



## The Impact of 30-Minute Jogging Before Iftar on University Students' Mood States During Ramadan

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### ABSTRACT

This study investigates the impact of 30-minute aerobic exercise before iftar on the mood states of university students during Ramadan. Fasting during Ramadan poses physiological and psychological challenges, including fatigue, irritability, and decreased mood. While previous studies have explored the negative impacts of fasting on mood, limited research has focused on the potential benefits of aerobic exercise in alleviating these effects. A total of 21 male university students aged 18-23 (mean age = 19.0 years), with a mean body weight of  $57 \pm 7.39$  kg and a mean height of  $163.76 \pm 7.45$  cm, participated in this study. They engaged in moderate-intensity jogging (60-70% of their maximum heart rate) for 30 minutes, three times per week, during Ramadan. The Profile of Mood States (POMS) questionnaire was used to measure mood changes across six subscales: tension, anger, fatigue, depression, vigour, and concentration. The Shapiro-Wilk test confirmed the normality of the data, and One-Way ANOVA was used to assess significant mood changes. The results showed significant reductions in negative mood states such as tension, anger, fatigue, and depression, and a notable increase in vigour. Conditions such as tension, anger, fatigue, and depression, as well as a significant increase in enthusiasm. Not only that, there is an increase in concentration. The findings of this study indicate that doing aerobic exercise before breaking the fast can improve mood and concentration well during the Ramadan fast, so this exercise offers a practical solution to support the mental and physical health of fasting students.

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### AUTHORS' CONTRIBUTION

- Conception and design of the study;
- Acquisition of data;
- Analysis and interpretation of data;
- Manuscript preparation;
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## INTRODUCTION

Ramadhan is one of the months full of meaning for Muslims all over the world. For a whole month, Muslims carry out fasting which lasts from sunrise to sunset. This is a challenge and has physiological and psychological impacts on the body during fasting. Starting from changes in body metabolism, eating patterns, and sleep quality to affecting physical and mental health. There have been many previous studies that support that fasting in Ramadhan can affect external factors such as fatigue from physical activity



which causes a decrease in mood. Therefore, an understanding is needed about how to maintain psychological well-being during the Ramadhan fast.

One intervention that is currently gaining attention during Ramadan fasting is aerobic exercise. Aerobic activity, which involves repetitive body movements at moderate intensity, has been shown to improve heart health, reduce anxiety, depression, and stress, and improve sleep quality and overall mood (Fry & Putrino, 2018; Morres et al., 2019; Zapalac et al., 2024). However, there are major challenges in doing physical activities during the Ramadan fast, namely, very limited time and body conditions that are affected by fasting (Farooq et al., 2021; Lessan & Ali, 2019). Previous research conducted by Crush et al., (2018) showed that short-duration aerobic exercise can have a positive impact on mood. Aerobic exercise performed before breaking the fast has been found to provide good physiological benefits because the body is in a state of energy deficiency that can be overcome by food intake after exercise. However, current research on the impact of aerobic exercise before breaking the fast on the mood of college students during Ramadan is still limited.

Interestingly, people are now starting to show good interest in aerobic exercise before breaking the fast. Physical activity not only helps the body regulate energy levels but can also reduce feelings of fatigue and anxiety that often occur during fasting (Kandola et al., 2018; Martin et al., 2016; McDowell et al., 2019). Doing aerobic exercise before breaking the fast is believed to reduce symptoms of fatigue, optimize the body's recovery process, and improve mood. Most people who usually have busy lifestyles and tight schedules are now looking for ways to maintain their mental health. Previous studies have shown that moderate-intensity exercise before breaking the fast can increase endorphins, optimize calorie burning, and reduce the buildup of stress that is often experienced during fasting. So this shows that aerobic exercise before breaking the fast can be a practical solution chosen by students to maintain their physical and mental balance.

Physiologically, aerobic exercise can increase blood flow and oxygen to the brain which has the potential to improve cognitive function and mood (Ferrer-Uris et al., 2022). During fasting, many individuals experience decreased blood sugar levels which can cause fatigue, irritability, and impaired concentration (Meo & Hassan, 2015; Wang & Wu, 2022). By doing aerobic exercise before breaking the fast, the body can activate the circulatory system and stimulate the production of endorphins which can reduce pain, increase alertness, and increase feelings of happiness (Liu et al., 2023). These hormones play an important role in improving mood and reducing feelings of anxiety that often occur during fasting. Exercising in the afternoon allows individuals to complete their physical activities before breaking the fast, minimize the negative impacts of lack of energy, and utilize food consumption to accelerate physical recovery after exercise (Lessan & Ali, 2019).

This study aims to investigate the effects of 30 minutes of aerobic exercise on the mood of fasting college students during Ramadan, focusing on four main dimensions of mood: tension, anger, depression, and vigour. These dimensions were chosen because

they encompass both negative and positive aspects of mood related to stress and vitality. In addition, we will also evaluate two additional variables that are directly related to physical condition during Ramadan, namely fatigue and concentration. Through these measurements, this study aims to explore how exercise.

## **METHODS**

### **Study Participants**

This study used a one-group control design. Participants in this study were 21 healthy students. The average age of participants was 19 years old, selected by purposive sampling. The inclusion and exclusion criteria in this study were determined through the identification of whether participants could meet the requirements of this study. The inclusion criteria were male students who were actively exercising between the ages of 18 and 23 years with a Body Weight of  $57 \pm 7.39$  Kg and a Body Height of  $163.76 \pm 7.45$  Cm. Furthermore, the exclusion criteria for this study were students under the age of 18 who had not fasted for 30 days. For the latter, participants would be excluded if they did not fast even for only 1 day.

### **30 Minutes Aerobic Exercise**

In this study, the intervention applied was aerobic exercise in the form of jogging for 30 minutes, which was carried out three times a week for four weeks. This exercise was designed with moderate intensity, ranging from 60-70% of the participants' maximum heart rate (HRmax). This moderate intensity was chosen because it has been proven effective in improving cardiovascular fitness without causing excessive fatigue, which can affect the consistency of student participation in the exercise program during the month of Ramadan. The duration and frequency of exercise are adjusted to the individual's physical condition during fasting.

### **Profile of Mood States (POMS) Questionnaire**

to measure changes in mood conditions using the Profile of Mood States (POMS) questionnaire (Grove & Prapavessis, 1992). The questionnaire was filled out after completing a 30-minute aerobic exercise session, participants were asked to fill out the POMS questionnaire. The questionnaire was filled out every week starting from the first week to the fourth week. This was done to evaluate mood changes directly and to determine the impact of aerobic exercise on students' mood status during the month of Ramadan. The POMS questionnaire consists of six subscales that measure mood parameters such as tension, anger, fatigue, depression, enthusiasm, and confusion, which allows researchers to conduct a detailed analysis of mood changes.

### **Statistical Analysis**

After all the data is obtained, the data is then tested statistically using the JASP software. The initial data will be tested descriptively by displaying the results of the mean and Standard Deviation. The Shapirow-Wilk test is used to determine whether the data is normally distributed. Furthermore, the data will be tested by One-way ANOVA to determine whether there is a difference in each week's p-value 0,05.

## RESULTS AND DISCUSSION

**Table 1.**  
Demographic Profile of Participants

Parameters	N	Mean±St.Dev
Age (Years)	21	19±0,62
Body Weight (Kg)	21	57±7,39
Body Height (Cm)	21	164±7,45

**Table 2.**  
Results Normality Test

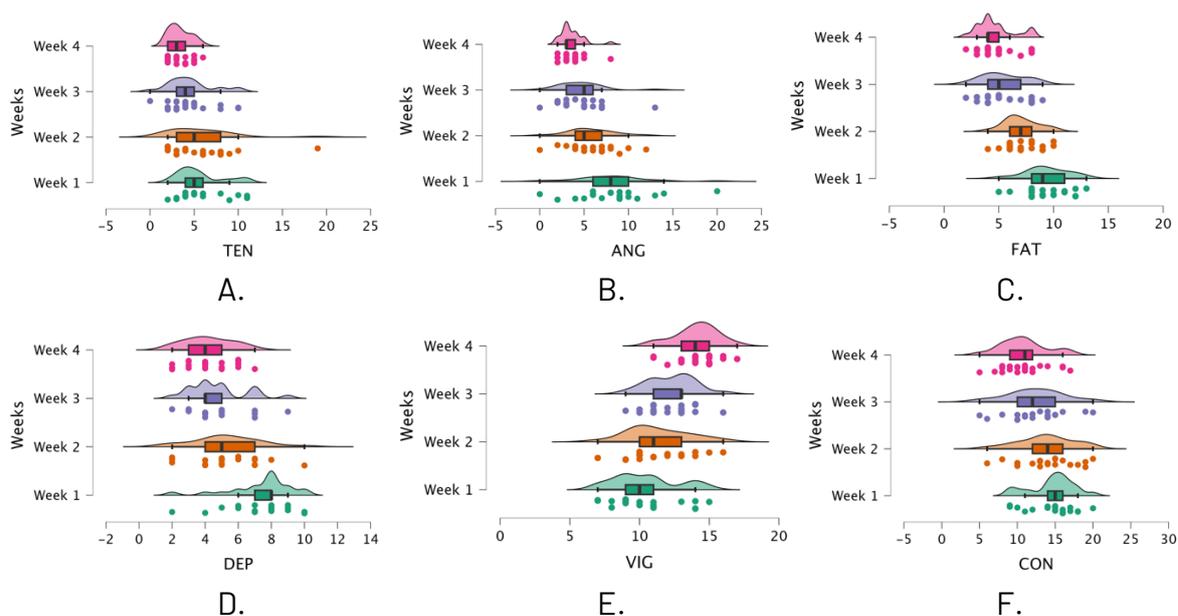
	Weeks 1	Weeks 2	Weeks 3	Weeks 4.
TEN	0,878	0,811	0,922	0,876
ANG	0,949	0,981	0,894	0,818
FAT	0,956	0,935	0,941	0,883
DEP	0,886	0,939	0,911	0,935
VIG	0,926	0,949	0,952	0,940
CON	0,938	0,973	0,975	0,963

The table above shows the results of the normality test using the Shapiro-Wilk test. The overall results indicate that all data are normally distributed, allowing for further testing to be conducted.

**Table 3.**  
The results of the average table and the difference test.

		Weeks 1	Weeks 2	Weeks 3	Weeks 4.
TEN	Mean±St.Dev	5,61±2,6	5,76±3,9	4,61±2,6	3,61±1,2
	Sig.			0,025	
ANG	Mean±St.Dev	8,19±4,2	5,76±2,7	4,61±2,6	3,61±1,3
	Sig.			<,001	
FAT	Mean±St.Dev	9,38±2,0	7±1,5	5,42±1,9	4,71±1,7
	Sig.			<0,001	
DEP	Mean±St.Dev	7,38±1,9	5,28±2	4,76±1,7	4,19±1,4
	Sig.			<,001	
VIG	Mean±St.Dev	10,47±2,3	11,33±2,2	12,28±1,7	14,09±1,5
	Sig.			<,001	
CON	Mean±St.Dev	14,61±2,9	13,81±3,6	12,42±3,7	10,85±3
	Sig.			0,003	

The table above shows the results of the difference test on changes in the mood status of students who do 30 minutes of aerobic exercise every week during the Ramadan fast. Based on the results above, it shows that there are significant changes in several mood parameters: Tension (TEN) decreased from 5,61 in the first week to 3.38 in the fourth week ( $p = 0,025$ ), Anger (ANG) decreased from 8,19 to 3,61 ( $p < 0,001$ ), Fatigue (FAT) decreased from 9,38 to 4,71 ( $p < 0,001$ ), Depression (DEP) decreased from 7,38 to 4,19 ( $p < 0,001$ ), Vigor (VIG) increased from 10,47 to 14,09 ( $p < 0,001$ ), and Confusion (CON) decreased from 14,61 to 10,85 ( $p = 0,003$ ). Overall, these results indicate that 30 minutes of aerobic exercise can significantly improve students' mood status during the Ramadan fast.



**Image 1.**

Mean graph results of: A. Tension (TEN), B. Anger (ANG), C. Fatigue (FAT), D. Depression (DEP), E. Vigor (VIG), F. Confusion (CON)

The results of this study found that 30 minutes of aerobic exercise can reduce mood, especially in reducing anxiety and tension (Figure 1). In-depth, the decrease in tension that occurs after aerobic exercise before breaking the fast shows that physical exercise can regulate stress levels effectively (Beserra et al., 2018; Edwards et al., 2017; Herbert et al., 2020). The tension that often arises during the Ramadan fast is a response to physical and mental stress, but this can be reduced by doing physical activity (Berthelot et al., 2021; Puterman et al., 2017). The increased heart rate and endorphin production during exercise play a major role in creating a happy atmosphere (Hossain et al., 2024). In addition, the positive impact felt during the first and second weeks shows that aerobic exercise has a big impact during Ramadan fasting. This is because a person faces fasting adaptation with changes in eating and sleeping rhythms so that 30 minutes of aerobic exercise can function to balance by supporting the body in facing heavier physical conditions due to fasting.

This study found that there was a significant increase in the joy and vitality of students who did aerobic exercise 30 minutes before breaking the fast, making it one of the very interesting findings in this study. Joy is one of the main components of mood with increased vitality which is very important in maintaining psychological balance, especially during the Ramadan fast (Skurvydas et al., 2021, 2024). The study by Amekran et al., (2023) indicates that aerobic exercise can help modulate the body's response to stress by optimizing the function of the autonomic nervous system. This system regulates bodily activities through increased secretion of endorphins and neurotransmitters (Daniela et al., 2022). This exercise plays a crucial role in maintaining an individual's enthusiasm and motivation (Basso et al., 2022). The hormones involved not only help improve mood but also contribute to better sleep quality, which is often disrupted during the Ramadan fasting period.

On the other hand, the fatigue factor can be seen at the beginning of the exercise. The results of the decrease in fatigue in this study did not show a significant increase during the Ramadan fast. However, a smaller decrease was seen during the third and fourth weeks, this may be due to the body's adaptation process during exercise. During the first and second weeks, the body has not fully adapted to the physical demands of fasting. However, as the exercise progresses, the body begins to adjust to the exercise adaptation, resulting in a more stable reduction in fatigue.

The results of this study also showed an increase in concentration in individuals who did aerobic exercise before breaking the fast. This increase is due to increased blood flow which increases the oxygen supply to the brain, which is very important for maintaining optimal cognitive function and concentration. Thus, this study is in line with studies by Al-Hariri et al., (2019) and Saddoud et al., (2021), which show that concentration is often disturbed due to low blood sugar levels and sleep disturbances during fasting. This increase in concentration shows the importance of the role of aerobic exercise in supporting concentration, which is often disturbed during the Ramadan fast. Therefore, aerobic exercise not only provides physical benefits but also supports students' academic productivity by improving their cognitive abilities, such as memory and mental acuity.

## CONCLUSION

This study concluded that 30 minutes of aerobic exercise before breaking the fast significantly improved mood in college students during Ramadan. Specifically, tension, anger, fatigue, and depression were reduced, while vigour and concentration were increased. These findings suggest that aerobic exercise may be an effective strategy to support mental well-being during fasting. It is recommended that future studies expand sample sizes and explore different types or intensities of exercise to identify the most beneficial interventions. It is hoped that all educational institutions will encourage both school and college students to engage in aerobic exercise before breaking the fast to improve and maintain physical and mental health during Ramadan.

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