

ROLE OF PHYTOESTROGEN AS FUNCTIONAL FOOD IN FEMALES DURING MENOPAUSE

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ABSTRACT

Many clinical aspects of women during menopause, such as psychological, physiological changes may influence quality of life. Menopause occurs typically between ages 45 and 55 years of age and is associated with hormonal changes, including a reduction of estrogen hormone and increase in follicle stimulating hormone. This hormone shift may lead to an increased risk of type 2 diabetes mellitus, osteoporosis, heart disease, metabolic syndrome, fatty liver diseases etc. Menopause is a natural biological process that progress with aging and it is characterized by the complete stop of the menstrual cycle resulting from the cessation of ovarian function. Phytoestrogens are natural compounds derived from plants; they offer potential benefits for females in reducing menopausal symptoms. The primary objective of this review paper is to compile literature on menopause, with a focus on the factors that influence menopausal health in both positive and negative way. A number of studies have found a link between menopausal symptoms and quality of life in women. Lifestyle modifications such as dietary interventions, play a significant role in the prevention of CVD, Diabetes, Osteoporosis etc. Depending on today's living and poor dietary habits, women have focused on the efforts to protect or improve their health status, especially due to intense work pace and increased poor eating habits.

Keywords: Functional foods, Phytoestrogen, Menopause, Cardiovascular disease, Osteoporosis.

INTRODUCTION

Menopause is the permanent discontinuation of menses caused by the reduction of estrogen production. This defined by age of approximately 45-55 years of age. Estrogen has a positive effect on inflammation, oxidative stress, production of nitric oxide by vascular aging, which indicates the continuing stiffening of arteries and reduction in vasodilatory capacity. Reduced estrogen production with menopause may be responsible for accelerated vascular ageing. It is well established that the maintenance of high-quality sleep is necessary for healthy ageing. Specific sleep disturbances mostly observed in menopause are insomnia, poor sleep quality, sleep deprivation, excessive daytime sleepiness and sleep disorders such as obstructive sleep apnea, restless legs syndrome, depression, and several different mood and anxiety related disorders. Disturbed sleep quality is also associated with poor quality of life, increased energy intake, intake of high fat and high sugar foods, decreased physical activity, weight gain and obesity risk. The structure of phytoestrogens is very similar to endogen estradiol derived from plants. Sources of phytoestrogens are widespread in Asian regions. They have health benefits, including reproductive health, heart health, a role in weight loss, hormone dependent tumors,

bone and skin health and the immune system. The most common sources of Phytoestrogen are legumes, grapes, peanuts, nuts, broccoli, cabbage, spinach, flaxseed, seeds, garlic, soyabean. Phytoestrogens can also suppress the clinical symptoms of menopause caused by a decrease in the production of endogenous estrogen.

MATHEODOLOGY

In October 2024, a nonsystematic literature search was conducted using the google scholar, PubMed electronic database to screen papers with the following search strategy; ‘functional food’, ‘phytoestrogen’, ‘menopause transition’, cardiovascular health, better sleep health. The same researches were also performed prior to submission of the final manuscript.

MENOPAUSAL SYMPTOMS

Table 1: Health problems in menopausal women

Symptoms	Reference	Conclusion
Hot flushes (49%), irritability (48.33%), anxiety (44.37%)	Saha <i>et al.</i> (2023)	They conclude that most of the women suffered these physiological and psychological symptoms.
Fatigue (67.8%), insomnia (43.4%), night sweats (44.2%), vaginal dryness (31%), poor memory (31%) etc.	Ganitha <i>et al.</i> (2017)	They conclude that most women were affected by menopausal symptoms because lack of awareness and inaccessibility of health services.
Anxiety (80%), physical and mental exhaustion (71.5%), sleep problem (61.2%), irritability (60.7%), heart problems (54%), hot flushes (36.7%) etc.	Kalhan <i>et al.</i> (2020)	They conclude that perimenopausal women were more risk of physical and psychological symptoms, so this stage women need more attention in comparison than postmenopausal women.
Sweating, depressive mood, hot flushes, urogenital, sexual problems, bladder problems, dryness of vagina, heart discomfort, joint and muscular problems etc.	Vazirani and Ravichandran (2024)	They conclude that prevalence of menopausal symptoms was high at Sree Balaji medical college and hospital because most of the women have no proper advice and knowledge about these symptoms.
Hot flushes (49%), irritability (48.34%), anxiety (44.37%), depressive mood (35.76%), bladder problems (23.17%), sleep problems (19.87%), sexual problems 914.56%), heart discomfort (16.56%) etc.	Vishwas <i>et al.</i> (2023)	They conclude that menopause is a neglected condition for majority of the women. This study highlighted that physical activity may play a protective role in reduce menopausal symptoms.

SCIENTIFIC EVIDENCE AND CLINICAL STUDIES

1. Bone Health (Osteoporosis)
2. Heart Health (cardiovascular disease)

Other Disease	References	Conclusion
Cardiovascular Health	Meegaswatte <i>et al.</i> (2024)	They conclude that the risk of developing health issues was increased with the menopausal transition. Weight gain in menopause specially increased abdominal adipose contribute to cardiovascular risk.
Heart Disease	Wang <i>et al.</i> (2024)	This study showed that the abundance of menopausal symptoms was positively related with CVD risk in most of the Chinese women. 5.6% subjects were diagnosed with risk of CVD and menopausal symptoms were seen in more common in among females.
Osteoporosis	Saadeh <i>et al.</i> (2022)	This study found that mostly menopausal women have high prevalence of osteoporosis. There is crucial need to develop awareness programs about osteoporosis risk factors with menopausal symptoms.
Bone Health	Thangappah, <i>et al.</i> (2022)	This study showed that prevalence of osteoporosis (31.8%) and osteopenia (38.4%) were seen in pre and postmenopausal women. 14% premenopausal and 42.4% postmenopausal women were osteoporotic. It concluded that status, duration and age of menopause and past history of fractures have a major risk for bone health problems.

FUNCTIONAL FOODS AS PHYTOESTROGEN

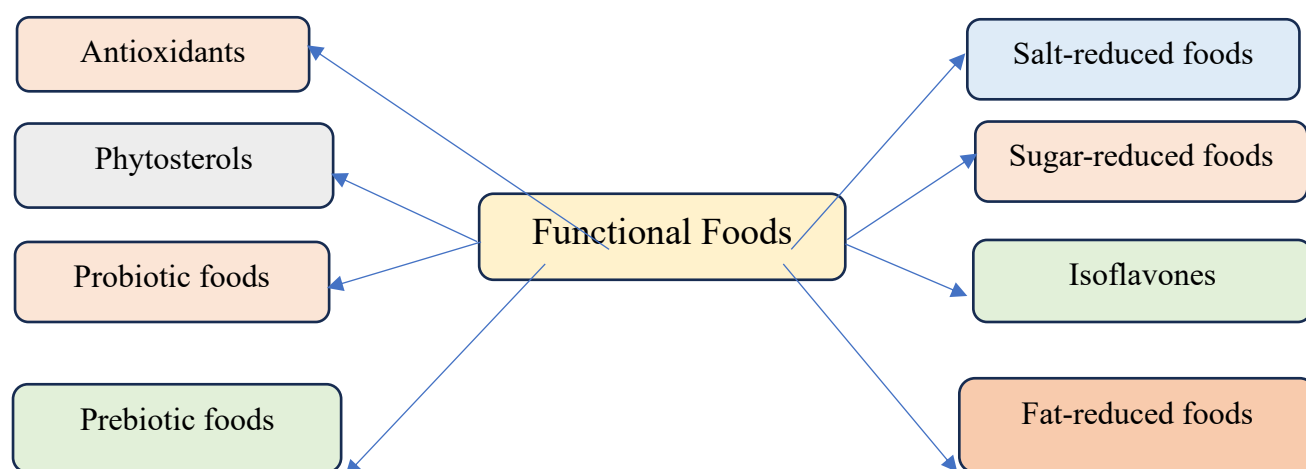


Fig. 1. Classification of Functional Foods

Table 2: Role of Phytoestrogen as functional food on menopause

Phytoestrogen food	Bioactive compound	Role on Menopause	References
Flax seeds	Lignin, ALA	Phytoestrogen have a magical power for reducing menopausal related problems. It mimics estrogen activity and offer potential relief during menopause and a lot of health benefit as a cardiovascular health etc.	Shaha et al. (2023)
Soyabean (soy products)	Isoflavones, B- estradiol	Helps in reduction of hot flushes and improves MRS score in menopausal females.	Kaur et al. (2020)

CONCLUSION

Functional food products and mixtures that have antioxidant and anti-inflammatory activity are proposed as novel strategies to decrease the symptoms and adverse health condition in menopausal women. There is a need for research focusing on the effectiveness of antioxidant and anti-inflammatory products in the overcome of menopausal problems in females. Moreover, dietary interventions (functional food recipe development) are important to reduce the adverse health condition in menopausal women.

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