

Intermittent Fasting and Adding More Days to Life

Abdul Kader Mohiuddin*

Department of Pharmacy, World University of Bangladesh, Dhaka, Bangladesh

*Corresponding Author: Abdul Kader Mohiuddin, Department of Pharmacy, World University of Bangladesh, Dhaka, Bangladesh, Telephone: +8801716477485; E-mail: mohiuddin3@pharmacy.wub.edu.bd (or) trymohi@gmail.com

Citation: Mohiuddin AK (2019) Intermittent Fasting and Adding More Days to Life. Appl Clin Pharmacol Toxicol 3: 121. DOI: 10.29011/2577-0225.100021

Received Date: 19 July, 2019; Accepted Date: 27 July, 2019; Published Date: 06 August, 2019

Respected sir,

With over half of the grown-up populace in the UK as of now delegated overweight or corpulent, joined by an expanded danger of type 2 diabetes and cardiovascular sickness, discovering increasingly compelling methodologies to deal with these conditions stays basic [1]. In 2016, WHO detailed that more than 1.9 billion people around the globe were overweight and more than 650 million people were stout which has significantly increased in number since 1975 [2]. Until this point, the most powerful mediation productive in warding off the aforementioned cellular markers of aging is Calorie Restriction (CR) that includes the organization of a well-adjusted, supplement thick eating regimen that diminishes calorie admission by 20%-40% without lack of healthy sustenance [3]. It is the main non-hereditary intercession that has reliably been found to expand both mean and maximal life expectancy over an assortment of animal varieties [4]. RCTs show that deliberate weight reduction lessens type 2 diabetes, impedes aging-related functional decrease; and expands subjective and physical capacity; and builds life expectancy [5]. Unobtrusive weight misfortunes of 5%-10% have been related with noteworthy improvements in cardiovascular malady hazard factors (i.e., diminished HbA1C levels, decreased blood pressure, increment in HDL cholesterol, diminished plasma triglycerides) in patients with T2D [6]. Notwithstanding the weight reduction impacts and metabolic improvements, a few other gainful impacts of helpful fasting have been depicted incorporating improvements in lipid profiles, osteoarthritis, mending of thrombophlebitis, recuperating of unmanageable dermal ulcers and resistance of elective medical procedure [7]. Late discoveries demonstrate that dinner timing is pivotal, with both intermittent fasting and balanced diurnal musicality of sustaining improving wellbeing and capacity, without changes in generally speaking admission. Brought down admission of specific supplements, as opposed to off by and large calories, is additionally key, with protein and explicit amino acids assuming unmistakable jobs [8]. Significantly, long-term introduction to a CR diet may likewise cause considerable reactions like amenorrhea, osteoporosis, diminished fertility and libido

(because of decreased testosterone in men), debilitated injury recuperating and expanded defenselessness to contaminations [9,10]. Fasting is unmistakable from Caloric Restriction (CR), in which day by day caloric admission is incessantly decreased by up to 40 %, yet feast recurrence is looked after [11]. The cellular and sub-atomic systems by which Intermittent Fasting (IF) improves wellbeing and neutralizes ailment procedures include enactment of versatile cellular pressure reaction flagging pathways that upgrade mitochondrial wellbeing, DNA repair and autophagy [12]. As of late, contemplates in both *in vitro* and *in vivo* models have demonstrated that intermittent fasting improved the chemotherapeutic reaction to cisplatin, doxorubicin, cyclophosphamide, oxaliplatin, sorafenib, mitoxantrone, gemcitabine, etoposide, temozolomide and tyrosine kinase inhibitors in models of glioma, neuroblastoma, melanoma, fibrosarcoma and bosom malignant growth, colon disease, pancreatic disease, hepatocellular malignant growth and lung malignant growth [13]. On the off chance that regimens that incite the metabolic switch can possibly improve body piece in overweight people. Additionally, IF regimens likewise incite the organized enactment of flagging pathways that upgrade physiological capacity, improve performance, and moderate aging and sickness forms [7]. Barnosky, et al. [14] nitty gritty examination of Alternative Day Fasting (ADF) and IF over CR in decreases in insulin resistance, fasting insulin, and instinctive fat mass and reasoned that IF and ADF as options in contrast to CR for weight misfortune and type 2 diabetes risk decrease in overweight and stout populaces.

Both focal and fringe timekeepers act to protect the circadian beat of various tissue physiology through controlling "tissue-specific gene expression" [15]. Couto, et al. [16] revealed that greatness of fat and skin reaction to time of day was around twice that of hours fasting. Epworth Sleepiness Scale (ESS) score to survey connection among IF and daytime lethargy announced clashing outcomes, evaluated by Almenessier, et al. [17]. A few investigations revealed a critical increment in daytime sluggishness, though different examinations showed no huge changes. Be that as it may, medium-term fasting, or fasting

during resting hours, is related with a nighttime ascend in plasma FFA, ghrelin, development hormone, and expanded hepatic gluconeogenesis. Adipose Tissue (AT) coordinates the cycling of Triglycerides (TG) by controlling the take-up, esterification, and arrival of FFA to satisfy the metabolic needs of the liver and muscle tissue. Henceforth, combination of circadian rhythms and eating might be advantageous [18]. Current proof proposes that as meager as 10 min of high force exercise can improve metabolic wellbeing and oxygen consuming limit and elective day fasting can lessen weight related changes in body arrangement, fasting insulin and glucose fixations [19]. Concentrates in rodents have exhibited that limiting the accessibility of sustenance to the ordinary evening nourishing cycle improves metabolic profiles and lessens the risk of corpulence and stoutness related conditions, for example, nonalcoholic greasy liver malady, and constant ailments, for example, diabetes and malignant growth [20]. Fasting periods with different examples are found in many religions. Truth be told, this plain practice is referenced in the Old Testament, just as other antiquated messages such the Koran and the Mahabharata. Muslims, for instance, quick from sunrise until sunset during the long stretch of Ramadan, while Christians, Jews, Buddhists, and Hindus customarily quick on assigned days or periods. For example, Ramadan intermittent fasting was connected with improvements in cardio metabolic risk factors [21,22]. Concentrates announced that all Total Cholesterol (TC), LDL, HDL and blood glucose have been improved after Ramadan contrasted with before Ramadan among competitors. Rahbar, et al. [23] presumed that fasting in Ramadan autonomous of anthropometric estimates diminishes IGF-1, IL-2, and serum lipid levels. As Smocking has been taboo during fasting of Ramadan, considers uncovered a noteworthy decrease in recycled smoke levels in open spots [24]. Indeed, even with no guidance on way of life changes, there are predictable but transient-decreases in weight and fat mass with the Ramadan quick, particularly in people with overweight or corpulence [25]. Ramadan intermittent fasting may be related with decline in sexual want, recurrence of sexual intercourse and serum FSH level [26]. Resistance preparing (weight lifting) in a fasted state influences the post-exercise anabolic reaction to weight preparing more positively than preparing after an encouraged state, however just when a sugar/protein/leucine blend was ingested following a substantial resistance instructional meeting [27]. Likewise, Frawley, et al. [28] detailed that fasted resistance exercise depends more intensely on fat digestion than sugar. Different examinations have discovered comparative dependence on fat as a fuel source during fasted vigorous exercise [29-32]. Surprisingly, IF during early adulthood, and furthermore during midlife, was adequate to expand lifespan, demonstrating a “memory” impact Hormesis is a phenomenon by which “low-level” poisonous pressure inspires reaction instruments that ensure against comparable however higher-level anxieties related with aging. Given that intermittent starvation in early life prompted expanded post-IF starvation

resistance notwithstanding expanded lifespan, hormesis could assume a job [25]. One of metabolic impacts of intermittent fasting is intermittent ketosis known for its appetite concealment impact bringing about intentional calorie decrease. As far as feast timing, skipping breakfast is like intermittent fasting [33]. Although several studies reported associations between breakfast skipping and fatigue at noon, worsens memory and higher body mass index as well as increased prevalence of obesity-related chronic illness; deficient in total energy, vitamins and minerals, increased risk of central adiposity, and risk of insulin resistance and cardio-metabolic disorders [34]. There are two essential assortments of the IF diet. The most well-known variety is time-limited feeding. It might be utilized in three variations: 16/8, 18/6 and 20/4. 16:8, comprising of a 16-hours quick, and after that an 8-hours dietary window. Another convention comprises of a 24-hours fasting period, exchanged with a 24 hours eating period, rehashed a few times each week. There are two potential frameworks, 5:2 or 4:3. In the 5:2 frame work, wherein caloric restriction is utilized for two days seven days, and an ordinary eating regimen for 5 days [35,36]. In any case, Intermittent fasting ought to not be utilized by kids, pregnant women, and people performing substantial physical work [37]. Additionally, menstruating women, the older, wiped out people, and long-separation voyagers are deferred from this Ramadan fasting [38,39]. Given the worry of liquid hardship and consequent electrolyte changes, kidney physiology is regularly essentially affected. This is particularly valid among those with Chronic Kidney Disease (CKD), inclining them to intense rounded damage. Moreover, parchedness is a noteworthy accelerating factor for renal stone development [40-42]. Antunes, et al. [43] expressed that fasting increment the affectability of tumor cell lines to cisplatin-initiated cells, and furthermore of those cell lines especially impervious to any pharmacological treatment.

In another investigation, fasting was found to balance the IGF-1 receptor (IGF-1R)/Epithelial Growth Factor (EGF) receptor (EGFR) and the Akt/mTOR pathways, which are dysregulated in stoutness and may prompt skin malignant growth [44]. In any case, Bragazzi, et al. [45] inferred that doctors ought to be told in perceiving uncommon dermatological issue related with fasting, for example, *Prurigo Pigmentosa* (PP). Damiani, et al. [38] announced critical lessening in the “Psoriasis Area and Severity Index” (PASI) score after the Ramadan fasting. In the event that would be a helpful device in distressful condition to improve learning and memory by downregulation of the putative atomic variables engaged with neuro-irritation, albeit chronic stressors are commonly outstanding for adverse consequences for the body especially subjective decrease [46]. To improve health, the objective ought to be to shed pounds by decreasing the aggregate sum of calories expended, as opposed to concentrating on when those calories are devoured [47]. 4-8hours’ time limited feeding lessens caloric admission (without calorie tallying) and fundamentally diminishes fat mass without

changing lean mass in youthful resistance prepared men. Gabel et.al, 2018 uncovered that 8-hours' time confined feeding produces mellow caloric restriction and weight misfortune, without caloric tallying. It might likewise offer clinical advantages by lessening blood pressure [48]. Adjusting body synthesis in such a way might be profitable to the competitor for different biomechanical, stylish, and train reasons, along these lines improving the probability of focused accomplishment in an objective weight-class (e.g., combat sports, weight lifting), weight-sensitive sports (e.g., endurance occasions, ski jumping), or tastefully passed judgment on games (e.g., gymnastics and working out) [49]. On the off chance that regimens might be a promising way to deal with get in shape and improve metabolic health for people who can endure interims of not eating, or eating practically nothing, for specific hours of the day or days of the week. Whenever demonstrated to be useful, these eating regimens may offer promising no pharmacologic ways to deal with improving health at the populace level with different general health benefits [50].

Abbreviations

CR	:	Calorie Restriction
IF	:	Intermittent Fasting
RCTs	:	Randomized Controlled Trials
(A1c) HbA1C	:	Glycated Haemoglobin
ADF	:	Alternative Day Fasting
ESS	:	Epworth Sleepiness Scale
IGF-1	:	Insulin-like Growth Factor 1
TC	:	Total Cholesterol
IL-2	:	Interleukin-2
CKD	:	Chronic Kidney Disease
EGF	:	Epithelial Growth Factor
PASI	:	Psoriasis Area and Severity Index

Acknowledgement

I'm thankful to Dr. Iain Templeman, Department for Health, University of Bath, BA2 7AY, UK for his valuable time to audit my paper and for his thoughtful suggestions. I'm also grateful to seminar library of Faculty of Pharmacy, University of Dhaka and BANSDOC Library, Bangladesh for providing me books, journal and newsletters.

Financial Disclosure or Funding: N/A

Conflict of Interest: The author declares that he has no competing interests.

Informed Consent: N/A

Author contributions: N/A

References

1. Ganesan K, Habboush Y, Sultan S (2018) Intermittent Fasting: The Choice for a Healthier Lifestyle. *Cureus* 10: 2947.
2. Harvie M, Howell A (2017) Potential Benefits and Harms of Intermittent Energy Restriction and Intermittent Fasting Amongst Obese, Overweight and Normal Weight Subjects-A Narrative Review of Human and Animal Evidence. *Behav Sci (Basel)* 7: 4.
3. Picca A, Pesce V, Lezza AMS (2017) Does eating less make you live longer and better? An update on calorie restriction. *Clin Interv Aging* 12: 1887-1902.
4. Anton S, Leeuwenburgh C (2013) Fasting or caloric restriction for healthy aging. *Exp Gerontol* 48: 1003-1005.
5. Templeman I, Thompson D, Gonzalez J, Walhin JP, Reeves S, et al. (2018) Intermittent fasting, energy balance and associated health outcomes in adults: study protocol for a randomised controlled trial. *Trials* 19: 86.
6. Furmli S, Elmasry R, Ramos M, Fung J (2018) Therapeutic use of intermittent fasting for people with type 2 diabetes as an alternative to insulin. *BMJ Case Rep*.
7. Anton SD, Moehl K, Donahoo WT, Marosi K, Lee SA, et al. (2018) Flipping the Metabolic Switch: Understanding and Applying the Health Benefits of Fasting. *Obesity (Silver Spring)* 26: 254-268.
8. Fontana L, Partridge L (2015) Promoting health and longevity through diet: from model organisms to humans. *Cell* 161: 106-118.
9. Rusli F, Lute C, Boekschoten MV, van Dijk M, van Norren K, et al. (2017) Intermittent calorie restriction largely counteracts the adverse health effects of a moderate-fat diet in aging C57BL/6J mice. *Mol Nutr Food Res* 61.
10. Malinowski B, Zalewska K, Węsierska A, Sokolowska MM, Socha M, et al. (2019) Intermittent Fasting in Cardiovascular Disorders-An Overview. *Nutrients* 11: 673.
11. Longo VD, Mattson MP (2014) Fasting: molecular mechanisms and clinical applications. *Cell Metab* 19: 181-192.
12. Mattson MP, Longo VD, Harvie M (2017) Impact of intermittent fasting on health and disease processes. *Ageing Res Rev* 39: 46-58.
13. Antunes F, Erustes AG, Costa AJ, Nascimento AC, Bincoletto C, et al. (2018) Autophagy and intermittent fasting: the connection for cancer therapy? *Clinics (Sao Paulo)* 73.
14. Barnosky AR, Hoddy KK, Unterman TG, Varady KA (2014) Intermittent fasting vs daily calorie restriction for type 2 diabetes prevention: a review of human findings. *Transl Res* 164: 302-311.
15. Van Laake LW, Lüscher TF, Young ME (2018) The circadian clock in cardiovascular regulation and disease: Lessons from the Nobel Prize in Physiology or Medicine 2017. *Eur Heart J* 39: 2326-2329.
16. Couto Alves A, Glastonbury CA, El-Sayed Moustafa JS, Small KS (2018) Fasting and time of day independently modulate circadian rhythm relevant gene expression in adipose and skin tissue. *BMC Genomics* 19: 659.
17. Almeneessier AS, BaHammam AS (2018) How does diurnal intermit-

- tent fasting impact sleep, daytime sleepiness, and markers of the biological clock? *Current insights. Nat Sci Sleep* 10: 439-452.
18. Stockman MC, Thomas D, Burke J, Apovian CM (2018) Intermittent Fasting: Is the Wait Worth the Weight? *Curr Obes Rep* 7: 172-185.
 19. Wilson RA, Deasy W, Stathis CG, Hayes A, Cooke MB (2018) Intermittent Fasting with or without Exercise Prevents Weight Gain and Improves Lipids in Diet-Induced Obese Mice. *Nutrients* 10.
 20. Patterson RE, Sears DD (2017) Metabolic Effects of Intermittent Fasting. *Annu Rev Nutr* 37: 371-393.
 21. Moro T, Tinsley G, Bianco A, Marcolin G, Pacelli QF, et al. (2016) Effects of eight weeks of time-restricted feeding (16/8) on basal metabolism, maximal strength, body composition, inflammation, and cardiovascular risk factors in resistance-trained males. *Journal of Translational Medicine* 14: 290.
 22. Toledo FW, Grundler F, Bergouignan A, Drinda S, Michalsen A (2019) Safety, health improvement and well-being during a 4 to 21-day fasting period in an observational study including 1422 subjects. *PLoS One* 14.
 23. Rahbar AR, Safavi E, Rooholamini M, Jaafari F, Darvishi S, et al. (2019) Effects of Intermittent Fasting during Ramadan on Insulin-like Growth Factor-1, Interleukin 2, and Lipid Profile in Healthy Muslims. *Int J Prev Med* 10: 7.
 24. Rouhani MH, Azadbakht L (2014) Is Ramadan fasting related to health outcomes? A review on the related evidence. *J Res Med Sci* 19: 987-992.
 25. Fernando HA, Zibellini J, Harris RA, Seimon RV (2019) Sainsbury A. Effect of Ramadan Fasting on Weight and Body Composition in Healthy Non-Athlete Adults: A Systematic Review and Meta-Analysis. *Nutrients* 11.
 26. Talib RA, Canguven O, Al-Rumaihi K, Al Ansari A, Alani M (2015) The effect of fasting on erectile function and sexual desire on men in the month of Ramadan. *Urol J* 12: 2099-2102.
 27. Trabelsi K, Stannard SR, Ghilisi Z, Maughan RJ, Kallel C, et al. (2013) Effect of fed- versus fasted state resistance training during Ramadan on body composition and selected metabolic parameters in bodybuilders. *J Int Soc Sports Nutr* 10: 23.
 28. Frawley K, Greenwald G, Rogers RR, Petrella JK, Marshall MR (2018) Effects of Prior Fasting on Fat Oxidation during Resistance Exercise. *Int J Exerc Sci* 11: 827-833.
 29. Romijn JA, Coyle EF, Sidossis LS, Gastaldelli A, Horowitz JF, et al. (1993) Regulation of endogenous fat and carbohydrate metabolism in relation to exercise intensity and duration. *Am J Physiol* 265: 380-391.
 30. Paoli A, Marcolin G, Zonin F, Neri M, Sivieri A, et al. (2011) Exercising fasting or fed to enhance fat loss? Influence of food intake on respiratory ratio and excess post exercise oxygen consumption after a bout of endurance training. *Int J Sport Nutr Exerc Metab* 21: 48-54.
 31. Bouhlel E, Salhi Z, Bouhlel H, Mdella S, Amamou A, et al. (2006) Effect of Ramadan fasting on fuel oxidation during exercise in trained male rugby players. *Diabetes Metab* 32: 617-624.
 32. Shimada K, Yamamoto Y, Iwayama K, Nakamura K, Yamaguchi S, et al. (2013) Effects of post-absorptive and postprandial exercise on 24 h fat oxidation. *Metabolism* 62: 793-800.
 33. Catterson JH, Khericha M, Dyson MC, Vincent AJ, Callard R, et al. (2018) Short-Term, Intermittent Fasting Induces Long-Lasting Gut Health and TOR-Independent Lifespan Extension. *Curr Biol* 28: 1714-1724.
 34. Mohiuddin Ak (2019) Skipping Breakfast Everyday Keeps Well-being Away. *Acta Medica* 50: 26-33.
 35. Johnstone A (2015) Fasting for weight loss: an effective strategy or latest dieting trend? *Int J Obes (Lond)* 39: 727-733.
 36. Harvie M, Howell A (2017) Potential Benefits and Harms of Intermittent Energy Restriction and Intermittent Fasting Amongst Obese, Overweight and Normal Weight Subjects-A Narrative Review of Human and Animal Evidence. *Behav Sci (Basel)* 7.
 37. Qoran, Surat 2 "Al-Baqarah", ayyat (verses) 185-186.
 38. Damiani G, Watad A, Bridgewood C, Pigatto PDM, Pacifico A, et al. (2019) The Impact of Ramadan Fasting on the Reduction of PASI Score, in Moderate-To-Severe Psoriatic Patients: A Real-Life Multi-center Study. *Nutrients* 11.
 39. Ganesan K, Habboush Y, Sultan S (2018) Intermittent Fasting: The Choice for a Healthier Lifestyle. *Cureus* 10.
 40. Emami-Naini A, Roomizadeh P, Baradaran A, Abedini A, Abtahi M (2013) Ramadan fasting and patients with renal diseases: A mini review of the literature. *J Res Med Sci* 18: 711-716.
 41. Bragazzi NL (2015) Ramadan fasting and chronic kidney disease: does estimated glomerular filtration rate change after and before Ramadan? Insights from a mini meta-analysis. *Int J Nephrol Renovasc Dis* 8: 53-57.
 42. Bragazzi NL (2014) Ramadan fasting and chronic kidney disease: A systematic review. *J Res Med Sci* 19: 665-676.
 43. Antunes F, Corazzari M, Pereira G, Fimia GM, Piacentini M, et al. (2017) Fasting boosts sensitivity of human skin melanoma to cisplatin-induced cell death. *Biochem Biophys Res Commun* 485: 16-22.
 44. Moore T, Beltran L, Carbajal S, Hursting SD, Di Giovanni J (2012) Energy balance modulates mouse skin tumor promotion through altered IGF-1R and EGFR crosstalk. *Cancer Prev Res (Phila)* 5: 1236-1246.
 45. Bragazzi NL, Sellami M, Salem I, Conic R, Kimak M, et al. (2019) Fasting and Its Impact on Skin Anatomy, Physiology, and Physiopathology: A Comprehensive Review of the Literature. *Nutrients* 11.
 46. Shojaie M, Ghanbari F, Shojaie N (2017) Intermittent fasting could ameliorate cognitive function against distress by regulation of inflammatory response pathway. *J Adv Res* 8: 697-701.
 47. Sofer S, Stark AH, Madar Z (2015) Nutrition targeting by food timing: time-related dietary approaches to combat obesity and metabolic syndrome. *Adv Nutr* 6: 214-223.
 48. Gabel K, Hoddy KK, Haggerty N, Song J, Kroeger CM, et al. (2018) Effects of 8-hour time restricted feeding on body weight and metabolic disease risk factors in obese adults: A pilot study. *Nutr Healthy Aging* 4: 345-353.
 49. Peos JJ, Norton LE, Helms ER, Galpin AJ, Fournier P (2019) Intermittent Dieting: Theoretical Considerations for the Athlete. *Sports (Basel)* 7.
 50. Patterson RE, Laughlin GA, LaCroix AZ, Hartman SJ, Natarajan L, et al. (2015) Intermittent Fasting and Human Metabolic Health. *J Acad Nutr Diet* 115: 1203-1212.