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Impact Of Ramadan Fasting on Physical Fitness: A Literature Review

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Abstract:

Background: Ramadan fasting, which is abstaining from food and beverages from sunrise to sunset. Many physiological systems linked to physical performance might be impacted by Ramadan fasting. The impact of fasting on physical fitness should be understood by medical experts, athletes, and the public who exercise during Ramadan.

Objective: Millions of healthy Muslim adults around the world follow Ramadan Intermittent Fasting (RIF), a special type of religious fasting. This study of the literature aims to gather the existing data and investigate the effects of Ramadan fasting on anaerobic power, muscle strength, body composition, psychological problems, behaviour, and aerobic capacity, among other elements of physical fitness.

Search Strategy: A systematic search of Google Scholar and PubMed (2011–2025) using Ramadan, fasting, physical performance, and muscle strength as keyword was conducted using only English-language, peer-reviewed human studies that passed the screening process for design, performance-related outcomes, and relevance.

Conclusion: Ramadan fasts often do not cause appreciable long-term decreases in physical fitness when the right adaption strategies are employed. The findings highlight how crucial it is to plan exercise, stay hydrated after iftar, and control sleep in order to sustain optimal performance. It is recommended to do additional research using larger samples and a specified methodology in order to resolve conflicting findings between studies.

Keywords: Ramadan intermittent fasting, physical fitness, physical performance, aerobic fitness, anaerobic capacity, muscle strength.

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Introduction

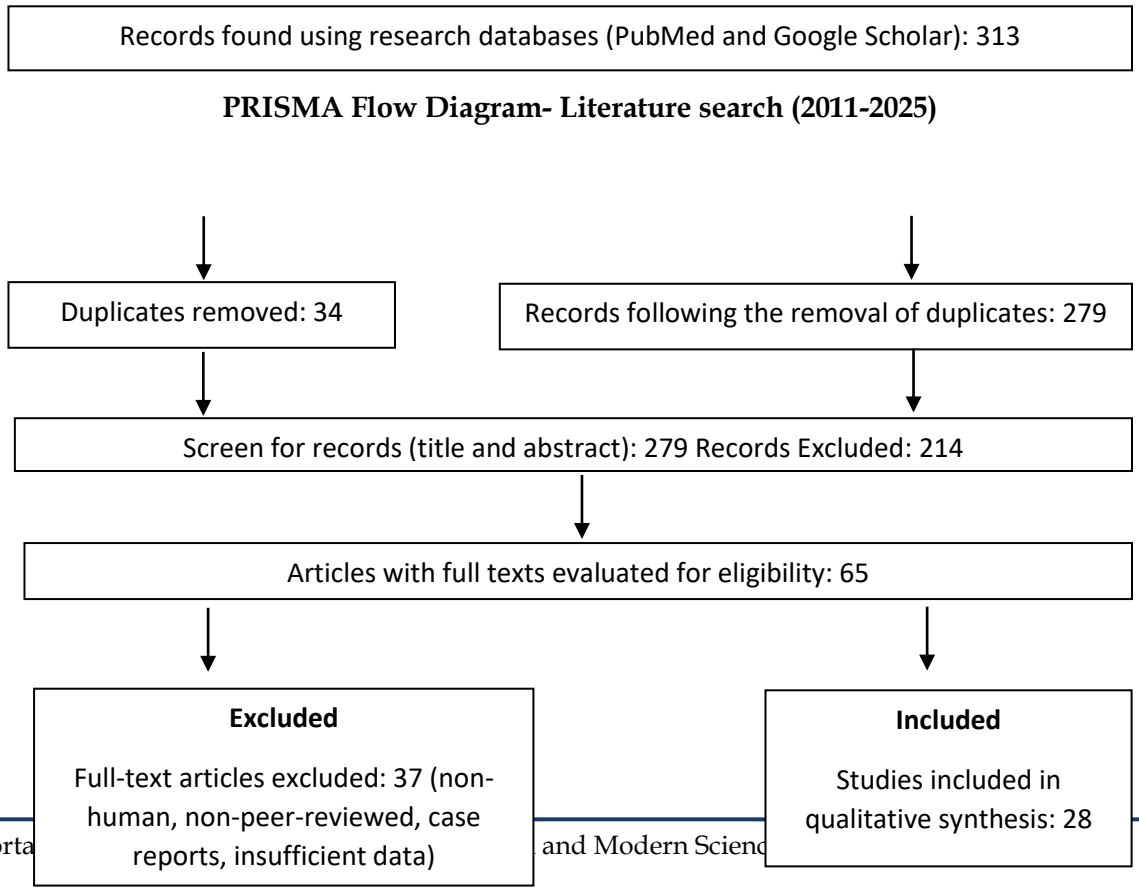
The ninth lunar month in the Islamic Hijri calendar, Ramadan is regarded as the holiest month in Islam. During Ramadan, millions of people fast from sunrise until sunset[1]. More than 1.6 billion Muslims around the world fast throughout Ramadan, which lasts a full lunar month. Muslims are advised to refrain from any destructive or aggressive behaviour, as well as from taking any liquid or solid nutrition, during this time of purification, meditation, and renewal.[2]. Dietary patterns can be altered by intermittent fasting, which can result in changes to physical features, metabolism, and caloric intake[3]. These modifications also have significant impact on sleep patterns, which may result in altered circadian rhythms and decreased nightly sleep

durations[4]. Additionally, studies indicate that fasting during Ramadan may have an impact on cholesterol levels, blood glucose management, and general hydration, among other aspects of human health[5]. Depending on how long and how hard a someone fasts, it may also have an impact on their physical performance, emotional stability, and mental health[6]. Research has looked at how Ramadan affects hormone levels, metabolism, and behaviour. Limited data on physical performance indicate that submaximal elements (e.g., heart rate) are mostly unaffected, but maximum work declines[7]. During Ramadan, food and drink are permitted during daylight hours. However, meals are limited to two, with no option for daytime snacks. This month may have a detrimental impact on energy intake, body weight, and hydration levels[8]. Researchers are also interested in how Muslims' levels of physical activity vary throughout Ramadan. Ramadan is thought to have an impact on people's everyday routines, including their physical activity habits, due to the extended fasting period and sleep difficulties. Most of the research on the impact of Ramadan fasting found that physical activity levels decreased[9]. When taken as a whole, these modifications could lead to disruptions that change how the body reacts to exercise, which could have a negative impact on athletic performance[10].

The aim of this review is to examine the effects of Ramadan fasting on aerobic capacity, anaerobic power, strength, body composition, and performance-influencing behavioural aspects including sleep and hydration.

Methodology

To find research on how Ramadan fasting affects different facets of physical fitness, a thorough review of the literature was done. A search was conducted for pertinent peer-reviewed articles published between January 2011 and October 2025 using two electronic databases: PubMed and Google Scholar. The following keywords were used to do the search: Ramadan, Ramadan fasting AND physical performance, Aerobic capacity. anaerobic performance, muscle strength, body composition OR exercise, athletes. In order to eliminate papers that weren't relevant, the search technique was improved by filtering titles and abstracts. Only English-language research with human subjects were included. Articles about the impact of Ramadan fasting on the body, metabolism, and performance were considered for review. Non-peer-reviewed materials, case reports, and research involving non-fasting persons were eliminated; review papers, experimental studies, and cross-sectional studies were included.



Physiological Changes During Ramadan Fasting

Ramadan fasting can affect circadian rhythms, hydration levels, sleep duration and quality, energy intake, and meal timing. The body continuously loses water, and dehydration will result if these losses are not replenished. The body's water content varies during the day due to episodic water absorption from food and beverages. However, Muslims will restrict from food and liquids between sunrise and sunset during the month of Ramadan, which will result in a gradual loss of bodily fluids. Dehydration is an abrupt decrease in the body's overall water content that, if severe enough, will affect mental and physical function[11]. 2018 saw the publication of articles about some medical disorders and possible alterations in healthy people. The impact of intermittent fasting (IF) in general and the treatment of specific conditions during RF in particular may be better understood thanks to these studies[12].

Impact on Body Composition and Weight Loss

During Ramadan, mealtimes and feeding habits may alter energy metabolism and body composition. Some cohorts show slight decreases in body mass and fat mass, but these changes are irregular and usually mild; the findings rely on training modifications and total energy consumption during non-fasting hours. Weight and fasting during the month of Ramadan were found to be statistically significantly correlated. One study showed that pairwise comparison of the groups revealed significant weight changes during the second and fourth weeks of Ramadan ($p = 0.001$). Ironically, the mean weight increased somewhat during the second week of Ramadan but decreased by 0.4 kg on average during the fourth week. The BMI likewise showed a significant shift ($p < 0.0001$) with the same trend, increasing until the second week of Ramadan and then down in the last week. The study also showed that fasting throughout Ramadan is a safe and healthy method of losing weight, particularly for Muslims. After Ramadan, it can also support sticking to a tight diet[13]. Another study showed that 45% people lost around 1kg weight after Ramadan fasting, 16.3% lost 0.5 kg while 20.8% remains the same weight provided before Ramadan fasting[14].

Impact on Aerobic Fitness (Endurance)

Particularly in the early days of Ramadan, numerous research document mild to moderate declines in VO_2 max, time-trial performance, or endurance capacity. These reductions are usually only temporary, and people usually resume their regular activities by the later days of Ramadan.

In 2016, a survey was conducted in which 54 Olympic football players were asked about fasting during the games. In terms of how Ramadan fasting affects physical performance, 85.2% of participants disagreed or strongly disagreed that fasting can improve physical skills, whereas 81.5% of participants agreed or strongly agreed that it can decrease endurance[15]. An extensive was performed where after a thorough analysis, the study concluded that maintaining body composition, training load, sleep, and nutrition during Ramadan had no effect on training or physical performance[16]. Another study discovered that during the first 1-2 weeks of Ramadan, there were little but noticeable drops in VO_2max and endurance running performance, which eventually returned to normal by the conclusion of the month[17].

Impact on Anaerobic Performance

A significant amount of research suggests that during Ramadan, particularly during the late fasting hours, short-term, high-intensity anaerobic performance such as peak and mean power on Wingate tests and certain measures of repeated-sprint ability is susceptible to deterioration. Results vary, though; a number of recent controlled studies indicate that athletes who modify their training schedule, diet, and sleep patterns see little to no change[18]. Multiple experimental investigations and systematic reviews have consistently shown that many cohorts have decreases in peak and mean power during Ramadan, especially when testing takes place in the afternoon or evening (late in the fast)[19][20][21]. During repeated high-intensity attempts, some studies indicate no change, while others demonstrate a rise in the tiredness index and a decrease in total work. The Fatigue Index (FI) increased significantly during Ramadan compared to previously ($p < 0.001$), according to the primary influence of the different testing periods, which was significant. Similarly, during the three testing sessions, there was a significant time-of-day impact showing that the FI was higher at 17:00 h than 07:00 h ($p < 0.001$)[22].

Muscle Strength

Numerous studies have examined the effects of Ramadan intermittent fasting (RIF) on muscle strength, and the majority of the data points to the preservation of strength performance provided proper training and dietary practices are followed. A number of studies have demonstrated that maximal strength (such as the 1-repetition maximum in the bench press or squat) is well-preserved throughout Ramadan, especially those involving resistance-trained athletes[23].

Ramadan fasting, which involves avoiding food and liquids during the day for about 29 to 30 days, may have an impact on sleep, hydration, and energy intake, all of which may have an impact on muscle function. Numerous studies have shown that throughout Ramadan, maximal voluntary strength (such as handgrip, isometric force, or one-repetition maximum) stays largely constant[24]. Strength measurements typically do not significantly decline for trained athletes who continue resistance training and consume enough calories and protein during non-fasting hours. Conversely, in recreational or untrained persons, minor temporary decreases (usually 1–5%) have been seen; these are frequently ascribed to decreased training volume, dehydration, or changed sleep patterns rather than the fasting itself[25].

Overall, the data shows that, as long as athletes maintain training intensity and make sure they are getting enough food and water, Ramadan fasting does not significantly reduce muscle strength.

Impact on Sleep Patterns

Sleep quality and quantity frequently decrease (due to eating and awakening at night), which can worsen fatigue and impact recovery, a key mediator of performance changes[26]. Some findings from another the study are analyzed, it becomes clear that Ramadan alters numerous aspects of sleep, exercise, and diet features. The most significant findings within the study's criteria were that there had been a shift in the hours of waking and sleeping. It can be demonstrated that there is no statistically significant difference in the overall quantity of sleep time[27].

Psychological Factors and Mental Health

In addition to being a spiritual practice, Ramadan fasting is a special behavioral and physiological intervention that may have an impact on mood, mental health, and cognitive function. In contrast to therapeutic fasting or extended calorie restriction, Ramadan intermittent fasting (RIF) has significant social and spiritual components that can influence psychological effects. Over the past ten years, research on the potential benefits of fasting on mental and emotional health has increased, with studies examining aspects like mood, anxiety, sleep, and cognitive function. Numerous controlled experiments have shown no discernible decline in cognitive abilities, such as short-term memory, alertness, or decision-making, throughout Ramadan. According to studies, the intellectual performance of healthy people remained constant during the month-long fast of Ramadan, suggesting that adaptive mechanisms such as enhanced metabolic activity and ketone utilization may support brain function.[28].

Exercise Timing and Useful Considerations

The timing of exercise during Ramadan month has a significant impact on training outcomes, safety, and physiological flexibility. Athletes and anyone who are physically active must carefully plan their exercise sessions to balance performance optimization, hydration, and recovery because food and fluid consumption are restricted from sunrise (Suhoor) to sunset (Iftar). Because of dehydration and limited glycogen availability, research suggests that exercise done during fasting hours—especially in the late afternoon—may result in increased perceived exertion, lower anaerobic power, and earlier tiredness[18,25]. On the other hand, it has been demonstrated that exercising after iftar, when rehydration and food replenishment are feasible, better supports high-intensity efforts and recovery processes. Similarly, if proper hydration and energy intake are guaranteed beforehand, early morning exercises held following suhoor (pre-dawn meal) might also be beneficial [24].

Conclusion

Intermittent fasting during Ramadan (RIF) causes a number of behavioral, psychological, and physiological changes that affect physical performance and fitness. The most reliable and persistent effect of Ramadan fasting, is a temporary reduction in short-term, high-intensity performance, especially in the later hours of the fasting day. Strength, power, aerobic capacity, and body composition are all affected in different ways, but they can often be maintained with proper training, nutrition, and sleep preparation. To lessen performance deterioration, a customized, sport-specific approach is recommended. Alleviating the negative effects of fasting on performance, dietary and behavioral changes are crucial. Eating balanced, nutritious meals during iftar and suhoor can help maintain energy availability and promote restoration. Additionally, it is crucial to maintain proper hydration from sunset to dawn in order to make up for the water and fluid losses that take place throughout the day during fasting.

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