

The Effects of Ramadan Fasting on Anthropometric Indices among Muslim Community in Miyazaki – JAPAN

Osama Awde Abdelghany Ibrahim Saleh*

Introduction

One of the greatest acts of worship for Muslims is Ramadan fasting, which is considered as an honorable guest. A guest that visits us once a year in Ramadan month, is the ninth month of Islamic lunar calendar consisting of 29-30 days and brings with it all sorts of goodness and happiness. Fasting in Ramadan is one of the five pillars of Islam, it is considered as the Muslim's third practical duty to Allah.

Fasting is another unique moral and spiritual characteristic of Islam linguistically, fasting in Islamic terminology, it means abstaining from things that break the fast from dawn until sunset, having first made the intention to do so (**Muhammad S. Al-Munajid, 2004**). Adult Muslims abstain from consuming food, fluids, medications, smoking and sexual relations between sunrise and sunset (**Kocaaga T. et., 2019**). We certain Ramadan starting day by one of the following cases:

- When Shaban (the 8th month of the Islamic calendar) completes thirty days.

* Lecturer at Department of Educational Sciences and Psychological and Social in Physical Education, Faculty of physical education, Benha University

- Sighting of the crescent: Allah the Most High has set crescent sighting as the only means for determining dates of various Islamic occasions such as Ramadan.

Ramadan is not fixed to any season or month with each year it advances by 11 days (**Saiyad S. et al., 2014**), depending on the geographical location and season of the year (**Muhammad S. Al-Munajid, 2004**). Time of fasting is about 9 to 22 hours per day in different geographical areas and seasons.

During this month, it is obligatory for all healthy Muslims adult, sane, resident who is able to fast and has nothing to prevent him or her from doing so, but there are cases that should not be fasted like children (before attainment of fifteen years old), menstruating women (before purify menstruation), travelers (he left the city and its suburbs), sick people (any sickness that makes people feel unwell) and elderly people (the very elderly who lost their strength and are getting weaker every day) to pray and keep fast.

(Saiyad S. et al., 2014& Muhammad S. Al-Munajid, 2004).

The Majority of Muslims typically consume two meals per day during this month, one immediately after sunset (Iftar) and the other one just before dawn (Suhur). They can eat, and drink between sunset and dawn but not after dawn (**Mazidi M. et al., 2014**).

Culture and socio-demographic status could also influence the variety of Ramadan fasting effects. Food habits are very different from other months, food and fluid intake are mainly nocturnal and usually frequency and quantity of food, physical activity during the day and night sleep are reduced. The ratio of macronutrients intake may differ with other months. For example, there is a large tendency to consume foods and water drinks which are richer in carbohydrate during this month. In addition, there is a tendency to consume foods that are richer in fats, particularly those high in mono-and polyunsaturated fatty acids. Whereas physical activity and night sleep are usually reduced. In some cultures, special festive foods that are richer in fat, protein and sugar may be consumed.

Changes in eating habits during Ramadan happen in the form of a reduction in frequency of food and beverage intake and an increased tendency to high-calorie food and drink consumption (**Norouzy A. et al., 2013**). It represents a major shift from established routines and “normality.” Timing and composition of meals change: an early breakfast is taken just before dawn (Suhur) and lunch is omitted. The fast is broken at sunset when the main meal (Iftar) is taken. Sleeping times and patterns also change to allow the morning meal to be consumed before dawn. Missing lunch, and the long gap between major meals, affect appetite.

During the month of Ramadan, there are profound changes in dietary habits and lifestyle, with the common practice being to consume one large meal after sunset and one lighter meal before dawn.

(Trepanowski & Bloomer, 2010)

The decrease of food frequency and quantity during the month of Ramadan leads researchers to investigate the effects of Ramadan fasting on body composition. Fasting has different impacts on different individuals. These variations highly depend on daily nutritional habits and the season that Ramadan occurs in. While most of the previous studies have focused on the effect of Ramadan fasting on body composition and metabolic changes in groups of Muslims (**Abdolreza Norouz. et al., 2010**). On the other hand, a few of studies have focused of the efficacy and benefits of daily lifestyle, cultural and Ethnic differences beside Ramadan fasting on body indicators as a general.

For many people the key question regarding fasting is whether it is good or bad for your health. The answer to this requires a quick overview of what happens inside the body during fasting, Recent studies have shown that as the effects of Ramadan fasting on anthropometric parameters and body composition one of them concluded the largest change observed during Ramadan was increased systolic and diastolic BP whereas the other metabolic parameters significantly decreased after Ramadan fasting (**El Bilbeisi A.H et al., 2019**). Body mass, body fat percentage, daily caloric intake, protein and

carbohydrate content of the diet were reduced in Ramadan. On the contrary, no influence was seen on fat free mass, liquid intake and fat content of the diet (**Kocaaga T. et al., 2019**).

While the results indicated the effect of Ramadan fasting on the body's water state does not reach the degree of dehydration (> 2% of body weight) Athlete. There was a significant positive correlation between starting body mass index and weight lost during the fasting period. Consistently, there was a significant reduction in fat percentage between pre-Ramadan and post-Ramadan in people with overweight or obesity but not in those of normal weight. Loss of fat-free mass was also significant between pre-Ramadan and post-Ramadan but was about 30% less than loss of absolute fat mass. At 2–5 weeks after the end of Ramadan, there was a return towards, or to, pre-Ramadan measurements in weight and body composition (**Fernando H. A. et al., 2019**). The results of the study showed that there were positive effects of Ramadan fasting on anthropometric measurements such as body weight, BMI, fat mass and waist circumference, which are cardiovascular risk factors, but similar positive effects were not observed on endocrine and metabolic parameters.

(Akkoca M. et al., 2018)

Ramadan fasting may cause reduction of respiratory muscle strength through reduction of body weight. According to our results, 3 months after Ramadan fasting, respiratory muscle function reflected by

maximal inspiratory muscle pressure and peak inspiratory flow was better than in Ramadan month and this effect was not seen when weight difference of persons was regarded as a covariate (**Soori M. et al., 2016**). By the 28th day of Ramadan, it was found that the body weight, BMI, body fat, water and mineral measures had decreased, significantly Protein body mass and calorie intake did not significantly change by (4-5) weeks after Ramadan, body weight and composition had returned to the same levels as on the first day.

(Syam A. F. et al., 2016)

Ramadan fasting did have beneficial impacts on body composition, but it did not have any significant effect on the parameters of Arterial stiffness and the resting heart rate in overweight and obese individuals. However, the lifelong continuation of eating habits like Ramadan fasting may provide beneficial effects on cardiovascular system (**Sezen Y. et al., 2016**). Ramadan affects the body physiology. It decreases the body weight and lowers the serum lipids, and blood glucose levels (**Ahmed H. F. et al., 2014**). Previous study showed that fasting during Ramadan results in a significant weight loss in obese patients; the weight loss was about 2.9 kg in obese patients and 0.9 kg in non-obese ones. Moreover, the BMI reduced significantly in obese patients, in comparison to non-obese individuals. The average BMI reduction in obese patients was 0.9 kg/m² (**Mazidi M. et al., 2014**). BMI and glucose metabolism did not change after Ramadan or at 6

weeks after cessation of Ramadan. At the end of Ramadan, a significant decrease in body fat percentage was observed, while significantly increases in heart rate, total cholesterol.

(Radhakishun N.N.E. et al., 2014)

Significant changes were observed in the form of decreased body weight, Body Mass Index, Waist to Hip Ratio, body fat percentage, blood pressure and heart rate. Dominance of the sympathetic nervous system over the parasympathetic nervous system has been shown to be a strong risk factor for cardiovascular disease. Weight loss has a positive effect on this balance and is associated with significant improvement in autonomic cardiac modulation through enhancement of parasympathetic effect **(Shruthi B. et al., 2013)**.

There were significant reductions in weight and BMI ($P < 0.001$) in almost all subjects, with the biggest being in males 35 years. Waist and hip circumferences fell in most subjects, except females aged (36-70) years. Fat mass fell in most subjects, ranging from (2.3) % to (4.3) % from baseline, except in females aged (36-70) years who did not experience a significant change. Fat-free mass was significantly reduced in all subjects ($P < 0.001$), whereas percentage body fat was lower only in males. in those aged (35) years and by in those aged (36-70) years. Dietary intake was similar before and during Ramadan, except in males whose protein intake fell during Ramadan.

(Norouzy A. et al., 2013)

Another study noted the physiological importance of fasting developing a balance between the different systems of the body. During the first stage of fasting, the level of metabolic activity decreases rapidly. It gives relaxation in the digestive system also the respiratory function has been greatly improved (**Khodaskar A. 2010**). Results from this study showed Ramadan fasting caused a reduction in weight, BMI, waist and hip circumferences, skinfold thicknesses, fat mass, fat free mass and body water. Ramadan fasting may be a protective agent from overweight and obesity as it continues every year.

(Norouzy A. et al., 2010)

In the light of what the world is witnessing of the spread of the Corona virus, which in turn has affected social life in all countries around the world, including Japan, and on their social and economic activities, including Muslims around the world and in their Islamic countries, the places of worship were closed before Ramadan until its end, and therefore Muslims in Japan also could not practice Praying throughout the month of Ramadan in the Islamic Center in the Miyazaki district, which is allocated to this as a result of preventive measures against the spread of the virus, which threatens a great impact on the pattern of life that changed during the month of Ramadan. Doing sports activities such as gyms.

Research Aims

The aims of this study are to:

1. Identify the effects of Ramadan fasting on anthropometric indicators among Muslims Community in Miyazaki-JAPAN.
2. Identify the effects of Daily lifestyle and Food preferences on anthropometric indicators among Muslims Community in Miyazaki-Japan.

Research questions

- 1- What are the effects of Ramadan fasting on anthropometric indicators among Muslims Community in Miyazaki-Japan?
- 2- What are the effects of Daily lifestyle and Food preferences on anthropometric indicators during Ramadan fasting among Muslims Community in Miyazaki-Japan?

Research Procedures

Research Methodology

In this study we conducted sampling and analysis using descriptive method of analysis.

Research Community

The research community includes 113 of the men represented all Muslim Community from different Countries (Egypt - Afghanistan -

Indonesia) who studying, working and living in Miyazaki – Japan and who indicated their intention to fast during Ramadan and all of them provided their consent to participate.

Research Sample

The study was conducted on (31) of Male Participants (11) Egyptian, (10) Afghanistan and (10) Indonesian. The samples were selected intentionally, candidates were selected based on their gender, age, and readiness to participate in the research. A prospective observational study was performed during Ramadan of 1441 A.H (April 2020) in Miyazaki, Japan. Measurements were performed at Miyazaki university open playground with all the health precautions such as divided the participants into small group - spacing - confirm to wear mask and use sterilizer before, between and after measurements whether for participants or the device.

Table (1)

The mean and standard deviation for age values of Muslims Community

Variable	Egyptian N (11)		Afghanistan N (10)		Indonesian N = (10)	
	M	SD ±	M	SD ±	M	SD ±
Age (Y)	33.8	7.49	30.8	6.78	31.4	3.52
Height (cm)	172.1	5.38	173.3	1.70	167.4	2.06

M: mean, **SD:** standard deviation, **N:** number of Members

Table (1) showed the data summary of age values for women and Egyptian community, there were 33.8 ± 7.49 and 30.8 ± 6.78 for Afghanistan community. whereas their Age values were 31.4 ± 3.52 for Indonesian community.

Data collection methods and tools

Anthropometric indices

Anthropometric indices (Height- Weight – BMI= $\text{weight kg}/(\text{Height})^2\text{cm}$ - Body Fat – Muscle mass – Body Water – RMR) were taken by using a portable stadiometer, after entering Height and Age we used TANITA Body Composition Analyzer 118-E without shoes and wearing only light clothing , Data was collected at 2 different time points first Reading (R1) the samples (measurements) have been taken 1 week before Ramadan, second Reading (R2) the samples (measurements) have been taken at last day of Ramadan.

Daily lifestyle and Food preferences Form:

A form was designed to collect data about Daily lifestyle and Food preferences variables after a survey of some Previous and Similar Studies, and that its relevance to the research methodology and to achieve our objectives.

The Validity Content of Daily Lifestyle and Food Preferences Form

To ensure that the form measures what was design for it, the researcher relied on the validity of the arbitrators (Experts) to ensure the validity of the form and the questions indicated in the questionnaire, and their suitability to measure Daily lifestyle and Food preferences, the experts agreed that they measure what design for them was.

The Reliability of Daily Lifestyle and Food Preferences Form

To ensure the reliability of Daily lifestyle and Food preferences Form, it was applied to (8) individuals from Muslim community which is independent of the basic research sample, then re-applying (R-test) the form to the same sample after one week, and the correlation coefficient was calculated between the first and second responses by using Spearman's correlation coefficient, as shown in the following table:

Table (2)

Correlation coefficient between the first and second test of Daily Lifestyle Form

N.	Daily lifestyle and Food preferences Form	Correlation coefficient
1	Meals often contain meat	**1.000
2	Meals often contain chicken	**1.000
3	Meals often contain seafood	**1.000
4	I like to drink (Water, juice, and green tea)	**1.000
5	I like to drink cola and soft drink	**1.000
6	I like to eat Rice in Ramada	**1.000
7	I like to eat bread in Ramadan	**1.000
8	I like to eat Dates and Sweet food	**1.000
9	I like to eat fast food or visit restaurant	**1.000
10	I like to eat many times after Fasting not only 2 meals	**0.997
11	I eat Suhur meal	**1.000
12	I have time to do some exercise	**1.000
13	I spend around (...) hours to study or work	**0.995
14	I am smoking after fasting	**0.997
15	How many hours you sleep during Ramadan	**1.000

Significant *P*-value <0.01

Table (2) shows there were High correlation coefficients between the first and second applications and their indicating that the contents of the Daily lifestyle and Food preferences form are stable and became Applicable for the basic sample.

Objectivity of the form

As for the objectivity of the Daily lifestyle and Food preferences Form, it is due to the clarity of the instructions for the application and the calculation of grades. The researcher believes that he was able to clarify the instructions of each question clearly and specifically, and that the questions use fixed units of measurement and deal with numbers according to each question, therefore all the questions scores are calculated objectively, away from self-assessments, which reassures the researcher of the objectivity of the used questions.

Statistical analysis

Statistical analysis was performed using SPSS, version 20.0 Data were checked for normality before analysis by the Kolmogorov–Smirnov test and by examining normality plots. The descriptive statistics of mean, standard deviation was calculated for the entire sample. Differences between results were analyzed, using paired samples t- test for normal distributed parameters and Wilcoxon Signed Ranks test for not normally distributed parameters. Differences between all group were analyzed, using multivariate (ANOVA). Statistical significance was considered at P - value <0.05 for all tests.

Results

Table (3)

Changes in Anthropometric Indices Before and After Ramadan of Egyptian Community

Anthropometric Indices	Egyptian Community				T-score	P-value
	Before Ramadan		After Ramadan			
	M	SD ±	M	SD ±		
Body Weight	78.8	3.12	79.1	3.30	0.352	NC
Body Fat	21.36	3.26	21.35	2.42	0.018	NC
Muscle Mass	36.1	3.56	36.6	2.92	0.602	NC
Total Body Water	57	2.41	57.7	2.28	1.217	NC
RMR	1824	43.98	1827	48.11	0.264	NC
BMI	26.3	2.01	25.9	2.11	0.872	NC

NC: Not Significant, Y: years old, P-value<0.05

Table (3) shows there were no statistically significant differences in all anthropometric indices among Egyptian community between before and after Ramadan fasting.

Table (4)

Changes in Anthropometric Indices Before and After Ramadan of Afghanistan Community

Anthropometric indices	Afghanistan Community				T-score	P-value
	Before Ramadan		After Ramadan			
	M	SD ±	M	SD ±		
Body Weight	69.9	7.69	68.1	8.00	4.545	0.001
Body Fat	18.5	2.45	18.18	2.67	1.394	NC
Muscle Mass	38	2.64	38.1	2.81	0.292	NC
Total Body Water	59.8	2.12	60	2.31	1.070	NC
RMR	1710	153.5	1699	164.9	1.233	NC
BMI	24.05	1.88	23.9	2.12	0.477	NC

NC: Not Significant, Y: years old, *P*-value<0.05

Table (4) shows there were statistically significant differences in body weight, while there were no statistically significant differences in another anthropometric indices among Afghanistan community between before and after Ramadan fasting.

Table (5)

Changes in Anthropometric Indices Before and After Ramadan of Indonesian Community

Anthropometric indices	Indonesian Community				T-score	P-value
	Before Ramadan		After Ramadan			
	M	SD ±	M	SD ±		
Body Weight	69.8	7.57	66.9	6.75	2.726	0.021
Body Fat	19.2	2.97	17.9	2.60	2.981	0.014
Muscle Mass	37.8	1.81	38.54	1.41	2.043	NC
Body Water	59.8	1.83	59.7	2.00	0.232	NC
RMR	1659	147.30	1659.3	167.3	0.000	NC
BMI	24.3	2.23	23.1	1.63	3.050	0.012

NC: Not Significant, Y: years old, P-value<0.05

Table (5) shows there were statistically significant differences in body weight, body fat and BMI, while there were no statistically significant differences in Muscle mass, body water and RMR among Indonesian community between before and after Ramadan fasting.

Table (6)

Differences in Anthropometric Indices among Muslim community Egyptian, Afghanistan and Indonesian before Ramadan

Anthropometric indices		EGY	AFG	INDO
Body Weight	EGY		0.001	0.001
	AFG	0.001		NC
	INDO			
Body Fat	EGY		0.003	0.023
	AFG	0.003		NC
	INDO			
Muscle Mass	EGY		0.032	NC
	AFG	0.032		NC
	INDO			
Body Water	EGY		0.005	NC
	AFG	0.005		NC
	INDO			
RMR	EGY		0.014	0.054
	AFG	0.014		NC
	INDO			
BMI	EGY		0.016	0.008
	AFG	0.016		NC
	INDO			

NC: Not Significant, **EGY:** Egyptian, **AFG:** Afghanistan, **INDO:** Indonesian, P -value<0.05

Table (6) shows there were statistically significant differences in (body weight-body fat-RMR-BMI) between Egyptian community and Afghanistan, Indonesian community before Ramadan fasting. While there were no statistically significant differences between Afghanistan

and Indonesian community in the same indices before Ramadan fasting. Also, the study reported that there were statistically significant differences between Egyptian and Afghanistan community in (muscle mass-body water), while there were no statistically significant differences between Egyptian and Indonesian community, Afghanistan and Indonesian community in the same indices before Ramadan fasting.

Table (7)

Differences in Anthropometric Indices among Muslim community Egyptian, Afghanistan and Indonesian after Ramadan

Anthropometric indices		EGY	AFG	IND
Body Weight	EGY		0.030	0.028
	AFG	0.030		NC
	INDO			
Body Fat	EGY		NC	NC
	AFG	NC		NC
	INDO			
Muscle Mass	EGY		NC	NC
	AFG	NC		NC
	INDO			
Body Water	EGY		0.030	0.032
	AFG	0.030		NC
	INDO			
RMR	EGY		NC	0.039
	AFG	NC		NC
	INDO			
BMI	EGY		NC	NC
	AFG	NC		NC
	INDO			

NC: Not Significant, **EGY:** Egyptian, **AFG:** Afghanistan, **INDO:** Indonesian, *P*-value<0.05

Table (7) shows there were statistically significant differences in (body weight-body water) between Egyptian community and Afghanistan, Indonesian community before after Ramadan fasting. While there were statistically significant differences in (RMR) between Egyptian and Indonesian community. Also, the study reported that there were no statistically significant differences in another anthropometric indices between Egyptian and Afghanistan, Indonesian community or between Afghanistan and Indonesian community after Ramadan fasting.

Table (8)

Percentage of Daily lifestyle and Food preferences of the Muslims Community during Ramadan

N.	Type of Food & Drink	Percentage %								
		Egyptian			Afghanistan			Indonesian		
		A	S	N	A	S	N	A	S	N
1	Meals often contain meat	80%	20%	0%	30%	70%	0%	10%	90%	0%
2	Meals often contain chicken	60%	40%	0%	30%	70%	0%	50%	50%	0%
3	Meals often contain seafood	0%	50%	50%	50%	50%	0%	10%	90%	0%
4	I like to drink (Water, juice, and green tea)	40%	60%	0%	90%	10%	0%	100%	0%	0%
5	I like to drink cola and soft drink	70%	30%	0%	50%	50%	0%	0%	20%	80%
6	I like to eat Rice in Ramada	0%	80%	20%	20%	80%	0%	100%	0%	0%
7	I like to eat bread in Ramadan	50%	50%	0%	90%	10%	0%	10%	80%	0%
8	I like to eat Dates and Sweet food	60%	30%	10%	10%	90%	0%	0%	100%	0%
9	I like to eat fast food or visit restaurant	0%	60%	40%	20%	40%	40%	0%	60%	40%
10	I like to eat many times after Fasting not only 2 meals	50%	10%	40%	40%	40%	20%	0%	60%	40%
11	I eat Suhur (<i>before sunrise</i>) meal	50%	50%	0%	90%	10%	0%	100%	0%	0%
12	I have time to do some exercise	N	2-3t	5-4t	N	2-3t	5-4t	N	2-3t	5-4t
		100%	0%	0%	30%	70%	0%	30%	60%	10%
13	I spend around (...) hours to study or work	6h	8h	≤ 8h	6h	8h	≤ 8h	6h	8h	≤ 8h
		30%	10%	60%	20%	30%	50%	90%	0%	10%
14	I'm smoking after fasting	60%	10%	30%	0%	0%	100%	0%	10%	90%
15	How many hours you sleep during Ramadan	4-5h	5-6h	≤ 7h	4-5h	5-6h	≤ 7h	4-5h	5-6h	≤ 7h
		60%	30%	10%	0%	60%	40%	0%	100%	0%

Discussion

Ramadan fasting is a natural experiment that occurs annually for one month and requires specific practices, such as nocturnal consumption of food and changes in meal frequency, food quality, energy intake and sleep cycle. Different studies have reported both positive and negative effects of Ramadan fasting on overall health. This study aimed to examine the influence of Ramadan fasting on anthropometric indices responses among Miyazaki Muslim communities who continued their usual fasting month. Cultures and sub-cultures differ in socio-economic backgrounds, daily lifestyle and dietary habits in Ramadan and the health-specific fasting related findings vary from study to study and sometimes even contradict (**Toda M and Morimoto K. 2000**). The likely causes for these heterogeneous findings are the differences between studies, like duration of fasting studied; it is assumed that such a variation may be related to the quality and quantity of foods ingested by Muslims in various countries and sub-cultures (**El Ati J. et al., 1995**).

This study indicated that didn't show any effects on anthropometric indices during before and after Ramadan fasting among Egyptian community, this can be explained due to table (8) that showed food preferences and daily lifestyle during Ramadan fasting for Egyptian community, that results indicated an increase in the

consumption of meat and chicken in the Iftar meal, Moreover, overstated consumption from sweet food and soft drink definitely it will have a negative effect on all anthropometric indices. which agrees with **(Temizhan et al., 1999)**, showed no change in the body weight during Ramadan fasting. Moreover, Although 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, but the result of table (8) showed that they were (50%) from Egyptian community is not satisfied with two meals (Iftar - Suhur), but they prefers to have meals between them, this caused that there no changes of BMR during Ramadan but increased with the end of Ramadan as indicated table (3).

In addition, table (8) showed that Egyptian community recorded the lowest rates of sleep hours approximately (4-5) hours compare with Afghanistan and Indonesian community during Ramadan, that is due to individuals tend to stay up late watching TV with the family and browsing phone that may reach before eating Suhur meal, thus individuals get (4-5) hours as a maximum of sleeping hours which causes a negative effects on the daily life style as a general, whether in dietary intake, physical inactivity and increasing in daytime lethargy, irritability and moodiness.

(**Lucas Jurado-Fasoli et al., 2018**), confirmed that the poor sleep quality could disrupt the circadian rhythms which are involved in several diseases related to the ageing process, such as, coronary heart disease obesity and depression. Certain studies have proposed a relationship between sleep quality and bone mineral density muscle mass and fat mass. A poor sleep quality increasing the risk of osteoporosis and produces metabolic and endocrine alterations increasing the risk of obesity.

As well as (**Naïf S. et al., 2018**), reported that no significant changes in any of the body composition parameters. Moreover, no significant changes were reported in any of the metabolic syndrome markers. In addition, table (3) showed that pre-test for Egyptian community before Ramadan fasting, they have unhealthy results regarding body weight, body fat and BMI compare the result of Afghanistan and Indonesian communities. that mean Egyptian community they don't have a healthy daily lifestyle and followed unhealthy food habits.

Regarding Afghanistan community table (4) showed that no statistically significant differences in most of anthropometric indices except in Body weight. (**Hamish A. Fernando, et al., 2019**), Confirmed that it has been established that during weight loss, people

of normal weight lose a greater proportion of weight as fat-free mass than people with overweight/obesity. In addition ,table (8) can be showed the extent of their interest for practicing physical activity (2-3) times per week during Ramadan fasting despite the health precautions followed in most countries due Covid-19 epidemic, including Miyazaki prefecture-JAPAN which closed a mosque that represent a place for Muslims activities besides, all Muslim communities try to spend as much time as possible praying, leading inner peace and tranquility, also health clubs and Gym it be closed.

The present findings seem to be consistent with other studies which found a decrease in body weight, As the result of (**Hamish A. Fernando, et al., 2019**), confirmed that Ramadan fasting led to statistically significant reductions in weight and all parameters of body composition and the reductions in weight and fat percentage were of greater magnitude in people with overweight/obesity versus those of normal weight.

Moreover, **Mohd Khalili et al., (2014)**, reported that all individuals, normal and overweight subjects showed a reduction in weight during the holy month of Ramadan. In additional, table (8) can be explain on how weight reduction is interpreted during the holy month of Ramadan, we suggested that weight reduction during

Ramadan fasting is due to increasing physical activity despite no changes in calorie intake, As (70)% of Afghanistan community engage in physical activity (2-3) times a week, in addition the Tarawih prayers that everyone performed it at home due to close a mosque as a preventive for spread Covid-19 epidemic, that involve long periods of standing, kneeling and prostrating.

Regarding Indonesian community table (5) showed that were statistically significant differences in most of anthropometric indices except in (Muscle mass – Body water - BMR), This can be explained due to table (8) that showed Food preferences and daily lifestyle during Ramadan fasting for Indonesian community, that results indicated they have balance and variety in eating meals, eagerness to drink beneficial drinks for their bodies and stay away from unhealthy drinks, nonsmokers, they care about resting their bodies with enough hours of sleep and most importantly with the spread of Covid-19 epidemic they are interested in practicing physical activity 2-3 times a week which can be seen from table (8).

(Hossein Nikfarjad, et al,2017), reported 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. Accordingly, current findings showed that total calorie intake was significantly decreased in Ramadan compared with pre-Ramadan period.

It appears that socioeconomic and cultural differences between Muslim countries and communities may influence the dietary practices and daily habits and thereby may contribute to the inconsistency of findings in different studies.

Ethical considerations:

Participants were fully informed about the methods and objectives of the study.

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Appendix (1)

A form of Daily lifestyle and Food Preferences

During Ramadan	Please choose by <input type="checkbox"/> or <input type="radio"/>		
	Always	sometimes	Never
Meals often contain meat			
Meals often contain chicken			
Meals often contain seafood			
I like to drink (Water, juice and green tea)			
I like to drink cola and soft drink			
I use Rice in Ramadan			
I use bread with meal			
I eat Dates and Sweet food			
I like to eat fast food or visit restaurant			
I like to eat many times after Fasting) not only 2 meals			
I eat SOHOR meals			
I have time to do some exercise (...) per week	Never	2-3 times	5-4 times
I spend around (...) hours to study or work	6 hours	8 hours	≤ 8 hours
I am smoking after fasting			
How many hours you sleep during Ramadan	4 – 5 H	5 – 6 H	≤ 7 H

Appendix (2)

TANITA Body Composition Analyzer E-118



Research Summary

The Effects of Ramadan Fasting on Anthropometric Indices among Muslim Community in Miyazaki – JAPAN

Osama Awde Abdelghany Ibrahim Saleh

Abstract

Fasting from dawn to dusk during Ramadan is obligatory for all healthy adult Muslims Male. Our study was conducted to identify the effects of Ramadan fasting and Daily Lifestyle during Ramadan on Anthropometric indices among Muslim community in Miyazaki, Japan. This current study was conducted during Ramadan 2020, The study was conducted on (31) Participants (11) Egyptian, (10) Afghanistan and (10) Indonesian. Anthropometric indices were taken by using a portable stadiometer, TANITA Body Composition Analyzer 118-E without shoes and wearing only light clothing. Data was collected at 2 different time points first Reading (R1) the samples (measurements) have been taken 1 week before Ramadan, second Reading (R2) the samples (measurements) have been taken at last day of Ramadan. Daily Lifestyle form was designed to collect data about Daily lifestyle and Food preferences variables, Analysis was done using Wilcoxon and

multivariate (ANOVA Test. The results showed This study indicated that didn't show any effects on anthropometric indices during before and after Ramadan fasting among Egyptian community. Afghanistan community results showed that no statistically significant differences in most of anthropometric indices except in Body weight. While Indonesian community were statistically significant differences in most of anthropometric indices except in (Muscle mass – Body water – BMI).

Conclusion

Ramadan fasting had beneficial effects on Anthropometric Indices body, but if it Accompanies with Health Daily Lifestyle.

Keywords

Ramadan fasting, Anthropometric Indices, Daily Lifestyle, Body Fat, Muscle Mass, BMI.