International
Journal of Medical and Exercise Science
(Multidisciplinary, Peer Reviewed and Indexed Journal)

ORIGINAL ARTICLE

TO STUDY THE IMPACT OF SOCIOECONOMIC STATUS ON BONE MINERAL DENSITY AMONG SOUTH INDIAN WOMEN

Search engine:
www.ijmaes.org

Gladia R[1], T. Ashrin[2*], Jibi Paul[3]

Authors:
[1,3]Faculty of Physiotherapy, Dr. MGR. Educational and Research Institute, Chennai, Tamil Nadu, India
[2*]BPT Graduate, Faculty of Physiotherapy, Dr. MGR. Educational and Research Institute, Chennai, Tamil Nadu, India

Corresponding Author:
[*]BPT Graduate, Faculty of Physiotherapy, Dr. MGR. Educational and Research Institute, Chennai, Tamil Nadu, India, Email id: ashrinthurab@gmail.com

ABSTRACT

Background of the study: Osteoporosis is a worldwide disease characterized by reduction of bone mass and alteration of bone architecture resulting in increased bone fragility and increased fracture risk. It mainly affects premenopausal and postmenopausal women. In Indian women prevalence of osteoporosis mainly because of low calcium intake, vitamin D deficiency, sex in equality, early menopause, genetic predisposition, lack of diagnostic facilities and poor knowledge on bone health. The aim of the study is to find out the impact of socioeconomic status on bone mineral density in south Indian women. **Methodology:** It is an observational study and non-experimental type. 100 subjects taken for this study. The age group between 35-60 years and women only selected for this study. The study duration is 2 months. The material used are paper and pen. Modified BG prasad socioeconomic classification. Self-administrated socioeconomic status questionnaire. The participants were given self-administered socioeconomic questionnaire and classified according to their socioeconomic status based on Modified BG Prasad socioeconomic classification to find the (SES) of an individual. The mineral density was corelated using Quantitative calcaneal ultrasound and recorded. The recorded data were analysed and interpreted. **Result:** Quantitative calcaneal ultrasound T score bone mineral density has shown significantly lower mean value -2.66 (osteoporotic) and as a whole,5% osteoporosis in subjects with lower economic status. **Conclusion:** The study concluded that low SES is risk for Osteoporosis. So, the awareness among people is essential for good healthy lifestyles and prevent the dangers of osteoporosis.

Key Words: Osteoporosis; Socioeconomic status; Bone Mineral Density; BG Prasad SES

Received on 18th January 2023, Revised on 14th February 2023, Accepted on 20th February 2023
DOI:10.36678/IJMAES.2023.V09I01.002

INTRODUCTION

Women's health concern is influenced by interrelated biological, social, and cultural factors. It is a global health problem both in the developed and developing countries. In Indian women, due to increasing longevity and risk factors, such as low calcium intakes, sex inequality, vitamin D deficiency, early menopause, genetic predisposition, lack of diagnostic facilities, and poor knowledge of bone health, have contributed to the high prevalence of osteoporosis and fractures [1-5].

Causes of osteoporosis include increasing age, female sex, postmenopausal status, hypogonadism or premature ovarian failure, low body mass index, ethnic background, rheumatoid arthritis, low bone mineral density, vitamin D deficiency, low calcium intake, hyper kyphosis, alcohol abuse, current smoking, immobilization, and long-term use of certain medications [6,7].

Osteopenia increases the risk of osteoporosis and osteoporotic fractures as the person gets older. Osteoporosis is three times more common in women as compared to men. The greatest bone loss occurs in women as its associated with oestrogen insufficiency during perimenopause. 70% of women over the age 80 years have osteoporosis [8, 9].

The women from the Indian subcontinent who have migrated to western countries are at increased risk of accelerated age-related bone loss when compared to their counterparts living in the same geographic region due to their darker skin, conservative dressing such as "Burqa," "Sari," and "Salwar kameez," and their genetic pattern[10-15].

Aim of the study: To study the impact of socioeconomic status on bone mineral density among south Indian women. This study mainly focused on women's bone health and creating awareness among them to reduce the risk of osteoporosis.

Need of the study: Osteoporosis is a metabolic disorder affecting the females more commonly than males. The prevalence rate of osteoporosis is also relatively high. In spite of high prevalence socioeconomic status also has an impact on bone mineral density among women. And there is no knowledge about osteoporosis among women.

The need of the study is to see whether socioeconomic status could affect the bone mineral density among women. There is also a need to create awareness among female who are at the risk about their silent metabolic disorder.

METHODOLOGY

It is an observational study and non-experimental type. 100 subjects taken for this study. The age group between 35-60 years and women only selected for this study. The study duration is 2 months. The material used are paper and pen. Modified BG prasad socioeconomic classification. Self-administrated socioeconomic status questionnaire. The participants were given self-administered socioeconomic questionnaire and classified according to their socioeconomic status based on Modified BG Prasad socioeconomic classification to find the (SES) of an individual. The mineral density was corelated using Quantitative calcaneal ultrasound and recorded. The recorded data were analysed and interpreted. Inclusion criteria:

Procedure: This study mainly focused on women's socioeconomic status with 100

subjects as participants, self-administered SES questionnaire are framed and circulated to the participants and analysed using BG Prasad classification to measure the Socioeconomic status (SES) of an individual or family based on their monthly income.

The recorded data was analyzed and interpreted, and their BMD was correlated using quantitative calcaneal ultrasound and the participant who diagnosed with BMD was given awareness program and counselling to reduce the risk of osteoporosis.

Descriptive Statistics on Anthropometric Measures							
						Skewness	
Variables	N	Minimum	Maximum	Mean	Std. Deviation	Statistic	Std. Error
AGE	100	35.00	60.00	47.553	2.387	-.058	.589

Table - 1 Descriptive Statistics on Anthropometric Measures

CALCANEAL ULTRASOUND	
MEAN	-2.66
S. D	.151
t-test	-39.22
df	4
Significance	000***

Table – 2 Lower Economic Status - T Score Bone Mineral Density

CALCANEAL ULTRASOUND	
MEAN	-1.62
S.D	.349
t-test	-25.95
df	30
Significance	000***

(*-P ≤ 0.001)**

Table – 3 Upper Lower Economic Status - T Score Bone Mineral Density

The above table reveals the Mean, Standard Deviation (S.D), t-test, degree of freedom(df) and p-value of subjects . This table shows that statistically significant difference within subjects. (***P ≤ 0.001)

CALCANEAL ULTRASOUND	
MEAN	-1.46
S. D	.800
t-test	-12.93
df	49
Significance	000***

(*-P ≤ 0.001)**

Table – 4 Lower Middle Economic Status - T Score Bone Mineral Density

The above table reveals the Mean, Standard Deviation (S.D), t-test, degree of freedom(df) and p-value of subjects. This table shows that statistically significant difference within subjects. (***P ≤ 0.001)

CALCANEAL ULTRASOUND	
MEAN	-.789
S. D	.979
t-test	-3.01
df	13
Significance	000***

(*-P ≤ 0.001)**

Table – 5 Upper Middle Economic Status - T Score Bone Mineral Density

The above table reveals the Mean, Standard Deviation (S.D), t-test, degree of freedom(df) and p-value of subjects . This table shows that statistically significant difference within subjects. (***P ≤0.001)

DISCUSSION

Osteoporosis is a “silent killer” disease of bone. Osteoporosis is a major problem of health care delivery services, both in the developed and developing countries. It is estimated that by 2050, one out of every two fractures worldwide will occur in Asia. This study concentrates to assess the effect of the socioeconomic status on the women awareness and the bone density status among women. The results indicated that the socioeconomic status like educational level and poverty are considered as risk of osteoporosis. Like other studies, this study shows that poor knowledge about osteoporosis [16,17].

Osteoporosis is a "silent killer" disease of bone. Osteoporosis is a major problem of health care delivery services, both in the developed and developing countries. It is estimated that by 2050, one out of every two fractures worldwide will occur in Asia [18].

Osteoporosis is more among household women. This study concluded that significant number of women had osteoporosis and osteopenia within 35-40 years age group. So proper awareness about osteoporosis causative factor and preventive measures targeted to household women may play an important role [19].

Association of lifestyle and food consumption with bone mineral density among people aged 50 years and above. This study conclude that high prevalence of osteoporosis and osteopenia was found in older people and it was found to be significantly associated with age, sex lower BMI, Smoking habit, and daily calcium consumption [20,21].

Pawan Kumar Sharma 2019 et al. Did a review on low bone mineral density and its risk factors in an urban adult population of South Indian. This study concluded that low BMD is highly prevalent in South Indian urban population. And low BMD and osteoporosis were positively associated with increasing age so early identification and preventive measures are more important [22].

The purpose of the study is to find the impact of socioeconomic status on bone mineral density among south Indian women. This study concentrates to assess the effect of the socioeconomic status on the women awareness and the bone density status among women. The results indicated that the socioeconomic status like educational level and poverty are considered as risk of osteoporosis. Like other studies, this study shows that poor knowledge about osteoporosis. Patient with a high risk is referred to orthopaedician and a physiotherapist [23].

Ethical clearance: Ethical clearance was obtained from the ethical Institutional Review Board of Faculty of Physiotherapy, Dr. MGR. Educational and Research Institute, Chennai with reference No: B-07/PHYSIO/IRB/2019-2020 approval letter dated 07/01/2020.

Conflicts of Interest: There is no conflict of interest to conduct and publish this study.

Fund for the study: This is self-funded study, no fund received from any organization.

CONCLUSION

The results indicated that the socioeconomic status like educational level and poverty are considered as risk of osteoporosis.

I suggest the awareness programme should be conducted in the general population and create awareness about osteoporosis.

The awareness among people creates the good healthy lifestyles and prevent the dangers of osteoporosis.

REFERENCE

1. Riggs BL, Khosla S, Melton LJ., III A unitary model for involutional osteoporosis: estrogen deficiency causes both type I and type II osteoporosis in postmenopausal women and contributes to bone loss in aging men. J. Bone Miner. Res. 1998; 13:763–773.
2. Hofbauer LC, et al. The roles of osteoprot-egerin and osteoprotegerin ligand in the paracrine regulation of bone resorption. J. Bone Miner. Res. 2000; 15:2–12.
3. Shevde NK, Bendixen AC, Dienger KM, Pike JW. Estrogens suppress RANK ligandind-

uced osteoclast differentiation via a stromal cell independent mechanism involving c-Jun repression. Proc. Natl. Acad. Sci. USA. 2000; 97:7829–7834.

4. Bullamore JR, Wilkinson R, Gallagher JC, Nordin BE. Marshall DHEffect of age on calcium absorption. Lancet. 1970 Sep 12;2(7672):535–7.
5. Cummings SR, Browner WS, Bauer D, Stone K, Ensrud K, Jamal S, Ettinger B. Endogenous hormones and the risk of hip and vertebral fractures among older women. Study of Osteoporotic Fractures Research Group. N Engl J Med. 1998; 339:733–738.
6. Gail A Greendale MaryFran Sowers, Weijuan Han Mei-Hua Huang, Finkelstein Joel S, Crandall Carolyn J, Lee Jennifer S, Karlamangla Arun S. Bone mineral density loss in relation to the final menstrual period in a multiethnic cohort: Results from the Study of Women's Health Across the Nation (SWAN) J bone Min Res. 2012;27(1):111.
7. Garnero P, Sornay-Rendu E, Duboeuf F, Delmas PD. Markers of bone turnover predict postmenopausal forearm bone loss over 4 years: the OFELY study. J Bone Miner Res. 1999 Sep;14(9):1614–21.
8. Riggs BL, Khosla S, Melton LJ., III A unitary model for involutional osteoporosis: estrogen deficiency causes both type I and type II osteoporosis in postmenopausal women and contributes to bone loss in aging men. J. Bone Miner. Res. 1998; 13:763–773.
9. World Health Organization Collaborating Centre for Metabolic Bone Diseases [October 28, 2009]; FRAXA WHO Fracture Risk Assessment Tool. Available at: http://www.shef.ac.uk/FRAX/.
10. Stone KL, Seeley DG, Lui LY, et al. For the Study of Osteoporotic Fractures Research Group BMD at multiple sites and risk of fracture of multiple types: long-term results from the Study of Osteoporotic Fractures. J Bone Miner Res. 2003; 18:1947–1954.
11. Heaney RP, Zizic TM, Fogelman I, et al. Risedronate reduces the risk of first vertebral fracture in osteoporotic women. Osteoporos Int. 2002;13(6):501–505.
12. Sarrel PM, Njike VY, Vinante V, Katz DL. The Mortality Toll of Estrogen Avoidance: An Analysis of Excess Deaths Among Hysterectomized Women Aged 50 to 59 Years. Am J Public Health. 2013 Sep;103(9):1583–1588. Epub 2013 Jul 18.
13. Dunnewind T, Dvortsin EP, Smeets HM, et al. Economic consequences and potentially preventable costs related to osteoporosis in the Netherlands. Value Health 2017;20(06):762–768.
14. Mitra S, Desai M, Ikram M. Association of estrogen receptor gene polymorphisims with bone mineral density in postmenopausal Indian women. Mol Genet Metab. 2006; 87:80–8.
15. Kanis JA, Johnell O, Oden A, Sembo I, Redlund-Johnell I, Dawson A, et al. Long-term risk of osteoporotic fracture in Malmö. Osteoporosis Int 2000; 11:669-74.
16. Mithal A, Bansal B, Kyer CS, Ebeling P. The Asia-pacific regional-epidemiology, costs, and burden of osteoporosis in India 2013: A report of international osteoporosis foundation. Indian J Endocrinol Metabolism 2014; 18:449-54.
17. Rossini M, Adami S, Bertoldo F, et al. Guidelines for the diagnosis, prevention and management of osteoporosis. Reumatismo 2016;68(01):1–39.
18. Management of osteoporosis in postmenopausal women: 2010 position statement of The North American Menopause Society. Menopause 2010;17(01):25–54, quiz 55–56.

19. Nidhi S Kadam, et al: Prevalence of osteoporosis in apparently healthy adults above 40 years of age in Pune city, India. Indian Journal of Endocrinology and Metabolism; 2018; 22:67-73.
20. Mithal A, Wahl DA, Bonjour JP, Burckhardt P, Dawson-Hughes B, Eisman JA, et al. Global Vitamin D status and determinants of hypovitaminosis D. osteoporosis Int. 2009;20:1807-20.
21. Gopinath NR, Sen RK, Behra P, Aggarwal S, K handelwal N, sen M. Awareness of osteoporosis in postmenopausal Indian women: AN evaluation of Osteoporosis Health Belief scale. J Life Health 2016; 7:180-4.
22. Winzenberg TM, Oldenburg B, Frendin S, Jones G. The design of a valid and reliable questionnaire to measure osteoporosis knowledge in women: the osteoporosis knowledge Assessment Tool (OKAT) BMC Musculoskelet Disord. 2003; 4:17.
23. Pacifici R. Estrogen, cytokines, and pathogenesis of postmenopausal osteoporosis. J Bone Miner Res. 1996; 11:1043–1051.

Citation:
Gladia R, T. Ashrin, Jibi Paul (2023). To study the Impact of Socioeconomic Status on Bone Mineral Density Among South Indian Women , ijmaes; 9 (1); 1428-1434.