Assessment of dietary intake pattern of muslim families during entire Ramzan period

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ABSTRACT

Present study was undertaken to evaluate the food intake pattern of 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 significant change in food intake pattern during Ramzan was observed. This change was more prevalent in females compared to males. The nutrient intake pattern also significantly changed during Ramzan. In females, nutrient intake pattern was changed more prevalently than males. In a nutshell, it can be concluded that, Ramzan fasting has a significant impact on food and nutrient intake pattern of females than males.

INTRODUCTION

Islam is an Arabic word that means 'submission' or 'obedience'. People who follow Islam are called Muslims. 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. The name 'Ramzan' is the name of ninth month of Islamic lunar calendar, which denotes intense heat, scorched ground and shortness of rations. The month of Ramzan contains 28 to 30 days (Sakr, 1998). Muslims fast completely from fair (dawn) to the maghrib (sunset) and eat only twice a day before dawn (Suhoor) and after the sunset (Iftar). Fasting is influential in alleviating a number of physical diseases for example, digestive system problems such as chronic stomach ache, inflammation of the colon, indigestion, liver diseases, obesity, arterio-sclerosis, high blood pressure, cancer, diabetes, insulin resistance, immune disorders, asthma, diphtheria and many other maladies. However, this fasting is also recommended for the treatment of mild to moderate, stable, non-insulin dependent diabetes, obesity and essential hypertension (Athar, 2005).

There are psychological effects of fasting as well. There is a inner peace and tranquility for those who fast during the month of Ramzan (Mohamed *et al.,* 2002). 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).

Generally, meal frequency is reduced during Ramzan fasting, which often leads to reduced energy intake and loss of body mass and body fat (Angel and Schwartz, 1975; Hallack and Nomani, 1988). During the daylight hours of Ramzan fasting, practicing Muslims are undoubtedly dehydrating. More than 50 per cent of rapid weight reduction is due to fluid

loss, which often leads to serious hypotension problems. The sudden change in routine digestive tract may affect directly or indirectly on the health and nutritional status of Muslim communities who carry fasting during Ramzan period. Hence, it is highly necessary to assess the correlation of the Ramzan fasting with the health and nutritional status of Muslim families in this area.

MATERIAL AND 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). Dietary intake pattern was assessed by using three days recall method. Nutrient intake pattern was examined by taking into account the amount of raw foods and their nutritive value as per NIN, further these nutrients were compared with recommended dietary allowances. The variations in nutritional status during these three phases were recorded.

OBSERVATIONS AND ANALYSIS

The findings of the present study as well as relevant discussion have been summarized under following heads:

Socio-economic status of study population :

The socio-economic details of the selected Muslim families are summarized in Table 1 and 2. Table 1 shows that 36.0 per cent families were joint and 4.0 per cent were extended, but majority of families were nuclear *i.e.* 60.0 per cent. Majority of families had small family size (44.0 %), but medium size families were 36.0 per cent and 5.0 per cent families were large. 68.0 per cent of the selected families belonged to above poverty line and 32.0 per cent belonged to high income group, but none of the study population was from below poverty line.

Table 2 shows that, from selected Muslim families 48.0 per cent females and 25.0 per cent of males were adults. Among females, 24.0 per cent and among males 62.5 per cent belonged to middle age group and 28.0 per cent of females and 12.5 per cent of males were adolescents. Only 8.0 per cent of females and 12.5 per cent of males were graduate, 12.0 per cent females and 37.5 per cent of males studied up to Higher Secondary. Greater number of females (48.0 %) and 37.5 per cent male studied up to High School. 24.0 per cent of females were only secondary pass. Among females, 8.0 per cent and among males

12.5 per cent were studied up to Primary. Most of the females *i.e.* 80.0 per cent were housewives and remaining 20.0 per cent were students. Among males, most of them *i.e.* 37.5 per cent

Table 1 : Family type and economic status of the study population		
Sr. No.	Particulars	Frequency
1.	**Type of family**	
	Nuclear family	15 (60.0)
	Joint family	9 (36.0)
	Extended family	1 (4.0)
	Total	25 (100.0)
2.	**Size of family**	
	Small family	11 (44.0)
	Medium family	9 (36.0)
	Large family	5 (20.0)
	Total	25 (100.0)
3.	**Economic status**	
	Below poverty line (< Rs. 15,000)	-
	Above poverty line (Rs. 15,000 to 1 Lakh)	17 (68.0)
	High income group (> Rs. 1 Lakh)	8 (32.0)
	Total	25 (100.0)

Figures in parenthesis indicate percentage

Table 2 : Age, educational status and occupation of the study population			
Sr. No.	Particulars	Female	Male
1.	Age group:		
	Adolescents (18-20 yrs.)	7 (28.0)	1 (12.5)
	Adults (21-40 yrs.)	12 (48.0)	2 (25.0)
	Middle old age (41- 60 yrs.)	6 (24.0)	5 (62.5)
	Total	25 (100.0)	8 (100.0)
2.	Education level:		
	Graduate	2 (8.0)	1 (12.5)
	Higher Secondary	3 (12.0)	3 (37.5)
	High School	12 (48.0)	3 (37.5)
	Secondary	6 (24.0)	0 (0.0)
	Primary	2 (8.0)	1 (12.5)
	Total	25 (100.0)	8 (100.0)
3.	Occupation:		
	Housewife	20(80.0)	-
	Student	5 (20.0)	1 (12.5)
	Mechanic	-	3 (37.5)
	Fruit and vegetable vendor	-	2 (25.0)
	Business	-	2 (25.0)
	Total	25 (100.0)	8 (100.0)

Figures in parenthesis indicate percentage

were mechanic and 25.0 per cent were fruit and vegetable vendors and businessman. Among male study population, 12.5 per cent males were students.

Food intake pattern :

Table 3 shows the average food intake pattern of selected Muslim families. The mean cereal consumption (g) of female subjects was noted as 186.4 ± 50.1 in Phase I. In Phase II, it was recorded as 133.0 ± 31.8. In Phase III, the mean cereal consumption was as 177.0 ± 34.7. Highly significant difference in mean cereal consumption was found in Phase I and Phase II. The difference in Phase II and Phase III was also found significant but the difference in Phase I and Phase III was not significant.

The mean pulse consumption (g) was observed as 54.0 ± 10.4 in Phase I. In Phase II, it was noted as 39.6 ± 18.8. In Phase III, the mean pulse consumption was found as 43.2 ± 17.4. Statistically, the difference in mean pulse consumption of Phase I and Phase II was found highly significant. The non-significant difference was found in Phase II and Phase III. Whereas, the

difference in mean pulse consumption of Phase I and Phase III was noted as significant.

The mean green leafy vegetable consumption (g) was recorded as 28.0 ± 11.0 in Phase I. In Phase II, it was 8.8 ± 3.6 and in Phase III, the mean green leafy vegetable consumption was 17.0 ± 14.3. Statistically, the difference in Phase I and Phase II was significant. But the difference in Phase II and Phase III was reported as non-significant, as well as the difference in Phase I and Phase III was also found non-significant.

The values of mean other vegetables consumption (g) in Phase I was 40.0 ± 30.8. In Phase II, it was 58.0 ± 49.3. In Phase III, mean of other vegetables consumption was 46.0 ± 45.7. Statistically, the difference in each phase was revealed as non-significant.

The mean roots and tubers consumption (g) was noticed as 82.0 ± 30.8 in Phase I. In Phase II, it was scored as 61.0 ± 27.0 and in Phase III as 72.0 ± 48.0. The difference in mean roots and tubers consumption was not found statistically significant.

The mean fruits consumption (g) during Phase I was recorded as, 28.0 ± 16.05. In Phase II, it was 58.0 ± 13.6. In

Sr. No.	Nutrients	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.	Cereal (g)	186.4 ± 50.1 (62.1)	133.0 ± 31.8 (44.3)	177.0 ± 34.7 (59.0)	4.48**	0.71 NS	0.75 NS
2.	Pulses (g)	54.0 ± 10.3 (120.0)	39.6± 18.8 (88.0)	43.2 ± 17.4 (96.0)	2.70**	0.98 NS	2.06 NS
3.	Leafy vegetables (g)	28.0 ±11.0 (22.4)	8.8 ± 3.6 (7.0)	17.0± 24.3 (13.6)	2.02*	0.81 NS	1.03 NS
4.	Other vegetables (g)	40.0± 30.8 (53.3)	58.0 ± 49.3 (77.3)	46.0 ± 45.7 (61.3)	1.40 NS	0.99 NS	0.43 NS
5.	Roots and tubers (g)	82.0 ±30.8 (164.0)	61.0±27.0 (122.0)	72.0 ± 48.0 (144.0)	1.80 NS	2.32*	0.71 NS
6.	Fruits (g)	28.0± 16.0 (93.3)	58.0±13.6 (193.3)	29.0±15.5 (96.6)	2.07*	1.08 NS	0.07 NS
7.	Milk and milk product (ml)	124.0±75.3 (124.0)	87.0 ±60.7 (87.0)	125.0±65.1 (125.0)	1.43 NS	0.17 NS	0.03 NS
8.	Sugar and jaggery (g)	17.4±5.4 (58.0)	21.0±5.6 (70.0)	19.2±6.8 (64.0)	0.41 NS	0.17 NS	1.03 NS
9.	Fats and oil (g)	32.3±6.6 (92.3)	31.0 ± 7.3 (88.5)	33.6±6.3 (96.0)	0.67 NS	1.35 NS	0.70 NS
10.	Meat / Fish / poultry (g)	12.0±9.8 (40.0)	34.0± 13.7 (113.3)	13.0±6.1 (43.3)	2.03*	2.04	0.13 NS
11.	Eggs (g)	12.0±11.7 (40.0)	8.0 ± 7.3 (26.6)	10.0±7.4 (30.0)	0.70NS	0.36 NS	0.34 NS

Table 3: Average food intake of females of selected muslim families (n=25)

Figures in parenthesis indicate per cent of BDA.
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

Phase III, the mean fruits consumption was 29 ± 15.55. Statistically, the difference in mean fruit consumption of Phase I and Phase II was found significant at only 5 per cent level. The difference in Phase II and Phase III was also significant at only 5 per cent level. But the difference in Phase I and Phase III was found non-significant.

The average values of consumption of milk and milk product (ml) during Phase I was 124.0 ± 75.3. In Phase II *i.e.* in Ramzan month, it was 87.0 ± 60.7. In Phase III, the mean milk and milk product consumption was reported as 125.0 ± 65.1. The difference in mean milk and milk product consumption in each phase was not found significant statistically.

The mean values of sugar and jaggery consumption (g) during Phase I was 17.4 ± 5.4. It was noticed as, 21.0 ± 5.6 in Phase II and 19.2 ± 6.8 in Phase III. Statistically, the difference in mean sugar and jaggery consumption in each phase was non-significant.

The mean consumption of fats and oils (g) in Phase I was observed as, 32.3 ± 6.6. In Phase II, it was noted as, 31.0 ± 7.3. Whereas in Phase III, mean fat and oil consumption was 33.6 ± 6.3. Statistically, the difference in mean consumption of fat and oil in each phase was not found statistically significant.

The mean values of meat / fish/ poultry consumption (g) in Phase I was found as 12.0 ± 9.8 g. In Phase II, it was 34.0 ± 13.7 g. In Phase III, the mean meat / fish/ poultry consumption was 13 ± 6.1 g. Statistically, the difference in mean meat / fish/ poultry consumption in Phase I and Phase II and the differences in Phase II and Phase III were found significant. Whereas, the difference in Phase I and Phase III was recorded as non-significant.

The mean egg consumption (g) in phase I was reported as 12.0 ± 11.7 g. In Phase II, it was noted 8.0 ± 7.3 g. In Phase III, the mean egg consumption was 10.0 ± 7.4 g. Statistically, the difference in mean egg consumption in each phase was not found significant.

The consumption of cereals, pulses and legumes and leafy vegetables was significantly reduced during the month of Ramzan. Whereas, intake of fruits and meat, fish or poultry significantly improved during the month of Ramzan.

Table 4 shows the food intake pattern of male subjects during three phases *i.e.* Phase I, Phase II and Phase III.

The mean cereal consumption (g) in Phase I was noted

Sr. No.	Nutrients	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.	Cereal (g)	235.0 ±45.3 (58.7)	153.7 ±25.0 (38.4)	183.7 ± 23.2 (45.9)	4.44**	2.48*	2.85*
2.	Pulses (g)	48.7± 15.5 (88.6)	30.0 ± 16.0 (54.5)	48.7 ± 15.5 (88.6)	2.38*	2.38*	0
3.	Leafy vegetables (g)	31.2 ± 20.2 (31.2)	18.7 ± 8.4 (18.7)	18.7 ±7.2 (18.7)	0.67$_{NS}$	0	0.67$_{NS}$
4.	Other vegetables (g)	75.0± 15.3 (100.0)	56.2 ± 11.5 (75.0)	50.0 ± 9.2 (66.6)	0.78$_{NS}$	0.17$_{NS}$	0.26$_{NS}$
5.	Roots and tubers (g)	106.2 ± 41.7 (141.6)	75.0 ± 26.7 (100.0)	87.0 ± 35.3 (116.0)	1.78$_{NS}$	0.80$_{NS}$	0.97$_{NS}$
6.	Fruits (g)	31.2 ± 14.8 (104.1)	78.1 ± 38.6 (260.4)	40.6 ± 22.5 (135.4)	1.98$_{NS}$	1.34$_{NS}$	0.34$_{NS}$
7.	Milk and milk product (ml)	175.0 ± 70.7 (175.0)	187.5 ± 62.0 (187.5)	218.7 ± 71.9 (218.7)	0.20$_{NS}$	0.32$_{NS}$	0.53$_{NS}$
8.	Sugar and Jaggery (g)	14.3 ± 7.2 (47.9)	21.2 ± 9.5 (70.8)	20.6 ± 8.6 (118.7)	2.63*	0.56$_{NS}$	1.86$_{NS}$
9.	Fats and oil (g)	33.4 ± 4.8 (83.5)	33.7 ± 6.4 (84.3)	35.6 ± 4.1 (89.0)	0.11$_{NS}$	0.69$_{NS}$	0.97$_{NS}$
10.	Meat / Fish / poultry(g)	37.5 ± 21.7 (125.0)	56.2±29.5 (187.5)	50.0 ± 30.7 (166.6)	0.35$_{NS}$	0.21$_{NS}$	0.17$_{NS}$
11.	Eggs (g)	25.0 ± 16.7 (83.3)	18.7±15.8 (62.5)	18.7 ± 13.6 (62.5)	0.48$_{NS}$	0.00$_{NS}$	0.48$_{NS}$

Table 4: Average food intake of males of selected muslim families (n=8)

Figures in parenthesis indicate percent of BDA.
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 P=0.01, respectively

as, 235.0 ± 45.3. In Phase II, mean cereal consumption was 153.7 ± 25.0. In Phase III, mean cereal consumption was 183.7 ± 23.2. Statistically, the difference in Phase I and Phase II was reported as highly significant. The difference in Phase II and Phase III and the difference in Phase I and Phase III were also found significant at 5 per cent level only.

The mean pulses consumption (g) in Phase I was observed as 48.7 ± 15.5. In phase II, it was 30.0 ± 16.0. In Phase III, mean pulse consumption was 48.7 ± 15.5. Statistically, the difference in Phase I and Phase II and Phase II and Phase III was recorded as significant. But the difference in Phase I and Phase III was found as non-significant.

The mean leafy vegetables consumption (g) in Phase I was 31.2 ± 20.2. In Phase II, it was 18.7 ± 8.4. In Phase III, mean leafy vegetables consumption was 18.7 ± 7.2. Statistically, the difference in mean leafy vegetables consumption in each phase was reported as non-significant.

The values of mean of other vegetables consumption (g) in Phase I was 75.0 ± 15.3. In Phase II, it was 56.2 ± 11.5. In Phase III, mean of other vegetables consumption was 50.0 ± 9.2. Statistically, the difference in mean of other vegetables consumption in each phase was revealed as non-significant.

The mean roots and tubers consumption (g) in Phase I was noticed as, 106.2 ± 41.7 g. In Phase II, it was scored as 75.0 ± 26.7 g. Whereas in Phase III, mean roots and tubers consumption was 87.0 ± 35.3 g. Statistically, the difference in mean roots and tubers consumption in each phase was not found significant.

The mean fruit consumption (g) in Phase I was noted as 31.2 ± 14.8. In Phase II, it was 78.1 ± 38.6. In phase III, mean fruit consumption on was 40.6 ± 22.5. Statistically the difference in mean fruit consumption in each phase was found non-significant.

The average values of milk and milk product consumption (ml) during phase I, was recorded as 175.0 ± 70.7. In Phase II, it was 187.5 ± 62.0. In Phase III, mean milk and milk products was 218.7 ± 71.9. The difference in mean milk and milk product consumption was found statistically non-significant.

The mean values of sugar and jaggery consumption (g) during Phase I was 14.3 ± 7.2. In Phase II, it was 21.2 ± 9.5. In Phase III, mean sugar and jaggery consumption was 20.6 ± 8.6. Statistically, the difference in Phase I and phase II was found significant 5 per cent level only. But the differences in Phase II and Phase III and Phase I and Phase III were found non-significant.

The mean consumption of fat and oil (g) was observed as 33.4 ± 4.8 in Phase I. In phase II, it was 33.7 ± 6.4. In Phase III, the mean fat and oil consumption was 35.6 ± 4.1. Statistically, the difference in mean fats and oils consumption was not noticed as significant at both 5 per cent and 1 per cent levels.

The mean values of meat / fish / poultry consumption (g) in Phase I was found as 37.5 ± 21.7. In Phase II, it was $56.2 \pm$ 29.5. In Phase III, mean meat / fish / poultry consumption was 50.0 ± 30.7. Statistically, the difference in mean meat or fish consumption was not noticed as significant.

The mean egg consumption (g) in Phase I was reported as 25.0 ± 16.7. In Phase II, it was noted as 18.7 ± 15.8. In phase III mean egg consumption was 18.7 ± 13.6. Statistically, the difference in mean egg consumption in each phase was not found significant.

The consumption of cereals, pulses and legumes was significantly reduced during the month of Ramzan, but intake of cereals, pulses and legumes significantly improved after Ramzan. Intake of sugar and jiggery significantly improved during the month of Ramzan.

Table 5 shows the nutrient intake pattern of female subjects during three phases *i.e.* Phase I, Phase II and Phase III.

The mean energy (kcal) intake of subject in Phase I was noted as 1520.9 ± 156.1. In Phase II, mean energy intake was reported as 1170.5 ± 325.4. In Phase III, mean energy intake was 1421.4 ± 298.4. Statistically, the difference in Phase I and Phase II and the difference in Phase II and Phase III were noticed as significant. But the difference in Phase I and Phase III was not revealed as significant.

The mean values of protein (g) intake in Phase I was reported as 44.7 ± 10.7. In Phase II, it was noted as 33.6 ± 15.0. Whereas in Phase III, mean protein intake was 39.0 ± 12.3. Statistically, the difference in Phase I and Phase II was recorded as significant. But difference in Phase II and Phase III and Phase I and Phase III was found non-significant.

The mean fat (g) intake in Phase I was observed as 45.6 ± 8.9. In phase II, it was 42.0 ± 13.5. In Phase III, mean values of fat intake was noted as, 47.5 ± 11.5. Statistically, the difference in mean fat intake in each phase was not noticed as significant.

The mean vitamin B_1 (mg) intake in Phase I was noted as 1.02 ± 0.24. During Phase II, it was found as 0.71 ± 0.19. In Phase III, mean vitamin B_1 intake was 0.86 ± 0.31. Statistically the difference in Phase I and Phase II was found significant. The difference in phase II and Phase III was also reported significant. But the difference in Phase I and Phase III was observed as statistically non-significant.

The mean intake of vitamin B_2 (mg) in Phase I was revealed as 0.63 ± 24 while in phase II was 0.47 ± 0.29. Whereas, in Phase III mean vitamin B_2 intake was noted as 0.59 ± 0.32. Statistically, the difference in phase I and Phase II was found significant. But the difference in Phase II and Phase III and Phase I and Phase III was not noticed as significant.

The mean vitamin B_3 (mg) intake in phase I was recorded as, 8.43 ± 1.35. In Phase II, it was found as 6.52 ± 2.50. In Phase III, mean vitamin B_3 intake was noted as 7.35 ± 1.90. The difference in phase I and Phase II was found statistically significant. But the difference in Phase II and Phase III was noted as statistically non-significant. The difference in phase I and Phase III was also noted as significant.

The average values of vitamin C (mg) intake in Phase I was observed as 20.0 ± 8.26. In Phase II, it was found as, 32.99 ± 10.78. In Phase III, mean vitamin C intake was noticed as, 29.43 ± 11.17. Statistically, the difference in Phase I and Phase III and Phase II and Phase III was revealed as non-significant. But the difference in Phase I and Phase II was found significant.

The mean β-carotene (µg) intake in Phase I was seen as, 1382.0 ± 987.1. In Phase II, it was 519.6 ± 230.5. In Phase III, mean β-carotene intake was 1124.6 ± 707.1. Statistically, the difference in Phase I and Phase II was opined as significant. But the difference Phase II and Phase III and Phase I and Phase III was not found significant.

The mean iron (mg) intake in Phase I was reported as 11.84 ± 4.59. In Phase II, it was noted as 8.59 ± 3.22. Whereas in Phase III, mean iron intake was found as 10.87 ± 6.20. The difference in Phase I and Phase II was revealed as statistically significant. But the difference in Phase II and Phase III and Phase I and Phase III was found non-significant.

The mean values of calcium (mg) intake in Phase I was noticed as 480.0 ± 166.1. In Phase II, it was 336.3 ± 106.6. In Phase III, mean calcium intake was 422.3 ± 108.2. Statistically, the difference in Phase I and Phase II was seen as significant. But the difference in Phase II and Phase III and Phase I and Phase III was noticed as non-significant.

The mean zinc (mg) intake in Phase I was noticed as 4.95 ± 0.88. In Phase II, it was 3.48 ± 1. In Phase III, mean zinc intake was 4.16 ± 1.05. Statistically, the difference in Phase I and Phase II was found significant. The difference in Phase II and Phase III was observed as significant. The difference in Phase I and Phase III was also revealed as significant.

The mean consumption of dietary fibre (g) in Phase I was noted as 25.0 ± 4.4. In Phase II, it was found as 18.7 ± 5.4. Whereas, in Phase III, mean dietary fiber was found as 22.4 ± 6.8. Statistically, the difference in Phase I and Phase II and the difference in Phase II and Phase III were observed as significant. But the difference in Phase I and Phase III was seen as non-significant.

The consumption of energy, protein, vitamin B_1, vitamin

Sr. No.	Nutrients	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.	Energy (kcal)	1520.9 ± 156.1 (81.1)	1170.5 ± 325.4 (62.4)	1421.4 ± 298.4 (75.8)	4.85**	2.84**	1.47 NS
2.	Protein (g)	44.7 ± 10.7 (89.5)	33.6 ± 15.0 (67.3)	39.0 ± 12.3 (78.1)	2.99**	1.38 NS	1.73 NS
3.	Fat (g)	45.6 ± 8.9 (146.1)	42.0 ± 13.5 (134.5)	47.5 ± 11.5 (152.2)	1.12 NS	1.56 NS	0.65 NS
4.	Vitamin B_1 (mg)	1.02 ± 0.24 (113.3)	0.71±0.19 (78.8)	0.86±0.31 (95.6)	4.89**	2.08*	1.93 NS
5.	Vitamin B_2 (mg)	0.63±0.24 (57.2)	0.47±0.29 (42.7)	0.59±0.32 (53.6)	2.12*	1.46 NS	0.44 NS
6.	Vitamin B_3 (mg)	8.43±1.35 (70.2)	6.52 ± 2.50 (54.3)	7.35 ± 1.90 (61.2)	3.36**	1.32 NS	2.31*
7.	Vitamin C (mg)	20.0 ± 8.26 (82.4)	32.99±10.78 (73.5)	29.43±11.17 (50.0)	2.73**	0.49 NS	1.37 NS
8.	B carotene (µg)	1382.0 ± 987.1 (57.5)	519.6 ± 230.5 (21.6)	1124.6 ± 707.1 (46.8)	2.01*	1.36 NS	0.44 NS
9.	Iron (mg)	11.84±4.59 (39.4)	8.59 ± 3.22 (28.6)	10.87 ± 6.20 (36.2)	2.88**	1.62 NS	0.62 NS
10.	Calcium (mg)	480.0 ± 166.1 (120.0)	336.3 ±106.6 (84.0)	422.3 ± 108.2 (105.9)	2.23*	1.06 NS	0.79 NS
11.	Zinc (mg)	4.95±0.88 (61.8)	3.48 ± 1.00 (43.5)	4.16 ± 1.05 (52.0)	5.51**	2.34*	2.86**
12.	Dietary fibre (g)	25.0 ± 4.4 (111.1)	18.7 ± 5.4 (83.3)	22.4 ± 6.8 (99.8)	4.41**	2.10*	1.54 NS

Figures in parenthesis indicate per cent of RDA.
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 P=0.01, respectively

B_2, vitamin B_3, β−carotene, iron, zinc, calcium and dietary fibre was significantly reduced during the month of Ramzan. Whereas, intake of vitamin C significantly increased during the month of Ramzan. But intake of vitamin B_1, zinc and dietary fibre significantly improved after month of Ramzan.

Table 6 shows nutrient intake pattern of male subject during three phases *i.e.* Phase I, Phase II and Phase III.

The mean values of energy intake (kcal) of in Phase I was noted as 1713.6 ± 192.3. In Phase II, it was found as 1489.9 ± 367.6. In Phase III, mean energy intake was reported as 1627.8 ± 219.9. The difference in mean energy intake in each phase was not noted as statistically significant.

The average values protein (g) intake in phase I was noticed as 57.7 ± 16.2. In Phase II, it was 48.5 ± 21.8. Whereas in Phase III, mean protein intake was 49.6 ± 12.9. Statistically, the difference in mean protein intake in each phase was not observed as significant.

The mean fat (g) intake was scored as 52.7 ± 9.2 in Phase I. In Phase II, it was 53.0 ± 16.0. In Phase III, mean fat intake was

56.6 ± 13.6. The difference in mean fat intake in each phase was found statistically non-significant.

The mean vitamin B_1 (mg) intake Phase I was observed as 1.17 ± 0.29. During Phase II, mean vitamin B_1 intake was noted as 0.79 0.14. In Phase III, mean vitamin B_1 intake was found as 0.87 ± 0.25. Statistically, the difference in Phase I and Phase II was found significant. But the difference in Phase II and Phase III was not noted as significant. But, the difference in Phase I and Phase III was revealed as significant.

The mean vitamin B_2 (mg) intake in Phase I was reported as 0.78 ± 0.36. In Phase II, it was scored as 0.64 ± 0.31. In phase III, mean vitamin B_2 intake was noted as 0.63 ± 0.32. Statistically, the difference in mean vitamin B_2 intake in each phase was revealed as non-significant.

The average values of vitamin B_3 (mg) intake in Phase I was reported as 9.72 ± 2.59. In Phase II, it was noted as 7.29 ± 2.34. During Phase III, mean vitamin B_3 intake was scored as 7.30 ± 1.05. The difference of Phase I and Phase II and Phase II and Phase III was not noticed statistically significant. But the

Sr. No.	Nutrients	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.	Energy (kcal)	1713.6 ± 192.3 (70.6)	1489.9 ± 367.6 (61.4)	1627.8 ± 219.9 (67.1)	1.01 NS	0.91 NS	1.00 NS
2.	Protein (g)	57.7 ± 16.2 (96.2)	48.5 ± 21.8 (80.9)	49.6 ± 12.9 (82.7)	0.95 NS	0.12 NS	1.1 NS
3.	Fat (g)	52.7 ± 9.2 (130.3)	53.0 ± 16.0 (131.1)	56.6 ± 13.6 (140.1)	0.043 NS	0.46 NS	0.68 NS
4.	Vitamin B_1 (mg)	1.17 ± 0.29 (97.5)	0.79 ± 0.14 (65.8)	0.87 ± 0.25 (72.5)	3.18**	0.79 NS	2.16*
5.	Vitamin B_2 (mg)	0.78 ± 0.36 (55.7)	0.64 ± 0.31 (45.7)	0.63 ± 0.32 (45.0)	0.82 NS	0.012 NS	0.89 NS
6.	Vitamin B_3 (mg)	9.72 ± 2.59 (60.7)	7.29 ± 2.34 (45.5)	7.3 ± 1.05 (45.6)	1.97 NS	0.012 NS	2.45*
7.	Vitamin C(mg)	18.26 ±9.51 (45.6)	39.63±16.41 (99.0)	21.45±7.56 (53.6)	2.22*	1.62 NS	0.48 NS
8.	B carotene (μg)	2576.7 ± 1665.0 (107.3)	817.8 ± 319.8 (34.0)	1587.4 ± 631.3 (66.1)	1.67 NS	0.64 NS	0.97 NS
9.	Iron (mg)	17.66±5.95 (63.0)	10.14 ± 3.10 (36.2)	10.01±3.73 (35.7)	3.17**	0.075 NS	3.08**
10.	Calcium (mg)	560.9 ± 101.1 (140.2)	572.6 ± 184.3 (143.1)	623.1 ± 182.5 (155.7)	0.08 NS	0.23 NS	0.34 NS
11.	Zinc (mg)	5.71±0.80 (51.90)	3.73 ± 0.61 (33.90)	4.34 ± 0.61 (39.45)	5.56**	1.99 NS	3.85**
12.	Dietary fibre (g)	29.0±7.0 (99.7)	19.3 ± 5.9 (66.3)	22.7 ± 5.9 (78.2)	2.98**	1.17 NS	1.91 NS

Table 6 : Average nutrient intake of males of selected muslim families (n=8)

Figures in parenthesis indicate per cent of RDA.
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

difference in Phase I and Phase III was revealed as significant.

The mean vitamin C (mg) intake in Phase I was reported as 18.26 ± 9.51. In Phase III, mean vitamin C intake was noticed as 39.63 ± 16.41. In Phase III, mean vitamin C intake was noted as 21.45 ± 7.56. Statistically, the difference in Phase I and Phase II was found significant. But, the difference in phase II and Phase III and Phase I and Phase III was not found significant.

The mean β carotene (µg) intake in Phase I was found as 2576.7 ± 1665.0. In Phase II, it was noted as 817.8 ± 319.8. In Phase III, mean b carotene intake was observed as 1587.4 ± 631.3. The difference in mean b carotene intake in each phase was revealed as non-significant.

The mean values of iron (mg) intake in Phase I was 17.66 ± 5.95. In Phase II, it was noted as 10.14 ± 3.10. In Phase III, mean iron intake was 10.01 ± 3.73. Statistically, the difference in Phase I and Phase II was found significant. But the difference in Phase II and Phase III was not found significant. The difference in Phase I and Phase III was also seen as significant.

The mean calcium (mg) intake in Phase I was noticed as 560.9 ± 101.1. In Phase II, it was found as 572.6 ± 184.3. In Phase III, mean calcium intake was scored as 623.1 ± 182.5. The difference in mean calcium intake in each phase was not reported as significant.

The average values of intake of zinc (mg) in Phase I was scored as 5.71 ± 0.80. In Phase II, it was found as 3.73 ± 0.61. Whereas in Phase III, mean zinc intake was noted as 4.34 ± 0.61. Statistically, the difference in Phase I and phase II was found significant. But the difference in Phase II and Phase III was not found significant. But, the difference in Phase I and Phase III was noted as significant.

The mean dietary fibre (g) intake during Phase I was found as 29.0 ± 7.0. In Phase II, it was 19.3 ± 5.9. In Phase III, mean dietary fibre intake was 22.7 ± 5.9. Statistically, the difference in phase I and Phase II was reported as significant. But the difference of Phase II and Phase III and Phase I and Phase III was not observed as significant.

The consumption of vitamin B_1, vitamin C, iron, zinc and dietary fibre was significantly reduced during month of Ramzan.

Conclusion :

It was concluded that Ramzan fasting significantly affects dietary intake pattern of Muslim males and females. A significant change in food intake pattern during Ramzan was observed. This change was more prevalent in females compared to males. The nutrient intake pattern, also significantly changed during Ramzan. In females, nutrient intake pattern was changed more prevalently than males.

REFERENCES

Afifi, Z.E. (1997). Daily practices, study performance and health during the Ramzan fast. *J. Social Health*, **117** (4) : 231-235.

Angel, J.F. and Schwartz, N.E. (1975). Metabolic changes resulting from decreased meal frequency in adult male muslims during the Ramzan Fast. *Nutri. Rep. Intr.,* **11** (1) : 29-38.

Athar, S. (2005). The spiritual and health benefits of Ramzan. *J. Health Edu.,* **1** : 1.

Awada, A. and Al Jumah, M. (1999). The first of Ramzan headache' In: headache, **39** : 490-493.

Braverman and Eric. (2004). The benefits of fasting' in total health, pp. 16-46.

Hallack, M.H. and Nomani, M.Z. (1988). Body weight loss and changes in blood lipid levels in normal men on hypocholesteric diets during Ramzan fasting. *Am. J. Clin. Nutr.,* **48** (5) : 1197-1210.

Kadri, N., Tilane, A., El Batal, M. and Taitit, Y. (2000). Irritability during the month of Ramzan. *Psychosom, Med.,* **62** (2) : 280-285.

Mohamed, G.A., Cab, N. and Katanec, D. (2002). Fasting of persons with diabetes mellitus during Ramzan. *Diabetologica Croatica*, **31** (2) : 75-84.

Rocky, R., Chapotot, F., Hakkou, F., Benchekrounn, M.T. and Buguet, A. (2001). Sleep during Ramzan : Intermittent Fasting. *J. Sleep. Res.,* **10** (4) : 319-327.

Sakr, A.H. (1998). Testing during Ramzan induces a marked increase in HDL cholesterol and decrease in LDL cholesterol. *Internat. J. Ramzan Fasting*, **2** : 18.

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