ISSN (E) 3007-3197
ISSN (P) 3007-3189
Publisher Name : COLLABORATIVE EDUCATIONAL LEARNING INSTITUTE
Frequency Of Journal: Bi-Annual
Annual Methodological Archive Research Review

VOL-3, ISSUE-3, 2025

Annual Methodological Archive Research Review

http://amresearchreview.com/index.php/Journal/about

Sarir Ahmad[1*]
Nisar Muhammad[2]
Salim Ur Rahman[3]
Ikram Ullah[4]
Muhammad Ilyas Khan[5]
Murad Khan[6]
Sadia Nisar[7]
Mehrab Khan[8]
Mahmuneer Nisar[9]
Sumbal Javed[10]

Physio-Metabolic Effects of Various Types of Fasting on Human Health

Sarir Ahmad
Plant Protection Department, The University of Agriculture Peshawar 25000 Pakistan & Entomology Department, Abdul Wali Khan University Mardan 23200 Pakistan.Corresponding Author Email: sarirplants@gmail.com
Nisar Muhammad
Theology Department, Islamia College University Peshawar 25000 Pakistan
Salim Ur Rahman
Theology Department, Islamia College University Peshawar 25000 Pakistan
Ikram Ullah
Biochemistry Department, Abdul Wali Khan University Mardan 23200 Pakistan

Abstract

Background: Deliberate abstinence from food intake has gained a huge success in tackling various health issues. People around the globe belonging to diverse religions fast to gain theological or health benefits. The prime two types are intermittent fasting and prolonged fasting. This review article digs to find the influence of fasting on the enzymatic and metabolic activities in the human body. Methods: Publication databases including Springer, Elsevier, and MDPI were assessed to find the key articles related to fasting. Results: Fasting can help the human body control glucose levels more effectively. The body starts using fats instead of glucose for energy, which helps lose weight. Fasting on alternate days for

ISSN (E) 3007-3197
ISSN (P) 3007-3189
Publisher Name : COLLABORATIVE EDUCATIONAL LEARNING INSTITUTE
Frequency Of Journal: Bi-Annual
Annual Methodological Archive Research Review

VOL-3, ISSUE-3, 2025

Muhammad Ilyas Khan
Entomology Department, Abdul Wali Khan University Mardan 23200 Pakistan
Murad Khan
Entomology Department, Abdul Wali Khan University Mardan 23200 Pakistan
Sadia Nisar
Islamic Studies Department, University Of Peshawar 25000 Pakistan
Mehrab Khan
Biochemistry Department, Abdul Wali Khan University Mardan 23200 Pakistan
Mahmuneer Nisar
Botany Department, Abdul Wali Khan University Mardan 23200 Pakistan
Sumbal Javed
Khyber Medical University, Peshawar 25000 Pakistan

around 8-12 weeks has been demonstrated to lower LDL (low-density lipoprotein) cholesterol (sometimes also called bad cholesterol) levels (20-25%) and triacylglycerol levels (15-30%), while increasing LDL (Low-Density Lipoprotein). The quantity and types of amino acids can change as a result of fasting, the amount and kinds of amino acids are affected by the period of the fasting. Glycerol, hydroxybutyric acid, free fatty acids, and acetoacetic acid incline, but alanine, serine, arginine, threonine, asparagine, and proline decrease during fasting. Literature suggests that fasting can improve brain function, learn function behavioral assessments, and enhance synaptic plasticity which increases the creation of new neurons from neural stem cells. Conclusion: It is suggested that fasting helps minimize the percentage of metabolic activities that are linked to chronic disease. It is imaginable that fasting could add positively to nutrition strategies to gain good health including marinating of blood glucose level, and weight of the body. However, more research work is required to find the long-term effects including the side effects of fasting on human health.

Keywords	Nutrition, *Fasting, Intermitted-fasting, Prolonged fasting, Glycogen, Lipo-Protein*

Competing Interests: The authors declare no conflict of interest
Funding Declartions: The authors did not receive any financial support for this study

ISSN (E) 3007-3197
ISSN (P) 3007-3189
Publisher Name : COLLABORATIVE EDUCATIONAL LEARNING INSTITUTE
Frequency Of Journal: Bi-Annual
Annual Methodological Archive Research Review

VOL-3, ISSUE-3, 2025

INTRODUCTION

Enormous health issues are emerging all over the globe; therefore, the need for innovative health solutions is explored in the field of medicine. However, the modern era is witnessing humongous progress in the quest for the cure of many diseases. Recently, dietary plans have been among the trends practiced. Humans practice fasting for health, theological, and ethical reasons. The concept of fasting is to voluntarily abstain from food/water intake for a definite time (Visioli *et al*., 2022).

The practice of fasting is found in almost every religion like Islam (Sawm), Hinduism (Upvas or Vrata), Christianity (Lent), and Judaism (ta'anit or ta'anis). The apparent goal of fasting in every religion is to abstain from food supplements but the philosophy of fasting is to purge the souls and gain spiritual peace (Mousavi, 2014). A details difference among the fasting of religious fasting is given in Table 1-4.

TABLE 1: DESCRIPTION OF FASTING IN ISLAM

Duration	**From Dawn to Dusk for**
Types	30 days of Ramdam (9th month of the Islamic calendar) (Compulsory). Shawal (10th month of the lunar-based Islamic calendar) 6 days (voluntarily). Monday and Thursday (voluntarily) 10th Day of Muharram (1st month of the Islamic calendar) (voluntarily). 9th Day of Dhul-Hijjah: Arafah (12th month of the Islamic calendar) (voluntarily). 15th Shaban (08th month of the Islamic calendar) Mid of every month i.e. 13th, 14th, and 15th)
Abstention from	All types of food including water. Couples are prohibited from having intercourse.
Purpose	Righteousness development. Not to behave ignorantly. Give up false speech and evil deeds. Strong enough to refuse sinful temptations at other times
Religious Reference	O you who believe, fasting is prescribed for you as it was prescribed for those before you that you may become righteous (Al-Quran) The month of Ramadhan [is that] in which was revealed the Qur'an, a guidance for the people and clear proofs of guidance and criterion (Al-Quran)

TABLE 2: DESCRIPTION OF FASTING IN HINDUISM

Duration	**From Dawn to Dusk for 9 days**
Types	Upvas and Vrata
Abstention from	Food other than water and fruits
Purpose	To fulfill a vow and, to purify the body and mind to acquire divine grace
Religious Reference	fasting increases digestive fire and causes digestion of Ama-dosha (metabolic toxins) (Ayurveda, a natural system of medicine)

ISSN (E) 3007-3197
ISSN (P) 3007-3189
Publisher Name : COLLABORATIVE EDUCATIONAL LEARNING INSTITUTE
Frequency Of Journal: Bi-Annual
Annual Methodological Archive Research Review

VOL-3, ISSUE-3, 2025

TABLE 3: DESCRIPTION OF FASTING IN CHRISTIANITY

Duration	**Personal and circumstantial but most commonly 46 days**
Types	The Daniel fast. Daniel's 10,21 day fast Daniel's king's fast The jonah fast The Ezra fast One, Three, Seven, Ten, Fourteen, Twenty, and Forty days fast Moses's 40 days fast Elijah's 40 days fast Jesus's 40 days fast
Abstention from	Food other than water and fruits
Purpose	To rend hearts To get God's attention
Religious Reference	Fasting is a way to humble yourself in the sight of God (Psalm 35:13; Ezra 8:21). King David said, "I humbled my soul with fasting" (Psalm 69:10) Do not deprive each other except perhaps by mutual consent and for a time, so that you may devote yourselves to prayer. Then come together again so that Satan will not tempt you because of your lack of self-control.

TABLE 4: DESCRIPTION OF FASTING IN JUDAISM

Duration	**From Dawn to Dusk for 6 days**
Types	Major and Minor fasts
Abstention from	Abstain from all sorts of foods and drinks Avoid body wash and sex
Purpose	Purity from sins Gratitude commemoration
Religious Reference	Fasting on Yom Kippur is a necessary component of the day. (Torah) The Day of Atonement should be one of "self-denial." (Torah)

TYPES OF FASTING

There are different types of fasts such as occasional short fasts, intermittent fasts, prolonged fasts, extended fasts, open-ended fasts, occasional group fasts, and longer group fasts. Choosing a type depends on how long will a person fast either individually or with a group. The most popular types are intermittent and prolonged fastin

ISSN (E) 3007-3197
ISSN (P) 3007-3189
Publisher Name : COLLABORATIVE EDUCATIONAL LEARNING INSTITUTE
Frequency Of Journal: Bi-Annual
Annual Methodological Archive Research Review

VOL-3, ISSUE-3, 2025

INTERMITTENT FASTING

Intermittent fasting (IF) is more accurately described as an eating pattern than a diet in the usual sense (Varady *et al*., 2022). Daily 16-hour fasts or fasting for 24 hours twice a week are two common IF methods. Humans have practiced fasting from the start of time. Ancient hunter-gatherers did not have access to grocery shops, refrigerators, or year-round food (Gunnars, 2020) They couldn't always find something to eat. As a result, humans have evolved to be able to survive for long periods without eating.

METHODS OF INTERMITTENT FASTING

It may be done in several ways, but all of them include splitting the day or week into eating and fasting periods (Rynders *et al*., 2019).

1. **The 16/8 method:** commonly known as the Leangains protocol, this method involves missing breakfast and restricting your daily eating time to 8 hours, such as 1-9 p.m., and fasting for 16 hours. (Kesztyüs *et al., 2021)*.
2. **Eat-stop-Eat:** This includes fasting for 24 hours once or twice a week, such as not eating from dinner one day to dinner the next (Nakamura *et al., 2021)*.
3. **The 5:2 diet:** with this approach, on two nonconsecutive days of the week, a person consumes only 500–600 calories, but eats normally on the other five days (Bjarnadottir*, 2018)*.

Fasting for shorter lengths of time is more usual; however, some people choose to fast for longer periods.

PROLONG FASTING

The human body has evolved to be able to go without food for lengthy periods, with the longest fast ever recorded being 382 days (Visioli *et al., 2022)*. Prolonged fasting is a type of calorie restriction that lasts at least two days. They are involved between 2 and 5 days, with a maximum of two weeks, and are only interrupted by drinking water and ordinary tea or coffee. It's best to start with shorter intermittent fasts and work your way up to longer fasts as the body adjusts to ketosis (Gunnars, 2010). For example, Start with a 12:12 intermittent fast, then progress to a 24-hour fast, and lastly to a two-day prolonged fast.

HEALTH BENEFITS OF FASTING

Fasting improves health by reducing fats, lipid breakdown, glucose regulation, a decline of reactive oxygen species (ROS), inflammation decline, and the ability of the cell to resist stress (De Cabo and Mattson, 2019). Fasting for more than 13 hours could reduce the risk of breast cancer (Marinac *et al*., 2016). Most age-related diseases such as cardiovascular diseases, cancer, and diabetes can be treated with a 15% calorie reduction but a chronic application can lead to side effects (Fontana *et al*., 2010). Enhancement of life span in many species of animals has been observed by calorie reduction for a certain period (Mattson and Wan, 2005). It is believed that a calorie-restricted diet can improve the quality of life. The experiment was performed to find the effect of a calorie-restriction diet on aged men. A decline in fats, body weight, and depression has been observed. An increase in energy level was observed. The quality of sleep remained unchanged (Teng *et al*, 2011). It has been observed in rats and mice that IF can prevent cardiovascular diseases when the mice were kept on an alternate day fasting before the coronary artery

ISSN (E) 3007-3197
ISSN (P) 3007-3189
Publisher Name : COLLABORATIVE EDUCATIONAL LEARNING INSTITUTE
Frequency Of Journal: Bi-Annual
Annual Methodological Archive Research Review

ligation for about three months (Ahmet *et al*., 2005). MI (coronary artery ligation) damage was found to improve in rats kept on alternate-day fasting group (ADF) (Godar *et al*., 2015).

Increasing age leads to many neurological disorders like Parkinson's disease, Alzheimer's disease, and stroke (Yankner *et al*., 2008). The death of neurons in these disorders leads to improper function of mitochondria, lysosome malfunctioning, and oxidative disturbance (Mattson, 2003). Resistance in degeneration of neurons was observed when rats were subjected to ADF before the application of Kainic acid. ADF also causes a decrease in motor dysfunction and striatal neuron decline (Bruce-Keller *et al*., 1999). Calorie restriction (CR) showed improvement in motor impairment and dopamine depletion when studied in rhesus monkeys (Maswood *et al*., 2004). Experiments on animals revealed the curing effect of IF against traumatic injury. Cervical spinal cord and thoracic contusion injury in experimental rats showed improvement after IF (Jeong et al., 2011).

Experiments on animals revealed the significance of periodic fasting in the treatment of cancer just like chemotherapy (Dorff *et al*., 2016). Periodic fasting was found curable in the case of a tumor and can also help to decrease the risk of lesions (Brandhorst *et al*., 2015). The effects of short-term fasting on breast cancer were studied in mice. Destruction of tumor cells and radiological responses have been recorded in patients subjected to a fasting-mimicking diet (De Groot *et al*., 2020).

Effects of fasting on the liver were studied in the ADF and time-restricted group (TRF). Both groups showed a decrease in body weight. The time-restricted group showed a decrease of 3.62±0.65kg (4.83±0.9%) while the alternate-day fasting group showed a decrease of 4.56±0.41kg (6.1±0.5%). Declines in levels of triglycerides were recorded in both groups. No changes in the blood pressure of both groups were recorded. High-density lipoproteins (HDL) and low-density lipoproteins (LDL), and levels of glucose also did not show significant changes (Cai *et al*., 2019). IF and calorie restriction improves levels of adiponectin (Heid *et al*., 2010). In a study on Thyroid hormone, the changes in concentration of thyroid hormone have been observed through changes in short-term food consumption. The administration of excess protein and short-term fasting showed inhibition of FGF21 secretion from the liver by Thyroid hormone. It confirms the role of thyroid hormone in the metabolism of protein (Basolo *et al*., 2019). IF regulates members of Lachnospiraceae. Lachnospiraceae in combination with Clostridiales causes butyrogenesis in the intestine of humans (Horne *et al*., 2015). Lachnospiraceae has several health benefits a decrease in the chances of cancer (De Vadder *et al*., 2014) curing inflammatory bowel syndrome (Flemer *et al*., 2018) mental health improvement (Yilmaz *et al*., 2019) lowering atopy (Simpson *et al*., 2020) improvement of the circulatory and respiratory system (Galazzo *et al*., 2020). Recently in the COVID-19 outbreak, despite following safety measures like social distancing, hand washing, and wearing masks IF was suggested to boost the immune system (Gao *et al*., 2021).

RAMADAN FASTING

Muslims fast for 29 or 30 days consequently by following the same fasting time pattern once a year. It is a type of IF; in which Muslims inhibit energy and water intake. They

ISSN (E) 3007-3197
ISSN (P) 3007-3189
Publisher Name : COLLABORATIVE EDUCATIONAL LEARNING INSTITUTE
Frequency Of Journal: Bi-Annual
Annual Methodological Archive Research Review
VOL-3, ISSUE-3, 2025

fast from dawn until dusk. In Muslim beliefs, it is necessary to fast; among all Muslims (male, female, and young mature boys/girls) (Elmajnoun *et al*., 2023)

Ramadan fasting has gained scientific interest and is considered safe because of its positive correlation with good health. Ramadan fasting helps the body lose weight and has a significant effect on diabetic patients as it regulates insulin and blood glucose levels. In recent studies, it was reported that 94% of diabetic patients observed a positive impact on their health due to fasting. It also helps in maintaining a good lifestyle due to better food intake, sleep patterns, and physical activities like variations in feed pattern (food and fluid intake), sleeping duration/quality, and, physical activities (Shatila *et al*., 2021).

EFFECT OF FASTING ON BLOOD GLUCOSE LEVELS

Fasting might be beneficial to your overall health. Fasting can also help your body control its glucose levels more effectively (Gunnars, 2020). Fasting may have an impact on how much insulin the body requires. In a recent survey, people with type 1 diabetes who followed a fasting schedule were able to reduce their insulin dose. Fasting may also help organs that have a role in diabetes (Albosta *et al*., 2021).

Glycogen is a type of glucose that your body stores in your liver. It takes roughly 12 hours for your body to consume the glycogen. When a person doesn't eat, the body starts using fat instead of glucose for energy, which helps you lose weight (Grajower *et al*., 2019). It also reduces the stress on your liver and pancreas. On the other hand, if a diabetic patient is fast, the largest risk is that blood sugar levels will drop critically (Mathew and Tadi, 2021). When a person doesn't eat, blood sugar levels decrease, and medicine might make them drop, even more, resulting in hypoglycemia. Hypoglycemia can make you feel wobbly, cause a person to pass out, or even put an individual in a coma. If a person eats to "break" fast, that person may be more susceptible to developing high blood glucose levels (Mathew and Tadi, 2021). This is referred to as hyperglycemia by doctors. This only happens when excessive amounts of carbohydrates are consumed. Fasting may not be the best approach if it causes a body to consume carbohydrate-rich meals (Gray and Threlkeld, 2000).

IF and calorie restriction improves levels of adiponectin (Van *et al*., 2010). Adiponectin enhances insulin function (Cui *et al*., 2011) Adiponectin also treats the improper function of beta cells (Van *et al*., 2010). Positive effects of adiponectin have been recorded through IF (Nelson *et al*., 2013). According to a research study, IF can decrease insulin resistance in diabetic patients (Harvie *et al*., 2013).

THE EFFECT OF FASTING ON HUMAN LIPID METABOLISM

Fasting on alternate days for around 8-12 weeks has been demonstrated to lower LDL cholesterol sometimes also called bad cholesterol) levels (20-25%) and triacylglycerol levels (15-30%), as well as an increase in the size of LDL particles (Calvo *et al*.,). Similarly, 3-12-week alternate-day fasting in those who are normal weight, overweight, or obese appears to reduce total cholesterol (10-21%) and triglycerides (14%-42%). Fasting for around 12-24 weeks improves lipids in the blood (Total cholesterol is reduced by 5-20%, and triglycerides are reduced by 17-50%) (Tinsley *et al*., 2015). The rate of lipid metabolism in adipose tissue rises when the glycogen (in hepatocytes) reduces (11-35 hours post-fasting), As a result of increasing plasma concentrations of free fatty acids (FFAs), the kidney, liver, astrocytes, and enterocytes manufacture more fatty acid-

ISSN (E) 3007-3197
ISSN (P) 3007-3189
Publisher Name : COLLABORATIVE EDUCATIONAL LEARNING INSTITUTE
Frequency Of Journal: Bi-Annual
Annual Methodological Archive Research Review

derived ketones as a source of energy shown in figure 1. Furthermore, all forms of IF can increase WAT browning-induced thermogenesis by boosting the expression of thermoregulatory genes. Energy balance and thermogenesis are dependent on brown adipose tissue. It primarily produces "Un-Coupling Protein 1" (UCP-1), which promotes the un-coupling energy created by the respiration and production of mitochondria and ATP respectively, resulting in the energy being released as heat, enhancing energy consumption, and reversing dyslipidemia resulting from a high diet (Wang and Wu, 2022).

THE EFFECT OF FASTING ON HUMAN PROTEIN METABOLISM

Protein in the body is oxidized and degraded to provide energy during fasting. Amino acids are the most fundamental building blocks of biological proteins, and they play a role in life's activities. They also serve a variety of physiological roles in the body and are an essential vitamin. The quantity and types of amino acids can change as a result of fasting, the amount and kinds of amino acids are affected by the period of the fast. Brocchi *et al*. (2022) examined the metabolic effects of plasma in rats that had been fasting (24 hours). After 3 hours of fasting, the actual quantity of necessary amino acids, total amino acids, and, plasma lactic acid concentration declined. During fasting, the concentration of hydroxybutyric acid, acetoacetic acid glycerol, and free fatty acids inclined, but alanine, serine, arginine, threonine, asparagine, and proline all decreased. The essential amino acid level decreased dramatically, much more so than the non-essential amino acid level (Urooj *et al*., 2020). Another study found that when there was a low level of urea, the ammonia level was dramatically lowered throughout the fasting period, while the nitrogen level remained relatively constant (Wang and Wu, 2022). The effect of fasting on the biochemical composition of the body was studied in about 52 participants of both sexes. All the participants were healthy. Results showed significant changes in creatinine, HDL, alanine aminotransferase, and albumin. There was no change in the level of total cholesterol, aspartate aminotransferase, blood sugar, and alkaline phosphatase enzymes (Urooj *et al*., 2020). In a study on Thyroid hormone, the changes in concentration of thyroid hormone have been observed through changes in short-term food consumption. The administration of excess protein and short-term fasting showed inhibition of FGF21 secretion from the liver by Thyroid hormone. It confirms the role of thyroid hormone in the metabolism of protein (Basolo *et al*., 2019).

THE EFFECT OF FASTING ON HUMAN NEUROENDOCRINE METABOLISM

Fasting for more than 2 weeks resulted in significant weight reduction and reduced epinephrine, dopamine, and norepinephrine levels during rest and activity levels in obese patients in a prospective study (Van *et al*., 2021). Furthermore, prolonged fasting lowers the amounts of thyrotropin and T3/T4, while raising the amounts of the glucagon, a growth hormone in the blood. During a prolonged fasting phase, serotonin release and turnover will rise (Brocchi *et al*., 2022). The plasma level of β-endorphin is much higher in subjects who have gone without food for 1-2 weeks. Fasting raises the expression of neuropeptide Y genes in certain brain areas in rodents (Tinsley *et al*., 2015). Additionally, during the first 7 days of fasting, massive quantities of catecholamines and glucocorticoids are released (Thau, 2021).

ISSN (E) 3007-3197
ISSN (P) 3007-3189
Publisher Name : COLLABORATIVE EDUCATIONAL LEARNING INSTITUTE
Frequency Of Journal: Bi-Annual
Annual Methodological Archive Research Review

VOL-3, ISSUE-3, 2025

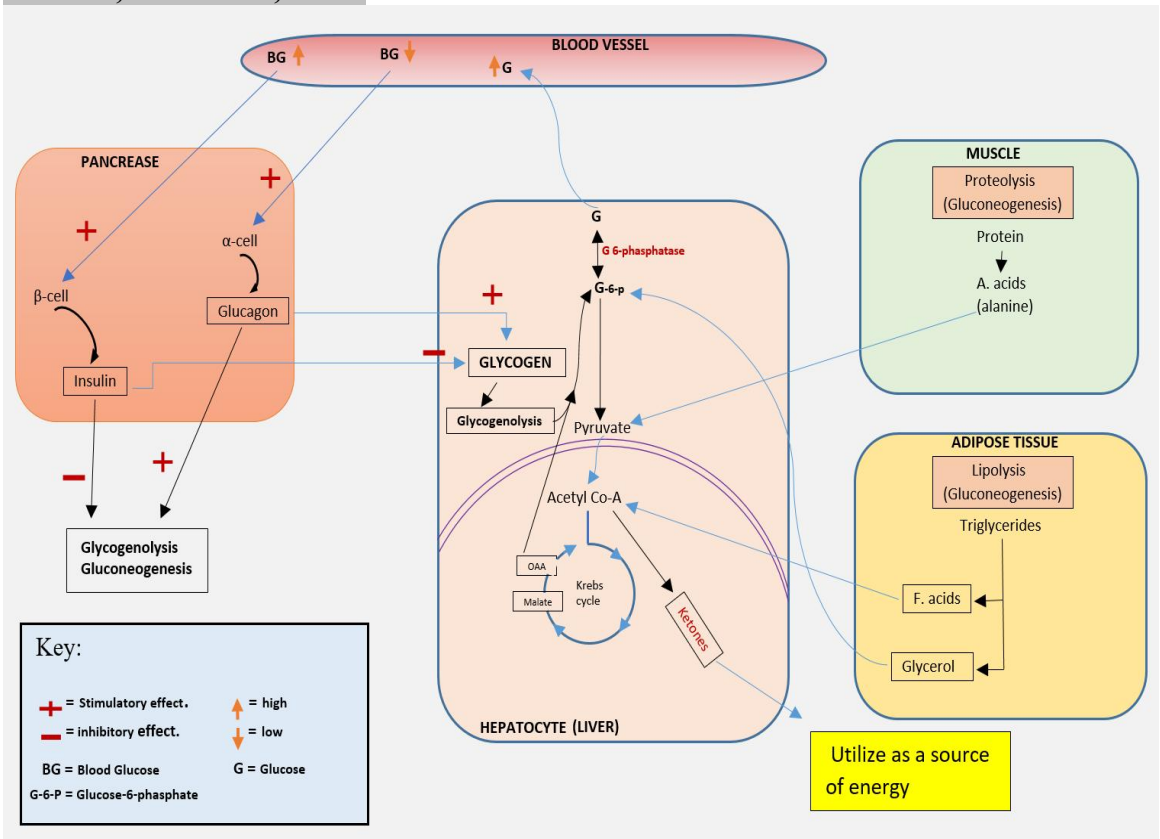

Figure 1; ***Metabolism processes and the role of glucagon and insulin during fasting. When the blood glucose level is reduced in the blood the alpha-cells of the pancreas; sensitize and release glucagon that causes glycogenolysis by acting on glycogen to produce G-6-p and enter the glycolysis pathway, convert glucose by G-6-phosphatase and cause gluconeogenesis by acting protein and lipid to produce amino acids and (fatty acids and glycerol) respectively, that use as a source of glucose to regulate blood glucose level. When blood glucose increases the Beta-cell of the pancreas; sensitizes and releases insulin that causes glucagon synthesis and uses blood glucose as a source of energy to regulate blood glucose levels.***

PSYCHOLOGICAL SHIFTS OF FASTING IN THE HUMAN BRAIN

Fasting has been shown to improve cognition and memory in studies conducted by psychologists (Patsalos and Thoma, 2020). All who fast acquire the patience to resist the temptations of food and other environmental stimulants, as well as the capacity to resist, which strengthens the virtue of self-sacrifice, allowing a person to be humbled and mature (Patsalos and Thoma, 2020). Fasting becomes a lesson in self-control and self-regulation, which improves discipline, as a fasting individual learns to regulate daily routine in a certain way. Fasting enables a person to recognize one's strengths and shortcomings, as well as how to control emotions in a way that might lead to self-improvement (Teong *et al*., 2021). This ability to learn how to perform tasks that might otherwise be difficult for many individuals builds confidence and self-efficacy. It's vital to remember that when fasting begins, the brain is restricted to rapid glucose intake,

ISSN (E) 3007-3197
ISSN (P) 3007-3189
Publisher Name : COLLABORATIVE EDUCATIONAL LEARNING INSTITUTE
Frequency Of Journal: Bi-Annual
Annual Methodological Archive Research Review

which can cause weakness, hunger, and headaches during the first few days. After some days, the brain relaxes and the body adjusts to a new set of circumstances. Not only body and brain adjust to the new set point, but individuals also feel more at ease as they lose weight (Qasim, 2018). With all of these clear benefits of fasting, medical experts have devised a 5:2 diet plan in which participants eat conventional meals five days a week and fast or adhere to a rigorous meal plan two days a week (Marengo *et al*., 2019).

CONCLUSION

Fasting is a fast-growing solution in the medical domain. Research trials on human as well as animal models suggest that fasting could be utilized in treating various diseases like obesity, and diabetes. Fasting can also decrease LDL, cholesterol, and triacylglycerol levels. Fasting can improve memory and enhance brain activity.

REFERENCES

Ahmet I, Wan R, Mattson MP, Lakatta EG, Talan M. Cardioprotection by intermittent fasting in rats. Circulation. 2005 Nov 15;112(20):3115-21.

Albosta M, Bakke J. Intermittent fasting: is there a role in the treatment of diabetes? A review of the literature and guide for primary care physicians. Clinical diabetes and endocrinology. 2021 Dec;7(1):1-2.

Basolo A, Begaye B, Hollstein T, Vinales KL, Walter M, Santini F, Krakoff J, Piaggi P. Effects of short-term fasting and different overfeeding diets on thyroid hormones in healthy humans. Thyroid. 2019 Sep 1;29(9):1209-19.

Bjarnadottir, A., 2018. The Beginner's Guide to the 5:2 Diet https://www.healthline.com/nutrition/the-5-2-diet-guide

Brandhorst S, Choi IY, Wei M, Cheng CW, Sedrakyan S, Navarrete G, Dubeau L, Yap LP, Park R, Vinciguerra M, Di Biase S. A periodic diet that mimics fasting promotes multi-system regeneration, enhanced cognitive performance, and healthspan. Cell metabolism. 2015 Jul 7;22(1):86-99.

Brocchi A, Rebelos E, Dardano A, Mantuano M, Daniele G. Effects of intermittent fasting on brain metabolism. Nutrients. 2022 Mar 17;14(6):1275.

Bruce-Keller AJ, Umberger G, McFall R, Mattson MP. Food restriction reduces brain damage and improves behavioral outcome following excitotoxic and metabolic insults. Annals of Neurology: Official Journal of the American Neurological Association and the Child Neurology Society. 1999 Jan;45(1):8-15.

Cai H, Qin YL, Shi ZY, Chen JH, Zeng MJ, Zhou W, Chen RQ, Chen ZY. Effects of alternate-day fasting on body weight and dyslipidaemia in patients with non-alcoholic fatty liver disease: a randomised controlled trial. BMC gastroenterology. 2019 Dec;19:1-8.

Calvo Y, Hoddy KK, Haus JM, Trepanowski JF, Kroeger CM, Klempel MC, Bhutani S, Varady KA. Alternate day fasting for weight loss in normal weight and overweight subjects: a randomized controlled trial.

Cui J, Panse S, Falkner B. The role of adiponectin in metabolic and vascular disease: a review. Clinical Nephrology. 2011 Jan 1;75(1):26-33.

De Cabo R, Mattson MP. Effects of intermittent fasting on health, aging, and disease. New England Journal of Medicine. 2019 Dec 26;381(26):2541-51.

ISSN (E) 3007-3197
ISSN (P) 3007-3189
Publisher Name : COLLABORATIVE EDUCATIONAL LEARNING INSTITUTE
Frequency Of Journal: Bi-Annual
Annual Methodological Archive Research Review

De Groot S, Lugtenberg RT, Cohen D, Welters MJ, Ehsan I, Vreeswijk MP, Smit VT, de Graaf H, Heijns JB, Portielje JE, van de Wouw AJ. Fasting mimicking diet as an adjunct to neoadjuvant chemotherapy for breast cancer in the multicentre randomized phase 2 DIRECT trial. Nature communications. 2020 Jun 23;11(1):3083.

De Vadder F, Kovatcheva-Datchary P, Goncalves D, Vinera J, Zitoun C, Duchampt A, Bäckhed F, Mithieux G. Microbiota-generated metabolites promote metabolic benefits via gut-brain neural circuits. Cell. 2014 Jan 16;156(1):84-96.

Dorff TB, Groshen S, Garcia A, Shah M, Tsao-Wei D, Pham H, Cheng CW, Brandhorst S, Cohen P, Wei M, Longo V. Safety and feasibility of fasting in combination with platinum-based chemotherapy. BMC cancer. 2016 Dec;16(1):1-9.

Elmajnoun HK, Faris ME, Abdelrahim DN, Haris PI, Abu-Median AB. Effects of Ramadan Fasting on Glycaemic Control Among Patients with Type 2 Diabetes: Systematic Review and Meta-analysis of Observational Studies. Diabetes Therapy. 2023 Mar;14(3):479-96.

Flemer B, Warren RD, Barrett MP, Cisek K, Das A, Jeffery IB, Hurley E, Micheal OR, Shanahan F, Paul WT. The oral microbiota in colorectal cancer is distinctive and predictive. Gut. 2018 Aug 1;67(8):1454-63.

Fontana L, Partridge L, Longo VD. Extending healthy life span—from yeast to humans. science. 2010 Apr 16;328(5976):321-6.

Galazzo G, van Best N, Bervoets L, Dapaah IO, Savelkoul PH, Hornef MW, Hutton EK, Morrison K, Holloway AC, McDonald H, Ratcliffe EM. Development of the microbiota and associations with birth mode, diet, and atopic disorders in a longitudinal analysis of stool samples, collected from infancy through early childhood. Gastroenterology. 2020 May 1;158(6):1584-96.

Gao YD, Ding M, Dong X, Zhang JJ, Kursat Azkur A, Azkur D, Gan H, Sun YL, Fu W, Li W, Liang HL. Risk factors for severe and critically ill COVID-19 patients: a review. Allergy. 2021 Feb;76(2):428-55.

Godar RJ, Ma X, Liu H, Murphy JT, Weinheimer CJ, Kovacs A, Crosby SD, Saftig P, Diwan A. Repetitive stimulation of autophagy-lysosome machinery by intermittent fasting preconditions the myocardium to ischemia-reperfusion injury. Autophagy. 2015 Sep 2;11(9):1537-60.

Grajower MM, Horne BD. Clinical management of intermittent fasting in patients with diabetes mellitus. Nutrients. 2019 Apr 18;11(4):873.

Gray, A., Threlkeld, R.J. Nutritional Recommendations for Individuals with Diabetes. South Dartmouth (MA): MDText.com, Inc.; 2000-. Available from: https://www.ncbi.nlm.nih.gov/books/NBK279012/ 2019

Gunnars K., 2020. Intermittent Fasting 101 — The Ultimate Beginner's Guide https://www.healthline.com/nutrition/intermittent-fasting-guide

Harvie M, Wright C, Pegington M, McMullan D, Mitchell E, Martin B, Cutler RG, Evans G, Whiteside S, Maudsley S, Camandola S. The effect of intermittent energy and carbohydrate restriction v. daily energy restriction on weight loss and metabolic disease risk markers in overweight women. British Journal of Nutrition. 2013 Oct;110(8):1534-47.

ISSN (E) 3007-3197
ISSN (P) 3007-3189
Publisher Name : COLLABORATIVE EDUCATIONAL LEARNING INSTITUTE
Frequency Of Journal: Bi-Annual
Annual Methodological Archive Research Review

Heid IM, Henneman P, Hicks A, Coassin S, Winkler T, Aulchenko YS, Fuchsberger C, Song K, Hivert MF, Waterworth DM, Timpson NJ. Clear detection of ADIPOQ locus as the major gene for plasma adiponectin: results of genome-wide association analyses including 4659 European individuals. Atherosclerosis. 2010 Feb 1;208(2):412-20.

Horne BD, Muhlestein JB, Anderson JL. Health effects of intermittent fasting: hormesis or harm? A systematic review. The American journal of clinical nutrition. 2015 Aug 1;102(2):464-70.

Jeong MA, Plunet W, Streijger F, Lee JH, Plemel JR, Park S, Lam CK, Liu J, Tetzlaff W. Intermittent fasting improves functional recovery after rat thoracic contusion spinal cord injury. Journal of neurotrauma. 2011 Mar 1;28(3):479-92.

Kesztyüs D, Vorwieger E, Schönsteiner D, Gulich M, Kesztyüs T. Applicability of time-restricted eating for the prevention of lifestyle-dependent diseases in a working population: results of a pilot study in a pre-post design. GMS German Medical Science. 2021;19.

Marengo, K., L.D.N, R.D., Jon, Johnson. How to do the 5:2 diet. 2019. https://www.medicalnewstoday.com/articles/324303

Marinac CR, Nelson SH, Breen CI, Hartman SJ, Natarajan L, Pierce JP, Flatt SW, Sears DD, Patterson RE. Prolonged nightly fasting and breast cancer prognosis. JAMA oncology. 2016 Aug 1;2(8):1049-55.

Maswood N, Young J, Tilmont E, Zhang Z, Gash DM, Gerhardt GA, Grondin R, Roth GS, Mattison J, Lane MA, Carson RE. Caloric restriction increases neurotrophic factor levels and attenuates neurochemical and behavioral deficits in a primate model of Parkinson's disease. Proceedings of the National Academy of Sciences. 2004 Dec 28;101(52):18171-6.

Mathew, T.K., Tadi, P. Blood Glucose Monitoring. [Updated 2021 Aug 11]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2022 Jan-. Available from: https://www.ncbi.nlm.nih.gov/books/NBK555976/ 2021

Mattson MP, Wan R. Beneficial effects of intermittent fasting and caloric restriction on the cardiovascular and cerebrovascular systems. The Journal of nutritional biochemistry. 2005 Mar 1;16(3):129-37.

Mattson MP. Excitotoxic and excitoprotective mechanisms: abundant targets for the prevention and treatment of neurodegenerative disorders. Neuromolecular medicine. 2003 Apr;3:65-94.

Mousavi, H. Philosophy of fasting in Quran and Islamic narratives and its relationship with human health, Based on scientific notions. Journal of Nutrition Fasting and Health. 2014 July 2(2): 71-75.

Musso G, Gambino R, Biroli G, Carello M, Faga E, Pacini G, De Michieli F, Cassader M, Durazzo M, Rizzetto M, Pagano G. Hypoadiponectinemia predicts the severity of hepatic fibrosis and pancreatic Beta-cell dysfunction in nondiabetic nonobese patients with nonalcoholic steatohepatitis. Official journal of the American College of Gastroenterology| ACG. 2005 Nov 1;100(11):2438-46.

ISSN (E) 3007-3197
ISSN (P) 3007-3189
Publisher Name : COLLABORATIVE EDUCATIONAL LEARNING INSTITUTE
Frequency Of Journal: Bi-Annual
Annual Methodological Archive Research Review

Nakamura K, Tajiri E, Hatamoto Y, Ando T, Shimoda S, Yoshimura E. Eating dinner early improves 24-h blood glucose levels and boosts lipid metabolism after breakfast the next day: a randomized cross-over trial. Nutrients. 2021 Jul 15;13(7):2424.

Nelson, D.L, Cox, M.M. Lehninger principles of biochemistry. 6th ed. New York: W.H. Freeman and Company; 2013.

Patsalos OC, Thoma V. Water supplementation after dehydration improves judgment and decision-making performance. Psychological research. 2020 Jul;84(5):1223-34.

Qasim, M., 2018. Headache while fasting can be managed https://www.thenews.com.pk/print/319808-headache-while-fasting-can-be-managed

Rynders CA, Thomas EA, Zaman A, Pan Z, Catenacci VA, Melanson EL. Effectiveness of intermittent fasting and time-restricted feeding compared to continuous energy restriction for weight loss. Nutrients. 2019 Oct 14;11(10):2442.

Shatila H, Baroudi M, El Sayed Ahmad R, Chehab R, Forman MR, Abbas N, Faris M, Naja F. Impact of Ramadan fasting on dietary intakes among healthy adults: a year-round comparative study. Frontiers in Nutrition. 2021 Aug 5;8:689788.

Simpson CA, Mu A, Haslam N, Schwartz OS, Simmons JG. Feeling down? A systematic review of the gut microbiota in anxiety/depression and irritable bowel syndrome. Journal of affective disorders. 2020 Apr 1;266:429-46.

Teng NI, Shahar S, Manaf ZA, Das SK, Taha CS, Ngah WZ. Efficacy of fasting calorie restriction on quality of life among aging men. Physiology & behavior. 2011 Oct 24;104(5):1059-64.

Teong XT, Hutchison AT, Liu B, Wittert GA, Lange K, Banks S, Heilbronn LK. Eight weeks of intermittent fasting versus calorie restriction does not alter eating behaviors, mood, sleep quality, quality of life and cognitive performance in women with overweight. Nutrition Research. 2021 Aug 1;92:32-9.

Thau, L., Gandhi, J., Sharma, S. Physiology, cortisol. StatPearls. 2021.

Tinsley GM, La Bounty PM. Effects of intermittent fasting on body composition and clinical health markers in humans. Nutrition reviews. 2015 Oct 1;73(10):661-74.

Urooj A, Kotebagilu NP, Shivanna LM, Anandan S, Thantry AN, Siraj SF. Effect of ramadan fasting on body composition, biochemical profile, and antioxidant status in a sample of healthy individuals. International journal of endocrinology and metabolism. 2020 Oct;18(4).

Van Galen KA, Booij J, Schrantee A, Adriaanse SM, Unmehopa UA, Fliers E, Schwartz GJ, DiLeone RJ, Ter Horst KW, la Fleur SE, Serlie MJ. The response to prolonged fasting in hypothalamic serotonin transporter availability is blunted in obesity. Metabolism. 2021 Oct 1;123:154839.

Van Linthout S, Foryst-Ludwig A, Spillmann F, Peng J, Feng Y, Meloni M, Van Craeyveld E, Kintscher U, Schultheiss HP, De Geest B, Tschöpe C. Impact of HDL on adipose tissue metabolism and adiponectin expression. Atherosclerosis. 2010 Jun 1;210(2):438-44.

Varady KA, Cienfuegos S, Ezpeleta M, Gabel K. Clinical application of intermittent fasting for weight loss: progress and future directions. Nature Reviews Endocrinology. 2022 May;18(5):309-21.

ISSN (E) 3007-3197
ISSN (P) 3007-3189
Publisher Name : COLLABORATIVE EDUCATIONAL LEARNING INSTITUTE
Frequency Of Journal: Bi-Annual
Annual Methodological Archive Research Review

Visioli F, Mucignat-Caretta C, Anile F, Panaite SA. Traditional and medical applications of fasting. Nutrients. 2022 Jan 19;14(3):433.

Wang Y., Wu, R. The Effect of Fasting on Human Metabolism and Psychological Health. Disease Markers, 2022.

Yankner BA, Lu T, Loerch P. The aging brain. Annu. Rev. Pathol. Mech. Dis.. 2008 Feb 28;3:41-66.

Yilmaz B, Juillerat P, Øyås O, Ramon C, Bravo FD, Franc Y, Fournier N, Michetti P, Mueller C, Geuking M, Pittet VE. Microbial network disturbances in relapsing refractory Crohn's disease. Nature medicine. 2019 Feb;25(2):323-36.