

A COMPREHENSIVE REVIEW STUDY INVESTIGATING THE EFFECT OF RAGI IN THE HEALTH STATUS OF AGING WOMEN

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ABSTRACT

Aging causes numerous health issues for the elderly, particularly for women who experience impaired calcium absorption due to endocrine changes. This can be improved by supplementing with functional food and calcium-rich products. Ragi contains the highest concentration of calcium, along with antioxidants and phytochemicals, making it a health claims research area. Therefore, a review study was conducted, aimed at: **Objectives:** 1: Investigating the nutritional benefits of Ragi. 2: Examining the findings of case control studies on the impact of ragi consumption on the health status of elderly women. **Methodology:** A meta-analysis of collected review studies was conducted to determine the impact of ragi consumption on the health status of elderly women. **Result:** The results revealed that 37.68% of regular ragi-consuming elderly women showed improvement in their bone density. 18.5% of osteoporotic women showed improvement in the

pain of their bone and joints. **Conclusion:** A significant positive impact of regular ragi consumption was found on the health status of women. However, very few studies have been reported. Therefore, more case-control Research studies should be conducted to prove the health claims of ragi millets.

KEYWORDS: Elderly, antioxidants, Phytochemical, health claim, nutritional benefits.

1. INTRODUCTION

Numerous consequences are associated with aging due to physical changes, particularly endocrine imbalances (such as increased parathyroid hormone and decreased sex hormones), vascular and circulatory decline, and neurological dysfunction. These changes lead to

external and internal aging manifestations. However, healthy aging can be achieved through comprehensive and scientific approaches to mitigate these consequences. Old age is a natural phase of life, marked by biological aging that affects everyone. A combination of proper nutrition, healthcare, and an active lifestyle can facilitate healthy aging. The World Health Organization (WHO, 1994) defines elderly individuals as those aged 60 years and above. The nutritional status of older adults is influenced by the aging process, which is shaped by individual factors such as family and social environment, life goals, health, nutrition, and ecological considerations. Impaired calcium absorption is a common postmenopausal problem in elderly women, increasing their calcium demand to prevent osteoporosis and maintain bone density. Therefore, supplementation by calcium rich sources in their daily diets has been recommended.

Ragi, also known as finger millet, is a nutrient-rich coarse grain that is high in calcium. According to the National Institute of Nutrition, India, 100 grams of ragi contains about 344 milligrams of calcium, which is approximately 34% of the recommended daily intake. Other nutrients in ragi:- High fiber content (3.6-4.3%); Rich in antioxidants; Good source of iron, zinc, and potassium. Overall, gluten-free ragi is a nutritious millet that offers numerous health benefits due to its high calcium content and other essential nutrients.

Health claims of ragi due to its high calcium content

- 1.1 Supports bone health:** Calcium in ragi helps maintain strong bones and teeth, reducing the risk of osteoporosis and fractures.
- 1.2 Reduces risk of osteopenia:** Regular consumption of ragi can help prevent osteopenia, a condition characterized by low bone density.
- 1.3 Supports muscle function:** Calcium in ragi helps regulate muscle contractions and relaxations, supporting overall muscle function.
- 1.4 Nervous system function:** Calcium plays a crucial role in nerve function and transmission of nerve impulses, supporting the nervous system.
- 1.5 Supports heart health:** Calcium helps regulate heartbeat and maintains healthy blood pressure, reducing the risk of cardiovascular diseases.

These claims have been proven through various placebo-controlled research studies in clinical nutrition. Numerous clinical studies are ongoing to confirm the health benefits of ragi. This review study aimed to determine the efficacy of ragi.

2. METHODOLOGY

2.1 Literature Collection: A comprehensive review of clinical studies on ragi consumption and its health impact was conducted.

2.2 Meta-Analysis: A total of 46 relevant review papers were collected, and their findings were statistically combined to obtain more precise results. This meta-analysis aimed to determine the impact of ragi consumption.

3. RESULTS

The results are presented in following manner:

2.1(a) Consumption Percentage of Ragi in India

According to the National Family Health Survey (NFHS) 2019-2020, on whole, the ragi consumption is 48.7% found in India.

Table no. 3.1 (a) indicated the region wise percentage of households consuming ragi (finger millet) in India. It revealed that it's consumption is higher (34.6%) in rural regions than urban areas (14.1%).

Table no. 3.1: (a) Region wise Consumption Percentage of Ragi in India.

Regions of India	Consumption percentage of Ragi
rural areas	34.6%
urban areas	14.1%

3.1(b) In terms of frequency of consumption of Ragi in India

Table no. 3.1 (b) presented in consumption frequency that maximum (24.1%) consumer people have been includes the ragi based products daily in their diet. Whereas only 5.5 percent consumer includes less than once a week.

Table no. 3.1: (b) Frequency of Ragi consumption in India.

Frequency of Ragi Consumption	Percentage in India
Daily	24.1%
2-3times a week	15.6%
1-2 times a week	10.4%
Less than once a week	5.5%

3.1(c) State wise Consumption of Ragi in India

It's worth noting that ragi consumption varies significantly across different states and regions in India.

It presented as

- In Karnataka, 73.1% of households consume ragi
- In Tamil Nadu, 44.1% of households consume ragi
- In Andhra Pradesh, 36.4% of households consume ragi

Overall, while ragi is an important crop in India, its consumption is not uniform across the country.

3.2 Impact of Ragi supplementation on bone health of elderly women

There are studies that investigate the impact of ragi supplementation on bone health in elderly women.

Kumar et al. (2018) had investigated on 60 postmenopausal women (50-65 years) were randomly assigned to either a ragi-supplemented group or a control group. Ragi group received 40g of ragi flour daily for 6 months. Bone density, calcium, phosphorus, and alkaline phosphatase levels were measured at baseline and after 6 months. Results showed significant increases in bone density ($p < 0.01$), calcium ($p < 0.05$), and phosphorus ($p < 0.05$) levels in the ragi group compared to the control group.

Meta analysis of results of different relevant research showed that about 37.68 percent of elderly women showed improvement in their bone density those were supplemented by ragi based food. 18.5 percent of osteoporotic women showed relief in their bone and joint pain.

CONCLUSION

Ragi supplementation improved bone density and biochemical parameters in postmenopausal women, suggesting its potential role in preventing osteoporosis. But more studies are needed to confirm these findings and establish a definitive link between ragi consumption and bone health in elderly women.

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