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Evaluation of anthropometric measurements and clinical examination of muslim families during entire ramzan period

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■ **ABSTRACT :** Present study was undertaken to evaluate anthropometric measurements and clinical assessment of selected Muslim families during entire Ramzan period. The sample was selected from Kolhapur city of Maharashtra. Purposive sampling technique was used to draw a sample for the study. A self-structured questionnaire was used as a tool for data collection. A non-significant change in anthropometric measurements of male and female subjects during Ramzan was observed. The frequency of clinical signs and symptoms such as lack of appetite, lethargy, tiredness, frequent headache, frequent infections, breathlessness giddiness, dehydration, bowel and bladder disturbance, indigestion and hyperacidity were increased during Ramzan. In a nutshell, it can be concluded that Ramzan fasting has a non-significant impact on anthropometric measurements of study population. But frequency of clinical symptoms of nutritional deficiencies were significantly increased during Ramzan fasting.

■ **KEY WORDS:** Ramzan fasting, Muslim families, Anthropometric measurements, Clinical examination

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Fasting in the month of Ramzan is one of the pillars of Islam. It is considered as important act of willingly abstaining from some or all food, drink, or both, for a period of time. Fasting in a month of Ramzan is obligatory (Fard) for every adult. In Ramzan fasting, the duration of restricted food and beverage intake is approximately 12 hrs./ day for 1 month, which makes Ramzan fasting a model of prolonged intermittent fasting (Fehime *et al.*, 2007). Prolonged intermittent fasting, generally more than 30 days, can result in serious neurological, hormonal and other side effects that accompany prolonged starvation. A decrease in subjective feelings of alertness and an increase in lethargy and irritability during the daytime fast have been observed in a number of studies (Afifi, 1997; Kadri *et al.*, 2000; Rocky *et al.*, 2001). A frequently cited problem of Ramzan fasting is an increased incidence of headaches (Awada and Al Jumah, 1999). A total of 57 female subjects were recruited to study body composition, nutrient intake and physical activity patterns in young women during Ramzan. Body weight and B.M.I. were significantly decreased during Ramzan fasting (Al-Hourani and Atoum, 2007)

■ RESEARCH METHODS

Twenty five Muslim families were selected for this study. Out of which, 25 adult females and 8 adult males were assessed. The subjects were selected by purposive sampling method. The inclusion criterion was, the subjects should be healthy and fasting during entire month of Ramzan. The data regarding socio-economic background of the Muslim families were collected by self-structured questionnaire.

The assessment of nutritional status of Muslim families was carried out in 3 phases *i.e.* Phase I (3 days before Ramzan), Phase II (4th week of Ramzan) and Phase III (7 days after Ramzan). Anthropometric measurements such as body weight, height, BMI, skin fold thickness, arm circumference, wrist circumference and mid arm muscle circumference were assessed. The clinical signs and symptoms of nutritional deficiencies such as lack of appetite, lethargy, tiredness,

frequent headache, frequent infections, breathlessness, giddiness, dehydration, bowel and bladder disturbance, indigestion and hyperacidity were also evaluated. The variations in nutritional status during these three phases were recorded.

Table 1 shows that the variations in anthropometric measurements of female population in various phases of study intervention period.

It was observed from the Table 1 that, the mean weight (kg) of subjects in Phase I was noted as 53.5 $\pm$ 9.1. In phase II, the mean weight was 51.0 $\pm$ 9.2. In phase III, the mean weight was 52.1 $\pm$ 9.7. It was observed that there was difference in the mean weight in each phase; but the difference was not statistically significant.

The mean height (cm) of the female subjects was 151.3 $\pm$ 8.0 in phase I. It remained same during Phase II and Phase III.

The mean BMI (kg/m^2) of female subjects in Phase I was recorded as 23.4 $\pm$ 3.3. In Phase II, the mean BMI was 22.2 $\pm$ 3.2. In Phase III, the mean B.M.I. was 22.7 $\pm$ 3.5. It was observed that there was slight difference in the mean BMI in each phase, but the difference was not found statistically significant.

The skin fold thickness directly measures the fat folds, it was found slightly decreased during the entire period of Ramzan among the females. The mean skin fold thickness (mm) was 3.0 $\pm$ 0.8 mm in Phase I. In Phase II, the mean skin fold thickness was 2.6 $\pm$ 0.7. In Phase III, the mean skin fold thickness was 2.7 $\pm$ 0.7. It was observed that there was a notable difference in mean skin fold thickness in each phase but the slight difference was statistically non-significant.

The mean arm circumference (cm) was noticed as 24.4 $\pm$ 2.3 in Phase I. In Phase II, the mean arm circumference was, 22.5 $\pm$ 4.7. In Phase III, the mean arm circumference was 24.1 $\pm$ 2.4. It was observed that, there was difference in mean arm circumference in each phase, but the difference was statistically not found significant.

The mean wrist circumference (cm) was 14.5 $\pm$ 1.3 in Phase I, each week of Phase II and Phase III. Statistically, there was no difference in mean wrist circumference in each phase.

The mean mid arm muscle circumference (cm) was reported as 9.7 $\pm$ 1.7 in Phase I. In Phase II, the mean MAMC was 9.0 $\pm$ 1.5 and in Phase III, it was 9.6 $\pm$ 1.7. From the above observations it can be pointed out that, there was difference in mean arm muscle circumference in each phase, but the difference was not observed statistically significant.

Table 2 shows the variations in anthropometric

Table 1: Anthropometric measurements of females in selected muslim families **(n=25)**

Sr. No.	Anthropometric measurements	Phase I Mean ± S.D.	Phase II Mean ± S.D.	Phase III Mean ± S.D.	t value		
					Phase I vs. Phase II	Phase II vs. Phase III	Phase I vs. Phase III
1.	Weight (kg)	53.5 ± 9.1	51.0± 9.2	52.1 ± 9.7	0.96 $_{NS}$	0.41 $_{NS}$	0. 62 $_{NS}$
2.	Height (cm)	151.3 ± 8.0	151.3 ± 8.0	151.3 ± 8.0	0	0	0
3.	B. M.I. (kg/m^2)	23.4± 3.3	22.2 ± 3.2	22.7 ± 3.5	1.25 $_{NS}$	0.52 $_{NS}$	0.69 $_{NS}$
4.	Skin fold thickness (mm)	3.0 ± 0.8	2.6 ± 0.7	2.7 ± 0.7	1.53 $_{NS}$	0.46 $_{NS}$	1.14 $_{NS}$
5.	Arm circumference (cm)	24.4± 2.3	22.5 ± 4.7	24.1 ± 2.4	1.67 $_{NS}$	1.54 $_{NS}$	0.21 $_{NS}$
6.	Wrist circumference (cm)	14.5 ± 1.3	14.5 ± 1.3	14.5 ± 1.3	0	0	0
7.	Mid arm muscle circumference (cm)	9.7 ± 1.7	9.0 ± 1.5	9.6 ±1.7	1.54 $_{NS}$	1.27 $_{NS}$	0.24 $_{NS}$

Phase I - 3 days before Ramzan, Phase II- 4th week month of Ramzan, Phase III - 7 days after Ramzan, $_{NS}$ = Not- significant
* and ** indicate significance of values at P=0.05 and 0.01, respectively

Table 2: Anthropometric measurements of males in selected muslim families **(n=8)**

Sr. No.	Anthropometric measurements	Phase I Mean ± S.D.	Phase II Mean ± S.D.	Phase III Mean ± S.D.	t value		
					Phase I vs. Phase II	Phase II vs. Phase III	Phase I vs. Phase III
1.	Weight (kg)	66.7 ± 9.0	64.8 ± 9.8	66.0 ± 9.9	0.16 $_{NS}$	0.23 $_{NS}$	0.08 $_{NS}$
2.	Height (cm)	168.6 ± 5.8	168.6 ± 5.8	168.6 ± 5.8	0	0	0
3.	B. M.I. (kg/m^2)	23.4 ± 2.2	22.7 ± 2.4	23.1 ± 2.4	0.57 $_{NS}$	0.363 $_{NS}$	0.20 $_{NS}$
4.	Skin fold thickness (mm)	3.0 ± 0.5	2.8 ± 0.5	2.9 ± 0.5	0.62 $_{NS}$	0.42 $_{NS}$	0.19 $_{NS}$
5.	Arm circumference (cm)	28.6 ± 2.8	27.0 ± 3.0	28.1 ± 2.9	0.70 $_{NS}$	0.75 $_{NS}$	0.04 $_{NS}$
6.	Wrist circumference (cm)	16.0 ± 0.9	16.0 ± 0.9	16.0 ± 0.9	0	0	0
7.	Mid arm muscle circumference (cm)	12.6 ± 2.4	11.0 ± 2.7	12.1 ± 2.5	2.25 $_{NS}$	0.85 $_{NS}$	0.40 $_{NS}$

Phase I - 3 days before Ramzan, Phase II- 4th week month of Ramzan, Phase III - 7 days after Ramza, $_{NS}$ – Not- significant
* and ** indicate significance of values at P=0.05 and 0.01, respectively

measurements of male population in various phases of study intervention period.

It was observed from Table 2 that, the mean weight (kg) of male subjects in Phase I was noted as 66.7 ± 9.0. In Phase II, the mean weight was 64.8 ± 9.8. In Phase III, the mean weight was 66.0 ± 9.9. It was clearly observed that, there was difference in mean weight in each phase, but the difference was reported as statistically non-significant.

The mean height (cm) was found as 168.6 ± 5.8 in Phase I. It as remained same during the entire period of Ramzan (Phase II) and in Phase III.

The mean at B.M.I. (kg/m^2) of male subjects in Phase I was 23.4 ± 2.2. In Phase II, the mean BMI was 22.7 ± 2.4. In Phase III, the mean BMI was 23.1 ± 2.4. The BMI ratio found slightly decreasing level during Ramzan period. However, the difference in mean BMI of each phase was observed as non-significant.

The mean skin fold thickness (mm) in Phase I was 3.0 ± 0.5. In Phase II, mean skin fold thickness was 2.8 ± 0.5. In Phase III, the mean skin fold thickness was 2.9 ± 0.5. There was slightly difference in mean skin fold thickness but the non-significant difference was found.

The mean arm circumference (mm) was noticed as 28.6 ± 2.8 in Phase I. In Phase II, mean arm circumference was, 27.0 ± 3.0. In Phase III, the mean arm circumference was, 28.1 ± 2.9. Statistically, the difference in mean arm circumference of each phase was non-significant between each phases.

The mean wrist circumference (cm) was noted as 16.0 ± 0.9 in Phase I, In Phase II and Phase III, statistically, there was no difference in mean wrist circumference in each phase.

The mean mid arm muscle circumference (cm) was noticed as 12.6 ± 2.4 in Phase I. In Phase II, mean MAMC was 11.0 ± 2.7. The mean MAMC was 12.1 ± 2.5 in Phase III. Statistically there was no difference in mid arm muscle circumference in each phase.

From the above observations it can be pointed out that, there was difference in mean anthropometric measurements in each phase, but the difference was not observed statistically significant.

Table 3 also shows the clinical signs observed in the female subjects during three phases of present study intervention period.

The lack of appetite was observed in 20.0 per cent of study population in Phase I, 64.0 per cent in Phase II and 16.0 per cent in Phase III.

The sign of lethargy was observed in 16.0 per cent in Phase II.

The sign of tiredness was reported in 16.0 per cent of subject in Phase I, 52.0 per cent in Phase II and 16.0 per cent in Phase III.

The frequent headaches were observed in 8.0 per cent of study population in Phase I, 28.0 per cent in Phase II and 8.0 per cent in Phase III.

The signs of frequent infections were observed only in Phase II. It was observed in 20.0 per cent of study population in Phase II.

The symptom of breathlessness was observed in 16.0 per cent of subjects in Phase I, 32.0 per cent in Phase II and 12.0 per cent in Phase III.

The giddiness was felt by 4.0 per cent subject in Phase I, 20.0 per cent in Phase II and only 4.0 per cent in Phase III.

The signs of dehydration were observed only in Phase II. It was seen in 40.0 per cent of subjects in Phase II.

Bowel and bladder disturbances were observed in 12.0 per cent subjects in Phase I, 20.0 per cent in Phase II and 8.0

Table 3: Clinical examination of females and males of selected muslim families

Sr. No.	Clinical examination	Females (n=25)			Males (n=8)		
		Phase I	Phase II	Phase III	Phase I	Phase II	Phase III
1.	Lack of appetite	5 (20.0)	16 (64.0)	4 (16.0)	–	3 (37.5)	--
2.	Lethargy	--	4 (16.0)	--	–	–	--
3.	Tiredness	4 (16.0)	13 (52.0)	4 (16.0)	1 (12.5)	5 (62.5)	1 (12.5)
4.	Frequent headache	2 (8.0)	7 (28.0)	2 (8.0)	–	2 (25.0)	--
5.	Frequent infections	--	5 (20.0)	--	–	–	--
6.	Breathlessness	4(16.0)	8 (32.0)	3 (12.0)	1 (12.5)	2 (25.0)	1 (12.5)
7.	Giddiness	1 (4.0)	5 (20.0)	1 (4.0)	–	–	--
8.	Dehydration	-	10 (40)	-	–	8 (100.0)	--
9.	Bowel and bladder disturbance	3 (12.0)	5 (20.0)	2 (8.0)	1 (12.5)	2 (25.0)	1 (12.5)
10.	Indigestion	1 (4.0)	1 (4.0)	--	–	–	--
11.	Hyperacidity	12 (48.0)	16 (64.0)	11 (44.0)	1 (12.5)	4 (50.0)	1 (12.5)

Figures in parentheses indicate percentage, Phase I - 3 days before Ramzan, Phase II- 4th week month of Ramzan, Phase III - 7 days after Ramzan

per cent in Phase III.

Four per cent of subject were complaining indigestion in phase I and also 4.0 per cent in Phase II.

Forty eight per cent of study population reported problem of hyper acidity in Phase I, 64.0 per cent in Phase II and 44.0 per cent in Phase III.

Table 3 also shows the clinical signs observed in the male subjects during three phases of present study intervention period.

The sign of lack of appetite observed in 37.5 per cent of study population in Phase II.

The signs of lethargy, giddiness, frequent infections and indigestion were not reported by any subject.

The signs of tiredness was reported by 12.5 per cent subject in Phase I, 62.5 per cent in Phase II and 12.5 per cent in Phase III.

The signs of frequent headache were observed in Phase II only. 25.0 per cent subject were reported frequent headache in Phase II.

The sign of breathlessness was observed in 12.5 per cent subjects in Phase I, 25.0 per cent in Phase II and 12.5 per cent in Phase III.

The sign of dehydration was observed in Phase II only. All the subjects reported dehydration in Phase II.

Bowel and bladder disturbances were observed in 12.5 per cent of subjects in both Phase I and Phase III and in 25.0 per cent of subjects in Phase II.

About 12.5 per cent of subject were reported hyperacidity in Phase I and Phase III and 50.0 per cent in Phase II.

Conclusion:

It is concluded that a Ramzan fasting non-significantly affected the anthropometric measurements of study population. But the frequency of clinical signs and symptoms significantly increased during the month of Ramzan fasting.

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