



EFFECT OF RAMADAN FASTING ON BODY COMPOSITION VARIABLES OF SPORTS PERSONS

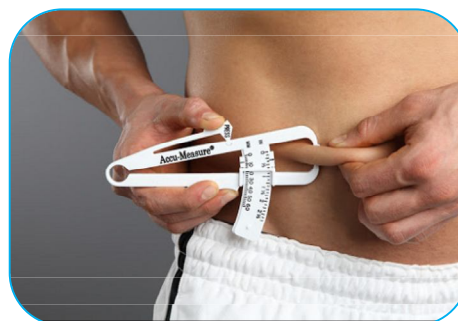
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ABSTRACT

Effect of Ramadan on body weight, body fat, body mass index, basal metabolic rate, lean body mass, bioelectrical impedance, and body water level has been studied in the present study. Data has been collected on 300 sports persons. Data was collected with the help of Meltron body composition analyser. Comparative analysis ANOVA was employed to see the effect on above said variables. Result indicated significant effect on body weight ($p < 0.05$), body fat ($p < 0.05$), body mass effect ($p < 0.05$), basal metabolic rate ($p < 0.05$), lean body mass ($p < 0.05$), bioelectrical impedance ($p < 0.05$), body water level ($p < 0.05$). In conclusion the body weight, body fat, lean body mass, body mass index, basal metabolic rate, and body water level decreased significantly.



KEYWORDS: *body weight, body fat, body mass index, basal metabolic rate, lean body mass, bioelectrical impedance, and body water.*

INTRODUCTION

Ramadan is one of the holy months of Arab Paganism fasting ritual one of the five pillars of Islam. In these months, Arabs would abstain from bloodshed and plunder, postpone any outstanding acts of revenge, and if possible perform the small pilgrimage (Umra) or the large (Hajj) visiting Mecca to worship Allah and the other gods of the Kaaba. There is plenty of literature and articles about Ramadan fasting, its purpose and its execution.

One of the most important rules of Islam is that every healthy adult Muslim must refrain from eating, drinking, smoking, and sexual relations from sunrise to sunset during the month of Ramadan, the ninth month of the Muslim calendar. The rules of Ramadan allow for a partial fast with food and water intake being permissible post-sunset and pre-dawn. The common practice is to eat two meals: one large meal after sunset and a much lighter one before dawn. Behavioural modifications are thus concerned with meal scheduling and shortening of time allowed for sleep.

It is generally assumed that Ramadan fasting is associated with a reduction of total energy intake and decline in body mass (Bigard et al., 1998). Total short-term fasting is detrimental to endurance (Aragon-Vergas, 1993) and anaerobic (McMurray et al., 1991) performance. It is also known that a low energy diet reduces the isometric endurance of skeletal muscle, probably because of a decrease in glycogen stores.

It already known that the 2012 Olympics Games in London was conducted during Ramadan and Muslim athletes continued their training and compete during Ramadan. It is an emergent need for examining how different athletic aspects are affected during Ramadan. While the London 2012 Olympics Games, during Ramadan, many Muslim athletes (males and females) didn't give up fasting. Results indicated that weight and BMI decreased significantly during Ramadan compared with pre Ramadan but increased significantly in post Ramadan. It has been suggested that this decline in body weight could be attributed to a decrease in fluid intake and hypohydration with little loss of body fat. Ramadan fasting is characterized by alterations in meal schedule and frequency. Meals are exclusively nocturnal and less frequent; hence this may affect energy and nutrient intake which indicated a varying degree of weight loss .

METHODOLOGY

Selection of Sample

In this present study total three hundred (300) subjects (age range: 18 – 25 years) male Muslim male sports persons after their informed consent were selected as subjects. All the data were collected at the time of holy month of Ramadan. All the subjects were regular practisers of sports and games. During the time of Ramadan all the subjects were in free living condition (not practicing sports and games). An attempt was made to determine the dominance of Morphological and Physiological characteristics in a sample of Muslim players. Body Composition: Weight, Height, BMI, fat mass, lean body mass, BMR, body water level were studied pre and post Ramadan fasting.

Assessment of Body Composition:

Body compositions of subject were determined by bio-electrical impedance method (Maltron body composition analyser BF-907, UK). All the assessments were done at evening hours and Half an hour before the test subjects were not allowed to take water. In this process subjects were asked for lying on supine position with their legs and arms slightly apart. The Maltron body composition analyser is a large analyser typically fixed on the hand and foot of the subjects with the help of electrodes. All relevant parameters were entered in the recording unit (gender, height, weight, age, fitness, nationality) .Four electrodes were applied on the right side of the body, on the hand, wrist, foot, and ankle. The total duration for recording was 5 minutes.

Maltron Body Composition analyser



Placement of ME4000 Electrode pads

HAND: The ME4000 Electrode Pads were placed centrally directly below the knuckle of the middle finger .The second Electrode Pad was placed on the crease of the wrist.



Figure 3.2

FOOT: The ME4000 Electrode Pads on the foot was applied centrally directly where the second and third toe meet the foot. The second Electrode Pad was placed at the crease of the ankle in the line with sine bone.



Figure 3.3

Cable Connection

Maltron body composition analyses two MEC1102 electrode cables of Maltron body composition analyser which have two long wires that extend from the plug. At the end of the cables are two clips-a positive (red) and negative (black)-a total four clips which connected with ME4000 electrode Pads.

HAND: Negative (black) electrode pad was clipped near to the knuckle, and the positive (red) Electrode Pad on the wrist.

FOOT: Negative (black) electrode pad was clipped near to the toes, and the positive (red) electrode pad on the ankle.

Quality Control Factors

Body composition analyser was used to measure the body composition variables. One subject used four electrode pads for data collection. Reuse of electrode pads were not allowed in any circumstances. Used electrode pad were thrown after using the pads.

Reliable and quality apparatus for collection of data was used, from the manufacturers of repute. In between two recording sessions interval was given to check the apparatus for accuracy and other maintenances / repairs / replacement, if required. This was also to break the ennui of the test, because this could affect administration of the test.

Analytical Procedure

All statistical analysis was performed in computer in MS Excel and SPSS-23. Analysis of data was done by using descriptive method where mean, standard error for each group was calculated. The inferential analysis or Comparative analysis was done by applying one way ANOVA to observe differences between pre Ramadan and post Ramadan measurements.

Results

Table 1: Showing the characteristics of body weight (kg) pre Ramadan and Post Ramadan test

Pre Ramadan	Post Ramadan	ANOVA	
Mean ± SE	Mean ± SE	F -ratio	Significance
62.88 ± 6.40	59.98 ± 5.96	33.05	$p < 0.01$

Table 1 demonstrated the summary for pre Ramadan and post Ramadan body weight. On the basis of table it is clearly seen that the average weight of players were reduced to 59.99 kg from 62.88 kg after the Ramadan. Body weight for pre Ramadan test were reported (62.88 ± 0.37) kg and post Ramadan were reported as (59.99 ± 0.37) kg. The inferential analysis (ANOVA) revealed statistically ($p < 0.05$) significant difference between pre Ramadan, and post Ramadan of body weight of players. Post Ramadan body weight (59.99 ± 0.37 kg) of players were significantly ($p < 0.05$) reduced than that of pre Ramadan (62.88 ± 0.37) kg of body weight of players.

Table 2: Showing the comparison between pre Ramadan and Post Ramadan body fat of Sports Persons

Pre Ramadan	Post Ramadan	ANOVA	
Mean ± SE	Mean ± SE	F -ratio	Significance
14.26 ± 3.49	12.40 ± 3.35	44.38	$p < 0.01$

Above table 2 demonstrated that the average body fat of players were reduced to 12.40 kg from 14.26 kg after the Ramadan. The inferential analysis (ANOVA) revealed statistically ($p < 0.05$) significant difference between pre Ramadan, and post Ramadan of body fat of players. Post Ramadan body fat (12.40 ± 0.19 kg) of players were significantly ($p < 0.05$) reduced than that of pre Ramadan (14.26 ± 0.20) kg of body fat.

Table 3: Showing the comparison between pre Ramadan and Post Ramadan bioelectrical impedance of sports persons

Pre Ramadan	Post Ramadan	ANOVA	
Mean ± SE	Mean ± SE	F -ratio	Significance
617.12 ± 4.23	644.95 ± 3.75	24.27	$p < 0.01$

Bioelectrical impedance analysis (BIA) is a method to estimate body composition, in particular body fat and muscle mass, where a weak electric current flows through the body and the voltage is measured in order to calculate impedance (resistance) of the body. Most body water is stored in muscle. Table 3 clearly demonstrated that the average bioelectric impedance of players were increased to 644.95 from 617.12 after the Ramadan. The inferential analysis (ANOVA) revealed statistically ($p <$

0.05) significant difference between pre Ramadan, and post Ramadan of bioelectrical impedance of players. Post Ramadan bioelectrical impedance (644.95 ± 3.75) of players were significantly ($p < 0.05$) increased than that of pre Ramadan (617.12 ± 4.23) of bioelectrical impedance (table 3).

Table 4: Showing the comparison between pre Ramadan and Post Ramadan body mass index of sports persons

Pre Ramadan	Post Ramadan	ANOVA	
Mean \pm SE	Mean \pm SE	F -ratio	Significance
23.24 \pm 0.14	22.18 \pm 0.14	28.98	$p < 0.01$

Table 4 depicted the summary of characteristics of body mass index (kg) for pre Ramadan and post Ramadan of sports persons. It is clearly seen that the average body mass index of players were decreased to 22.18 kg from 23.24 kg after the Ramadan. The inferential analysis (ANOVA) revealed statistically ($p < 0.05$) significant difference between pre Ramadan and post Ramadan of body mass index. Post Ramadan body mass index (22.18 ± 0.14) of players were significantly ($p < 0.05$) decreased than that of pre Ramadan (23.24 ± 0.14) of body mass index (table 4).

Table 5: Showing the comparison between pre Ramadan and Post Ramadan basal metabolic rate of sports persons

Pre Ramadan	Post Ramadan	ANOVA	
Mean \pm SE	Mean \pm SE	F -ratio	Significance
1449.33 \pm 4.61	1417.79 \pm 4.06	26.35	$p < 0.01$

Table 5 depicted that the difference in basal metabolic rate of players were decreased to 1417.79 Kcal from 1449.33 Kcal after the Ramadan. The comparison (ANOVA) revealed statistically ($p < 0.05$) significant difference between pre Ramadan and post Ramadan of basal metabolic rate of players. Post Ramadan basal metabolic rate (1417.79 ± 4.06 Kcal) of players were significantly ($p < 0.05$) decreased than that of pre Ramadan (1449.33 ± 4.61 Kcal) of basal metabolic rate (table 5).

Table 6: Showing the comparison between pre Ramadan and Post Ramadan lean body mass of sports Persons

Pre Ramadan	Post Ramadan	ANOVA	
Mean \pm SE	Mean \pm SE	F -ratio	Significance
48.62 \pm 0.25	47.58 \pm 0.22	9.76	$p < 0.01$

Table 6 depicted the average lean body mass of players were decreased to 47.58 kg from 48.62 kg after the Ramadan. The inferential analysis (ANOVA) revealed statistically ($p < 0.05$) significant difference between pre Ramadan and post Ramadan of lean body mass of players. Post Ramadan lean body mass (47.58 ± 0.22 kg) of players were significantly ($p < 0.05$) decreased than that of pre Ramadan (48.62 ± 0.25 kg) of lean body mass.

Table 7: Showing the comparison between pre Ramadan and Post Ramadan body water level of sports persons

Pre Ramadan	Post Ramadan	ANOVA	
Mean \pm SE	Mean \pm SE	F -ratio	Significance
34.99 \pm 0.26	32.75 \pm 0.24	40.65	$p < 0.01$

Table 7 illustrated that the average body water level of players were decreased to 32.75 liters from 34.99 liters after the Ramadan. The inferential analysis (ANOVA) revealed statistically ($p < 0.05$) significant difference between pre Ramadan and post Ramadan of body water level of players. Post Ramadan body water level (32.75 \pm 0.24 liters) of players were significantly ($p < 0.05$) decreased than that of pre Ramadan (34.99 \pm 0.26 liters) of body water level.

CONCLUSION

Based on above results it could be concluded that:

The body composition of sports persons changed significantly after Ramadan. The effect of Ramadan have been seen on body weight, body fat, lean body mass, body mass index, basal metabolic rate, and body water level of sports persons. The body weight, body fat, lean body mass, body mass index, basal metabolic rate, and body water level decreased significantly.

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