

RAMADAN FASTING AND SPORTS PERFORMANCE: A MALAYSIAN PERSPECTIVE

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The purpose of this study was to identify factors that would affect Muslim athletes in their training or competition during the Ramadan fast. This would lead to a better understanding of the changes in lifestyle, behavioural and training practices of Muslim athletes when they participate in Ramadan fasting and exercise at the same time. A total of 172 Malaysian Muslim national elite athletes participated in a questionnaire survey assessing personal perception on sport performance, sleep pattern, food and fluid intake during Ramadan fasting. The results showed that a quarter of these athletes perceived that there was an adverse effect from the Ramadan fast on their sport performance. A majority of them (58.1%) said that Ramadan fasting did not affect their sleep pattern but 52.3% of them did take an extra nap during the daytime. Most of the athletes (45.9%) ate the same amount of calories as they normally would however 86.0% believed that they drank more fluids than usual. The changes in lifestyle during the Ramadan fast did not adversely affect the perceived sport performance in this cohort of Muslim elite athletes. However, there is an equivocal opinion on the impact of Ramadan fasting on the quality of training.

1 Introduction

Earlier studies on Ramadan fasting have focused on changes in blood hormonal markers and electrolytes of healthy individuals, as well as its metabolic consequence in clinical patients (Gumaa *et al.*, 1978; Mustafa *et al.*, 1978). The subsequent research on the influence of Ramadan in connection with exercise was carried out assessing the body composition and energy metabolism (Sweileh *et al.*, 1992), followed by a limited investigation evaluating the impact of Ramadan on physical exercise performance (Ramadan, 2002). The scheduling of the Singapore 2010 Youth Olympic Games 2010 and London 2012 Olympic Games during the period of Ramadan provided impetus to the sports science fraternity to study the effects of Ramadan fasting in competitive athletes from a sports performance perspective, which resulted in a series of scientific publications on Ramadan and soccer performance (Zerguini *et al.*, 2008).

As most Malaysian national elite athletes are Muslim, a special measure is clearly warranted in preparing these athletes for the Olympic Games. We therefore, conducted this study with the purpose of identifying factors that would affect Malaysian Muslim national elite athletes in their training or competition during the Ramadan fasting. This study also serves a useful purpose in understanding the changes in the lifestyle, behavioural and training practices of our Muslim athletes when they participate in Ramadan fasting and exercise at the same time. We believe that this baseline information is of practical importance as a starting point in conducting a more specialised and focused research on the Ramadan fast and sports performance. Specifically, we hypothesise that the daily diet and sleep patterns, training quality and sport performance may be negatively perceived by this cohort of athletes during Ramadan fasting.

2 Methods

A total of 172 athletes, representing 57% of the total Malaysian Muslim national athletes from the sanctioned programme of the National Sports Council of Malaysia (NSCM) and national sport associations (NSA) volunteered to take part in this study. They comprise both elite and elite-backup athletes from a range of sporting events. These elite athletes included those who have participated in previous Olympic Games; whereas the elite-backup athletes are those regarded as potential Malaysian representatives to future Olympic Games by NSCM and NSA. The study was approved by the Institutional Research Committee of the National Sports Institute of Malaysia and the Research Ethics Committee (Human) of Universiti Sains Malaysia. Demographical characteristics of the participants are presented in Table 1.

A questionnaire survey was administered at the national training centre at Bukit Jalil, Malaysia in 2009 when the Ramadan month began on 22 August and ended on 19 September. Each participant was given a set of questionnaires written in Malay, in which they were required to answer all the questions. The questionnaire was designed to establish a personal perception profile of each participant regarding the following aspects: personal particulars and training background, effects on sport performance, sleep pattern, and food and fluid intake during Ramadan fasting. Prior to filling in the questionnaire, the participants were informed by the investigators on the objective of the study and its relevance to their sport participation. They were also assured of the confidentiality of their responses. An investigator was available for athletes during the session to ask pertinent questions concerning the study or clarify queries on the survey.

The data were analysed using the descriptive or frequencies statistics and were summarised as means \pm standard deviation or percentages as appropriate (SPSS 16.0 for Windows, United States).

3 Results

Of the 172 athletes participating in this survey, 59.9% were male and the rest were female (Table 1). Most of the male athletes were involved in motor skill sports whereas

nearly half of the female athletes were engaged in team/court sports. A majority of participants were elite athletes with at least 5 years of competitive experience.

Table 1. Demographical characteristic of the participants.

	All (<i>N</i> = 172)	Male (<i>N</i> = 103)	Female (<i>N</i> = 69)
Age (years)	21.1 ± 3.2	21.2 ± 3.5	20.9 ± 2.7
Sporting event:			
Combative (%)	12.2	13.6	10.1
Endurance (%)	12.2	19.4	1.4
Motor Skill (%)	34.2	34.0	34.6
Racket Games (%)	8.2	9.7	5.8
Team/Court (%)	31.2	23.3	47.8
Level of performance:			
Elite (%)	61.0	63.1	58.0
Elite-Backup (%)	39.0	36.9	42.0
Years of participation:			
< 5 years (%)	44.2	44.6	43.4
5 – 10 years (%)	50.6	49.6	52.0
> 10 years (%)	5.2	5.9	4.3

Note: combative sports = karate and silat; endurance sports = road/track cycling; motor skill sports = bowling, lawn bowl, archery, weight lifting; racket sports = badminton and squash; team/court sports = field hockey, sepak takraw.

Table 2 shows frequency statistics of Malaysian Muslim national athletes' perception towards the effects of the Ramadan fast on their sports performance and routine training. Only a few of the athletes did not observe the Ramadan fast and for those who did, a majority performed the Ramadan fast for the entire month. Approximately 47% of athletes did not feel that Ramadan fast had an effect on their competitive performance in sport. In contrast, a small percentage (9%) of the athletes reported that the Ramadan fast had actually resulted in enhanced sport performance, whereas at least 26% of all athletes felt otherwise. Overall, there was an equivocal opinion on whether the Ramadan fast had any impact on the quality of training.

More than half of the Malaysian Muslim national athletes said that Ramadan fast did not affect their sleep patterns, but around one third thought Ramadan fasting did affect their sleep pattern (Table 3). Of those athletes who reported that their sleep patterns were altered, about 16% was due to reduced sleep duration with 6% reporting that the quality of sleep was affected. This resulted in about 65% of athletes feeling extra sleepy in the day time during the Ramadan month. About 52% of the athletes were taking extra naps in the day time during the fasting month.

Table 2. Effects of Ramadan fast on sports performance and quality of training.

	All (N = 172)	Male (N = 103)	Female (N = 69)
Observance of Ramadan fast:			
Yes (%)	95.9	95.1	97.1
No (%)	4.1	4.9	2.9
Duration of fasting:			
Entire month (%)	68.6	85.4	43.5
Some days of the month (%)	27.3	14.6	56.5
Effects on sport performance:			
Positive (%)	8.7	11.7	4.3
Negative (%)	26.7	25.2	29.0
No effect (%)	47.7	46.6	49.3
Not sure (%)	16.9	16.5	17.4
Effects on quality of training:			
Yes (%)	38.4	42.7	31.9
No (%)	37.2	35.9	39.1
Not Sure (%)	24.4	21.4	29.0

Table 3. Effects of Ramadan fast on sleep pattern.

	All (N = 172)	Male (N = 103)	Female (N = 69)
Effects on sleep pattern:			
Yes (%)	33.7	37.9	27.5
No (%)	58.1	54.4	63.8
Not sure (%)	8.2	7.7	8.7
Aspects of sleep that is affected:			
Quality (%)	5.8	6.8	4.3
Duration (%)	16.3	20.4	10.2
Quality and duration (%)	11.0	9.7	13.0
Feeling of sleepy during daytime:			
Yes (%)	65.1	66.0	63.8
No (%)	24.4	26.2	21.7
Not sure (%)	10.5	7.8	14.5
Taking extra nap during daytime:			
Yes (%)	52.3	51.5	53.6
No (%)	31.4	36.8	23.2
Not sure (%)	16.3	11.7	23.2

Table 4 presents descriptive data on how the Malaysian Muslim national athletes view their daily diet modification during the month of Ramadan. Slightly more than one third of the athletes thought that they ate more than usual during the Ramadan with about 20% believing that they actually ate less. Approximately half of the athletes considered themselves consuming the same amount of food during Ramadan month.

About 68% of athletes reported a decrease in body weight at the end of Ramadan month. Interestingly, 55% of athletes did not snack between the Iftar (breaking-fast) and Sahur (starting-fast), with one third of them actually snacked during the night whilst the remaining 13% were not sure about snacking.

With regard to fluid intake, more than 81% of athletes believed that they had increased their consumption of drinks during Ramadan month with around 47% of them reporting that they were very often dehydrated.

Table 4. Effects of Ramadan fast on food and fluid intake.

	All (<i>N</i> = 172)	Male (<i>N</i> = 103)	Female (<i>N</i> = 69)
Amount of calories intake:			
Eat more (%)	34.3	38.9	27.5
Eat less (%)	19.8	18.4	21.7
Same amount (%)	45.9	42.7	50.7
Volume of fluid intake:			
Drink more (%)	86.0	89.3	81.2
Drink less (%)	7.6	5.8	10.1
Same amount (%)	6.4	4.9	8.7
Additional snack intake:			
Yes (%)	30.8	35.0	24.6
No (%)	55.8	56.3	55.1
Not sure (%)	13.4	8.7	20.3
Self-perceived of body weight during Ramadan fasting:			
Increased (%)	6.4	8.7	2.9
Decreased (%)	68.0	67.0	69.9
Unchanged (%)	25.6	24.3	27.2
Perceived feeling of dehydrated during daytime:			
Yes (%)	47.7	46.6	49.3
No (%)	31.4	35.0	26.1
Not sure (%)	20.9	18.4	24.6

4 Discussion

To our knowledge, this is the first relatively large study on the perception of elite Muslim male and female athletes towards the impact of Ramadan fasting on their competitive performance across a variety of sports disciplines. Our major finding showed that nearly all of the Malaysian Muslim national athletes observed Ramadan fast. Previous studies have indicated anecdotal evidence of negative effects of Ramadan fasting on exercise performance, and thus it is surprisingly that, only a quarter of them perceived that there was an adverse effect of the Ramadan fast on their sport performance. In addition, a majority of these athletes did not think that their sleep patterns were altered during the Ramadan month despite many of them feeling extra sleepy during the day time of the Ramadan month. Most of the athletes also ate the same amount of food as they normally do although a good number of them believed that they drank more fluids than usual.

An understanding of the impact of Ramadan fasting on exercise and sports performance is warranted because many sporting calendars do not consider the challenge of Ramadan fasting on Muslim athletes when scheduling the sports activities. Moreover, Muslim athletes train and compete throughout the Ramadan month. By far, scientific data on athlete training sessions during Ramadan fasting as compared to non Ramadan fasting month is lacking (Leiper *et al.*, 2008) and the associations between the Ramadan fast and training adaptation have not been well established in elite athletes. Further research is needed to focus on the effects of the Ramadan fast on training quality or adaptation of athletes in these sports (i.e., archery, bowling, etc.), especially in those training sessions that scheduled after Iftar throughout the Ramadan month. Besides, in those highly physical demanding sports, it is worth exploring either the best time to schedule training for competitive athletes undertaking this religious practice.

The effects of Ramadan on nocturnal sleep pattern changes have been investigated in a sample of eight healthy young male subjects (Roky *et al.*, 2001) but not among the competitive athletes adhering to a sport performance-oriented lifestyle. Therefore, it is unclear whether this cohort of elite athletes would display the identical night-time sleep architecture shown by normal healthy people during the Ramadan month, in terms of polysomnographical characteristics (Roky *et al.*, 2001). Nevertheless, the study on fasting young male footballers by Leiper *et al.* (2008) reported that having about 1 hour less sleep every night throughout Ramadan with total night sleep time averaging more than 8 hours, did not show sleep quality to have been compromised.

It is crucial to maintain sufficient caloric intake as excessive energy deficit can lead to loss of muscle mass and inability to sustain power during exercise over the weeks of Ramadan fasting. Fluid intake is also important for many aspects of life, particularly for optimal thermoregulation during exercise. Our findings seem to negate the common belief that Muslims are inclined to overcompensate for energy intake and reduce total food intake throughout the fasting. In reality, the Ramadan fast is only intermittent or partial, i.e. diurnal but does not encompass nocturnal prohibition of food and fluid intake. Therefore, we would like to emphasise that the total amount of food intake in our Muslim athletes during the period of Ramadan is not necessarily reduced when compared with

regular months, showing our findings are consistent with other recent studies (Meckel *et al.*, 2008).

In the present study, we did not specifically measure the subjective feeling of the athletes for the intensity of thirst or their hydration status. Thus, it is incomprehensible why there was a feeling of being dehydrated while there was actually an excessive fluid intake. The only logical explanation was that the athletes in the present study did not really drink as much as they perceived themselves doing so. There are 91% or more of these fasting athletes who reported that their body weight tended to drop or remained unchanged at the end of the Ramadan month, reflecting a negative or equilibrium fluid balance (Maughan *et al.*, 2008).

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