected to dependent 't' test. The findings of the study showed that the combined food deprivation and physical training group showed significant changes in agility than the other experimental and control groups.

Keywords: Food Deprivation, Circadian Oscillation, Agility, Obese Men.

Introduction

Circadian rhythms are self sustained variations in biological and behavioral functions with a period of 24 hours. Circadian rhythms are internally driven by the brain's suprachiasmatic nucleus (SCN), the "circadian clock". These endogenously produced circadian rhythms can be modified by bright light (or darkness), melatonin, and exercise because the SCN receives neural input from cells in the retina that detect light, has melatonin receptors, and receives input from brain areas integrating information about the level of physical activity and central nervous system arousal. Healthy people are usually synchronized to the environment in which they live, and the dominant synchronizer is the light dark cycle. The potential for circadian rhythms to influence sport performance is related to the neural outputs of the SCN. Neurons from the SCN project most densely to the hypothalamus, but there are also projections to the forebrain. The hypothalamus plays an important role in regulating a host of body and brain functions with potential relevance to athletic performance (Gauthier et al. 2004).

Health is our birthright and to remain healthy, it is not necessary to depend upon any health centre physician or medication. It is entirely in our hands to keep healthy. However, in the present day conditions keeping good health is becoming more and more difficult and diseases are proliferating. All sorts of evils have crept into our society. Obese individuals have shorter life expectancy and greater risks of hypertension, diabetes mellitus, certain cancers and osteoarthritis. Obesity may be caused by genetic and environmental factors. As an exercise specialist, one play an important role in combating this major health problem by encouraging a physically active lifestyle and by planning exercise programs and scientifically sound diets for one's clients, in consultation with trained nutrition professionals. Restricting caloric intake and increasing caloric expenditure through physical activity and exercise are effective ways of reducing body weight and fatness while normalizing blood pressure and blood lipid profiles.

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Methodology

The purpose of the study was to find out the effect of circadian oscillation during food deprivation on agility among obese men. To achieve the purpose of the present study, sixty obese men from Islamiah College, Vaniyambadi, Tamilnadu, India were selected as subjects at random and their ages ranged from 18 to 25 years. The subjects were divided into four equal groups of fifteen

subjects each. Group I acted as Experimental Group I (Food Deprivation Training), Group II acted as Experimental Group II (Physical training), Group III acted as Experimental Group III (Food Deprivation & Physical training) and Group IV acted as Control Group. Pre test was conducted for agility. This initial test scores formed as pre test scores of the subjects. Experimental Group I was exposed to food deprivation training, Experimental Group II was exposed to physical training, Experimental Group III was exposed to food deprivation & physical training and Control Group was not exposed to any experimental training other than their regular daily activities. The duration of experimental period was 120 days. After the experimental treatment, all the sixty subjects were tested on agility. This final test scores formed as post test scores of the subjects. The pre test and post test scores were subjected to dependent 't' test. In all cases 0.05 level of significance was fixed to test hypotheses.

Results

Table I. Mean gains & losses between pre and post test scores on agility at different hours of experimental and control groups

S.No	Hours	Pre-Test Mean	Post-Test Mean	Mean difference	Std. Dev (±)	σ DM	't' Ratio
Food Deprivation Group							
1	6.00 am	23.89	23.19	0.70	0.46	0.12	5.84*
2	8.00 am	23.87	23.17	0.70	0.46	0.12	5.84*
3	4.00 pm	23.88	23.15	0.73	0.62	0.16	4.47*
4	6.00 pm	23.77	23.14	0.63	0.41	0.10	5.93*
Physical Training Group							
1	6.00 am	23.87	23.20	0.67	0.24	0.06	10.73*
2	8.00 am	23.76	22.74	1.02	0.51	0.13	7.69*
3	4.00 pm	23.83	22.48	1.35	0.31	0.08	16.53*
4	6.00 pm	23.80	22.47	1.33	0.50	0.13	10.12*
Combined Food Deprivation and Physical Training Group							
1	6.00 am	23.90	22.45	1.45	0.53	0.13	10.48*
2	8.00 am	23.78	22.10	1.68	0.54	0.14	11.79*
3	4.00 pm	23.88	22.02	1.86	0.52	0.13	13.63*
4	6.00 pm	23.78	22.09	1.69	0.47	0.12	13.78*
Control Group							
1	6.00 am	23.88	23.82	0.06	0.57	0.14	0.40
2	8.00 am	23.73	23.71	0.02	0.71	0.18	0.08
3	4.00 pm	23.85	23.84	0.01	0.75	0.19	0.06
4	6.00 pm	23.79	23.76	0.03	0.44	0.11	0.31

* Significant at 0.05 level

From table I the obtained 't' ratios for pre and post test mean difference of agility for food deprivation group at 6.00 am (5.84), 8.00 am (5.84), 4.00 pm (4.47) and 6.00 pm (5.93), for physical training group 6.00 am (10.73), 8.00 am (7.69), 4.00 pm (16.53) and 6.00 pm (10.12), for combined food deprivation and physical training group at6.00 am (10.48), 8.00 am (11.79), 4.00 pm (13.63) and 6.00 pm (13.78). The obtained ratios when compared with the table value of 2.14 of the degrees of freedom (14) it was found to be statistically significant at 0.05 level of confidence. For control group at 6.00 am (0.40), 8.00 am (0.08), 4.00 pm (0.06) and 6.00 pm (0.31) were lesser than the table value of 2.14 of the degrees of freedom (14) it was found to be statistically significant at 0.05 level of confidence.

Figure I. Pre and post test differences of the experimental and control groups on agility at 6.00 am

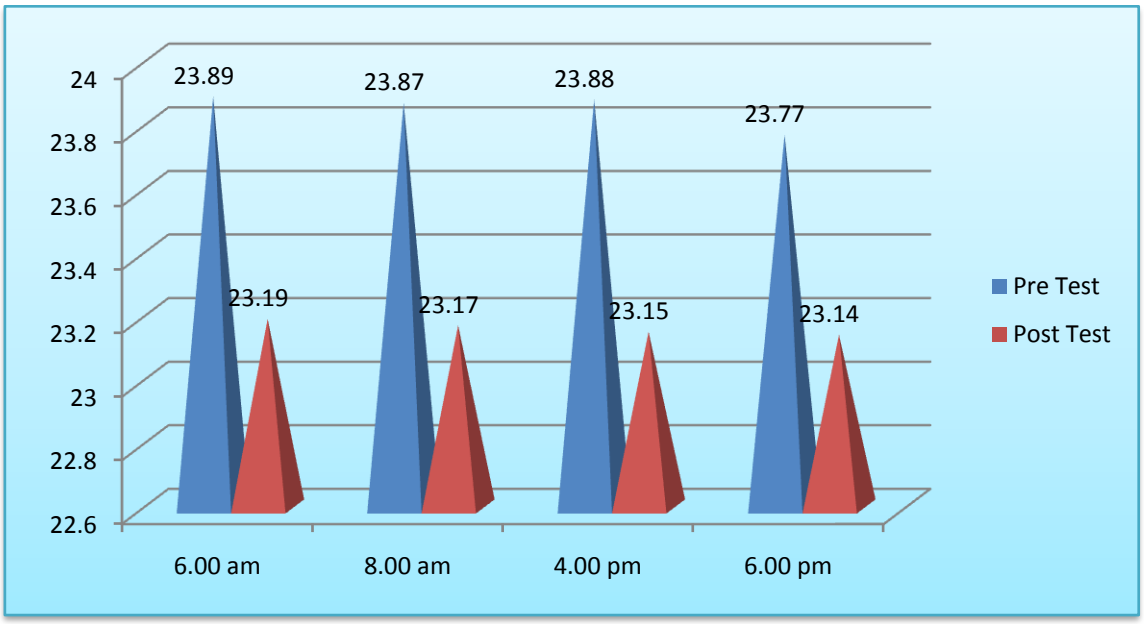


Figure II. Pre and post test differences of the experimental and control groups on agility at 8.00 am

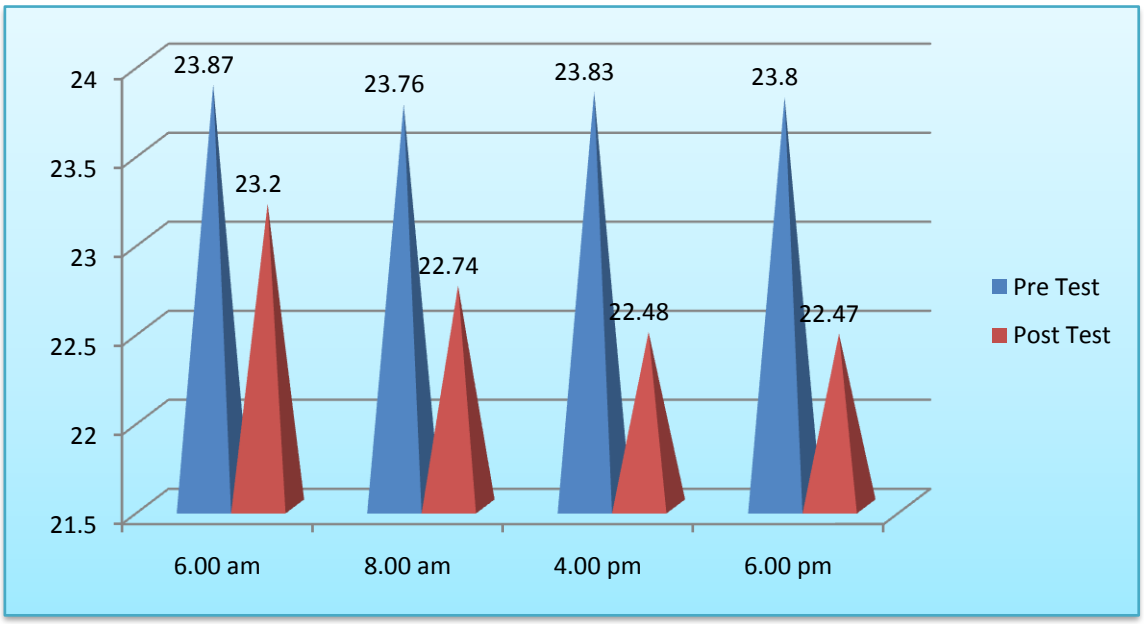


Figure III. Pre and post test differences of the experimental and control groups on agility at 4.00 pm

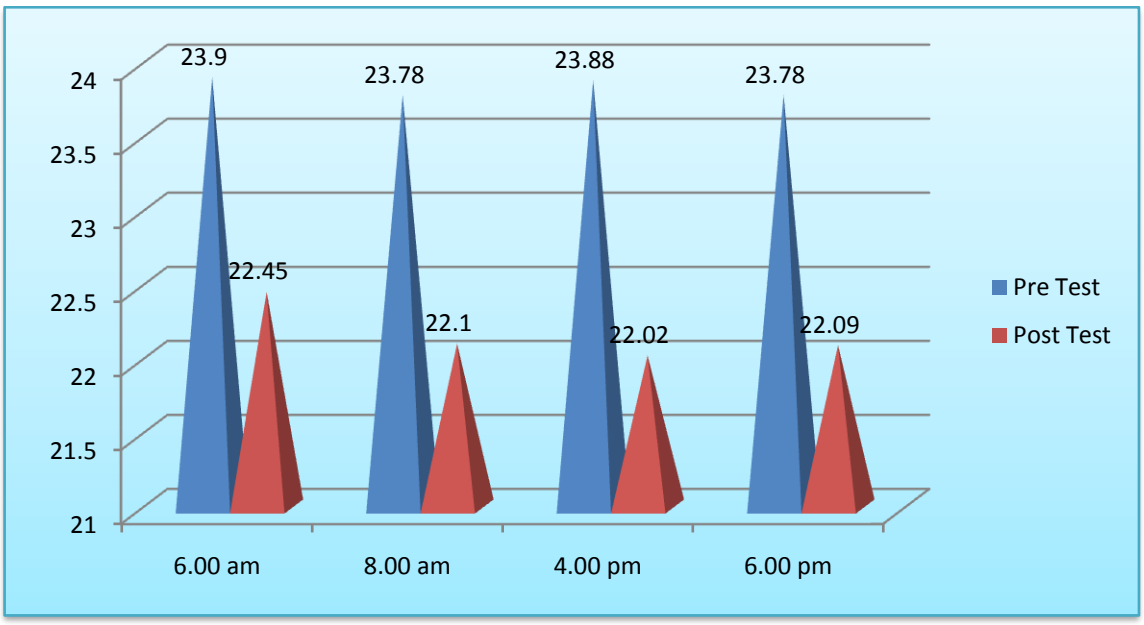
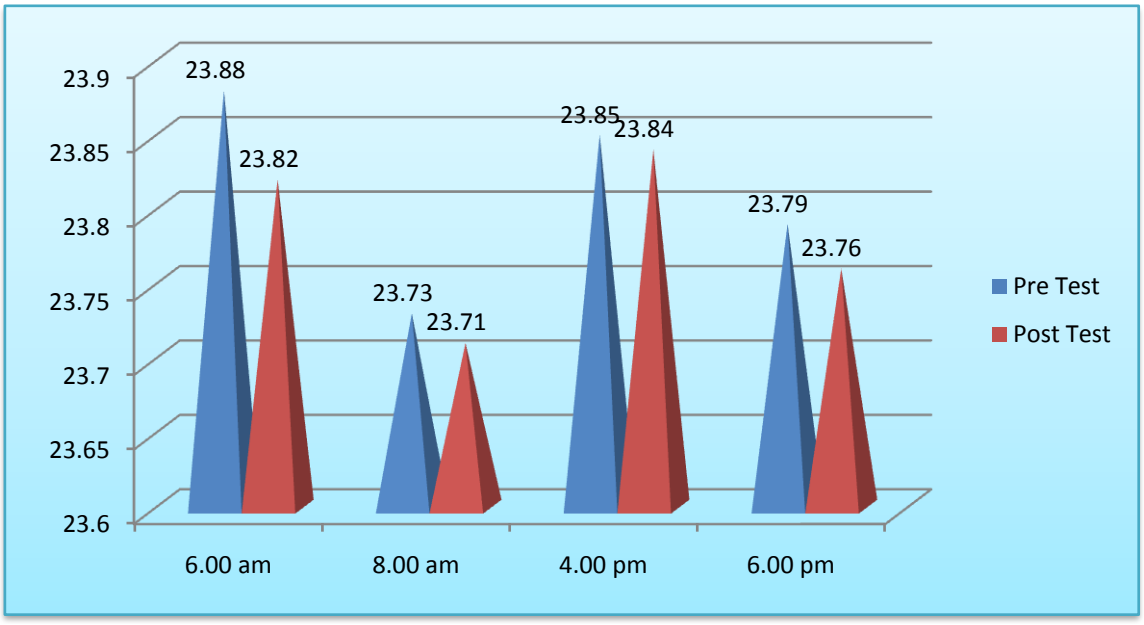


Figure IV. Pre and post test differences of the experimental and control groups on agility at 6.00 pm



Conclusions

From the analysis of the data, the following conclusions were drawn:

1. The findings of the study showed that there were significant changes in agility due to influence of physical training at 6.00 am, 8.00 am, 4.00 pm and 8.00 pm respectively.
2. The findings of the study showed that there were significant changes in agility due to influence of physical training at 6.00 am, 8.00 am, 4.00 pm and 8.00 pm respectively.
3. The findings of the study showed that there were significant changes in agility due to influence of combined food deprivation and physical training at 6.00 am, 8.00 am, 4.00 pm and 8.00 pm respectively.
4. The findings of the study showed that the combined food deprivation and physical training group showed significant changes in agility than the other experimental and control groups.

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