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THE INFLUENCE OF FASTING AND HUNGER ON MOTIVATION

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Abstract:

This study is to examine the influence of fasting and hunger on motivation. According to the National Health and Morbidity Survey (NHMS), it is found that 31.3 percent of individuals that had been screened through the National Health Screening Initiative in 2023 are overweight with body mass index (BMI) over 25 kg/m2. Another 22.2 percent were obese with a BMI of more than 31 kg/m2 and in total, 53.5 percent of Malaysians that had been screened were either overweight or obese. Through a comprehensive literature review and analysis of recent studies, this paper explores the correlations between fasting and hunger, related to its physiological details. This paper highlights the Islamic perspective of fasting according to the Islamic beliefs which is one of the five pillars of Islam and other Islamic perspectives consists of nafs al-ammarah, nafs al-lawammah and aql with its relation to the science of motivation and self-regulation. This paper concludes that most of the studies found a positive relationship with fasting and that fasting gives many benefits for human beings especially in the spiritual aspects. A deeper understanding is needed for this study and the effect of sample size and exploring the different seasons of Ramadan across all countries.

Keywords:

Fasting, Motivation, Hunger, Behavioral Change, Literature Review

Introduction

Fasting and hunger are two major physiological states, which seriously influence human behavior, especially in the area of motivation. Hunger occurs when the body signals its need to take food for energy maintenance and survival. The physiological response of such a process is mainly regulated through hormones such as ghrelin, which activates appetite when the stomach is empty (Méquinion et al., 2020; Stribiţcaia et al., 2020). Hunger influences how people prioritize their actions, often driving them to searching for food, getting it, and consuming it (Smith & Grueter, 2021). Fasting, however, is a voluntary absence of food intake for a set period of time. Whereas hunger would naturally occur when there is deprivation of food, fasting is often intentional and can be accompanied with variations in psychological and emotional experiences (Swami et al., 2022). Each state gives extremely unique insight into how the human body and mind interact in an effect on motivation.

The relationships between hunger, fasting, and motivational issues are complicated and have drawn a lot of interest from the field of physiological psychology. Motivation has been described as internal processes that control the direction, energy, and persistence of goal-oriented behavior. Hunger serves as a primary driver for survival and concentrates effort on searching for food, often at the expense of other activities (Smith & Grueter, 2021). Research indicates that physiological states, such as hunger, may heighten motivation towards the pursuit of rewards, as reflected in increased dopamine responses to relevant food stimuli in a state of hunger (Hsu et al., 2020). Similarly, fasting can be seen as an energy-restricted state that might affect how individuals choose their goals, regulate their emotions, or perform cognitive tasks (Kerem et al., 2020). Thus, understanding these effects can provide valuable insights of how physiological states shape decisions-making and behavior.

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This topic has gained relevance in today's society because of increasing trends toward fasting practices and hunger-related problems throughout the world. For instance, intermittent fasting has gained great popularity for its potential in health benefits such as improved metabolic processes and weight control (Méquinion et al., 2020; Swami et al., 2022). In addition, religious fasting, such as that practiced in Ramadan, has provided opportunities for researchers to discover how people manage their motivational level, self-regulation, and productivity without food intake over a certain extended period. Moreover, an understanding of changes in motivational aspects during hunger will contribute to the solution of world issues at the global level, such as obesity, a disease which can negatively affect individual health.

Physiological psychology provides a framework to understand how fasting and hunger influence motivation due to changes in the body and brain. Physiological processes elicited by hunger, include drops in blood glucose and rises in certain hormones such as ghrelin which signal the body's energy need (Stribiţcaia et al., 2020; Smith & Grueter, 2021). These changes might alter brain activity, especially within areas of the hypothalamus and prefrontal cortex that feature prominently in the regulation of hunger and decision-making (Kerem et al., 2020). Fasting, while initially associated with similar physiological responses, can also lead to adaptations in the body, including improved insulin sensitivity and shifting utilization of energy (Méquinion et al., 2020; Swami et al., 2022). These physiological changes directly impact motivational states, influencing how people set and achieve their goals during periods of food restriction.

This paper seeks to review the complex relationship between fasting, hunger and motivation by synthesizing data from past studies and Islamic teachings. From this, it explores how fasting affects cognition and emotions in terms of the dual effects of hunger on self-regulation, decision-making, and goal-oriented behavior. Physiological responses include hormonal changes and shift in brain activity, while the spiritual aspects of fasting, especially within Islam, promotes good character and moral reflection. By synthesizing diverse perspectives, this review seeks to summarize current findings, identify gaps in the literature, and provide the groundwork for future studies on the influence of fasting and hunger on motivation.

Methodology

This review was executed using a systematic search strategy through several online academic databases including Google Scholar, MDPI and Science Direct. To ensure related collections of paper, the keywords used were, “fasting,” “behavioral and motivational effects,” “hunger on motivation,” and “reward for fasting.” Additionally, Boolean operators (AND, OR) were utilized to specify the research results.

Inclusion and Exclusion Criteria

All papers included in this review were published from January 2020 to December 2022 to ensure current discussion on the topic. The literature included were original research papers as well as systematic reviews on both rodents and human studies. Additionally, inaccessible papers and papers published using other languages than English were not included in this review.

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Data Extraction

A systematic form was developed for this review, which allowed for a structured synthesis of findings. The included information was demographic of participants, findings, limitations and directions for future studies.

Findings

Fasting and hunger can significantly influence motivation through physiological and psychological mechanisms. Hunger represents a "need state" that mediates the relationship between biological requirements and environmental satisfaction. Hunger is the encountered motivation that facilitates the replenishment of the body's energy through food intake (Beaulieu & Blundell, 2020). When the body experiences hunger, it increases the motivation to seek food to satisfy the hunger. Hunger focuses attention on food-related needs and triggers urgent food-seeking behaviors. This makes hunger one of the most powerful biological motivators, motivating individuals to prioritize the acquisition and consumption of food to restore energy. The negative aspect that is discomfort drives action, while the positive aspect that is appetite enhances the enjoyment of eating. Collectively, these processes guarantee both survival and fulfilment, illustrating hunger as a physiological and psychological motivator. Findings from a study by Zhang et al. (2020) about fasting and incentive signaling emphasized how fasting alters brain activity to heighten sensitivity to rewards, not just for food but also for non-food stimuli. According to the study, fasting enhances activation in brain regions linked to reward sensitivity, including the caudate, putamen and thalamus. These regions constitute the brain's reward circuitry that is modulated by dopamine, a crucial neurotransmitter in reward processing. The increased activity in these regions during fasting indicates an overall rise in reward sensitivity, likely resulting from the brain's prioritization of reward-seeking behaviors. Moreover, the correlation between fasting, external influences and internal regulation of eating behaviors illustrates the interaction of discipline, awareness and the psychological effects of restricted eating practices. A study by Hasan et al. (2021) found that daylong fasting frequently diminishes impulsive eating tendencies, resulting in more deliberate and self-controlled food selections for Iftar, that is the meal at the end of the fasting day. This is an example of how intrinsic motivation influences eating habits positively. For certain individuals, fasting offers a chance to cultivate healthy connections with food by enhancing awareness and encouraging controlled and moderate consumption. Positive reinforcements also influence fasting, and repeating the fast annually encourages people to fast again (Ring et al., 2022). The positive experiences include improved physical well-being, a stronger sense of religiousness and connection to God, and a deeper sense of self-awareness and mindfulness. The emotional and physical advantages of fasting also serve as an incentive for individuals to sustain the practice, as they associate it with better well-being.

Fasting increases hormones such as ghrelin that sends signals to the brain and stimulates appetite and the urge to eat. Due to the nature of hunger that needs immediate gratification, fasting requires resisting it while strengthening self-discipline. The brain reward system is also closely linked to the relationship between hunger and motivation. Dopamine activity rises in response to hunger, making food more pleasurable and encouraging actions to get food. When energy levels are low, this system ensures that eating comes first. Dopamine release can be enhanced by the expectation of eating after a fast, which increases the desire to find food. The changes in metabolism caused by fasting affect brain function and motivation. The body produces ketone bodies as an alternate energy source during fasting when it switches from metabolizing glucose to metabolizing fat, because the amount of glucose when fasting is in

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short supply (Jensen et al., 2020). Ketones are constantly present in the blood and the levels rise during fasting and prolonged exercise (Laffel, 1999). They are an extremely effective brain fuel that improves focus and mental clarity. As a result of these metabolic changes, people will be more motivated and alert to find food, which supports goal-directed behavior.

Discussion

Application to Current Issue

Studies have shown that fasting and hunger affect motivation, influencing both physiological and psychological behaviors. Past findings can be effectively applied to current issues all over the world. One of the most relevant issues in relation to the topic is obesity, in which motivation and reward systems play an important role in controlling hunger, as well as weight management. The World Health Organization has emphasized the severity and rising concern of obesity in most countries, especially in middle-income countries like Malaysia. According to the Ministry of Health Malaysia, more than half of the population in Malaysia is either obese or overweight (Harun & Nizam, 2024). The ministry also reported that the prevalence of obesity in Malaysia has significantly increased to 54.4%, compared to previous findings in 2019 at 19.1%. Moreover, in the Southeast area, the prevalence of overweight in Malaysia was found to be the second highest among all countries (Nazeha et al., 2021). Therefore, all these findings suggested that the prevalence of obesity and overweight in Malaysia is a rising problem that should be addressed by the government and community itself to find a solution together.

Hanssen et al. (2021) revealed that hunger has different physiological mechanisms for lean and obese individuals. This difference can be attributed to insulin sensitivity which plays a role in mediating the relationship between hunger and motivation. High insulin sensitivity will show strong motivational response while insulin resistance will decrease these effects. For lean individuals, hunger is positively associated with motivation for both food and non-food rewards. However, obese individuals show lower response to non-food rewards during hunger due to insulin resistance, showing dysregulation in the interaction between hunger and the motivational system in obesity. These findings strongly suggest that individuals with obesity may not experience the same amount of motivation and reaction to hunger. Hence, obese people are generally less responsive to non-food rewards during hunger compared to lean people, leading to binge eating instead of healthy eating behavior.

While the physiological mechanisms of hunger differ in lean and obese individuals, the religious fasting practices focus on self-regulating behaviors when it comes to suppressing hunger for both lean and obese individuals. This is especially true since religious fasting emphasizes discipline, mindfulness and various health benefits, including weight loss (Hasan et al., 2021; Sharafeddine et al., 2024). Shariatpanahi et al. (2008) found that after a month of religious fasting, insulin sensitivity improved, which may indicate increased motivation towards non-food rewards. Along the same line, Abdallah et al. (2023) showed that calorie intake decreases during the fasting month from approximately 2069 kcal before Ramadan to 1798 kcal during Ramadan. This reduction in calories is associated with weight loss and reduced waist circumference, as well as improvements in body composition which are important for metabolic health (Hoddy et al., 2020). These findings can be applied to reduce the current problem of obesity by encouraging healthier eating habits and diets, such as intermittent fasting. Intermittent fasting can be a great way for healthy weight loss by changing

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the body's energy source from glucose to fat. Hence, this can help obese people to control their bad eating habits and improve their health.

Another interesting perspective of fasting, beyond the metabolic mechanisms, is the integration of social aspects in fasting, especially religious fasting. Ritual fasting offers mindfulness and communal support for individuals as well as increased feelings of belongingness when practiced as a community. Research by Ring et al. (2022) highlighted that fasting in religious or cultural practices often helps in building good relationships and sense of support between the community. In this sense, it invites positive feelings and overall well-being, while lessening fatigue, anxiety and stress in general. Based on this study, ritual fasting can be an effective intervention to overcome obesity through societal support and communal feelings.

Despite well established research, a few limitations must be highlighted to guide future studies and to aid in the interpretation of findings. Firstly, the studies cited are mostly discussing ritual fasting, especially religious fasting during Ramadan. This fasting is done for 30 days which is considered a short-term fasting commitment. No studies regarding the long-term effects of fasting were cited and discussed in this review which might leave a huge gap in understanding the short-term and long-term differences in physiological mechanisms involved in hunger and behavioral motivation. Additionally, key focus on context-specific fasting rituals may limit the generalizability to people from other cultural contexts or intermittent fasting processes, which may yield different observations in biological changes. Furthermore, the studies by Zhang et al. (2020) and Hasan et al. (2021) discussed in this review focuses on observational data, with no randomized or controlled procedures which may translate into limited correlational conclusions with no definite causal attribution between variables. Therefore, care must be taken when interpreting the data. As such, the results from these studies are susceptible to confounding variables because other variables such as dietary intake, socioeconomic status and health issues are not measured or controlled.

Accordingly, future research is crucial for the implementation of effective interventions for the issue of obesity. Past research suggests that high sensitivity to non-food rewards is important to increase alternative reward systems in individuals (Zhang et al., 2020). Future research could address this suggestion by studying the effectiveness of non-food rewards such as financial rewards or social reinforcement in reducing reliance on food for emotional or psychological satisfaction. Furthermore, future study should explore the effectiveness of fasting-based intervention with metabolic treatment such as GLP-1 analogues to help obese people. Past research has suggested that differences in insulin and reward sensitivity play a role in reducing obesity. So, investigation focusing on fasting and pharmacological treatments could inform better intervention plans to significantly improve motivation and obesity management. Lastly, there is a huge gap in understanding the long-term effects of fasting, as most existing studies only focused on the short-term impacts. Therefore, future research should apply longitudinal design to examine if fasting helps in sustaining motivation for healthy eating behaviors, especially among obese people. In order to draw conclusive casual evidence, research through randomized controlled trials can be implemented to measure differences in insulin levels for people who go through fasting protocols and those in the control group.

Islamic Perspective Integration

Fasting in Islam serves as both a spiritual and physical practice that is designed to influence human behavior, promote self-control, and affect the body's natural processes. From the

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perspective of physiological psychology, the experiences of fasting and hunger during Ramadan play a vital role in shaping motivation. These experiences impact brain chemistry, foster self-discipline, and inspire compassion for others. The Qur'an (2:183), emphasizes that fasting aims to cultivate self-control and a heightened awareness of God, referred to as taqwa. As supported by Khattak et al. (2018), the act of fasting is believed to enhance Taqwa, or God-consciousness, which is a central aim of Islamic worship, and it can be understood as an elevated intrinsic motivation that encourages alignment of actions with divine guidance.

Apart from that, the relationship between *nafs al-ammarah* (the commanding self) and *nafs al-lawwamah* (the reproaching self) provides valuable insights into how fasting and hunger can shape motivations. These ideas from Islamic teachings connect deeply with both individual's spiritual and psychological experiences. *Nafs al-ammarah*, as mentioned in the Qur'an, refers to that part of the soul that often leads individuals to act on their worst impulses. The verse (Qur'an 12:53), highlights how this aspect of human being tends to seek immediate pleasure, whether through overeating, giving in to temptations, or avoiding self-discipline. Throughout the fasting period, individuals directly confront the desires of *nafs al-ammarah* by denying it the instant gratification it craves. This act of withholding food activates the hypothalamus, the part of the brain that regulates hunger and energy, demonstrating one's ability to resist primal urges and helps to build self-discipline and control. Additionally, fasting also affects the brain's reward system, particularly by modulating dopamine activity. Hunger and fasting increase dopamine sensitivity, which increases the sense of reward associated with delayed gratification. This adaptation reinforces the value of enduring short-term discomfort for long-term benefits. For instance, a study by Hasan et al. (2021) found that some participants felt Ramadan helped them manage their eating habits, as they became more mindful of their food choices after fasting hours. In this way, fasting not only challenges an individual's desires but also encourages personal growth and a deeper sense of purpose.

Nafs al-lawwamah, or the self-reproaching soul, represents a higher level of self-awareness, as emphasized in the Qur'an (75:2). It encourages people to reflect on their lives, take responsibility for their actions, and work toward self-improvement. By consciously refraining from food, drink, and other desires, individuals create an opportunity to reflect on their actions and intentions, which deepens their connection to Allah as well as other creatures and ethical values. This process of reflection is further supported by physiological changes in the prefrontal cortex that occur during fasting which is responsible for decision making and self-control. As cognitive abilities improve during fasting, individuals become better able to focus on long-term spiritual and moral goals rather than immediate physical needs, aligning their behavior with the principles of accountability and intentionality found in Islamic teachings. Moreover, fasting causes a temporary stress response that activates the hypothalamic-pituitary-adrenal (HPA) axis, leading to the release of cortisol. While cortisol is often seen as a stress hormone, its controlled release during fasting can help enhance resilience and emotional regulation. Therefore, building resilience through hunger reinforces the Islamic belief that true strength is found in overcoming one's desires.

Nafs al-ammarah and *nafs al-lawwamah* are modulated by the *'aql*, or intellect, which is the essential part in determining whether one's actions are helpful or harmful. While desires may motivate individuals to fast, it is the *'aql* that reminds them of their connection to Allah and helps them choose to obey or against His commands. These ideas create a framework for understanding how fasting transforms both the body and soul, linking Islamic principles with

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the science of motivation and self-regulation. By engaging intellect during fasting, individuals can better manage their desires and make choices that align with their spiritual values. This practice shows how hunger, when approached with intention, can boost intrinsic and extrinsic motivation and lead to meaningful personal and social change.

Conclusion

In conclusion, fasting and hunger have a significant influence on human motivation through physiological, psychological, and spiritual mechanisms. Empirical evidence showed that fasting triggers hormonal changes by enhancing ghrelin and dopamine activity, which heighten reward sensitivity and increase individual motivation toward goal-directed behavior. The review also discussed the importance of fasting, either through intermittent fasting or religious fasting practices, as one of the ways to curb obesity since it is associated with improved eating control, metabolic health, and reduced impulsive food-seeking behaviors.

In Islamic context, fasting shows theological significance as it is discussed using the concepts of *nafs al-ammarah* (impulsive self) and *nafs al-lawwamah* (self-reflective self), which allow people to develop self-control and personal development. These concepts along with the *'aql,* provide a spiritual framework that compliments the scientific contribution, connecting fasting with self-regulation and intrinsic motivation. Lastly, future research is recommended to focus on the long-term impact, diverse fasting practices across cultures, and possible approaches that integrate fasting with other obesity and motivation management therapies. Longitudinal research as well as a more controlled and randomized design should be prioritized for future directions so that long-term motivational and physiological changes can be examined.

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