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REVIEW ARTICLE

Health Benefits and Adverse Effect of Islamic Intermittent Fasting

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ABSTRACT

Fasting is defined as restriction from the feeding of food and drink for variable durations of time, which is connected with increased durability and has potential advantages for human health. Fasting is a dietary behavior that is performed mainly as a health-promoting pattern. According to Prophet Muhammad (PBUH), Islamic fasting is a shield to protect believers against sins and lustful desires. One of the prime goals of religious fasting is the purification of the human soul and body separately. Intermittent fasting is a dietary pattern, in which the fasting and feasting periods occur in a cycle. Muslims practice fasting by refraining from eating, drinking, and smoking from Sahur until Iftar during the holy month of Ramadan for 28-30 days. Present review focus on health benefits and adverse effect of Islamic intermittent fasting.

Keywords: *Intermittent fasting, Islamic fasting, Health benefits, Adverse Effect*

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INTRODUCTION

Islam has five pillars including faith, prayers, alms, fasting, and pilgrimage. According to Prophet Muhammad (PBUH), Islamic fasting is a shield to protect believers against sins and lustful desires. Muslims who exercise Islamic fasting abstain from eating, drinking, smoking, and sexual intercourse fromSahurto Iftar. The believers of Islam, practice fasting during the holy month of Ramadan and other specific days of the lunar year as a mandatory task.[1]Fasting is defined as restraint from the consumption of food and drink for variable durations of time, which is associated with increased longevity and has potential advantages for human health. Fasting is a dietary behavior that is performed mainly as a health-promoting pattern. Holy fasting involves the avoidance of consuming food and drink as a religious duty at various times of year in different regions of the world. According to Islam, fasting protects believers against sins and passionate desires. Muslims practice fasting by refraining from eating, drinking, and smoking from Sahur until Iftar during the holy month of Ramadan for 28-30 days. One of the primary aims of religious fasting is the purification of the human soul and body simultaneously. Additionally, this restraint dietary pattern could help individuals attain high spiritual godliness. Islamic fasting is an effective approach to health development and is associated with numerous health benefits, including the

- Decrease of hypertension,
- Enhancement of insulin sensitivity,
- Weight loss,
- Boost of endorphin levels,

- Improvement of asthma,
- Immune cell regeneration,
- Reduction of inflammation,
- Detoxification, and
- Improvement of rheumatoid arthritis.

It is notable that Islamic fasting may cause some health discomforts, such as

- Dehydration,
- Headaches,
- Constipation,
- Sleep deprivation, and
- Poor sleep quality.[2]

So, fasting Muslims are suggested to follow defensive measures in order to minimize the adverse effects of fasting. These individuals must follow to a balanced diet containing fruits and vegetables, pulses, whole grains, meat, fish, and dairies. In adding, they need to drink fluids abundantly, such as water, fresh juices, and soups, during the interval between Iftar and Sahur. Fasting Muslims are advised to avoid deep-fried foods, sweets, fatty foods, refined carbohydrates, salty foods, and caffeinated and carbonated drinks.

INTERMITTENT FASTING

Intermittent fasting is a dietary pattern, in which the fasting and feasting periods occur in a cycle. IF may include alternate -day fasting and time-restricted feeding. ADF consists of 24 hours of fasting and 24 hours of feasting. In this regard, Islamic fasting is similar to ADF since the feasting and fasting periods in Islamic fasting range between 12-18 hours on average depending on the season and geographical area.[1] Examples of religious fasting regimens are shown in Table 1.

Table 1: Common fast and their dietary restrictions in some religions [3]

Religion	Etiquette	Timing of fast
Islam	Nofood/water from sunrise to sunset	28–30 days of Ramadan (obligatory) and each Monday and Thursday (voluntary)
Hindu	Can involve 24 h of full abstinence from al foods and liquids; commonly practiced with abstinence from solid food	New moon days, some festivals such as Shivaratri, Saraswati Puja, and Durga Puja
Buddhist	No solid food; some liquids allowed	Usually on full-moon days and other holidays
Jewish	No food/drinks from sunset to sunset (and from sunrise to sunset for "minor fasts"	Yom Kippur, the Day of Atonement, and 6 other days of "minor fasts"
Mormon	No food/water for two consecutive meals	First Sunday of each month
Catholics	No meat (and no meat on Fridays during Lent). Small meals allowed	Ash Wednesday and Good Friday
Eastern Orthodox	No meat, dairy products, eggs. Fish prohibited on some fast days	Fast periods include Lent, Apostles' Fast, Dormition Fast, Nativity Fast. Also includes every Wednesday and Friday
Baha'i	No food/drinks from sunrise to sunset	19 days (2–10 March)

Benefits of Fasting [4-6]

Therefore, the nonmaterial benefits of fasting in the holy month of Ramadan can be divided into two types, it is given in Table 2:

Table 2: Benefits of Fasting

1. The Spiritual Benefits	2. The Social Benefits
• Fasting is a form of devotion whose intention is to seek nearness to God rather than achieving material and non-divine goals. • When man is involved in worshiping, his attention is directed to God and this could be an exercise for man to improve his spiritual power by withdrawing material goals. Thus, one of the benefits of fasting is creating an empowered spiritual man. • This is especially true when the fasting individual accompanies his worship with prayers. • Prayer is a form of discussion between man and God leading to an affectionate relationship between them; so that man doesn't view himself apart from God . • As a result, the basic preliminaries for creating an individual who is spiritually empowered are formed.	• When Muslims fast at specific time in Ramadan, their spiritual motivation is formed collectively. • The core social and familial benefits of fasting are the simultaneous gatherings of people both in the society and family for the act of worshiping God and having Sehri and Iftar. • As such, the rates of many social disorders drop in Ramadan; the fact which has drawn the attention of a large number of sociologists. • Hence, it could be concluded that by achieving closeness to God, not only can people reach spiritual rewards, but they also perform better in their social activities.

HEALTH BENEFITS OF ISLAMIC INTERMITTENT FASTING

Islamic fasting is parallel to alternate day fasting and time-restricted feeding and is related with several health benefits, including weight loss, reduced insulin resistance, blood glucose, and blood pressure, improved lipid profile, prevention of obesity, diabetes, cardiovascular diseases, and cancer, protection against neurodegeneration, diminished inflammation, improved general health , and extended life span [7].

Table 3: Metabolic Health Benefits of Islamic Intermittent Fasting [1]

Health Benefit	Proposed Mechanisms
Weight Loss	• Reduced energy intake • Reduction of total body fluids • Absence of fluid intake • Altered serum levels of leptin, insulin, and cortisol due to changes in sleeping patterns and daily energy consumption • Consuming foods and drinks only at night, which could delay absorption due to decreased gastric emptying and blood flow compared to daytime.
Reduced Blood Glucose	• Altered sleep–wakefulness cycle leads to changes in levels of factors involved in regulation of energy intake and energy expenditure, such as leptin, neuropeptide-Y, insulin, melatonin, and steroid hormones (e.g., cortisol and, testosterone).
Reduced Insulin Resistance	• Reduction of serum leptin levels
Reduced Blood Pressure	• Dehydration • Decreased ventricular ejection and arterial stiffness
Improved Lipid Profile	• Qualitative feeding behavior • Calorie restriction and timing of food intake

Table 4: Other Health Benefits of Islamic Intermittent Fasting [1]

Health Benefit	Proposed Mechanisms
Cardiac Protection	• Reduction of inflammation and apoptosis of myocardial cells • Reduction of oxidative damage and increased cellular stress resistance
Diabetes Prevention	• Decreased insulin resistance and fasting insulin levels, increased insulin sensitivity and glucose uptake, decreased lipolysis and assistance in weight loss • Decreased lipolysis and circulating concentrations of free fatty acids
Protection against Neurodegeneration	• Stimulation of production of new neurons from neural stem cells (neurogenesis) and synapse formation by increasing expression of BDNF and neurotrophin-3 to restore damaged nerve cell circuits • Stimulation of neuroprotective and neurotrophic pathways through elevation of antioxidant defense and BDNF and suppressing inflammation through reducing pro-inflammatory cytokines (TNF-α, IL-1β, and IL-6)
Promotion of Health Span	• Decreased episodes of depression • Reduction of asthma-related symptoms and oxidative stress markers • Decreased serum levels of stress hormones in women with polycystic ovary syndrome
Obesity Prevention	• Increased adiponectin and decreased leptin levels
Cancer Prevention and Treatment	• Prolonged nightly fasting decreases the risk of breast cancer recurrence by improving glucoregulation and sleep. • Decreased generation of mitochondrial reactive oxygen species. • Reduced serum insulin-like growth factor-1 (IGF-1), which regulates cellular proliferation, growth, and apoptosis.
Reduction of Inflammation	• Decreased levels of other inflammatory markers (e.g., homocysteine and C-reactive protein) • Reduction of expression of proinflammatory cytokines like Interleukin-6 (IL-6) and Tumor necrosis factor α (TNF α).
Extension of Lifespan	• Anti-ageing effects (reduction of metabolic markers of diabetes, cardiovascular diseases and cancer, reduced oxidative damage, and increased cellular stress resistance) • Delayed onset of age-related declines in size, number, and function of mitochondria • Activation of anti-ageing pathways through down-regulation of insulin/IGF-1 and mTOR pathways

Physical Health Benefits of Ramadan Fasting

Table 4 shows the main health benefits of Islamic fasting concerning the body weight, lipid and glucose levels, anti-oxidative effects, longevity, and effects on renal and immune function.[2]

Table 5: Physical Health Benefits of Ramadan Fasting

Health Benefit	Mechanism
Reduction of Body Weight	• Reduction in daily energy consumption through the limited consumption of foods and beverages
Glucose Reduction	• Decreased serum leptin levels
Effects on Renal Function	• No changes in serum calcium/phosphorus
Increased longevity	• Anti-ageing effects and eliminating the risk of diabetes, oxidative damage, and cancer
Lipid Reduction	• Decreased LDL level
Antioxidative Effects	• Increased pro-inflammatory cytokines
Effects on Immune Function	• Increased activity of natural killer cells

Management of the Adverse Effects of Islamic Fasting

Islamic intermittent fasting is linked with some adverse effects, such as

- Dehydration,
- Headaches,
- Heartburn,
- Constipation,
- Decreased sleep quality, and
- Anemia,

Islamic fasting might be connected with few complications, such as hypoglycemia, hyperglycemia, diabetic ketoacidosis, hypovolemia, and thrombosis (Table 5).[7]

Table 6: Diabetes Complications Associated with Islamic Fasting

Diabetes Complications	Proposed Mechanisms
Hypoglycemia	• Risk of hypoglycemia increased by abstinence from eating in Islamic fasting
Diabetic Ketoacidosis	• Prolonged fasting caused the depletion of stored glycogen, followed by the release of fatty acids from adipocytes and the subsequent generation of ketones.
Thrombosis	• Risk of thrombosis increased due to fasting-induced dehydration, leading to increased blood viscosity and diabetes-associated hypercoagulability.
Hyperglycemia	• Prolonged fasting decreased insulin levels, which may induce glycogenolysis and gluconeogenesis, resulting in hyperglycemia. • Excessive reduction of antidiabetic medication dosage to avoid hypoglycemic complications during fasting hours; excessive food intake during non-fasting hours may elevate the risk of hyperglycemia.
Hypovolemia	• Islamic fasting may be associated with dehydration due to the decreased fluid intake during fasting hours. • Hyperglycemia induced by prolonged fasting caused osmotic diuresis, leading to electrolytes loss and hypovolemia.

Normal physiology of feeding and fasting [8]

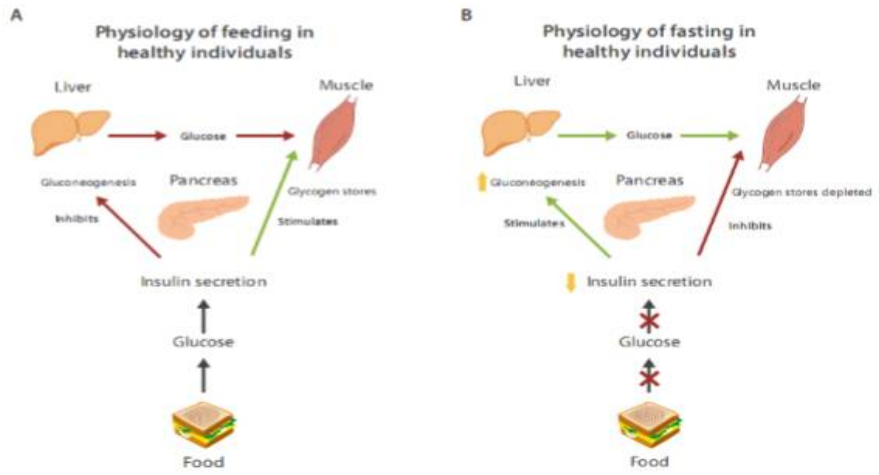

Figure 1: Normal physiology of feeding and fasting

USE OF MEDICATIONS DURING RAMADAN

The administration of required medications via parenteral routes IV or IM or as suppositories and inhalers are allowed by some scholars during fasting. Though, taking oral medications is not allowed, and if there is no other alternative route for medications, the patient is exempted from fasting. The following guidelines are recommended:

- Patients, who must take their medications more than twice in 24 hours, should avoid fasting. Others may take their drugs at Iftar or Sahur.
- If probable, physicians should make every attempt to prescribe long-acting or slow-release drugs once or twice at night, and allow the patient to observe fasting.
- Patients with epilepsy may experience convulsions if only 100 mg phenytoin is used at night, however, one could control epilepsy with a single dose of 300 mg phenytoin daily, allowing the epileptic patient to fast during Ramadan.
- Old patients and those with underlying renal disease who take non-steroidal anti-inflammatory drugs should have frequent monitoring of renal function, since fasting may increase serum urea and sodium levels in such individuals.
- Long-acting oral anticoagulant medications could be employed as a single night-time dose without affecting the incidence of thromboembolic events or hemorrhagic complications. [9]

CONCLUSION

Current review article conclude that;

1. Muslims performing Islamic IF enjoy various health benefits, including
   - Weight loss,
   - Reduced insulin resistance,
   - Blood glucose, and
   - Blood pressure,
   - Improved lipid profile,
   - Prevention of obesity,
   - Diabetes,
   - Cardiovascular diseases, and
   - Cancer,
   - Protection against neurodegeneration, and
   - Diminished inflammation.
2. Islamic fasting is connected with common health problems, including
   - Dehydration,
   - Headaches,
   - Heartburn,
   - Constipation,

- Anemia, and
- Poor sleep quality, which could be minimized by preventive measures

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