

# Osteoporosis Related Minimal Trauma Fractures: Awareness Among Health Workers In Nigeria

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## Citation

A Olayinka, A Caleb, A Lawrence, E Patricia, O Olalekan, O Oluwakemi, O Akintujoye. *Osteoporosis Related Minimal Trauma Fractures: Awareness Among Health Workers In Nigeria*. The Internet Journal of Orthopedic Surgery. 2006 Volume 4 Number 2.

## Abstract

**Objectives:** To assess health workers knowledge, level of awareness of osteoporosis related minimal trauma fracture (ORMTF), prevention and treatment perception in Nigeria.

**Methods:** A hospital-based cross sectional study was conducted in 2006 at Ile-Ife located in the western Nigeria with population of 96500. Each of the hospitals that provided main health care services was visited and subjects were selected by non probability accidental sampling method. Health workers who refused consent and those who are not involved in the management of patient were excluded. A total of 3,357 health workers were in the health institutions. Data was collected using self administered semi structured questionnaires. Health workers of at least three years on the job are considered experienced. Data analysis was through the use of Statistical Package for Social Sciences version 11. Limitations were health workers on various forms of vacations and unreturned questionnaires.

**Results:** A total of 404 questionnaires were returned giving return rate of 96.2%. There were 215(53.2%) females and 189(46.8%) males with a female: male ratio of 1.1: 1. A total of 149(36.8%) were at least in the 5th decades of life. Among the health workers, 368(91.1%) heard about osteoporosis but 101(27.4%) knew the correct meaning. 322(87.6%) felt ORMTF is a reality while 28(7.7%) believed it was a myth. The age; sex; religion, marital status were not significant factors affecting ORMTF level of awareness unlike the type of profession ( $X^2=57.415$ ,  $p=0.000$ ). The source of awareness were least identified with training and electronic media. 320(87.0%) respondents knew ageing, medications-233(63.3%), menopause-223(61.1%), malnutrition- 76(47.8%), cigarette smoking-150(40.8%), alcohol-143(38.9%), osteoporosis in first degree relative-66(17.9%), small body frame-55(14.9%), castration-91(24.7%) as ORMTF risk factors. A majority, 87.1% did not know steroid use, nutritional deficiency and immune deficiency as aetiological factors of ORMTF. Knowledge on complications varied. 51(13.9%) and 276(75%) respondents felt osteoporosis cannot cause bone fracture and death respectively. Perception on treatment revealed that 42.1% felt diet with vitamins and stress management (1%) will be required. Strongly agreed by majority (98.4%) was health education to increase awareness and prevention of ORMTF predisposing factors.

**Conclusions:** Health workers level of awareness is very low of the risk factors, methods of prevention and consequences of osteoporosis related minimal trauma fractures. Effective promotional instruments (training and electronic media) can be used to increase awareness on osteoporosis severity and prevent orthopaedics health burden impact on the population.

## INTRODUCTION

Osteoporosis-associated fracture is a major public health problem in the United States of America and Northern Europe with significant health care cost<sup>1</sup>. Osteoporosis related minimal trauma fracture (ORMTF) is defined as a disease characterized by low bone mass and micro architectural deterioration of bone tissue leading to enlarged

bone fragility and a consequent increase in fracture risk with minimal trauma. Significant risks have been reported in people of all ethnic backgrounds<sup>2</sup>. Men as well as women are affected by osteoporosis a disease that can be prevented and treated<sup>3</sup>.

However, the real incidence of ORMTF might not be

estimated correctly because of the poor health records in Nigeria. One out of every two women and one in every four men over 50 year will have osteoporosis related fracture in their life time <sup>4</sup>. Osteoporosis is responsible for more than 1.5million fractures annually including 300,000 hip fractures, 700,000 vertebra fractures, 250,000 wrist fracture and more than 300,000 fractures at other sites <sup>5</sup>. Based on figures from hospital and nursing homes the estimated national direct expenditures for osteoporosis and related fracture was \$18 billion annually <sup>6</sup>. Worldwide projections showed that the risks of osteoporosis fracture will probably increased three to four times than that in the present<sup>7</sup>. The first step in the prevention of ORMTF is to make the community aware of the risk factors and preventive measures.

In Turkey and United States, it has been shown that the level of awareness of osteoporosis is very low despite the huge economic cost, morbidity and mortality risk associated with this preventable and treatable disease<sup>8</sup>. In Nigeria, there is no population based study on awareness and prevention of ORMTF social economic burden. It is against this background that current study was conceived to be carried out among health workers in Nigeria. Health Workers responsibilities were to counsel, educate and treat patients with the ORMTF.

The Specific Objectives are to assess the knowledge of health workers on ORMTF; assess the level of their awareness of ORMTF; determine their perception towards treatment and prevention of ORMTF. The limitations included health workers on vacations thus not available for this study and unreturned questionnaires.

## **METHODS AND MATERIALS**

This study was carried out among health workers in health institutions of Ile-Ife, Osun State, Nigeria between the months of January and February, 2006. Ife Central Local Government has a total population of 96500 according to the 2000 National Population Commission data. Health care services were mainly provided by Obafemi Awolowo University Teaching Hospital Complex (O.A.U.T.H.C), Urban comprehensive Health Centre, Eleyele, Seventh Day Adventist Hospital Lagere, Ife State Comprehensive Health Centre Sabo, Obafemi Awolowo University Health Centre and other private hospitals within Ile-Ife. The aforementioned health institutions with 3,357 health workers participated. The workers taken as health professionals included medical doctors, nurses, pharmacists,

physiotherapist, medical–health information officers, medical laboratory scientists and administrative staff.

The prevalence of Nigerian level of awareness of OMTRF was not known, the prevalence was taken to be 50% which means that 384 questionnaires were expected to be administered. However, we administered 420 questionnaires to obtain good representative of the health workers population.

Each of the hospitals was visited and subjects were selected by non probability accidental sampling method. Health workers who were not willing to fill the questionnaire and hospital workers who are not involved in the management of patient like cleaners, security and maintenance staff were excluded. The respondents who knew that osteoporosis can present as both emergency and non-emergency were considered to have adequate knowledge on ORMTF. Respondents that would refer patient to a specialist were regarded as having a positive treatment perception attitude. However, respondents that would advice ORMTF patients to see traditional healer or advice patients he/she does not need treatment or tell patient that the condition has no treatment were regarded as having negative treatment perception.

## **ANALYSIS**

Data were analyzed by using Statistic Package for Social Sciences (SPSS) version 11.0 for windows. Transformations of variables were done where necessary in particular, quantitative variables. Test of significance was calculated by the use of Analysis of variance (ANOVA), Chi-square with Fischer's exact test where numbers were small and Yates correction when indicated. Student t-test was used for comparison of means. Multivariate analysis was carried out to determine the relationship between variables and determine the correlation between the profession, year of experience, and level of ORMTF awareness and other variables using logistic regression analysis. The confidence interval (CI) was at 95% due to the small sample size. The p-value was considered significant at  $p < 0.05$ .

## **RESULTS**

### **DEMOGRAPHIC CHARACTERISTICS**

Out of the 420 questionnaires administered, 404 were returned giving a 96.2% return rate. A total of 368 were aware of osteoporosis, 101 (27.4%) knew the correct meaning. The incorrect meanings given included softening of bone 103 (25.5%), demineralization of bone 132 (32.7%), bone tumour 5 (1.2%). Fifty (13.6%) of those that were

aware of the condition knew the correct synonyms for osteoporosis. Table 1 shows the socio - demographic characteristics of the health workers.

**Figure 1**

Table 1: Socio-Demographic of health workers (n=404)

Socio-demographic Status	No. of health workers	Percentage (%)
Age		
20 – 29	105	26.0
30 – 39	150	37.1
40 – 49	95	23.5
50 – 59	53	13.1
≥ 60	1	0.2
Sex		
Male	189	46.8
Female	215	53.2
Marital Status		
Single	123	30.4
Married	281	69.6
Religion		
Christianity	348	86.1
Islamic	54	13.4
Traditional worshippers	2	0.5
Profession		
Medical Doctor	145	35.9
Pharmacist	17	4.2
Physiotherapist	10	2.5
Nurse	151	37.4
Med. Lab. Scientist	32	7.9
Administrator	45	11.1
Med. Health Information	3	0.7
Dietician	1	0.2

The highest level (93.3%) of OMTRF awareness was recorded in the 3<sup>rd</sup> decade of life . Among the health workers in the 5<sup>th</sup> decade and above, 136(91.3% ) were aware of

OMTRF . Of the 215 females , 197 (91.6%) were aware as compared with 189(90.5%) males that were aware. The married (68.2%) were more aware than single (31.8%) health workers. The age ( $X^2 = 1.365$ , d.f = 4, p= 0.850), sex ( $X^2 = 0.164$ , d.f = 1, p = 0.685), religion ( $X^2 = 0.204$ , d.f = 2, p = 0.903) and marital status ( $X^2 = 5.191$ , d.f = 3, p = 0.158) were not statistically significant .

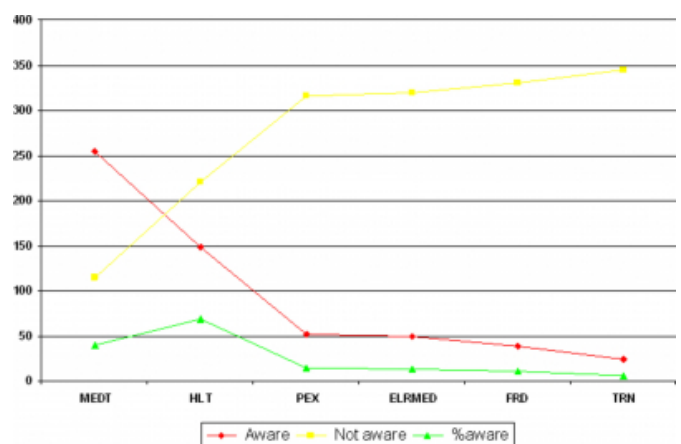
## KNOWLEDGE OF HEALTH WORKERS ABOUT OMTRF

Among the health professionals,38.3% of medical doctors and 38.3%nurses are aware of the disease, compared to the 7.6%, 7.9%, 4.3%, 2.7%, 0.5% and 0.3% that was found among health administrators, medical laboratory scientists, pharmacist, physiotherapists, medical health information and dietician respectively. The mean years of professional experience of the respondents were nurses (15.4yr  $\pm$  10.2), medical doctors (4.8yr  $\pm$  4.7), administrators (9.4yr  $\pm$  7.2), medical laboratory scientists (8.8yr  $\pm$  7.2 ), pharmacists (8.6yr  $\pm$  5.3), physiotherapists (7.6 yr  $\pm$  4.5), medical health information (18.3 yr  $\pm$  9.3) and dietician (10.0 yr). The lowest level of awareness was seen among medical health information and dietician . The level of awareness of ORMTRF with regards to the profession was statistical significance ( $X^2 = 57.415$ , df = 7, p= 0.000).

There was a significant relationship between education level of the health workers and ORMTRF knowledge (p=0.000); spouse 's education level and their profession were related to ORMTRF awareness(p=0.005). Figure 1 shows the sources of ORMTRF awareness.

**Figure 2**

Figure 1: Sources of OMTRF awareness.



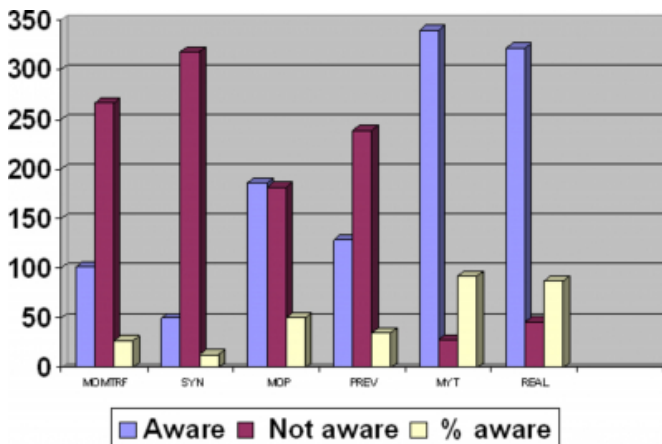
KEY: MEDT – MEDICAL TEXTHLT – HEALTH TALKPEX – PERSONAL EXPERIENCEELRMED – ELECTRONIC MEDIAFRD – FRIENDSTRN -

## TRAINING

Figures 2 and 3 shows the level of knowledge on ORMTRF awareness and knowledge about ORMTRF aetiology respectively. Majority of the respondents that were aware of osteoporosis did not know steroid use, nutritional deficiency and immune deficiency as aetiological factors for ORMTRF.

**Figure 3**

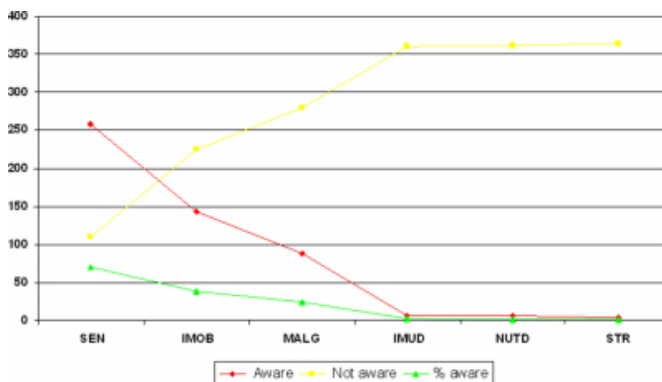
Figure 2: Level of knowledge on OMTRF awareness among health workers.



Key: MOMTRF: Meaning of OMTRF  
SYN: Synonym's of osteoporosis  
MOP: Mode of presentation  
PREV: Prevalence of OMTRF  
MYT: OMTRF is a myth  
REAL: OMTRF is a reality

**Figure 4**

Figure 3: Knowledge about OMTRF aetiology



KEY: SEN – SENILITY  
IMOB – IMMOBILIZATION  
MALG – MALIGNANCY  
IMUD – IMMUNODEFICIENCY  
NUTD – NUTRITIONAL DEFICIENCY  
STR – STEROID USE

Table 2 shows the knowledge on ORMTRF symptoms and complications. A total of 193 (53%) knew ORMTRF could present as both an emergency and non-emergency. Forty-two

(11%) identified the mode of presentation as emergency only and 133 (36%) felt is non-emergency . Table 3 shows the knowledge about risk factors and predisposing factors for ORMTRF.

**Figure 5**

Table 2: Knowledge on OMTRF Symptoms and complications.

Symptoms of OMTRF	No. of Respondents (n=368)	Percentage (%)
Chronic bone pain	271	73.6
Stress fracture	263	71.5
Asymptomatic	195	52.4
Non union/Delayed union of fracture	156	42.4
Loss of height	143	38.9
Complications of OMTRF		
Fracture with little trauma	303	82.3
It can cause deformity of the spine	264	25.3
It can lead to abnormal gait	280	76.1
It can lead to death	93	25.3
It can not cause fracture of bone	51	13.9

**Figure 6**

Table 3: Knowledge on risk factors and predisposing factors for OMTRF.

Risk Factors	No of Respondents (n = 368)	%
Ageing	320	87.0
Medication	233	63.3
Menopause	225	61.1
Malnutrition	176	47.8
Cigarette smoking	150	40.8
Alcohol consumption	143	38.9
Osteoporosis in first degree relative	66	17.9
Small body frame	55	14.9
Castration	91	24.7
Predisposing Factors	No. of Respondents (n=368)	%
Poor diet	245	66.6
Sedentary life style	223	60.6
Race	174	47.3
Genetic factors	158	42.9
Social factors	113	30.7
Geographical location	71	19.3
Haemoglobinopathy	4	1.1

Treatment perception and Attitude of health workers towards ORMTRF patients:

A total of 376(93.1%) would refer patient to a specialist, had positive attitude .However, 28(6.9%) had a negative attitude. Table 4 shows perception on treatment options for ORMTRF.

**Figure 7**

Table 4: Perception on Treatment methods for OMTRF

Treatment methods	No of health workers	%
Adequate diet & vitamins	155	42.1
Hormone replacement therapy	100	27.2
Calcium supplement	91	24.7
Physiotherapy/Regular exercise	103	28
Medication	58	15.8
Sun light	35	9.5
Surgery	21	5.7
Avoiding sedentary life Style	9	2.4
Stress Management	4	1.0

## DISCUSSION

The rise in age-specific incidence of osteoporosis minimal trauma related fracture (ORMTF) over the past century has been well documented<sub>9</sub>. Our study is needed to increase awareness of this disease and to monitor the epidemiology of ORMTRF as longevity and the number of elderly population increase and quality of life improves<sub>10</sub>. This combination of factors may, in fact, mean that the incidence of osteoporotic fractures will rise in the near future in Nigeria, a possibility that should be kept in mind by the local public health authorities and practicing orthopaedic surgeons.

There was no significant difference in the level of awareness among the male and female sex health workers because of the co-education curriculum, working environment and continue medical education are the same. The known risk factors of female sex and menopause appeared not to have influence on the ORMTRF awareness among health workers. The prevalence of osteoporosis is 7 percent in white men,5 percent in black men, and about 3 percent in Hispanic-American men<sub>11</sub>. Data on the prevalence of osteoporosis in Nigerian men and other ethnic groups are lacking. Because men have greater bone mass, they present with osteoporotic fracture about 10 years later than women<sub>12</sub>. The first step in the prevention of osteoporosis in women should be to make them aware of the risk factors.

Health workers in the peri- menopause and post menopause

age were aware of ORMTF. A direct personal experience ,from relatives or close friends case illustrations with ORMTF may account for this observation. This study agree with that from Poland by Drozdowska B and coworkers where they assessed the influence of age, level of education and personal experience on knowledge about osteoporosis. They found that higher level of education and younger age improves the knowledge of osteoporosis<sup>13,14</sup> with no systemic influence of personal experience with the disease in the younger age group.

The majority that felt ORMTF is not a myth was associated with the working environment influence . A direct or indirect contact with patients diagnosed osteoporotic related diseases increased the awareness of some profession. The experience and type of profession has a significant effect on the level of awareness. Majority of doctors and nurses were aware as compared with other paramedical professions.

Among the health workers that heard of osteoporosis, only 27.4% knew the scientific meaning of osteoporosis . The others gave diverse incorrect meaning which included; softening of bone, demineralization of bone , bone tumour. and osteomalacia . Although, 8.9% said they have never heard of osteoporosis, they were realistic unlike 91.1% who were having a wrong knowledge about ORMTF similar to research report from Norway<sup>15</sup>.

The majority of the health workers did not know that death can result from ORMTF. This is in conformity with the studies done among Turkish women in 2001 and Gallup survey in America where it was found that 90.3% of the women did not know osteoporosis could lead to death and were unable to identify significant risk factors<sup>16,17</sup>. The health workers who knew that ORMTF presentation could be both emergency and non-emergency were few. They would be able to identify this group of patients early and offered prompt treatment. However, a greater number did not understand the public health importance of the ORMTF due to inadequate awareness.

Sources of the knowledge were least obtained through training and electronic media. The training of health workers in general is not adequate in content as regard to osteoporosis and ORMTF. The electronic media through radio and television as source of dissemination of knowledge on ORMTF is recommended for our environment. The two sources are cheap, with a wide land mass coverage, accessible and applicable to rural and urban dwellers. Patients with fracture have limited knowledge and awareness

of osteoporosis, and the information that they do have seems to come mainly from the media rather than from professionals. Orthopaedic surgeons apparently do not place much importance on lifestyle factors such as smoking or excess alcohol consumption in their dealings with patients with fracture. A greater emphasis is to be placed on public health education in general and specifically in patients who have already suffered a fracture. Findings from this survey indicate that there is room for improvement in services to patients with established osteoporosis, such as those with recent fractures, as there is now increasing evidence that interventions can be helpful and reduce the impact of fractures and associated cost and morbidity in the community. Written policies should be established in orthopaedic units for automatic referral of patients with low trauma fracture to an interested specialist in the area.

The health workers knowledge on cigarette smoking, alcohol consumption, osteoporosis in first degree relative, small body frame and castration is poor. The negative effects of small body frame is not well recognized because of wide spread childhood malnutrition in the society and adaptation. Low bone mass itself is asymptomatic and causes

no morbidity. However, the consequences of osteoporosis, fractures, can cause significant debility. It could results in osteoporosis later in life from suboptimal bone mass density. This could lead to a generation with preventable ORMTF if not identified early .

Human castration is not a common clinical practice . This may limit the exposure of the health workers to the fact that is a risk factor for ORMTF. In all societies, tobacco use and excessive alcohol consumption are more prevalent in men than in women, and both are independently associated with an increased incidence of osteoporotic fractures<sup>18</sup>. Tobacco-related bone loss is linked to smoking duration and quantity. The mechanism may be a combination of decreased body weight, decreased calcium absorption, decreased estradiol levels, and a direct toxic effect on bone metabolism. Alcohol in modest amounts may have a protective effect on bone density, but sustained high consumption causes bone loss<sup>19</sup>. It is likely that alcohol has a direct toxic effect on osteoblastic function. Excessive alcohol consumption is also often associated with poor nutrition and decreased physical activity, both of which are associated with bone loss in ORMTF.

The most common reasons for postmenopausal women never having taken Hormonal Replacement Therapy(HRT)

for osteoporosis related fractures in Scotland<sub>20</sub> were that they had never considered the treatment and had not discussed it with a doctor due to lack of awareness. Health Education is of paramount importance in the prevention of ORMTF. Majority of the health workers perceived that osteoporosis should be preventable and treatable despite their knowledge deficit on meaning of osteoporosis and predisposing factors to ORMTF. It shows that the level of awareness could be improved upon with adequate health education based on the positive perceptions of the health workers.

Education is known to have an influence on the public health measures in a country, and it was found to be the strongest predictive factor for knowledge on osteoporosis according to research by the Central Bureau of Statistics of Norway, among 1514 subjects<sub>15</sub>. There is need for effective promotional instruments such as educational activities in different level about osteoporosis and ORMTF. It should contain public education using mass media-radio, television, and news paper advertisement. Patient education through informative booklets, face to face education will be effective, cheap and affordable. Also, medical staff training that will encompasses the provision of guidelines for practice and follow up of ORMTF care. These should be organized and financed by the stakeholders in health matters; national health policy makers, medical associations and other non-governmental organizations. Courses, workshops and seminars on ORMTF should become routine for health workers to create awareness of osteoporosis in the current Bone and Joint decade .

### **CONCLUSION**

According to our study, a considerable number of health workers are unaware of the risk factors and the consequences of osteoporosis with a superficial familiarity giving the society false sense of security about ORMTF, its severity and its potential impact on the elderly population.

Public awareness concerning the dangers of ORMTF is of utmost importance that require motivation of individuals to take steps to prevent its devastating effects. The public expects the health workers to be thoroughly knowledgeable about bone health. The physicians should assume an active, highly visible role in this regard. Many health workers are observing from the sidelines and not well-read on the subject. ORMTF is a health concern that should propel all orthopaedic surgeons to the forefront. To effect change requires knowledge, so health workers must be thoroughly educated about the devastating effects of ORMTF and then

become well equipped to prevent and treat it. Increasing ORMTF awareness can then be effected in patients and the community. Awareness of ORMTF among health workers should be one of the major topics of health promotion in family practice to enhance the quality of life in older age and prevent ORMTF.

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