




Impact of Ramadan Fasting on Medical Conditions: A Concise Narration of the Literature in 2023

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Abstract

Ramadan fasting (RF), the religious practice of abstaining from food and drink from dawn to sunset during the Islamic holy month, continues to generate significant research interest regarding its health implications. This narrative review synthesizes findings from 141 studies published in 2023, offering clinicians an updated perspective on the evolving evidence base. Research highlights RF's complex physiological effects, demonstrating both potential benefits and risks across various medical domains. The gut microbiome undergoes temporary alterations during fasting, with reductions in beneficial bacteria followed by post-Ramadan recovery of diversity. Cardiovascular studies reveal improved endothelial function and arterial elasticity, though they also identify delayed hospital presentations for acute coronary events. Maternal–fetal research provides reassuring data, with large-scale analyses showing no significant association between in utero RF exposure and childhood stunting or underweight. Endocrine management studies offer practical insights, showing flexibility in thyroxine timing and safe glucocorticoid adjustment protocols for adrenal insufficiency patients. Renal research demonstrates that strategic nighttime hydration can mitigate daytime dehydration effects, while neurological investigations characterize the prevalent but manageable phenomenon of caffeine-withdrawal headaches. Mental health findings present a nuanced picture, with population-level improvements in well-being contrasting with increased stress among specific subgroups like male students. Emergency department data show consistent patterns of complaints during Ramadan, without evidence of increased mortality. Specialty areas including bariatric surgery, ophthalmology, and hematology contribute valuable patient-specific considerations, while sports medicine research documents the trade-offs between fat reduction and athletic recovery in fasting athletes. The collective evidence underscores the importance of individualized, culturally competent care approaches that respect religious observance while addressing medical needs. Key clinical takeaways include the value of pre-Ramadan assessments, the feasibility of medication timing adjustments, and the need for targeted monitoring in vulnerable populations. Despite methodological limitations inherent in a single-database, nonsystematic review, this synthesis provides

Keywords

- ▶ literature
- ▶ professional and patients' perceptions
- ▶ pregnancy
- ▶ professional
- ▶ Ramadan
- ▶ research
- ▶ sports
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- ▶ sleep

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practitioners with actionable insights to guide patient counseling and management during Ramadan. Future research directions should prioritize long-term outcome studies, investigations in high-risk populations, and implementation science to translate evidence into clinical practice. The 2023 literature ultimately reinforces that with appropriate preparation and monitoring, most patients can safely observe Ramadan fasting while maintaining health stability.

المقالة باللغة العربية

تأثير صيام رمضان على الحالات الطبية: عرض موجز للأدبيات في عام 2023

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لا يزال صيام رمضان، وهو الممارسة الدينية التي تتضمن الامتناع عن الطعام والشراب من الفجر حتى غروب الشمس، يثير اهتماماً بحثياً كبيراً فيما يتعلق بتأثيراته الصحية. تجمع هذه المراجعة السريرية نتائج 141 دراسة نُشرت في عام 2023، مقدمة للأطباء آخر المستجدات في الأدلة العلمية المتطورة. يُسلط البحث الضوء على التأثيرات الفسيولوجية المعقدة لصيام رمضان، حيث يُظهر الفوائد المحتملة وكذلك مخاطر الصيام عبر مجالات طبية مختلفة.

بينت الأبحاث تعرض ميكروبيوم الأمعاء لتغيرات مؤقتة أثناء الصيام، مع انخفاض في البكتيريا المفيدة يتبعها استعادة التنوع بعد رمضان. كما كشفت الدراسات القلبية الوعائية عن تحسن في وظائف البطانة ومرونة الشرايين، على الرغم من أنها تشير أيضاً إلى تأخر في إدخال المرضى إلى المستشفى نتيجة الأحداث القلبية الحادة. كما قدمت أبحاث صحة الأم والجنين بيانات مطمئنة، حيث تُظهر التحليلات واسعة النطاق عدم وجود ارتباط كبير بين التعرض لصيام رمضان أثناء الحمل وتأخر النمو أو نقص الوزن عند الأطفال.

توفر دراسات إدارة الغدد الصماء رؤى عملية، مثل مرونة توقيت تناول الثيروكسين وبروتوكولات أمانة لتعديل الجلوكوكورتيكويد مرضى قصور الغدة الكظرية. بينما تُظهر الأبحاث الكلوية أن تناول السوائل ليلاً يمكن أن يخفف من آثار الجفاف نهائياً، كما أظهرت الدراسات العصبية ظاهرة شائعة وهي صداع انسحاب الكافيين خلال النهار. وقدمت الأبحاث الخاصة بالصحة النفسية صوراً مختلفة، حيث أظهرت بعضها تحسناً نفسياً لدى بعض السكان، بينما زاد التوتر النفسي لدى فئات محددة مثل الطلاب الذكور. ومن ناحية أخرى تُظهر بيانات أقسام الطوارئ أنماطاً ثابتة من الشكاوى خلال رمضان، دون دليل على زيادة الوفيات. كما تساهم تخصصات طبية أخرى مثل جراحات السمنة، وطب العيون، وأمراض الدم في اعتبارات مهمة للمرضى، بينما توثق أبحاث الطب الرياضي المفصلة بين تقليل الدهون واستعادة الأداء الرياضي لدى الصائمين.

تشدد الأدلة المجمعة في هذه البحوث على ضرورة اتباع نهج رعاية فردي وثقافي براعي الممارسات الدينية ويعالج الاحتياجات الطبية. تشمل النقاط السريرية الرئيسية أهمية التقييمات قبل رمضان، وإمكانية تعديل توقيت الأدوية، والحاجة إلى المراقبة المستهدفة للفئات الضعيفة مثل كبار السن.

رغم القيود الموجودة في هذه المراجعة غير المنهجية لقاعدة بيانات واحدة، إلا أن هذا التجميع يقدم لممارسي الرعاية الصحية رؤى عملية تساعد في توجيه الإرشادات الطبية وإدارة المرضى خلال شهر رمضان. لذلك، ينبغي أن تركز الأبحاث المستقبلية على دراسات النتائج طويلة المدى، والتحقيقات في الفئات عالية الخطورة، وذلك لتحويل الأدلة إلى ممارسات سريرية. وتؤكد الأدبيات لعام 2023 في النهاية أنه مع التخطيط والمراقبة المناسبة، يمكن لمعظم المرضى صيام رمضان بأمان مع الحفاظ على استقرارهم الصحي.

الكلمات المفتاحية: الأدبيات، تصورات الممارسين والمرضى، الحمل، المحترفون، رمضان، الأبحاث، الرياضة، القلب والأوعية الدموية، النوم.

Introduction

Ramadan, the ninth lunar month, is a religious month dedicated to fasting, prayer, and charity. The impact on health and disease stems from the biological effects of fasting and associated social changes. Health care providers (HCPs) have shown increased interest in potential health-related risks due to Ramadan fasting (RF), where adult Muslims abstain from eating and drinking between dawn and sunset. While patients with chronic or acute medical conditions may be exempt, many still fast, sometimes against medical advice, which may adversely affect their health without evidence-based recommendations.¹ Keeping up with RF research developments is challenging, making a narrative overview useful for summarizing findings. Previous reviews covered literature from 2017 to 2022.^{2,3} This review provides a thematic overview of global RF research in 2023, summarizing key findings and clinical implications.

Methods

This narrative, nonsystematic review used PubMed (the National Center for Biotechnology Information at the U.S.

National Library of Medicine) to retrieve literature published between January 1 and December 31, 2023. The search term "Ramadan fasting" identified 141 records, manually reviewed for relevance. Diabetes-related articles were excluded due to their volume and submitted separately.⁴ Physiology and nutrition studies were also excluded for marginal clinical relevance. Only full-text, English-language human studies were included.

Results

The findings spanned multiple clinical themes (► **Table 1**).

Gut and Liver

Nine articles were published in 2023, including six primary studies⁵⁻¹⁰ and three reviews, on the effect of RF on the gut and liver.¹¹⁻¹³ Jo et al found decreased short-chain fatty acids and beneficial bacteria during RF, with diversity rebounding post-Ramadan.⁵ Saglam et al noted reduced Firmicutes and increased Proteobacteria post-RF, influenced by dietary changes.⁶ Popa et al linked RF to weight loss and metabolic improvements via gut microbiota modulation.⁷ Alshammari et al found no significant changes in tumor biomarkers

Table 1 Emerging themes from the literature review on Ramadan fasting (RF) in health and disease, excluding the diabetes-related articles in 2023

Themes	Articles
Gut and liver: Gut microbiome, colon cancer, GERD, symptoms of the GI disorders	9
Cardiovascular: Acute coronary syndromes, blood pressure, endothelial dysfunction, and arterial stiffness, effects of brief nutrition education on healthy eating practices	4
Maternal and fetal health: Impact of RF on maternal nutrition, well-being, fetal nutrition, growth, and development	7
Hormones: Thyroxine and glucocorticoid replacement during Ramadan	4
Kidneys: Impact of fluid intake at night during Ramadan and impact of RF on inflammation (hs-CRP)	2
Neurology: Headache and cognitive function	2
Mental health and quality of life: Widely diverse aspects of mental health and quality of life in different groups	4
Emergency medicine: Pattern of emergency department visits in general and for older adults	2
Miscellaneous clinical problems: Surgery, infection, hematology, ophthalmology, women's health, and regenerative medicine	7
Sports medicine and athletes health: Studies on nutrition, body composition, sleep, fitness, physical and cognitive coping strategies	8
Professional perspectives: Insights on the RF-related perceptions and practices of health care professions from Muslims and non-Muslims in Muslim majority regions and in the West	5

Abbreviations: GERD, gastroesophageal reflux disease; GI, gastrointestinal; hs-CRP, high-sensitivity C-reactive protein.

(carcinoembryonic antigen, lactate dehydrogenase) in colorectal cancer patients fasting during chemotherapy.⁸ Abdallah et al reported improved metabolic profiles, gastrointestinal motility, and symptoms post-RF,⁹ while Bohamad et al observed reduced gastroesophageal reflux disease (GERD) symptoms after Ramadan.¹⁰ Reviews emphasized pre-Ramadan counseling for inflammatory bowel disease (IBD) and liver disease patients,¹¹ with no significant link between fasting and peptic ulcers.¹² Lin et al highlighted RF's benefits for metabolic dysfunction-associated steatotic liver disease.¹³

In conclusion, RF benefits gut and liver health by improving metabolism and reducing GERD symptoms, while remaining safe for cancer patients. However, IBD patients may need monitoring due to potential flare risks. Optimal outcomes require proper nutrition and medication timing during nonfasting hours.

Cardiovascular Risk

Four studies examined the cardiovascular risk of RF.^{14–17} Aydin et al found no circadian variation in ST-elevation myocardial infarction (STEMI) onset during Ramadan but noted delayed hospital presentation.¹⁴ Hypertension (HT) patients showed improved endothelial function (flow-mediated dilation) post-RF, linked to reduced C-reactive protein (CRP) and cortisol.¹⁵ Gul et al demonstrated that nutrition education improved dietary adherence and metabolic profiles during RF,¹⁶ while Alinezhad-Namaghi et al reported reduced arterial stiffness (pulse wave velocity) in metabolic syndrome patients fasting during Ramadan.¹⁷

In conclusion, RF improves cardiovascular health by enhancing endothelial function and reducing arterial stiffness in hypertensive and metabolic syndrome patients while maintaining stable STEMI patterns (though with delayed hospital

presentation). Pre-Ramadan nutrition education significantly boosts dietary compliance and metabolic outcomes, highlighting its value in cardiovascular risk management during fasting.

Maternal and Fetal Health

Chu et al found no significant association between in utero RF exposure and child stunting/underweight.¹⁸ Denizli et al noted similar perinatal outcomes in fasting versus nonfasting pregnant women but prolonged nonstress test evaluations in fasters.¹⁹ Chen et al's meta-analysis found no RF link to birth weight or gestational age,²⁰ while Ong et al reported mixed findings on fetal health.²¹ Shahawy et al emphasized nuanced counseling for pregnant fasters,²² and Pradella et al linked first-trimester fasting to reduced birth weight, moderated by dietary fat intake.²³ Başbüyük et al found no difference in breast milk composition or infant weight gain between fasting and nonfasting mothers.²⁴

In conclusion, RF during pregnancy shows no major adverse effects on fetal growth or breast milk quality, though first-trimester fasting may slightly reduce birth weight (reversible with proper nutrition). While perinatal outcomes remain generally comparable, clinicians should provide trimester-specific nutritional counseling—emphasizing hydration, high-fat diets, and fetal monitoring—to ensure optimal outcomes for fasting mothers and babies.

Hormones

Mahzari et al found no significant thyroid-stimulating hormone/free thyroxine (FT4) changes based on levothyroxine timing during Ramadan,²⁵ while Elsherbiny reported most patients remained euthyroid post-RF.^{26,27} Hee et al showed safe conversion to prednisolone in adrenal insufficiency patients fasting during Ramadan.²⁸

In conclusion, RF requires no levothyroxine dose adjustments for hypothyroid patients and allows safe prednisolone conversion for AI, with most patients maintaining stable hormone levels throughout fasting.

Kidneys

Tarabeih et al found RF increased creatinine/urea during fasting, which is reversible with hydration,²⁹ while a hemodialysis study reported reduced inflammation markers post-RF.³⁰ This indicates that RF causes reversible kidney stress (elevated creatinine/urea) that normalizes with hydration while offering potential anti-inflammatory benefits for hemodialysis patients.

Neurology

Magdy et al reported caffeine-withdrawal headaches in 55.5% of fasters,³¹ and Rad et al found food reminders impaired cognitive control.³² To adapt, taper caffeine pre-Ramadan, limit food reminders, and use acetaminophen if needed for headaches.

Mental Health

Ahmed et al noted no significant stress changes in fasting schoolchildren,³³ while Mejri et al found bipolar disorder patients often stopped fasting, with self-stigma linked to negative perceptions.³⁴ Sulaiman et al reported improved mental well-being during Ramadan,³⁵ and Alotaibi et al observed healthier lifestyles but higher stress in male medical students during RF.³⁶ These results indicate that individualized approaches are essential—promoting mindfulness for stress-prone groups (e.g., students) and nonjudgmental counseling for psychiatric patients.

Emergency Medicine

Khojah et al found fever and abdominal pain were the most common emergency department (ED) complaints during Ramadan,³⁷ while Sahin et al³⁸ noted fewer central nervous system complaints but more cardiovascular diagnoses in elderly ED patients.³⁹ These findings suggest the need for targeted ED preparedness—emphasizing infection control, gastrointestinal evaluation, and enhanced cardiac monitoring for older adults during the fasting period. HCPs should educate vulnerable populations about preventive measures (hydration, balanced meals) while ensuring emergency services are optimized for these predictable seasonal health trends.

Miscellaneous Clinical Reports

Kermansaravi et al highlighted risks of RF in patients following metabolic and bariatric surgery,³⁹ and AlZunaidy et al reported improved metabolic markers in premenopausal and postmenopausal women.⁴⁰ Widhani et al found reduced high-sensitivity CRP in human immunodeficiency virus (HIV) patients,⁴¹ with no significant RF impact on β -thalassemia major or sickle cell disease.^{42,43} Ettehad et al noted retinal thickness changes but no vision impairment during RF.⁴⁴

Sports Medicine

Studies highlighted reduced fat mass and sleep duration in basketball players,⁴⁵ no chronotype impact on aerobic fitness,⁴⁶ caffeine's performance benefits in handball players,⁴⁷ and early suhoor (predawn meal) worsening performance versus late suhoor.⁴⁸ Footballers developed irregular coping strategies.⁴⁹ While anaerobic/cognitive performance declined in the afternoon/evening, it improved following exercise.⁵⁰ Resistance training maintained muscle strength/hypertrophy regardless of fed/fasted state.⁵¹ These results indicate the importance of tailored nutrition, training scheduling, and recovery strategies to maintain peak performance. Resistance training remains effective regardless of fasting status, but athletes should adjust coping strategies to manage fatigue.

Professional Perspectives

Hillier et al highlighted gaps in Western HCPs' knowledge of RF,⁵² while Dabaja et al found physicians uncomfortable discussing fasting with pediatric patients.⁵³ Abou Leila et al noted Muslim doctors were more proactive in pre-Ramadan counseling,⁵⁴ and Oqal et al reported strong pharmacy personnel knowledge on medication routes during fasting.⁵⁵ King et al emphasized cultural competency for non-Muslim clinicians treating Muslim patients.⁵⁶ These reports indicate the need for cultural competency around RF through targeted training, proactive pre-Ramadan patient consultations (especially for high-risk groups), and collaboration with pharmacists on medication timing. Clinicians must initiate nonjudgmental discussions to address knowledge gaps, particularly in pediatric and non-Muslim majority settings, while leveraging resources like multilingual guides and interprofessional support to ensure safe fasting practices.

Clinical Implications

While the article has focused on clinically relevant studies, it does not stand alone in translating these findings into clinical practice. Several clinical practice guidelines provide specific recommendations for HCPs. For example, how should clinicians advise patients with chronic conditions who wish to fast during Ramadan? Developing the guidelines will require the inclusion of literature over the years.²⁻⁴

Limitations

This narrative review has several constraints: its nonsystematic approach and reliance on a single database (PubMed) preclude rigorous quality assessment or meta-analysis, though this allows a broad thematic coverage of the 2023 literature. Diabetes research was excluded due to its extensive volume (addressed separately⁸), while physiology/nutrition studies were omitted as they were beyond this review's clinical scope. These methodological choices prioritize accessibility for clinicians over comprehensive synthesis.

Conclusion

Global academic RF research in 2023 explored diverse health impacts: gut/liver (microbiome, GERD, cancer safety), cardiovascular (endothelial function, arterial stiffness), and maternal–fetal health. Key findings included benefits of pre-Ramadan nutrition education, stable hormone replacement outcomes, and distinct ED patterns (increased cardiovascular cases in elderly). Sports medicine revealed performance optimization strategies, while professional studies highlighted cultural competency gaps in HCPs. This snapshot aids clinicians in updating practice for fasting patients.

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Conflict of Interest

None declared.

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