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Review

Unraveling the metabolic health benefits of fasting related to religious beliefs: A narrative review

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ABSTRACT

Periodic fasting, under a religious aspect, has been adopted by humans for centuries as a crucial pathway of spiritual purification. Caloric restriction, with or without exclusion of certain types of food, is often a key component. Fasting varies significantly among different populations according to cultural habits and local climate conditions. Religious fasting in terms of patterns (continuous versus intermittent) and duration can vary from 1 to 200 d; thus, the positive and negative impact on health can be considerable. Advantages of religious fasting are claimed by many but have been explored mainly by a limited number of studies conducted in Buddhist, Christian, or Muslim populations. These trials indicate that religious fasting has beneficial effects on body weight and glycemia, cardiometabolic risk markers, and oxidative stress parameters. Animals exposed to a diet mimicking fasting have demonstrated weight loss as well as lowered plasma levels of glucose, triacylglycerols, and insulin growth factor-1, although lean body mass remained stable. Diabetic mice on repeated intermittent fasting had less insulin resistance that mice fed ad libitum. The long-term significance of such changes on global health remains to be explored. This review summarizes the data available with regard to benefits of fasting followed for religious reasons on human health, body anthropometry, and cardio-metabolic risk markers; aims to bridge the current knowledge gap on available evidence and suggests considerations for the future research agenda. Future studies should explore every type of religious fasting, as well as their consequences in subpopulations such as children, pregnant women, and the elderly, or patients with chronic metabolic diseases.

Introduction

Various forms of fasting have been used for health and for religious reasons for centuries. Fasting is defined as the abstinence from food for varying duration, and has been associated with increased longevity and a potential beneficial role for human health [1]. Fasting tends to be a dietary habit among people in the context of a health-promoting dietary pattern [2]. Religious fasting (RF) is primarily based on various levels of caloric restriction and limitations of food items, and comprises an essential feature in most popular religions [1]. From a spiritual point of view, RF aims at the purgation of the soul and body. Following RF as a dietary pattern is considered as a means to attain high spiritual virtues [1,3]. Although exact mechanisms of its role on human health remain unclear, previous results indicated potential beneficial effects, including prevention of certain diseases such as obesity, diabetes mellitus type 2, and cardiovascular diseases [3,4]. Religious fasting has gained popularity outside of countries of origin as a consequence of the migration of population. Healthcare personnel may have limited knowledge about RF and its relevance in the management of health. The benefits of RF on human health are based on a limited body of evidence. The results of animal experiments have been used to support some of the claims.

This review aims at summarizing available evidence regarding potential protective effects of fasting followed for

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religious reasons on human health, body anthropometry, and cardio-metabolic risk markers, with an analysis of the current knowledge gap from available evidence and with the future research agenda in mind.

Criteria of selected fasting models

The literature search was performed on PubMed, Scopus, Google scholar, and Google using three keywords: "fasting," "religious fasting," and "intermittent fasting." The results are summarized in Figure 1. We did not report the specific impact of fasting on metabolism or health when no scientific data were found. For example, although Hindu fasting is followed by millions of believers, the characteristics of fasting are not consistent, and therefore, it is impossible to draw meaningful conclusion. Similarly, very short fasting models, such as the Jewish Yom Kippur (1 d/y), were excluded because of the unlikelihood of their impact on health.

Types of religious fasting

RF is defined as the abstinence from certain types of food for spiritual reasons [1]. Believers following RF are trained in the substantial meaning of RF, which in fact is related to temperance. Daily caloric restriction is a common feature in this dietary pattern [1,3–5]. As a consequence, RF makes such populations very devoted to their nutritional habits for extended time periods throughout the year and, therefore, effects significantly several health parameters [1]. Various characteristics are to be distinguished among different types of RF, such as frequency and duration throughout the calendar year, as well as the type of restricted food consumption [1,3–5]. These parameters are the main basis of categorization of the different patterns of RF followed by most believers worldwide, as well as adopted widely as a popular dietary pattern for health-promoting as well as spiritual reasons [6,7].

In animal studies, fasting is defined as no food consumption for 24 h, whereas in human studies, there is limited food consumption on a daily or weekly basis [8–13]. Human studies mostly featured a succession of days with up to 75% caloric reduction and ad libitum food intake [6,7]. Complete prolonged fasting has not been studied in the context of RF.

Ramadan fasting

Ramadan fasting is one of the five pillars of Islam, through which fasting believers aim at attaining spiritual purity of the soul. The Ramadan fasting period lasts 28 to 30 d depending on the year [4,14]. During the holy month of Ramadan, food, water or other liquids, and smoking are forbidden from dawn to sunset [14,15]. Muslims follow the Ramadan fasting period with the exception of travelers, patients, menstruating or breast-feeding women, and children [4,16]. Typically, Muslims during the Ramadan fasting period have two main meals, one before dawn and the other after sunset [1]. Additionally in some geographic regions, Ramadan is characterized by abundant food intake during the night, a fact quoted in bibliography as "gorging" [17]. Duration of the Ramadan fasting period varies according to geographic location of residence and of seasons [4,16]. Thus in 2015, Muslims in Norway fasted for almost 22 h, whereas

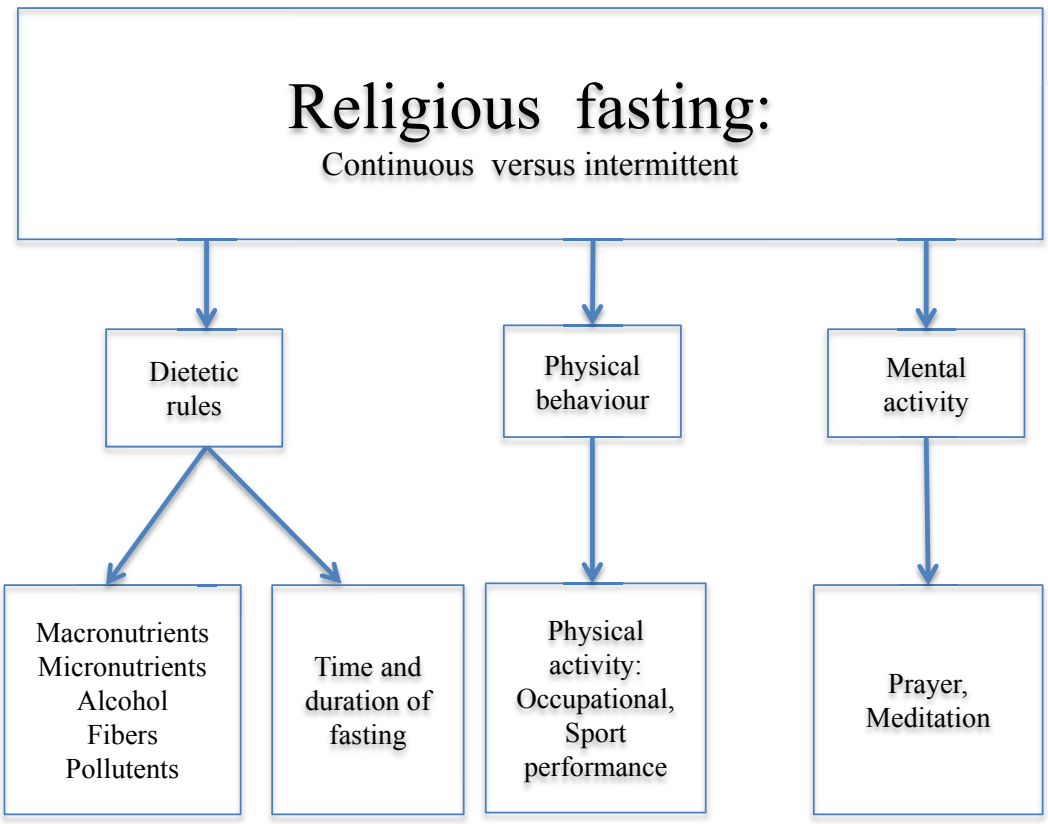

Fig. 1. Summarized data about different religious fasting models. Different types of religious fasting are to be distinguished according to their modalities, including complete versus intermittent fasting. All were associated with various degrees of constraint regarding the dietetic rules, physical behavior, and mental activity.