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KEYWORDS : Women, Lifestyle and food habits, Bone disorders, Bone Mineral Density

Incidence and risk factors of bone disorders among selected working women

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ABSTRACT

World Health Organization has declared the first decade of 21st century as "Decade for bone and joint disorders". Low bone mass fractures is the sixth most disability causing disease in world. Biologically women are more prone to low bone mass disorders. Moreover, the change in life style, food habits and stress has made working women vulnerable to disorders like osteopenia. The present study is focused on measuring Bone Mineral Density among selected group of working women and attributing the reasons of bone disorders with respect to food habits, body-mass index and life style patterns.

INTRODUCTION

Good health is a major resource and an important dimension of the quality of life. But in present times, changes in lifestyle and dietary pattern stemming from rapid modernization have favoured an increase in the occurrence of non communicable yet chronic and degenerative diet related diseases (Parvathi et al., 2008). Changing demographic profile and technological progress have lead to many health problems, coupled with sedentary life style and unsuitable diets, which have contributed to chronic degenerative diseases like cardiovascular diseases, diabetes mellitus, osteoporosis, arthritis, hypertension and other disorders (Semple et al., 2004). Urban populations are at increased risk for noncommunicable disease, through exposure to unhealthy diets and by leading a sedentary life (Raghuvanshi, 2013).

Osteoporosis is a major public health threat worldwide. Studies have reported that Asian women have higher predisposition for osteoporosis than their Caucasian counterparts (Anuradha and Neha, 2013). The prevalence of osteoporosis and low bone mass is expected to increase worldwide with increased aging of the population.

Women are at greater risk of developing osteoporosis than men. This is because changes in hormone levels can affect bone density. The female hormone estrogen is essential for healthy bones. After the menopause, the level of estrogen in the body falls and this can lead to a rapid decrease in bone density. Estrogen stimulates osteoblasts and post menopausal women have reduced osteoblastic activity. This leads to a decrease in the bones organic matrix, which causes osteoporosis (Cummings, 2002).

The osteoporosis landscape in India and many research lighted up the hard fact that the prevalence of bone related disorders has increased rapidly in women of different ages. Inadequate nutrition and lifestyle changes is associated with the prevalence of bone related disorders among women. In a study among Indian women aged 30-60 years from low income groups, Bone Mineral Density (BMD) at all the skeletal sites were much lower than values reported from developed countries, with a high prevalence of osteopenia (52%) and osteoporosis (29%) thought to be due to inadequate nutrition (Shatrugna et al., 2005). According to a study inadequate knowledge of women about healthy lifestyles and their lack of timely awareness to assess the risk factors and screening tests account for developing this debilitating condition (Iran, 2014). Imparting knowledge, inculcating preventive behavior towards a healthy lifestyle could ultimately aid in the prevention of lifestyle diseases (Mane et al 2012).

Every year, there are an estimated 500,000 spinal fractures, 300,000 hip fractures, 200,000 broken wrists and 300,000 fractures of other bones. About 80 per cent of these fractures occur from relatively minor falls or accidents (www.asianhealthsecrets.com).

Adequate calcium intake, vitamin D synthesis and exercise are the three crucial elements in determining peak bone mass. Thus there is an urgent need for greater public awareness about osteoporosis. For the women, middle aged and elderly, by way of early detection and treatment of osteoporosis with available agents can significantly reduce the risk of fractures and associated morbidity and mortality.

OBJECTIVES

The current study was carried out with the following objectives :

- To determine the socio-economic, lifestyle pattern, dietary habits and other details of selected working women
- To determine the health status and assess the Bone Mineral Density (BMD) of working women
- To find the incidence of bone related risk of the selected urban working women

METHODOLOGY

The current study was conducted among urban working women population in an education institution in Coimbatore city. Based on the cooperation extended and the availability of other facilities 150 women between the 25 years to 65 years were selected. The study was explained to the subjects in groups and their acceptance to participate in the study was obtained on voluntary basis.

A well structured questionnaire was formulated to elicit information on the socio-economic status, lifestyle pattern, food consumption pattern, health status and reproductive history were collected. The height and weight was measured using standard procedure and Body Mass Index was computed. The blood pressure was measured using sphygmomanometer with the help of medical practitioner.

The health status, clinical assessments and bone mass was assessed for the selected working women. The Bone Mineral Density (BMD) was detected using ultra sound bone densitometer at crown heel measurement technique by an expert technician. The WHO criteria was used to evaluate the BMD and the datas were recorded and analysed. After screening the results, the participants were given nutrition education regarding dietary recommendations, healthy diet, exercises and lifestyle modifications.

RESULTS AND DISCUSSION

The results pertaining to the present study are presented and discussed under the subsequent headings:

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A. SOCIO-ECONOMIC STATUS

Demographic factors like age, sex, marital status, educational qualification, type of family, income level and expenditure pattern are the factors that influence the socio-economic profile and also play an important role on the consumption pattern of food and the nutrient intake of the selected subjects . 2008.

Table- I shows the socioeconomic details of the selected women

Table - I

PARTCULARS	No.	Percent
AGE (Years)		
25 - 35	28	18.7
36 - 45	38	25.3
46 - 55	39	26.0
56 – 65	45	30.0
EDUCATIONAL STATUS		
Higher secondary	15	10.0
Graduation	18	12.0
Post Graduation and above	117	78.0
MARITAL STATUS		
Married	120	80.0
Unmarried	30	20.0
FAMILY TYPE		
Nuclear Family	96	64.0
Joint Family	54	36.0
MONTHLY INCOME		
Low Income (< Rs.5000)	18	12.0
Middle Income	34	22.7
(Rs.5000- Rs. 20000)		
High Income (> Rs.20000)	98	65.3

Socio-economic background of the selected working women

Table I shows that the selected working women belonged to varied age group from 25 to 65 years.

With regard to education level of the selected working women population, majority of them (78 %) have qualified post graduation and above and minority (10%) had completed the higher secondary education. Greater part (80%) of the selected working women were married and belonged to nuclear family system of 64 per cent. With regard to income status most of the selected women of 65.3 per cent were earning more than Rs. 20,000 per month and minority of 12 per cent were getting less than Rs. 5000 per month.

B. DIETARY PATTERN

Table II gives the details on the dietary pattern of the selected women

Table – II

Dietary pattern of the selected women

PARTICULARS	No.	Perc
DIET PATTERN		
Vegetarian	36	24
Non-vegetarian	98	65
Ova-vegetarian	16	11
MEAL PATTERN		
< 3 Meals	26	17
3 Meals	117	78
> 3 Meals	7	5
FOOD MODIFICATION		
Regular food pattern	98	65
Irregular food pattern	24	16
Modified diet	28	19

Table II shows that majority 65 per cent of the selected women belonged to non-vegetarian diet pattern followed by vegetarian diet of 24 per cent. According to Dholakia (2006) the increased amount of minerals and vitamins in vegetarian foods contribute richly to smooth functioning of bone metabolism. The activity of non-vegetarian diet initiates and permeates bone demineralisation as seen by serial bone mineral density studies done by direct photon absorptiometry. It was clear from Table II that majority 78 per cent of the women planned three meals per day and minority 5 per cent followed more than three meals. Greater part of 65 per cent of the selected women were following regular food pattern. Their working condition would be the reason for maintaining such habitual food pattern and least portion of 19 per cent had the habit of modification of their diet pattern for personal and other reasons.

C. ANTHROPOMETRIC MEASURE MENTS

Height, Weight and BMI Measurements

The height and weight measurements of the selected subjects is given in Table-III

Table - III

Height, Weight and Body Mass Index of selected working women

Age	Mean		
	Weight (kg)	Height (m)	B.M.I (kg/m2)
25-35	59.43	1.64	22.21
36-45	63.61	1.59	25.32
46-55	64.49	1.58	25.78
55-65	67.42	1.60	26.32

It is evident from Table III that as age increases the body weight boost. Greater part of the selected women had a normal weight and height measures in the middle of 25 – 35 years and age increases body weight is gained. This may be due to various reasons such as sedentary life styles, physiological factors and weight gained during pregnancy.

The Indian reference women have been defined as having an ideal body weight 55kg (ICMR, 2008). The risk of developing osteoporosis increases with age, sex and lack of physical activity (Carney, 2007).

D. BODY MASS INDEX AND BONE MINERAL DENSITY

Figure - I illustrates the Body Mass Index of the selected women.

Figure – II

Bone Mineral Density Measurements of the selected working women

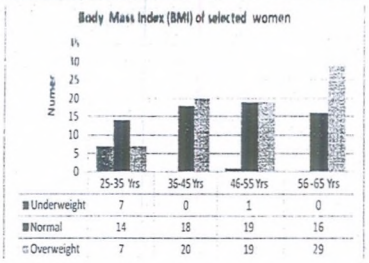
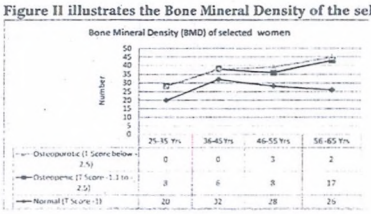


Figure – I Body Mass Index Measurements of the selected women

The body-mass index of women at various age categories is plotted. The normal weight subjects are present in all categories consistently. Under-weight women are present in 25 to 35 years age group only. As women grow older, they tend to gain weight and retain it. Moreover, as age increases, the body-mass index increases steadily. This is attributed to low physical work occupation of subjects.

Figure II illustrates the Bone Mineral Density of the selected



It was observed that among the selected population, 71 per cent women had normal bone mineral density. Among the working women category 26 per cent were osteopenic and three per cent osteoporotic women. Hence nearly one third of the selected women were suffering from bone disorders and low bone mass.

Women with adequate bone mass density are present in all age group in almost equal proposition. This is followed by osteopenic women, who have susceptible bone loss. The proportion of osteopenic women increases with age. Women with osteoporotic condition are present above age of 46 years. Generally accelerated bone-loss is observed above 45 years. This is attributed to menopause occurring in women after 45 years. The deprivation of estrogen cause accelerated bone-loss in women.

Figure III gives the age wise distribution of bone mineral status.

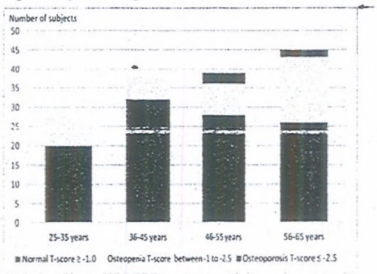


Figure III
Age wise distribution of the Bone Mineral Density Measurements of selected women

Figure IV
Family history of illness of the selected working

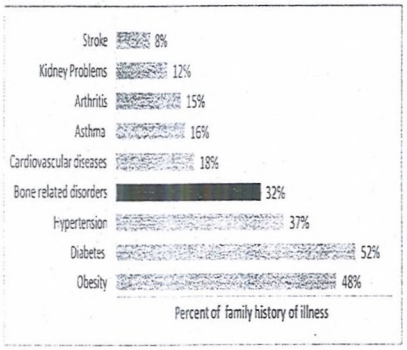
E. FAMILY HISTORY OF ILLNESS

Family history is also a factor in the development of osteoporosis. Studies have shown that young women whose mothers have suffered vertebral fractures often have reduced bone mass themselves however, a family history of the disease is also considered a risk factor for men (Recker and Deng, 2007).

Some of the research findings have highlighted the importance of some dietary factors for bone health in early stages (Kevin, 2007).

Figure IV gives the details of family history of illness among the selected working women.

It was observed that among the selected women many of them had the family history of illness such as obesity (48%), diabetes mellitus (52%), hypertension (37%), bone related disorders (32%), cardiovascular diseases (18%), asthma (16%), arthritis (15%), kidney problems (12%) and stroke (6%).



CONCLUSION

The present study revised the bone health of the working women and relation between BMI and BMD was drawn. Almost 30 per cent of the working women were diagnosed for low bone disorders, including 3.5 per cent of osteoporosis condition.

Underweight in young women (25 – 35 years) and overweight in adult women (> 45 years) were prime reasons for osteopenic condition. The study reveals young pre-menopausal women entering osteopenic condition. The sedentary life style, lack of nutrient rich food choice, and less physical activity before menarche are certain reasons for this trend. The economic cost and social burden in treating fracture persons encourages us to identify and develop strategies to combat osteopenia. Nutritional supplements coupled with easy yoga exercises can be proposed for improvement in bone mass.

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