Available online at www.ijpcr.com
International Journal of Pharmaceutical and Clinical Research 2017; 9(11): 690-695

ISSN- 0975 1556

Research Article

Assess the Prevalence of Osteoporosis Among Middle Aged Women in Mamandur

Abirami P, M Nithya, K Priyanka, G Hemalatha

SRM college of nursing, Potheri, SRM Nagar, Kattankulathur, Tamil Nadu 603203

Received: 4th Oct, 17; Revised 17th Nov, 17, Accepted: 20th Nov, 17; Available Online:25th Nov, 17

ABSTRACT

Objective: The aim of this study was to determine the prevalence of Osteoporosis among Middle Aged Women and to associate the prevalence of Osteoporosis among Middle Aged Women with their demographic and Clinical variables. Methods: Quantitative approach and non-experimental descriptive research design was used. The data collection included two parts. Part A: Demographic variables, Part B:Clinical Variables, Part C: Standardized rating scale to assess the bone mineral density.A total of 130 middle aged women who fulfilled the inclusion criteria were chosen as samples by using non-probability purposive sampling technique. The study was conducted at Mamandur, Kancheepuram dt. Results: The data were analyzed and interpreted based on the objectives using descriptive and inferential statistics. Among 130 clients , 28 (22%) have normal T- score (< - 1.0); 66(51%) have osteopenia (- 1.0 to - 2.5) ; 36 (28%) have osteoporosis (- 2.6 to - 4.0) and there is a statistical significant association on prevalence of osteoporosis among middle aged women with their demographic variables like age and type of family with T – score levels at 95% ($P < 0.05$). Conclusion: Osteoporosis is an important public health problem leading to an increased risk of developing spontaneous and traumatic fractures. Because of the morbid consequences of osteoporosis, the prevention of this disease and its associated fractures is considered essential to the maintenance of health, quality of life, and independence in the elderly population.

Keywords: Prevalence of Osteoporosis, Middle Aged Women, Bone mineral density, Osteoporosis, Osteopenia.

INTRODUCTION

Bone is a living, dynamic tissue that undergoes constant remodeling throughout life. This is necessary to allow the skeleton to increase in size during growth, respond to the physical stresses placed on it, and repair structural damage due to structural fatigue or fracture. This process requires a range of proteins and minerals, which are absorbed from the bloodstream[1]. In childhood, bones grow and repair very quickly, but this process slows down as you get older. Bones stop growing in length between the ages of 16 and 18, but continue to increase in density until late 20s. From about the age of 35, gradually lose bone density. This is a normal part of ageing, but for some people it can lead to osteoporosis and osteoporosis is a condition that affects the bones, causing them to become weak and fragile and more likely to break[2]. Before a woman reaches 30 years of age her body gains more bone than it loses. Around age 30, this process balances out. However, the onset of menopause around 50 years of age may speed up the rate of bone loss. If bone loss becomes severe, a woman may develop osteoporosis. The condition can be prevented by exercising regularly and making some other lifestyle changes[3]. Osteoporosis has been operationally defined on the basis of bone mineral density (BMD) assessment. According to the WHO criteria, osteoporosis is defined as a BMD that lies 2.5 standard deviations or more below the average value for young healthy women (a T-score of <-2.5 SD) S(1,6)". It is often referred as a "silent theif" disease because the first visible clinical sign of osteoporosis is often the fracture of the hip, spine or forearm. Osteoporosis ranks as one of the costliest diseases of aging after diabetes, hyperlipidemia, hypertension and heart diseases. In India it is highly prevalent women are reported to be affected. Recent data indicate that Indians have lower bone density than north-American and European women and also it is reported that osteoporotic fractures occur 10-20 years earlier in Indian women as compared to Caucasians[4]. Osteoporosis is characterized by low bone mass with micro architectural deterioration of bone tissue leading to enhance bone fragility, thus increasing the susceptibility to fracture[5]. Osteoporosis is characterized by low bone mass with micro architectural deterioration of bone tissue leading to enhance bone fragility, thus increasing the susceptibility to fracture. Osteoporosis is an important public health problem leading to an increased risk of developing spontaneous and traumatic fractures. In India osteoporotic fractures occur more commonly in both sexes, and may occur at a younger age than in the western countries. Although exact numbers are not available, based on available data and clinical experience, 36 million Indians may be affected by osteoporosis by 2013[6].

According to estimates, there are about 300 million people with osteoporosis in India and suspect it may be more over double the population of Australia. The evidence based on ageing population indicates that there may be a 50 per cent

**Author for Correspondence: abiramikarnamurthy@gmail.com*

Category	T- score range
Normal	T- score ≥ - 1.0
Osteopenia	-2.5 < t – score <- 1.0
Osteoporosis	T – score ≤ - 2.5
Severe osteoporosis	T – score ≤ - 2.5 with fragility fracture

increase in the number of people with osteoporosis in India in the next 10 years. So, this is a huge problem in India[7].

The World Health organization reveals that one out of three adult females in India suffers from osteoporosis, making India one of the worst affected countries in the world. The Arthritis Foundation of India says there has been an estimated 200 per thousand cases across Asia in 10 years. In India at the end of 2000, there were an estimated 9 million new osteoporotic fractures, of which 1.6 million were at the hip, 1.7 million were at the forearm and 1.4 million were clinical vertebral fractures. By 2050, the worldwide incidence of hip fracture in men is projected to increase. The combined lifetime risk for hip, forearm and vertebral fractures coming to clinical attention is around 40%, equivalent to the risk for cardiovascular disease[8].

Bones stop growing in length between the ages of 16 and 18, but bone density continues to increase slowly until a person's late 20s. At this point the balance between bone demolition and bone construction becomes stable. After the age of around 35, bone loss increases very gradually as part of the natural ageing process. This can lead to osteoporosis and an increased risk of broken bones, especially in later life. Women are particularly susceptible because bone loss becomes more rapid for several years following the menopause[9].

Because of the morbid consequences of osteoporosis, the prevention of this disease and its associated fractures is considered essential to the maintenance of health, quality of life, and independence in the elderly population. In May 1998, the Fifty-first World Health Assembly, having considered The world health report 1997: conquering suffering, enriching humanity, which described the high rates of mortality, morbidity and disability from major non communicable diseases – including osteoporosis, adopted a resolution requesting the Director-General to formulate a global strategy for the prevention and control of non communicable diseases. A scientific group meeting subsequently reported on the prevention and management of osteoporosis. The report of the present Scientific Group on Assessment of Osteoporosis at the Primary Health Care Level is a further step in the development of cohesive strategies for tackling osteoporosis in response to the World Health Assembly resolution. It is expected that the report of this meeting will lead to improvements in the assessment of osteoporosis patients throughout the world, and make a valuable contribution to the development of effective global strategies for the control of this important disease[10]. Worldwide osteoporosis cause more than 8.9 million fractures annually resulting in a osteoporotic fracture every 3 seconds. Osteoporosis is estimated to affect 200 million women worldwide approximately one tenth of women aged 60, one fifth of women aged 70, two fifth of women aged 80 and two third of women aged 90. In India about 26 million were estimated to suffer from osteoporosis in 2003, which is projected to rise to 36 million by 2013 osteoporosis, is a major health problem thats particularly prevalent among women than in men at a ratio of 4 : 1[11]. Bone loss happens gradually and can progress without any warning signs untill the disease is advanced. The one in six lifetime risk of getting a hip fracture is greater than one in nine risk of developing breast cancer and the death rate is higher. Therefore osteoporosis is not usually diagnosed because it remains asymptomatic until fracture occurs with advancing age, giving rise to significant mortality and morbidity[12].

Once a fracture occurs due to osteoporosis, 20 % of the patient meet with death and 50 % of them do not regain their normal movement again. The current WHO figures estimates that over 270 million people are likely to suffer osteoporosis is often reffered as "silent thief ". Osteoporosis is not usually diagnosed because it remains asymptomatic until fracture occurs with advancing age, giving rise to significant morbidity and some mortality. Once a fracture occurs due to osteoporosis, 20 % of the patients meet with death and 50% of them do not regain their normal movement again. The current WHO estimates that over 270 million people are likely to suffer osteoporosis by the year 2020 AD in India[13].

METHODS

Quantitative approach and non-experimental descriptive research design was used. A total of 130 middle aged women who fulfilled the inclusion criteria were chosen as samples by using non-probability purposive sampling technique. The study was conducted at Mamandur,Kancheepuram dt. The data collection included two parts. Part A: Demographic variables, Part B:Clinical Variables, Part C: Standardized rating scale to assess the bone mineral density.The Study variable was Prevalence Of Osteoporosis among Middle aged Women and the Demographic variables were Age, gender, religion, education, occupation, family monthly income, socio economic status, type of family, type of diet, Clinical variables were Height, Weight, BMI

Criteria for sample selection

The investigator adopted following selection criteria to select the Samples. The Inclusion Criteria were Women who are between the age group of 35 – 45 years, residing in selected villages, willing to participate in the study and able to read, write, speak Tamil or English Women who are Physically ill during the time of data collection were excluded from the study.

Ethical consideration

Formal approval was obtained from the Institutional Review Board and Institutional Ethical Committee of SRM University, Kattankulathur, Chennai, Tamil Nadu, India. In addition, the participants were informed of their right to withdraw anytime during the study.

Instruments

The Demographic and clinical Variables tool was developed by the investigator based on the review of literature discussion with experts and investigators

Table 1: Frequency and percentage distribution of demographic data among the middle aged women in mamandur. N = 130

Demographic variable		Frequency(n)	Percentage(%)
Age	35-40 Years	77	59
	41-45 Years	53	41
Religion	Hindu	113	87
	Muslim	17	13
Gender	Male	0.0	0
	Female	130	100
Education	Graduate or Post Graduate	2	2
	High School Certificate	23	18
	Middle School Certificate	29	22
	Primary School Certificate	38	29
	Illiterate	38	29
Occupation	Un Skilled Worker	105	81
	Unemployed	25	19
Family Income	Rs.1596 - Rs.4726	75	58
	Rs.4722 -Rs. 7877	24	19
	Rs.7877 – Rs.11876	5	4
	Rs. 11876 – Rs.15753	21	16
	Rs.15753 And Above	5	4
Type of Family	Nuclear Family	90	69
	Joint Family	40	31
Type of Diet	Vegetarian	8	6
	Non Vegetarian	122	94
Height	140 – 150	69	53
	151 – 160	47	36
	161 – 170	14	11
Weight	Below 45	32	25
	46 – 55	48	37
	56 – 65	28	22
	Above 65	22	17
BMI	< 18.50 (Underweight)	18	14
	18.50 – 24.99(Normal)	56	43
	25.00(Overweight)	1	1
	25.00 – 29.99 (Pre – Obese)	36	28
	30.00 – 34.99 (Obese Classification – I)	16	12
	35.00 – 39.99 (Obese Classification – II)	3	2

Table 2: Assessment of prevalence of osteoporosis among middle aged women in Mamandur.

		Frequency (n)	Percentage (%)
T – Score	Normal T – Score < -1.0	28	21.5
	Osteopenia -1.0 to -2.5	66	50.8
	Osteoporosis - 2.6 to -4.0	36	27.7
	Total	130	100.0

Table reveals that among 130 clients 28 (22%) have normal T- score (< - 1.0) ; 66(51%) have osteopenia ; (- 1.0 to - 2.5) 36 (28%) have osteoporosis (- 2.6 to - 4.0) .

personal experience. To assess the Bone Mineral Density, Bone mineral Densitometer was used and standardized rating scale were used to assess the prevalence.The scoring Interpretation includes as follows

Method of data collection

The formal permission was obtained from the head of the department of community medicine. The investigator explained the objectives and method of data collection to the clients and it was carried out within the given period of 1 week at Mamandur. Verbal concern was obtained from the samples in Mamandur to carry out the main study from 09.03.2017 to 17.03.2017

The samples was chosen through non probability purposive sampling technique. A total number of 130 clients who met the inclusion criteria were selected . The investigator explained the purpose of conducting the study and reassured the client that the collection will be kept confidential

On selection of the subject, a self introduction was given. Consent was obtained and confidentiality of the response was assured. The investigator assessed the prevalence of osteoporosis by distributing the tools to the sample and bone mineral density test was assessed by Bone mineral densitometer. In case of any doubts the investigators clarified the doubts .On average it took 15minutes for an individual to Complete the assessment.

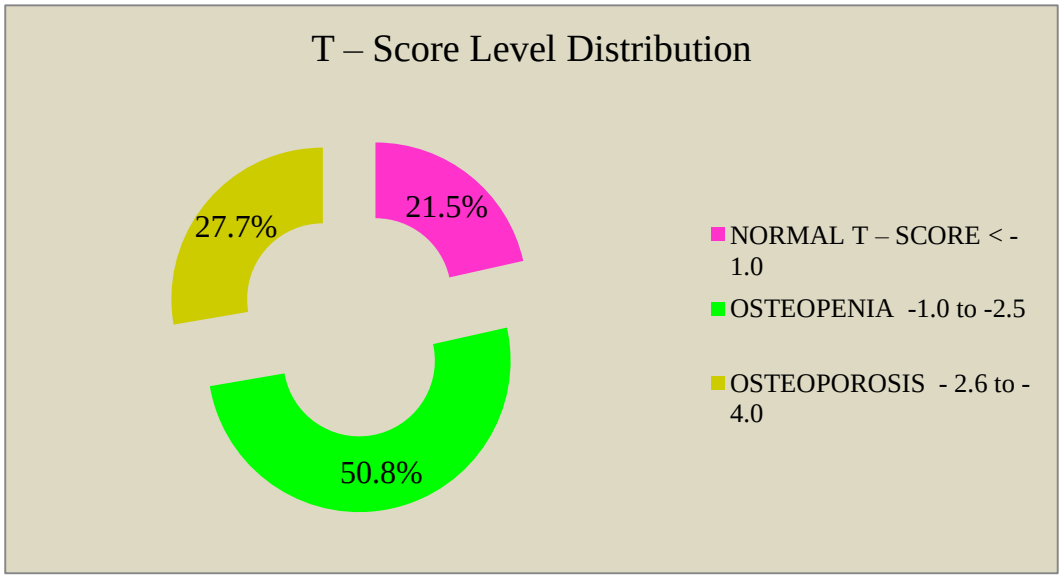

Figure 1: shows the prevalence of osteoporosis among middle aged women in mamandur.

Statistical analysis

The information collected from the study participants was scored and tabulated. The data were entered into the master coding sheet and saved in Microsoft Excel. Statistical analysis was conducted using Statistical Package for Social Sciences-16. Mean, percentage, and standard deviation were used to explain the demographic variables, Clinical variables and Chi-square test was used to associate the demographic and Clinical variables with prevalence of Osteoporosis.

RESULTS

In the current study, 130 samples were assessed for the demographic, Clinical variables and it reveals tha**t** among 130 clients 77 (59%) are in between 35 – 40 years of age ; 53 (41%) are in between 41 – 45 years of age **.**Considering the religion of the clients 113 (87 %) are Hindu religion; 17 (13%) were Christians. Among 130 (100%) are females Considering the educational status of the client 2 (2 %) are under graduate or post graduate ; 23 (18 %) are under high school certificate ; 29 (22%) are under middle school certificate ; 38 (29%) are under primary school certificate ; 38 (29%) are under illiterate .Regarding occupation of the clients 105(81%) are under unskilled worker ; 5(20 %) are unemployed**.** Considering the income of the clients 75 (58%) are earning (1596 – 4726) rupees ; 24 (19%) are earning (4722 – 7877) rupees ; 5 (4%) are earning (7877 –11876) rupees ; 21 (16%) are earning (11876 – 15753) rupees s; 5 (4%)are earning more than Rs.15753.Regarding type of family of clients 90 (69.2%) are under nuclear family ; 40 (31%) are under joint family Among 130 samples ,8 (6 %) were vegetarian ; 122 (94 %) were non-vegetarian Regarding the Clinical Variables**,** 69 (53%) were between (140 – 150)cm ; 47 (36%) were between (151 – 160)cm ; 14 (11%) were between (161-170)cm **.**Considering the weight of the client 32(25%) were below 45 kg ; 48 (37%) were (46 – 55) kg ; 28 (22%) were (56– 65) kg ; 22 (17%) were above 65kg **.**Regarding BMI of the client 18(14%) were < 18.50 (underweight); 56(43%) were 18.50 -24.99 (normal); 1(1%) were 25.00 (overweight) ; 36(28%) were 25.00- 29.99 (pre–obese) ; 16(12%) were 30.00- 34.99 (obese classification - I) ; 3(2%) were 35.00- 39.99 (obese classification - II)

Table 3 reveals that there is a significant association between age and type of family with T – score levels at 95% % ($P < 0.05$). There is no association with respect to other variables .

DISCUSSION

Osteoporosis is an age related disease of bone that leads to an increased risk of fracture. In osteoporosis, the bone mineral density (BMD) is reduced, bone micro architecture is disrupted and the amount and variety of protein in bone is altered[14]. Osteoporosis is one of the major disorders of our time and is increasing at an alarming rate. It affects over 10 million women in the United States and is expected to affect 14 million by the year 2020[15].

The number of osteoporosis patients reported in India is approximately 26 million; the numbers projected to increase is 36 million by 2013. It is revealed that 4,895 patients in various cities of India, 80% of women and 50% of men of them, suffer from low bone mass, 73.9% of women and 26.2% of men of above 60 years of age among them have been suffering from osteoporosis. Almost all osteoporosis fractures the person's risk of death doubles compared to that of a non-osteoporosis person of the same age and similar circumstances. So the current situation is alarming[16].

The Primary aim of this study was to assess the prevalence of osteoporosis among the middle aged women of 35 – 45 years in Mamandur The study findings were among 130 clients in Mamandur 28 (22%) have normal T- score (< - 1.0); 66(51%) have osteopenia (- 1.0 to - 2.5) ; 36 (28%) have osteoporosis (- 2.6 to - 4.0) .The following study is correlated with the current study. Samar, M Dev, V Kribakaran, R Savita et.al (2000) conducted to evaluate the prevalence of osteoporosis in South Indian urban and rural populations using portable ultrasound heel bone densitometer ; A total number of 497 Indian people were

Table 3: Association between the prevalence of osteoporosis among middle aged women with their demographic and Clinical variables in Mamandur. **N= 130**

Demographic variable		Normal T – Score < -1.0		Osteopenia -1.0 to -2.5		Osteoporosis - 2.5 to -4.O		Total n (%)		Chi Square Test	P Value
		n	%	n	%	n	%	n	%		
Age	35-40 Years	15	54	47	71	15	42	77	59	8.894	0.012
	41-45 Years	13	46	19	29	21	58	53	41	2 df	*
Type of Family	Nuclear Family	21	75	38	58	31	86	90	69		
	Joint Family	7	25	28	42	5	14	40	31		
	18.50 – 24.99 (Normal)	7	25	32	49	17	47	56	43		
	25.00(overweigh)	0	0	0	0	1	3	1	1		
	25.00 – 29.99 (Pre – Obese)	10	36	17	26	9	25	36	28	9.462 2 df	0.009 **
	30.00 – 34.99 (Obese Classification – I)	5	18	8	12	3	8	16	12		
	35.00 – 39.99 (Obese Classification – II)	1	4	1	2	1	3	33	2		

screened for osteoporosis using portable heel ultrasound bone densitometer. It includes 342 urban populations, and 155 rural populations. In all the participants, the heel bone mineral density (BMD) was measured. The peak value of estimated heel BMD (g cm-2) measured in the rural young females was 0.515, whereas in urban females it was 0.462, it was higher in rural young females than in urban females, and was significant; The peak value of estimated heel bone mineral density, BMD (g cm-2)measured in the rural young males was 0.522, whereas in urban males it was 0.528, and there was no significant difference between the two types male population; In rural females the calculated percentage loss in estimated heel BMD (g cm-2) between young adult age and moderate age was found to be 17.1%, whereas in urban females it was 8.4%; The percentage loss in estimated heel BMD between young adult age and old age were found to be 33.6% and 21.6% in rural females and urban females respectively ; In rural females the calculated percentage loss in estimated heel BMD value was greater than in urban females; In rural males the calculated percentage loss in estimated heel BMD (g cm-2) between young adult age and moderate age was found to be 8.6%, whereas in rural males it was 1.5% ; The percentage loss in estimated heel BMD between young adult age and old age was found to be 12.1% in rural males, it was found that 10.3% and 14.3% of the rural Indian women and men respectively, aged above 50 years had osteoporosis, whereas in urban women and men, the percentage of osteoporotic were found to be 0% and 10.5% respectively[17]. Another research which was carried out by Ethel S.Siris, et al (2002) to describe the occurrence of low bone mineral density (BMD) in postmenopausal women, its risk factors, and fracture incidence. A total of 200160 ambulatory postmenopausal women aged 50 years or older with no previous osteoporosis diagnosis derived from 4236 primary care practices in 34 states. Baseline BMD T scores, obtained from peripheral bone densitometry performed at the heel, finger, or forearm ; risk factors for low BMD, derived from questionnaire responses; and clinical fracture rates at 12-month follow-up.The findings shows that almost half of this population had previously undetected low BMD, including 7% with osteoporosis. Peripheral BMD results were highly predictive of fracture risk[18].

Osteoporosis is a disease that threatens the people slowly and insidiously over many years. Bones can eventually become so fragile that they cannot with stand normal mechanical stress. Osteoporosis is 8 times more common in women than in men for several reasons such as lower calcium intake, early bone resorption, pregnancy and breast feeding also increases the likelihood of osteoporosis[19].

CONCLUSION

Over 300 million people suffer from osteoporosis in India. More women die of osteoporosis fractures than of breast and ovarian cancers. Osteoporosis fractures occur 10-20 years earlier in Indians compared to people in Western countries. India shows the highest prevalence of osteoporosis. One in two Indian women above the age of 35- 45 suffers from osteoporosis. In India, six out of 10 fractures and bone injuries are caused by osteoporosis. Unfortunately, osteoporosis shows no symptom and is often diagnosed only after a fracture, by which time the patient may have suffered considerable bone loss**.**

Assessing the prevalence of osteoporosis among middle aged will be helpful to health professionals to carry out health awareness campaigns to enhance the health related knowledge to the public in general and specifically to the women.

REFERENCES

1. Gullberg B, Johnell O, Kanis JA (1997) World-wide projections for hip fracture. Osteoporosis Int 7: 407–413.

2. Johnell O, Kanis JA (2004) An estimate of the worldwide prevalence, mortality and disability associated with hip fracture. Osteoporosis Int 15: 897–902.
3. Kanis JA (2007) WHO Technical Report. University of Sheffield, UK: 66.
4. Osteoporosis foundation factsheet.
5. Riggs LB, Peck WA, NH Bell (1991) Physician's Resource Manual on Osteoporosis: A Decision-Making Guide. National Osteoporosis Foundation, Washington, DC 2: 1-38.
6. M Anburajan (1999) "Evaluation of Osteoporosis using conventional radiographic methods and dual energy x – ray absorptiometry", Ph D Thesis, Anna University, Chennai, India.
7. Ott SM (1990) Attainment of peak bone mass. J Clin Endocrinol Metab 71: 1082A-1082C.
8. Rico H (1992) Bone mass peak and incidence of osteoporosis and the Spanish Civil War. Calcif Tissue Int 50: 104.
9. WHO Study Group (1994) Assessment of Fracture Risk and Its Application to Screening from Post-Menopausal Osteoporosis. WHO Tech Rep Ser: 843.
10. US Department of Health and Human Services (2004) Bone Health and Osteoporosis: A Report of the Surgeon General. Rockville, MD: US Department of Health and Human Services Office of the Surgeon General.
11. Shatrugna V, Kulkarni B, Kumar PA, Rani KU, Balakrishna N (2005) Bone status of Indian women from a low-income group and its relationship to the nutritional status. Osteoporos Int 16: 1827-1835.
12. Marwaha RK, Tandon N, Garg MK, Kanwar R, Narang A, et al. (2011) Bone health in healthy Indian population aged 50 years and above. Osteoporos Int 22: 2829.
13. New Delhi: ICMR Publication, Published by Director General (2010). Population based reference standards of peak bone mineral density of Indian males and females: An ICMR multi-center task force study 1–24.
14. Paul T, Asha HS, Mahesh DM, Naik D, Rajaratnam S, et al. (2012) The diagnosis of osteoporosis among subjects of southern Indian origin above 50 years of age–The impact of the Indian council of medical research versus Caucasian bone mineral density reference standards Department of Endocrinology, Diabetes and Metabolism, Christian Medical College, Vellore, India. Indian J Endocrinol Metab 16: S514–24.
15. Marwaha R, Tandon N, Kaur P, Mani KJ (2012) Establishment of age-specified bone mineral density reference range for Indian females using dual-energy X-ray absorptiometry. J Clin Dens 15: 241.
16. Lynn, H.S., Lau, E.M.C., Au, B., Leung, P.C. Bone mineral density reference norms for Hong Kong Chinese. Osteoporosis Int. 2005;16:1663–1668
17. Samar, M Dev, V Kribakaran, R Savita, A M. Screening rural and urban Indian population for osteoporosis using heel ultrasound bone densitometer. International conference on communication systems and network technologies.2011.629-633.
18. Siris E, Miller P, Barrett-Connor E, Abbott T, Sherwood L, Berger M 1998 Design of NORA, the National Osteoporosis Risk Assessment Program: A longitudinal US registry of postmenopausal women. Osteoporos Int 8(Suppl 1):S62–S69
19. Fujiwara, S. Estimating incidence of osteoporosis by bone mineral density, from population based study (in Japanese). Jyouju kagaku kenkyuu kenkyuuhoukoku (Report of Aging and Health Reasearch). 1995;4:508–511.