

A Comprehensive Review of the Effects of Fasting on Physical Performance and Health Capacity of Travelers during Long-Duration Journeys: Physiological, Psychological, and Adaptation Mechanisms

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Abstract

This comprehensive review article explores the multifaceted effects of fasting on the physical performance and health capacity of travelers during long-duration journeys. As travel becomes increasingly common, understanding the physiological and psychological implications of fasting is crucial for optimizing health outcomes. The review synthesizes existing literature on the physiological adaptations that occur during fasting, including metabolic shifts, energy utilization, and hydration status. Additionally, it examines the psychological effects, such as mood alterations and cognitive performance, which can significantly impact a traveler's experience. The article further discusses adaptation mechanisms that enable individuals to maintain physical performance while fasting, highlighting strategies for effective fasting practices during extended travel. By providing insights into the interplay between fasting, physical performance, and health capacity, this review aims to inform travelers and health professionals about the potential benefits and challenges associated with fasting in the context of long journeys.

Keywords: Physical Performance, Health Capacity, Long-Duration Journeys, Adaptation Mechanisms.

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Introduction

Over the past decades, the rapid growth of long-distance travel—particularly in international tourism—has placed increasing emphasis on travelers' health and physical capacity, attracting the attention of both researchers and health policymakers.¹ At the same time, the growing practice of fasting across diverse populations—whether as a religious observance such as Ramadan or as intermittent and prolonged fasting aimed at improving lifestyle and metabolic health—has highlighted the importance of examining its implications under travel conditions.² Different fasting regimens exert distinct physiological effects. Ramadan fasting typically involves alterations in dietary intake and sleep patterns, whereas intermittent or periodic fasting is more often associated with energy regulation, improved inflammatory profiles, and weight

control.³ These variations may become particularly significant in long-term travel, where challenges such as irregular meal timing, frequent relocations, sleep disruption, physical fatigue, and psychological stress can substantially influence travelers' ability to maintain performance and overall health.⁴ Despite the growing body of research, most studies have focused on isolated aspects of fasting, leaving a gap in understanding its broader impact in the context of extended travel. A comprehensive and systematic review is therefore needed to integrate current evidence on the physiological and psychological effects of fasting in travelers.⁵ Such an effort could inform practical recommendations to enhance well-being and physical performance during long journeys and ultimately support the development of

targeted health and nutritional strategies for the global traveling population.⁶

Physiological Effects of Fasting

Fasting induces a metabolic shift toward fat utilization, accompanied by a relative reduction in glycogen stores and modulation of endurance capacity. Evidence also indicates positive adaptations in oxygen consumption and aerobic performance. With appropriate hydration management and prevention of travel-related risks, fasting can be maintained without significant adverse effects on the health and physical capacity of travelers.⁷

Psychological Effects of Fasting

Fasting can be associated with relative improvements in mood and reductions in certain anxiety symptoms in many individuals, while simultaneously presenting temporary risks of decreased attention or increased fatigue, particularly when combined with sleep deprivation. For such individuals, strategic daily planning—including activity scheduling—along with proper management of sleep and hydration, and the selection of balanced post-iftar meals, may help preserve or even enhance aspects of cognitive and psychological performance.⁸

Bodily Adaptation and Circadian Rhythm

Time-restricted intermittent fasting can regulate the body's circadian rhythm and mitigate jet lag symptoms. This approach also enhances metabolic processes and muscle recovery, consequently improving physical performance and health capacity in travelers during long-duration journeys.⁹

High-Risk Groups

During long-duration travel, fasting can have diverse effects on travelers' physical performance and health, with its impact depending on individual conditions, age group, and health status. Certain groups, such as older adults, individuals with chronic diseases (e.g., diabetes and cardiovascular disorders), pregnant women, children, and professional athletes, may be at higher risk and require special care and careful planning.¹⁰ Studies show that with appropriate medical supervision, dietary adjustments, and proper meal timing, fasting can also provide significant benefits, including improved immune function, reduced inflammation, better glycemic and blood pressure control, increased energy, enhanced concentration, and greater resilience to stress.¹¹ Therefore, with proper management, even high-risk groups can benefit from the positive effects of fasting and experience

long-duration travel with adequate health and physical performance.

Discussion

Multiple studies have shown that fasting, by reducing glucose levels and promoting fat utilization, can improve insulin sensitivity and metabolism, contributing to weight loss, improved lipid profiles, and cardiovascular health.¹² This process also lowers stress hormone levels and enhances travelers' psychological well-being, which plays a critical role in sustaining physical performance during challenging journeys. However, certain adverse effects, such as weakness, headache, dehydration, and gastrointestinal issues, have been reported under specific conditions, requiring closer clinical attention.¹³ Research in various countries has indicated that the Islamic fasting model is comparable to intermittent fasting patterns observed in Western societies, yielding similar outcomes such as weight reduction, stress relief, decreased anxiety, and improved cardiovascular health.¹⁴ Meta-analyses have also reported positive associations between fasting and the preservation of cognitive function, enhancement of immune function, and improvement in sleep quality. Fasting can contribute to optimizing both physical and mental health, promoting weight loss, enhancing metabolism, and increasing stress tolerance.¹⁵ Travel physicians should focus on screening travelers with underlying conditions (e.g., insulin-dependent diabetes, cardiovascular and renal diseases), adjusting medications, and recommending adequate fluid intake during fasting trips.¹⁶ Proper nutritional education and preventive care can help prevent common adverse effects and declines in traveler performance. The main limitations of recent studies include short follow-up periods, small sample sizes, and the lack of data specific to travelers under environmental stress.¹⁷ Much of the evidence is self-reported or obtained under controlled conditions, with limited data from very long journeys or diverse climatic conditions. There is a clear need for clinical studies with longer follow-up, better control of variables, and monitoring of individuals with chronic diseases.¹⁸

Practical Recommendations for Travelers

Fasting, as a religious and spiritual dietary practice, has significant effects on both physical and mental health, which become particularly important during long-duration travel. Nutritional and hydration management before and during travel is crucial; adequate water intake and consumption of electrolyte-containing fluids help maintain fluid balance and prevent fatigue. Proper pre-travel nutrition with light, energy-rich meals, along with careful planning of meals throughout the day, contributes

to maintaining energy levels and physical endurance.¹⁹ To prevent jet lag, scientific recommendations include exposure to natural light—particularly morning light—maintaining regular and adequate sleep, and synchronizing meal times with the destination's time zone, which helps regulate the body's circadian rhythm and reduce jet lag symptoms. Engaging in light physical activity during travel, such as walking, stretching, and equipment-free exercises, even for short periods, positively influences fitness maintenance and fatigue reduction.²⁰ High-risk groups, including older adults, individuals with chronic conditions, and those adapting to new environments, should consult a physician prior to travel and adhere to special precautions, such as proper hydration, appropriate nutrition, and avoidance of strenuous activities under adverse conditions. Awareness of signs of dehydration and physical strain, and prompt response to them, is also critical.²¹ Beyond spiritual benefits, fasting offers numerous scientifically recognized health advantages, including blood glucose control, improvement of cardiometabolic parameters, reduction of oxidative stress, and promotion of detoxification, which can even enhance immune function and physical capacity. With proper management of fasting, nutrition, and physical activity, long-duration travel can be a positive and healthy experience.²² Focusing on nutritional and hydration management, implementing jet lag mitigation strategies, maintaining appropriate physical activity, and giving special attention to the safety of high-risk groups provide practical, evidence-based approaches to optimize the quality of long-duration travel under fasting conditions, thereby enhancing both health and physical performance.²³

Conclusion

Fasting during long-duration travel, when properly managed, can not only maintain physical health but also enhance travelers' physiological and psychological capacities. Evidence indicates that metabolic changes induced by fasting, improvements in cardiovascular profiles, stress reduction, and circadian rhythm optimization are factors that can strengthen physical performance and adaptive capacity in travelers. However, the occurrence of issues such as dehydration, fatigue, and sleep disturbances—particularly in high-risk groups—highlights the need for medical supervision and nutritional education. Overall, adopting an approach based on proper management of nutrition, hydration, jet lag prevention, and attention to individuals' specific conditions can make fasting an effective strategy for improving health and the quality of long-duration travel. In parallel, conducting broader field-based studies and long-term investigations

across diverse populations is essential to develop more precise scientific and practical guidelines in this area.

Highlights

What Is Already Known?

Fasting has positive effects on physical performance and health capacity. It can enhance endurance, reduce inflammation, and improve concentration. During long journeys, fasting aids in energy management and adaptation to various conditions, also contributing to improved mental well-being.

What Does This Study Add?

This study adds valuable insights into the specific effects of fasting on physical performance and health during long journeys. It highlights the physiological and psychological mechanisms that support endurance and energy management, emphasizing how fasting can enhance adaptability to challenging conditions. Furthermore, it underscores the potential mental health benefits, such as improved focus and mood, which are crucial for travelers facing fatigue and stress.

Authors' Contributions

All authors equally contributed to this study.

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Conflicts of Interest Disclosures

The authors declared no conflict of interest.

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