Osteoporosis and its nutritional management among women working at textile industry

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Abstract: Osteoporosis is a bone disorder where the bone density and structure are affected resulting to increased risk of bone fracture. The incidence of osteoporosis is highly prevalent among women especially who are at the menopausal stage. Estrogen deficiency plays a major role in the pathogenesis of post menopausal Osteoporosis. Henceforth the study was aimed to assess the existing nutritional knowledge regarding osteoporosis management; to find out the association between relative demographic characteristics on osteoporosis. To develop and evaluate effectiveness of self instructional module in identifying osteoporosis and its nutritional management. **Findings:**The study was conducted by longitudinal method comprising Pre test- Post test. 50 working women aged 30 to 60 years from Readymade Garments, Kumta, Karnataka, were selected by non probability sampling approach. 76% respondents had inadequate nutritional knowledge regarding osteoporosis management,while none of the participants had adequate knowledge in the pre test. Our findings revealed a statistical significance (χ^2=71.86*, P<0.05) in the enhancement of nutritional knowledge scores and education level, age, family type, source of information, food habit, and mean percentage nutritional knowledge scores among respondents. This indicated a positive impact of nutritional intervention programme by administration of self instructional module. However there was no significant relationship between demographic characteristics such as marital status, number of children, work experience, family income/month. From the data it WASe concluded that implementing self instructional module noted to be effective in increasing knowledge regarding osteoporosis management among respondents.

Key words: Effectiveness, Management Osteoporosis, Textile industry

Introduction

Osteoporosis is one of the major health problems faced by women. Estrogen deficiency plays a major role in the pathogenesis of post menopausal Osteoporosis. Osteoporosis is a disorder of bone in which the density and quality of bone are reduced resulting in increased risk of fracture. Over 300 million people suffer from osteoporosis in India, without realizing that every osteoporosis related fractures double the risk of death. Bone weakens when the levels of calcium and other minerals in the bone are low. As a result the bone becomes weak and breaks with minimal force. The incidence of osteoporosis is high amongst Indian women especially amongst women who are in the menopausal stage. Estrogen is a hormone in women that protects bones, when estrogen levels drop sharply following menopause a woman can lose up to 20% of her bone density.[1, 2, 3]

A study report that among Indians, women form Karnataka aged between 30-60 years from low income groups had high prevalence of osteopenia and osteoporosis thought to be due to inadequate nutrition. Although it is commonly associated with post-menopausal women, osteoporosis can also affect men, younger women and children. Education about recommendations for healthy bones is important in maintaining bone health and managing Osteoporosis. Osteoporosis is more common in people who have a small, thin body frame and bone structure[4, 5].

Dietary calcium and vitamin D deficiencies are important factors in the risk for osteoporosis, women who smoke, particularly after menopause, have a significantly greater risk of spine and hip fractures than non-smokers. Lack of exercise and a sedentary lifestyle can also increase the risk of osteoporosis. Engaging in regular low-impact aerobic exercise (such as walking or swimming) and weight-bearing exercise can help prevent it.[6]

Osteoporosis risks can be reduced with lifestyle changes and sometimes medication or may involve both. Lifestyle change includes diet and exercise; tobacco smoking and high alcohol intake have been linked with osteoporosis, smoking cessation and moderation of alcohol intake are commonly recommended as ways to help manage it. Weight-bearing endurance exercise and/or exercises to strengthen muscles improve bone strength in those with osteoporosis and fall prevention can help prevent osteoporosis complications.[7, 8, 9]

Rosenstock Ietal, 1988 showed that education can help client's acquire new knowledge and skills to deal with osteoporosis. Health belief and motivation are known to be integral aspects of health promotion. Knowledge and health beliefs are of particular importance for working women because of their increased risk of osteoporosis. As osteoporosis becomes a greater threat to their health and quality of life, perception of this serious threat including harmful consequences in relation to personal health and social status leads to the likelihood of action in the form of provision of self-instructional module on management of osteoporosis to overcome the consequence.[10, 11, 12]

Further, study on management and related risk factors of osteoporosis in pre and post menopausal among Indian women to determine the management of osteoporosis, and in turn increase the awareness, education, management, and treatment

of osteoporosis suggested that there is the need for large community-based studies so that high-risk population can be picked up and early interventions and other life style changes can be instituted. [13, 14]

Comparative study on 261 women aged 45 and older was conducted to determine the osteoporosis health related behavior among healthy peri-menopausal and post menopausal Israeli Jewish and Arab women. The results reported that expanding knowledge about osteoporosis as proved to be beneficial for increasing participation in management behavior in both groups. [15]

A meta analysis conducted on treatment of postmenopausal osteoporosis in women concluded that bisphosphonates were reported to have consistently reduced the risk of vertebral fractures. Hormone replacement therapy showed positive outcomes, but its use has been found to increase the risk of cardiovascular disease and breast cancer. Teriparatide and monofluorophosphate also showed efficacy against osteoporosis. Calcium and vitamin D were given to patients as food supplements. [16]

A descriptive study was conducted on the pediatricians' to assess their knowledge, attitudes, and counseling practices in management of osteoporosis to manage adult osteoporosis by the method of selecting one hundred eighty-seven primary care pediatricians on knowledge, attitudes, and practices regarding osteoporosis management. Thirty-eight percent of respondents regarded osteoporosis management to be an important issue, and less than half reported that they counseled patients for osteoporosis management. And they concluded that Osteoporosis management should begin in childhood and adolescence. [17]

Edicott, 2013, reported that osteoporosis specific educational sessions clearly increased knowledge and health benefits among women with or without family history of osteoporosis. A foremost step in raising awareness and planning education is to examine how much is known about the disease[18,19,20]. Therefore the present study aims to assess the level of knowledge and perception about the risk factors for osteoporosis in adult women and to evaluate the impact of organized nutrition and health education sessions on women's knowledge and perception about osteoporosis and its management.

Hence a need based study was taken up with the objectives

· To assess the existing knowledge regarding osteoporosis and its management among women at selected textile industry.

· To evaluate the effectiveness of self instructional module on nutrition and health knowledge regarding osteoporosis and its management.

· To find out the association between selected demographic variables and pre-post assessment on knowledge scores regarding osteoporosis and its management.

Material and methods

Research methodology involves the systematic procedure by the researcher, which starts from initial identification of the problem to its final conclusion. The methodology of research indicates the general pattern of organizing the procedure for gathering valid and reliable data for the purpose of investigation.

Research setting: The study was conducted on osteoporosis and its management among women at selected textile industry, Kumta. The research work was a longitudinal study comprising pre and post assessment. Post assessment was conducted after nutrition and health education intervention regarding osteoporosis and its management.

Assessment criteria: The criteria for selecting these setting were geographical proximity, feasibility for conducting the study, availability of the required sample and familiarity of the investigator with these settings.

Data collection: The sample consists of 50 working women at textile industry, Kumta, Karnataka, selected to participate in a research study. A purposive sampling method through non-probability sampling approach was used for selection of working women. **Tools and techniques**: Self administered structured check list was used to elicit information on demographic profile of the subjects. A structured knowledge questionnaire was developed to assess knowledge of working women regarding Osteoporosis and its management (both pre and post assessment). **Scoring pattern**: Scoring pattern was also adopted for categorizing the nutrition and health knowledge level for osteoporosis and its management as adequate, moderately adequate and inadequate [13].

Statistical analysis: The data obtained was analyzed statistically using Excel stat, SPSS package. Percent, mean and chi square were used to determine the association between the level of knowledge and selected variables. Further the data were interpreted at the alpha significance level $P<0.005$.

Results and discussion

Osteoporosis is not a symptomatic process, but progress silently until a facture occurs and this incidence is highly prevalent especially among post menopausal women. Thus this investigation was intended to evaluate perception of knowledge level on osteoporosis and its management. As well as the impact of nutrition and health education programme in minimizing the risk factor.

Findings of the study from Fig. 1 reveals that majority of the respondents (38%) of were in the age group of 41-50 years followed by 34% in the age group of 51-60 years and 28% in the age group of 30-40 years.

Fig. 2 details about the educational level of the respondents. 38% of the respondents had Higher Primary Education, 28% of them had Primary education and 26% of the respondents had completed Under Graduation, while 8% of the respondents had completed Graduation.
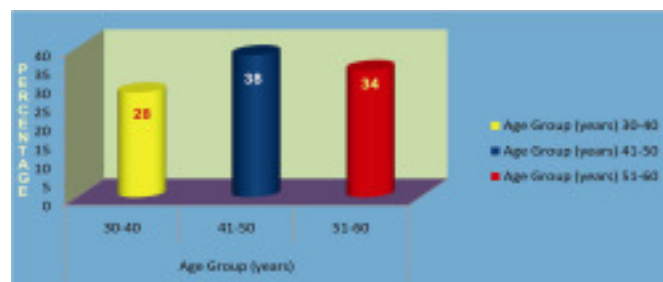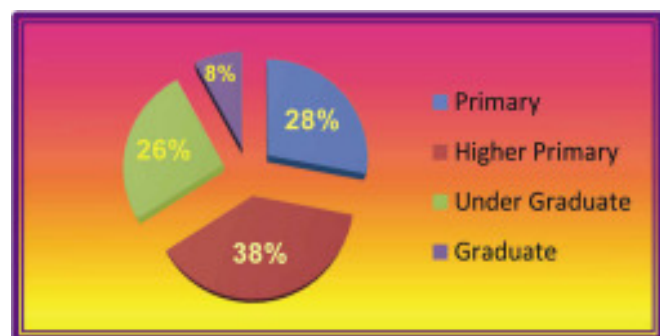
Fig.1. Distribution of respondents by age

Fig.2. Distribution of respondents by educational level

Table 1 reveals the demographic details of the respondents. With respect to marital status, it was observed that 88% of the respondents were married, 12% of the respondents were Unmarried. 50 percent of the respondents were having two children, 20% respondents had one child, 18% of the respondents were having 3 children and 12% of the respondents had no children.

Regarding their financial status, it was observed that 42% of respondents had monthly income of ₹ 7, 000 - 9,000, 32% of had ₹10,000 - 14,000 and 26% respondents had monthly income of ₹ 4,000 - 6,000. 60 percent of them belonged to nuclear family, 40% respondents were from to Joint Family. Information regarding their food habits showed that 62% were non vegetarian, 38% were vegetarian.

Table 1. Demographic details of the respondents

Characteristics	Category	Respondents (%)
Marital Status	Married	88
	Unmarried	12
Family Income/month	₹ 4,000-6000	26.0
	₹ 7000-9000	42.0
	₹10,000-14,000	32.0
Type of Family	Nuclear	60.0
	Joint	40.0
Food Habits	Vegetarian	38.0
	Non Vegetarian	62.0

Table 2. Frequency distribution of respondents with history of Osteoporosis.

Characteristics	Category	Respondents(%)
Onset of osteoporosis (years)	1-4	28.0
	5-7	40.0
	8-11	32.0

Table 2 reveals the information about the year of onset of osteoporosis among the respondents. 40% of the respondents were suffering from osteoporosis since 5-7 years, 32% respondents were having it for 8-11 years. 28 percent of the respondents had osteoporosis from 1-4 years.

Source of information about osteoporosis and its management among the respondents were collected, Fig. 3 showed that majority (62%) of respondents received information about Osteoporosis from Print Media while 38% of respondents received information from electronic media.

From Fig. 4, the classification of respondents' knowledge regarding osteoporosis by pre-test knowledge scores it was understood that none of them had adequate knowledge, 24% had moderate knowledge and 76% had inadequate knowledge.

Fig. 5 highlights Pre test mean knowledge scores of respondents' perception of osteoporosis and its management. Concept and incidence was perceived highest at the level of 37.7%, followed by knowledge regarding causes and risk factors at 35.1%. However information regarding diagnosis and complications and management and treatment of osteoporosis was 34.8% and 32.8% respectively. This explains that even
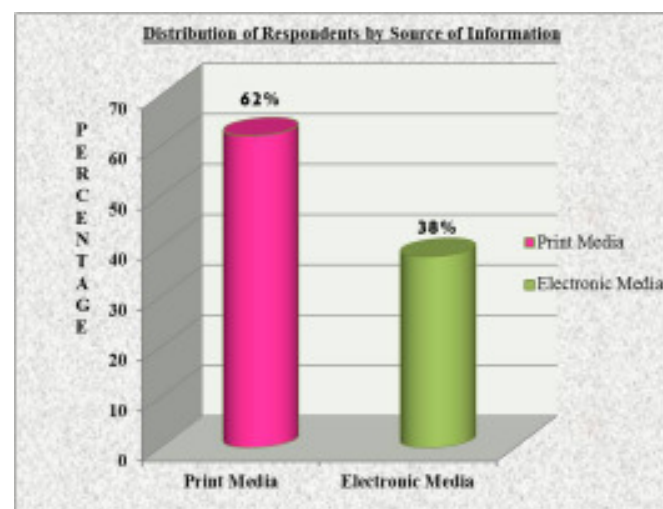

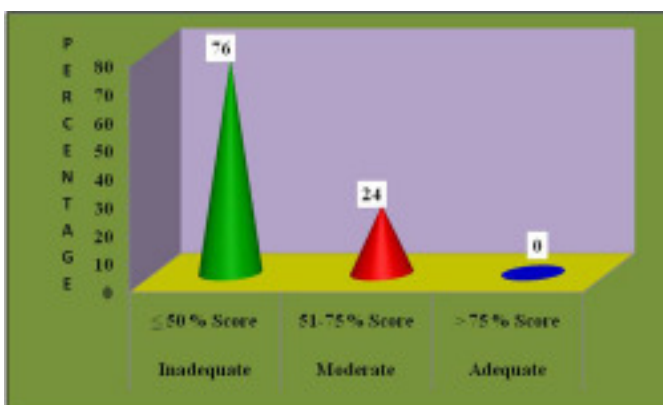Fig. 3. Source of Information regarding osteoporosis obtained by the respondents

Fig . 4. Classification of respondents by pre test knowledge level on osteoporosis and its management
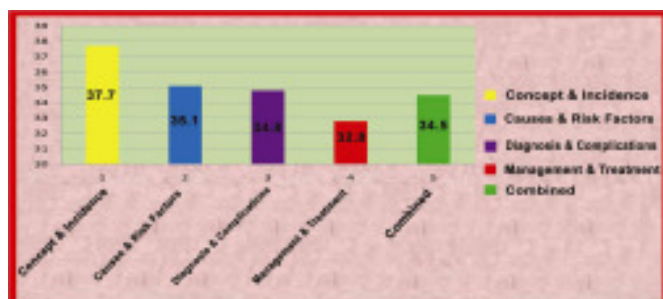
Fig..5. Pre test mean knowledge scores of respondents perception of osteoporosis and its management

though they were aware of the condition, the facts and management knowledge was inadequate.

Association between demographic variables like marital status, educational level, family Income, etc and Pre- test knowledge level on osteoporosis and its management was found to be highly significant for all the aspect under the study at P<0.005. Similar results were observed in the study reports by National osteoporosis foundation, 2000.

Figure.6 on distribution of respondents by post- test knowledge level on osteoporosis and its management showed that in the post test 62.0% of respondents had adequate knowledge, 38.0% of the respondents had moderate knowledge

Table 3 reveals that the highest level of perception (76.7 %) was seen for causes & risk factors of osteoporosis after the intervention. This was followed by diagnosis & complications with the perception level of 75.2%. The respondents perceived the concept & incidence and management and treatment at
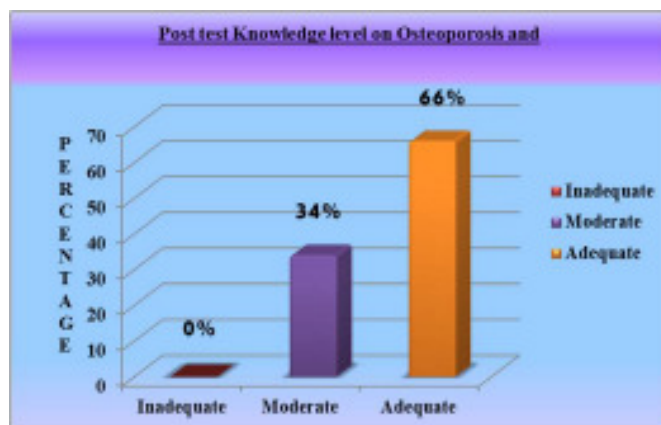

Fig..6. Distribution of respondents by post- test knowledge level on osteoporosis and its management

73.7% and 73.6% respectively after the intervention. Thus it can be concluded that there was definitely positive impact of invention programme among the respondents.

Further, the scoring method adopted for categorizing the respondents knowledge level regarding osteoporosis and its management as showed in Table 4, reveals the interesting fact that health care can influence by one's own health belief according to the "Health belief model" developed by Rosenstoch's and Beckers (1974)[11]. There was drastic increase in the knowledge level score of the respondents after the intervention scoring 66.0% with adequate knowledge and 34.0% at moderate level against the pre -assessment of 76.0% inadequate and 24.0% moderate level. The chi-square test indicates the significant difference in the level of knowledge of

Table 3. Post-test mean knowledge scores of respondents on perception of osteoporosis and its management

No.	Knowledge Aspects	Statements	Max. Score	Respondents Knowledge		
				Mean	SD	Percentage
I	Concept & Incidence	10	10	5.16	0.9	73.7
II	Causes & Risk factors	9	9	6.90	1.1	76.7
III	Diagnosis & Complications	4	4	3.76	0.9	75.2
IV	Management & Treatment	17	17	13.98	2.7	73.6

Table 4. Classification of respondents on knowledge level on osteoporosis and its management

Knowledge Level	Category	Classification of Respondents				$\div^2$ Value(P< 0.05)
		Pre test		Post test		
		Number	Percent	Number	Percent	
Inadequate	d" 50 % Score	38	76.0	0	0.0	71.86*
Moderate	51-75 % Score	12	24.0	17	34.0	
Adequate	> 75 % Score	0	0.0	33	66.0	

Table 4. Mean pre and post test knowledge perception about osteoporosis and its management

Sl. No.	Knowledge Aspects	Respondents Knowledge (%)						Paired 't' Test
		Pre test		Post test		Enhancement		
		Mean	SD	Mean	SD	Mean	SD	
I	Concept & Incidence	37.7	15.7	73.7	13.3	36.0	16.4	15.52*
II	Causes & Risk factors	35.1	15.4	76.7	12.5	41.6	16.8	17.51*
III	Diagnosis & Complications	34.8	19.3	75.2	18.8	40.4	23.0	12.42*
IV	Management & Treatment	32.8	13.3	73.6	14.2	40.7	16.7	17.23*
	Combined	34.5	12.7	74.5	9.9	40.1	12.2	23.24*

osteoporosis and its management pre and post assessment (c^2 =71.86*, P< 0.05). This statistical significance in the enhancement of knowledge scores indicate the positive impact of intervention programme.

Table 4 infers the mean pre and post assessment knowledge perception about osteoporosis and its management. The table indicates that there was significant enhancement in the perception of osteoporosis and its management with regard to concept and incidence from 37.7 (pre assessment) to 73.7% (post assessment). Similar observation was seen with the information regarding causes & risk factors from 35.1 to 76.7%, diagnosis & complications from 34.8 to 75.2% and management & treatment from 32.8 to 73.6%. The overall mean score in the knowledge gained after the intervention programme between pre and post assessment from 34.5 to 74.5% with 40.1% enhancement. There was a significant association observed in the enhancement with the knowledge scores regarding perception of osteoporosis and its management among the study respondents (t=23.24*, P< 0.05). Similar results was observed from the studies conducted by Madhusudhan R.S., *et al.,* 2014[14].

Association between demographic variables like age (c^2 =9.89*, P< 0.05), type of family [c^2 = 5.36*, p<0.05], source of information [c^2 = 4.53* p<0.05] and food habits [c^2 = 4.74* p<0.05] with the post test knowledge level about osteoporosis and its management was highly significant. It can be concluded that intervention programme with administration of self instructional module had a definite influence on the post test knowledge level about osteoporosis and its management

Conclusion

Knowledge about osteoporosis and its management among women respondents was assessed. The overall mean and mean percentage of pre test knowledge scores on osteoporosis and its management was found to be 13.7 and 34.5% respectively. It indicates that the respondents lack knowledge about osteoporosis and its management. From this study it was concluded that education of the respondents was positively associated with their knowledge. It was observed that age group (years), type of family, food habit, source of information found significant association with their pre test knowledge regarding osteoporosis and its management.

Based on the perception, pre-test knowledge of osteoporosis the highest knowledge was found on concept and incidence, and least knowledge was found on management of osteoporosis + Nutrition + Supplements.

Hence, it is concluded that, the respondents had inadequacy in their knowledge in all areas. Nutrition and health intervention programme with administration of self instructional module was found to be beneficial for the respondents, which was indicated in the post assessment enhancement of knowledge regarding osteoporosis and its management.

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