

# Role of therapeutic fasting in women's health: An overview

Pradeep M. K. Nair, Pranav G. Khawale

Department of Intramural Research, Office of Research and Development, National Institute of Naturopathy, Ministry of AYUSH, Government of India

## ABSTRACT

Fasting is a therapeutic tool practiced since millennia by different cultures and medical systems heterogeneously. PubMed and Google Scholar search engines were searched using the keywords "fasting," "intermittent fasting," "calorie restriction," "women's health," "women's disorders," "fasting and aging," and "fasting and health." All the animal and human studies which address women's health and disorders were included in the review. Fasting has shown to improve the reproductive and mental health. It also prevents as well as ameliorates cancers and musculoskeletal disorders which are common in middle-aged and elderly women. The present studies available have limitations such as majority of the studies are preclinical studies and human studies are with lesser sample size. Future studies should address this gap by designing medically supervised fasting techniques to extract better evidence. Nevertheless, fasting can be prescribed as a safe medical intervention as well as a lifestyle regimen which can improve women's health in many folds.

**Key Words:** Diet, fasting, menopause, therapeutic fasting, women's health

## INTRODUCTION

Fasting is a common practice as a regimen for traditional or cultural reasons. Many religious groups incorporate fasting into their rituals and fast on designated days of the week or calendar year.<sup>[1]</sup> Evidence states that medically supervised fasting for 7–21 days is efficacious in the treatment of rheumatic diseases, chronic pain syndromes, hypertension, and metabolic syndrome (MetS), etc.<sup>[2]</sup> Naturopathy uses fasting as the first-line management in treating diseases.<sup>[3]</sup> Ayurveda also delineates fasting as "upavasa" and has reported clarity of sense organs, enhanced digestive capacity, enthusiasm, and decreased

signs and symptoms of diseases by fasting.<sup>[4,5]</sup> During reproductive life, woman encounters heterogeneous diseases ranging from nutritional deficiencies to cancers. Although many programs are focused on women's health, fasting is a missing link whose role in enhancing health of women needs to be evaluated.

## MATERIALS AND METHODS

PubMed and Google scholar search engines were searched using the keywords "fasting," "intermittent fasting," "calorie restriction," "women's health," "women's disorders," "fasting and aging," and "fasting and health." The studies which were focused on the health and disorders which are linked to women's health are included in this review. The outcomes are depicted under the heads of implications of fasting in various women disorders.

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**Address for Correspondence:** Dr. Pradeep M. K. Nair, Research Officer, National Institute of Naturopathy, Ministry of AYUSH, Government of India, Office of Research and Development, Tadiwala Road, Pune - 411 001, Maharashtra, India. E-mail: drpradeep18bnys@gmail.com

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### Fasting and cancer

Cancers figure among the leading causes of morbidity and mortality worldwide, with approximately 14 million new cases and 8.2 million cancer-related deaths in 2012.<sup>[6]</sup> Among women, the five most common sites diagnosed were breast, colorectum, lung, cervix, and stomach cancer.<sup>[7]</sup> Of these, breast cancer is considered as the second most common cancer in the world.<sup>[8]</sup> Fasting is a proven prognostic tool against cancer and other metabolic diseases.<sup>[9]</sup> Fasting can theoretically inhibit several critical pathways in the development and progression of cancer while simultaneously causing malignancies more sensitive to treatments, for instance chemotherapy and radiotherapy.<sup>[10]</sup> A recent pilot study has shown that a periodic fasting mimicking diet has decreased the risk factors/biomarkers related to cancer.<sup>[11]</sup> Fasting mainly inhibits tumor growth by inhibiting angiogenesis.<sup>[12]</sup> Tumors cannot grow more than 0.5 mm without having new blood supply; thus, fasting can slow down the growth of tumor.<sup>[13]</sup> Fasting for 48 h in mice model with breast cancer has found to be significantly suppress the tumor growth.<sup>[14]</sup> All these studies suggest the possible role of fasting in augmenting cancer care to a greater extent. However, more clinical trials are needed in this area to warrant optimal outcomes.

### Fasting and reproductive health

Diet and reproduction have a mutually benefiting relationship. Overweight and obesity in early adulthood appear to increase the risk of menstrual problems, hypertension in pregnancy, and subfertility.<sup>[15]</sup> Polycystic ovary syndrome (PCOS) is the most common endocrine disorder in women.<sup>[16]</sup> The clinical manifestation of PCOS varies from a mild menstrual disorder to severe disturbance of reproductive and metabolic functions. A recent study conducted on women with PCOS revealed that fasting can reduce the chronic sympathetic overactivity in PCOS. This, in turn, will reduce stress neurohormone levels and ensure the physical and mental health.<sup>[17]</sup> Short-term calorie restriction has shown to increase luteinizing hormone in obese women with PCOS,<sup>[18]</sup> which emphasizes the effect of fasting in correcting ovulatory consequences in women. Moreover, lifestyle change is the first-line treatment in an evidence-based approach in the management of the majority of PCOS women who are overweight.<sup>[19]</sup> Studies reveal that as little as 5–10% weight loss has significant clinical benefits improving psychological outcomes, reproductive features (menstrual cyclicality, ovulation, and fertility), and metabolic features (insulin resistance and risk factors for cardiovascular disease [CVD] and DM2).<sup>[18]</sup> A moderate energy reduction diet (500–1000 kcal/day reduction) reduces body weight by 7–10% over a period of 6–12 months.<sup>[20]</sup> This bespeaks the role that fasting can play in enhancing women's reproductive health.

### Fasting and musculoskeletal health

Musculoskeletal conditions are very rife and are having an overwhelming impact on one's life. They are the most common cause of severe long-term pain and physical disability, and they affect hundreds of millions of people around the world. They significantly affect the psychosocial status of affected people as well as their families and caretakers.<sup>[21]</sup> Musculoskeletal conditions differ in their nature; it ranges from ailments of acute onset and short duration to lifelong disorders including osteoarthritis, rheumatoid arthritis (RA), osteoporosis, and low back pain. The prevalence of many of these conditions increases markedly with age.<sup>[22]</sup> Fasting has shown to affect the parathyroid hormone secretion and which is thought to be beneficial in improving bone health.<sup>[23]</sup> Parathyroid hormone is affected by alteration in circadian rhythm and plays a major role in both calcium and phosphate metabolism and the bone remodeling process.<sup>[24]</sup> Fasting has shown to ameliorate clinical manifestations of RA by reducing the food intolerance, diminishing gastrointestinal permeability, and decreasing intake of precursors of inflammatory mediators such as cytokines, prostaglandins, and leukotrienes.<sup>[25]</sup> Fasting for 7–10 days has shown to reduce pain, stiffness, and dependency on analgesics compared to the controls in RA patients.<sup>[26]</sup> This emphasizes that fasting has a possible role in obviating inflammation which is one of the major conducting factors for musculoskeletal disorders. Osteoporosis and related fractures are a significant concern for the global community. As the population continues to age, morbidity and mortality from fractures due to low bone mineral density will likely continue to increase.<sup>[27]</sup> Calorie restriction, a mode of fasting, has been proposed to modulate and potentially slow the progression of age-related diseases such as CVD, cancer, obesity, Alzheimer's disease, and osteoporosis.<sup>[28]</sup> Heterogeneous findings implicate that fasting helps in weight loss and thereby helps in subsiding body mass index.<sup>[29]</sup> Reduction in weight will help in diluting the risk of fracture and other comorbidities.

### Fasting and metabolic health

The MetS is a summary measure of important CVD risk factors that frequently coexist. The syndrome is evident in 20–30% of middle-aged women and has been linked to the development of CVD and diabetes.<sup>[30-32]</sup> Women tend to develop the disease about 10 years later than men, with a marked increase through the menopausal years.<sup>[33]</sup> The changeover from pre- to post-menopause is associated with the emergence of many features of the MetS, including (1) increased central (intra-abdominal) body fat; (2) a shift toward a more atherogenic lipid profile, with increased low-density lipoprotein (LDL) and triglycerides levels, reduced high-density lipoprotein (HDL), and small, dense

LDL particles; and (3) increased glucose and insulin levels.<sup>[34]</sup> Intermittent fasting (IF) has been evolved as a potential tool in redressing metabolic abnormalities as reported in various experimental studies.<sup>[35]</sup> The cardioprotective effect of IF was revealed by Varady *et al.* The study results confirmed the significant cardioprotective actions of IF, such as weight loss; reduction of fat tissue mass, blood pressure, and heart rate; and improvements in lipid profile, with decrease in total cholesterol and LDL-cholesterol levels and increase in HDL-cholesterol levels.<sup>[36]</sup> Four weeks of fasting has shown to reduce total weight, body mass index, and waist circumference.<sup>[37]</sup> A reduced waist circumference usually correlates with improved insulin sensitivity.<sup>[38]</sup> This signifies the role of fasting as an intervention in ameliorating as well as preventing metabolic dysfunctions, which is common in elderly women.

### Fasting and mental health

Mental health issues are common in women who undergo menopausal transition.<sup>[39]</sup> It is estimated that 80–85% of all women experience unpleasant menopausal symptoms at some points throughout their menopausal transition. The most common symptoms stated are hot flashes, night sweat, irritability, moodiness, tension, anxiety, and emotional instability.<sup>[39]</sup> Many studies explain the positive effects of fasting on promoting mental health.<sup>[40]</sup> It is reported that fasting improves the self-esteem to a greater extent,<sup>[41]</sup> which bestows in maintaining a positive mental status. Fasting also has shown to reduce symptoms of anxiety and depression and improve social functioning.<sup>[42]</sup> Fasting has been proved effective in diminishing stress and depression levels.<sup>[43]</sup> Many clinicians have found that fasting was often accompanied by an increased level of vigilance and a mood improvement. Many neurobiological mechanisms have been proposed to describe the effects of fasting on mood, such as changes in neurotransmitters, quality of sleep, and synthesis of neurotrophic factors. Many clinical observations relate an early effect of fasting on depressive symptoms with an improvement in mood, alertness, and a sense of peacefulness.<sup>[44]</sup> Thus, fasting serves as a mental health enhancer.

### CONCLUSION

A woman encounters various health issues during both pre- and post-menopausal period. This affects their quality of life to a greater extent. Fasting is a nonpharmacological intervention practiced since ancient times by various medical disciplines for broad spectrum of diseases. Although the evidence favors its therapeutic efficacy, it is hardly used in the modern era as an intervention tool. It has been restricted as a religious regimen practiced superstitiously than in a scientific way. Fasting as discussed has a major role to play in women's health during the

various phases of her life. However, there is a need for larger randomized control trials to explain these benefits in a larger level. The present studies available have major limitations such as majority of the studies are preclinical studies and human studies are with lesser sample size. Ethical issues in assigning humans on fasting for longer duration are expressed as a major challenge in conducting fasting trials. The future studies should address this gap by designing medically supervised fasting techniques to extract better evidence. Nevertheless, fasting can be prescribed as a safe medical intervention as well as a lifestyle regimen which can improve women's health in many folds.

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### Conflicts of interest

There are no conflicts of interest.

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