

# Knowledge, attitude, and misconceptions towards osteoporosis among patients with musculoskeletal health problems

**Purpose/Introduction:** To determine the level of awareness and knowledge about osteoporosis among a sample of patients with musculoskeletal diseases.

**Methods:** Through a cross-sectional study on patients with musculoskeletal disorders either degenerative or inflammatory (aged 18-62 years), 1200 participants were interviewed and responded to a prepared validated questionnaire about the knowledge and attitude towards Osteoporosis (OP) and its potential complications as fragility fractures and kyphosis.

**Results:** Seventy eight percent (936) of the studied subjects know osteoporosis (of them only 930 agreed to complete the study) while 22% did not know a disease called osteoporosis and did not complete the remaining questions. A positive effect was found for educational level, occupation, and residence on knowledge of osteoporosis ( $P=0.000$ ,  $P=0.001$ ,  $P=0.002$  respectively). Among those who completed the questionnaire, the majority (72.2% and 82%) were found to have the misconceptions that OP can lead to joint deformities and bone pain which reflected that their knowledge about the disease lacks the required in-depth awareness.

**Conclusion:** There are variable degrees of knowledge and attitudes towards osteoporosis among patients with musculoskeletal disorders which are affected by multiple factors including educational level, occupation, residence and marital status. However, the in-depth awareness about the disease is highly limited and efforts should be done to overcome this point as a first step to prevent the disease.

**Keywords:** osteoporosis • knowledge • co-morbidities • musculoskeletal diseases

## Introduction

Osteoporosis (OP) is a systemic disease characterized by low bone mass and deteriorated bony tissue microarchitecture due to abnormalities of bone turnover resulting in fragility and higher exposure to fracture risk [1]. Many criteria for osteoporosis diagnosis have been proposed. According to the World Health Organization (WHO), osteoporosis is defined as a Bone Mineral Density (BMD) at the hip and/or the spine at least 2.5 Standard Deviations (SD) below the mean peak bone mass of young healthy adults as determined by Dual-energy X-ray Absorptiometry (DXA) [2].

Osteoporosis is well known as an important

worldwide health problem, affecting about 200 million people [3]. More than 40% of women and 20% of men suffering from OP are vulnerable to have an osteoporotic (fragility) fracture throughout their life [4].

Osteoporosis is associated with a mortality rate ranges from 15 to 30% which is near to mortality rate in breast cancer and stroke [5]. It is a widely recognized, silent metabolic disease that manifests clinical signs only after sufficient damage has already been done. In 2014, the National Osteoporosis Foundation found that a total of 54 million adults aged more than 50 years in the USA are affected by OP and low bone mass [6].

**Abdelhafeez Moshrif<sup>1</sup>, Hany M Aly<sup>\*2</sup> & Hamid Khalifa<sup>3</sup>**

<sup>1</sup>Department of Rheumatology, Faculty of Medicine, Al-Azhar University, Assiut, Egypt

<sup>2</sup>Department of Rheumatology, Faculty of Medicine, Al-Azhar University, Cairo, Egypt

<sup>3</sup>Department of Community Medicine, Faculty of Medicine, Al-Azhar University, Assiut, Egypt

**\*Author for correspondence:**

hanyaly79@azhar.edu.eg

In Egypt, assessment of numerous performed studies revealed that 53.9% of postmenopausal women have osteopenia and 28.4% have OP. On the other hand, 26% of men have osteopenia and 21.9% have OP [7]. The prevalence of OP is increasing steadily and ongoing as a major public health problem in concordance with the universal increasing life expectancy; especially more rapidly in the developing countries [8]. It is supposed that by 2050, the Egyptian population will be close to 130 million inhabitants, and more than 30% of its population will be aged 50 years and over [9]. Based on the fact that rheumatic diseases are not well included in the mass media in our region and that the rheumatic and musculoskeletal diseases are learned by the internists and not the rheumatologists in most of our universities, we supposed that there is a deficiency in the knowledge related to these diseases. As part of a systemic project to evaluate the awareness and attitude towards rheumatic and musculoskeletal disorders among our patients, this study aimed to determine the level of awareness and knowledge about osteoporosis among a sample of patients with musculoskeletal health problems.

## Methods

Through a cross-sectional study, 1200 participants (18-62 years) of those attending the outpatient clinics of rheumatology of our university hospitals between June 2019 to January 2020 complaining of musculoskeletal diseases either degenerative or inflammatory were interviewed and provided with detailed information about the study. An informed consent was provided from each participant. The work conforms to the ethical standards of the Helsinki declaration and was approved by the local institutional ethical committee of Al-Azhar university. The participants responded to a prepared questionnaire about the knowledge and attitude towards Osteoporosis (OP) and its potential complications as fragility fractures and kyphosis.

The questionnaire was proposed and constructed by the first author and then revised, refined and adapted by the rest of the authors. To validate the survey, a pilot analysis was done and the second and third authors then revised the accuracy of the Arabic translation of the version provided, its design, content and easiness to fill in.

The information collected included age, sex, geographic area, educational level, and a response to direct questions in the form of "do you know OP? answered by yes or no. Those who know the disease were asked to complete the study and respond to the close-ended questions about "can OP lead to joint deformities, pain, fragility fracture and kyphosis? Answered by yes, no, I

don't know. The aim of the questions about the causality relationship between OP and joint deformities as well as bone pain was to examine the in-depth knowledge of the participants as these two questions reflect the misconceptions about OP that it can lead to pain and joint deformity. Patients were contacted face-to-face and their answers were recorded patient by patient and then transferred into an excel sheet.

## Statistical analysis

Data were analyzed using SPSS version 25. Continuous data were expressed as mean  $\pm$  standard deviation or frequency and percentages. The significance was assessed using the Pearson Chi-square test for comparison of the given normally distributed variables of the two groups (those who know and those who don't know).  $P < 0.05$  was considered significant.

## Results

A total of 1200 participants with musculoskeletal health problems were included in the study with different levels of education (Illiterate 39.0%, before high education 48.3% and highly educated 12.7%), occupation (No work 62.2%, crafted 9.3%, daily worker 12.8%, employee 6.7% and private job 9%) gender (male 41.2% and female 58.8%), marital status (single 17.2%, married 77.3%, divorced 1.5% and widowed 4%) and residence (rural 75.8% and urban 24.2%) as shown and detailed in Table 1. Their knowledge about osteoporosis was tested by the question (Do you know a disease called osteoporosis?). 270 subjects did not know osteoporosis (22%) and not allowed to complete the questions. From 936 (78%) subjects know the disease only (930) agreed to complete the questions about comorbidities. A moderate knowledge was found about osteoporosis comorbidities among those who completed the study and no effect was found for the marital status and gender) on the level of knowledge ( $P=0.32$  and  $0.182$  respectively). A significant effect has been found for education ( $P=0.000$ ), residence ( $P=0.001$ ) and occupation ( $P=0.002$ ) (Table 1).

The majority of patients (72.26 %) were found to have the misconception that OP can lead to joint deformities. No effect was found for the educational level ( $P: 0.170$ ), occupation ( $P: 0.272$ ), gender ( $P: 0.284$ ), and residence ( $P: 0.154$ ) on this misconception (Table 2).

On the other hand, the majority of our patients (82%) also were found to have the misconception that OP can lead to bone pain. No effect was found for the educational level ( $P: 0.619$ ), occupation ( $P: 0.419$ ), gender ( $P: 0.955$ ), and residence ( $P: 0.346$ ) on knowledge about bone pain caused by OP (Table 3). This indicates that

**Table 1. Knowledge about OP: Do you know a disease called OP?**

The study Population	Who know osteoporosis (n=936)		Who don't know osteoporosis (n=264)		Total (n=1200)	
	No.	%	No.	%	No.	%
Education level:						
Illiterate	272	58.1	196	41.9	468	39
before high education	518	89.3	62	10.7	580	48.3
High	146	96.1	6	3.9	152	12.7
Pearson Chi-square: 91.698; P: 0.000 **						
Occupation:						
No work	582	78	164	22	746	62.2
Crafted	92	82.1	20	17.9	112	9.3
Daily worker	96	62.3	58	37.7	154	12.8
Employee	70	87.5	10	12.5	80	6.7
Private job	96	88.9	12	11.1	108	9
Pearson Chi-square: 17.402; P: 0.002 **						
Gender:						
Male	372	75.3	122	24.7	494	41.2
Female	564	79.9	142	20.1	706	58.8
Pearson Chi-square: 1.779; P: 0.182 #						
Marital status:						
Single	176	85.4	30	14.6	206	17.2
Married	718	77.4	210	22.6	928	77.3
Divorced	14	77.8	4	22.2	18	1.5
Widowed	28	58.3	20	41.7	48	4
Pearson Chi-square: 8.837; P: 0.032 *						
Residence:						
Rural	682	74.9	228	25.1	910	75.8
Urban	254	87.6	36	12.4	290	24.2
Pearson Chi-square: 10.240; P: 0.001 **						
Total	936	78	264	22	1200	100

**Table 2. Knowledge about joint deformities and osteoporosis. Can OP lead to joint deformities?**

The study Population	Yes (672)		No (26)		I don't know (232)		Total (930)	
	No.	%	No.	%	No.	%	No.	%
Education level								
Illiterate	180	66.7	6	2.2	84	31.1	270	29
before high education	374	72.5	18	3.5	124	24	516	55.5
High	118	81.9	2	1.4	24	16.7	144	15.5
Pearson Chi-square: 11.592; P: 0.170 #								
Occupation:								
No work	406	70.2	12	2.1	160	27.7	578	62.2
Crafted	58	64.4	4	4.4	28	31.1	90	9.7
Daily worker	76	79.2	6	6.2	14	14.6	96	10.3
Employee	54	77.1	2	2.9	14	20	70	7.5
Private job	78	81.2	2	2.1	16	16.7	96	10.3
Pearson Chi-square: 9.903; P: 0.272 #								
Gender								
Male	282	76.2	10	2.7	78	21.1	370	39.8
Female	390	69.6	16	2.9	154	27.5	560	60.2
Pearson Chi-square: 2.516; P: 0.284 #								
Marital status:								
Single	142	80.7	6	3.4	28	15.9	176	18.9
Married	504	70.6	18	2.5	192	26.9	714	76.8

Divorced	10	71.4	2	14.3	2	14.3	14	1.5
Widowed	16	61.5	0	0	10	38.5	26	2.8
Pearson Chi-square: 9.786; P: 0.134 #								
Residence								
Rural	486	71.5	14	2.1	180	26.5	680	73.1
Urban	186	74.4	12	4.8	52	20.8	250	26.9
Pearson Chi-square: 3.743; P: 0.154 #								
Total	672	72.3	26	2.8	232	24.9	930	100

Table 3. Knowledge about bone pain and osteoporosis. Can OP lead to bone pain?								
The study Population	Yes (764)		No (18)		I don't know (148)		Total (930)	
	No.	%	No.	%	No.	%	No.	%
Education level								
Illiterate	212	78.5	4	1.5	54	20	270	29
before high education	430	83.3	8	1.6	78	15.1	516	55.5
High	122	84.7	6	4.2	16	11.1	144	15.5
Pearson Chi-square: 6.252; P: 0.619 #								
Occupation:								
No work	470	81.3	12	2.1	96	16.6	578	62.2
Crafted	68	75.6	2	2.2	20	22.2	90	9.7
Daily worker	76	79.2	4	4.2	16	16.7	96	10.3
Employee	60	85.7	0	0	10	14.3	70	7.5
Private job	90	93.8	0	0	6	6.2	96	10.3
Pearson Chi-square: 8.150; P: 0.419 #								
Gender								
Male	304	82.2	8	2.2	58	15.7	370	39.8
Female	460	82.1	10	1.8	90	16.1	560	60.2
Pearson Chi-square: 0.093; P: 0.955 #								
Marital status:								
Single	154	87.5	4	2.3	18	10.2	176	18.9
Married	586	82.1	14	2	114	16	714	76.8
Divorced	6	42.9	0	0	8	57.1	14	1.5
Widowed	18	69.2	0	0	8	30.8	26	2.8
Pearson Chi-square: 13.395; P: 0.037 #								
Residence								
Rural	548	80.6	14	2.1	118	17.4	680	73.1
Urban	216	86.4	4	1.6	30	12	250	26.9
Pearson Chi-square: 2.121; P: 0.346 #								
Total	764	8	18	1.9	148	15.9	930	100

our participants have superficial knowledge but not true awareness about the disease. 71% of patients knew that OP can lead to fragility fracture while 26% of them don't know this important relation. No effect was found for the educational level (P: 0.084), occupation (P: 0.298), gender (P: 0.931), marital status (P: 0.217) and residence (P: 0.534) on knowledge about fragility fracture caused by osteoporosis? (Table 4).

32.7 % of consulted participants were found to have the knowledge that OP can lead to kyphosis. No effect was

found for the educational level (P: 0.547), occupation (P: 0.177), gender (P: 0.236), and residence (P: 0.673) on knowledge about this causality (Table 5).

### Discussion

Awareness and knowledge about OP significantly decrease the risk of fractures and other comorbidities. Also, a healthy lifestyle and healthy behaviors decrease the fracture risk of OP [10]. Different factors such as educational level and occupation may affect the level of awareness about OP, OP fragility fractures and other

**Table 4. Knowledge about fragility fractures caused by osteoporosis. Can OP lead to fragility fractures?**

The study Population	Yes (660)		No (30)		I don't know (240)		Total (930)	
	No.	%	No.	%	No.	%	No.	%
Education level								
Illiterate	186	68.9	4	1.5	80	29.6	270	29
before high education	350	67.8	24	4.7	142	27.5	516	55.5
High	124	86.1	2	1.4	18	12.5	144	15.5
Pearson Chi-square: 13.911; P: 0.084 #								
Occupation:								
No work	398	68.9	16	2.8	164	28.4	578	62.2
Crafted	64	71.1	2	2.2	24	26.7	90	9.7
Daily worker	62	64.6	6	6.2	28	29.2	96	10.3
Employee	56	80	4	5.7	10	14.3	70	7.5
Private job	80	83.3	2	2.1	14	14.6	96	10.3
Pearson Chi-square: 9.553; P: 0.298 #								
Gender								
Male	266	71.9	12	3.2	92	24.9	370	39.8
Female	394	70.4	18	3.2	148	26.4	560	60.2
Pearson Chi-square: 0.143; P: 0.931 #								
Marital status:								
Single	136	77.3	2	1.1	38	21.6	176	18.9
Married	504	70.6	26	3.6	184	25.8	714	76.8
Divorced	6	42.9	0	0	8	57.1	14	1.5
Widowed	14	53.8	2	7.7	10	38.5	26	2.8
Pearson Chi-square: 8.305; P: 0.217 #								
Residence								
Rural	47670.0	70	20	2.9	184	27.1	680	73.1
Urban	18473.6	73.6	10	4	56	22.4	250	26.9
Pearson Chi-square: 1.253; P: 0.534 #								
Total	660	71	30	3.2	240	25.8	930	100

**Table 5. Knowledge about the relation between kyphosis and osteoporosis. Can OP lead to kyphosis?**

The study Population	Yes (580)		No (46)		I don't know (304)		Total (930)	
	No.	%	No.	%	No.	%	No.	%
Education level								
Illiterate	162	60	10	3.7	98	36.3	270	29
before high education	322	62.4	26	5	168	32.6	516	55.5
High	96	66.7	10	6.9	38	26.4	144	15.5
Pearson Chi-square: 6.904; P: 0.547 #								
Occupation:								
No work	356	61.6	22	3.8	200	34.6	578	62.2
Crafted	48	53.3	8	8.9	34	37.8	90	9.7
Daily worker	60	62.5	10	10.4	26	27.1	96	10.3
Employee	42	60	4	5.7	24	34.3	70	7.5
Private job	74	77.1	2	2.1	20	20.8	96	10.3
Pearson Chi-square: 11.463; P: 0.177 #								
Gender								
Male	228	61.6	26	7	116	31.4	370	39.8
Female	352	62.9	20	3.6	188	33.6	560	60.2
Pearson Chi-square: 2.885; P: 0.236 #								
Marital status:								
Single	106	60.2	12	6.8	58	33	176	18.9
Married	456	63.9	30	4.2	228	31.9	714	76.8
Divorced	8	57.1	2	14.3	4	28.6	14	1.5

Widowed	10	38.5	2	7.7	14	53.8	26	2.8
Pearson Chi-square: 5.752; P: 0.452 #								
Residence								
Rural	416	61.2	34	5	230	33.8	680	73.1
Urban	164	65.6	12	4.8	74	29.6	250	26.9
Pearson Chi-square: 0.793; P: 0.673 #								
Total	580	62	446	4.9	304	32.7	930	100

comorbidities. To the best of our knowledge, this is the first study about knowledge and misconceptions of OP among patients with musculoskeletal diseases.

In our study, 78% of the studied subjects know the disease with the level of knowledge about osteoporosis was affected by the educational status, residence, and occupation while no sex effect was found. This may be more or less similar to a study conducted on a sample of pre and postmenopausal women in 2015 showed that 95.1% of the studied population was familiar with OP. However, their knowledge about the disease risk factors and comorbidities was considered moderate [11]. The same was reported in Saudi Arabia as 82% of participants in a community-based study had heard about OP with significant effect of the educational level, gender, occupation, age, and income on their awareness [12].

Ergen and Akcaireported reported a high level of awareness among Turkish women with postmenopausal OP (90.5%) [13] however, another earlier multicenter Turkish study conducted by Kutsal et al. reported a relatively low level of knowledge about the disease (54%) [14].

Nguyen et al reported a high level of awareness among Vietnamese women (81.6%) [15]. On the other hand, a study performed on healthy subjects in North Egypt in 2015 [16] using Osteoporosis Knowledge Assessment Tool (OKAT) [17] revealed poor knowledge about OP. In the same context, another Egyptian study performed in 2018 revealed that a low percentage of pre and post-menopausal women were aware of OP and fracture (16.67% & 12.96% and 30.65% & 19.35% respectively) [18]. The same was recently reported by Iranian study as the majority (81%) of females were found unaware about OP and its complications [19]. Also, a poor knowledge of OP was reported among female nursing school students in Damascus [20] as well as among female students in Saudi college [21].

In a recent review article on the prevalence and awareness of OP in the area of the Middle East and North Africa, Geita and Hammam reported a variable but high prevalence of OP in this area with an overall

lack of knowledge and awareness about the disease, its risk factors, preventive measures and complications. The authors also reported a limited number of studies regarding the established prevalence of osteoporotic fractures [22]. In a dissertation presented in 2000 by Schnieder at the University of Montana about the awareness of OP prevention and its impact on the bone health conducted on 73 American postmenopausal women, the author reported inadequate knowledge about the preventive measures for OP estimated as 77%. While there was an insignificant relationship between the overall awareness of how to prevent the disease and the bone health of the studied women. Nevertheless, significant differences had been found between certain aspects of the prevention program and the participant's bone health measured by DXA [23]. Similarly, low awareness of OP among Indian postmenopausal women was reported before [24]. A pilot study in Qatar performed on 90 OP patients reported variable degrees of knowledge among patients affected by the level of education and recommended the need for more in-depth awareness about the disease [25].

In this study, we intended to evaluate two misconceptions commonly encountered in the daily practice to examine in depth the knowledge of those stating that they know the disease. As expected, the majority of our participants were found to have misconceptions that OP can lead to joint deformities and bone pain reflecting the lack of true knowledge about OP. The educational level, occupation, residence in urban areas and gender did not affect their knowledge regarding these two points as well as regarding the causality of OP with fragility fracture and kyphosis.

Our study has many limitations as the low sample size of participants, the lack of questions about the modifiable and non-modifiable risk factors of the disease. Furthermore, the used questionnaire didn't include the types of osteoporosis as the drug-induced and disease-related OP as well as the knowledge of the studied participants about the tools of measuring bone mineral density.

### Conclusion

There are variable degrees of knowledge and



attitude towards osteoporosis among patients with musculoskeletal conditions that were affected by multiple factors including educational level, occupation, residence and marital status.

Conflict of interest

None.

Ethical approval

The study was approved by the Ethics Board of Al-Azhar University, Egypt.

Conflicts of interest

The authors declare no conflicts of interest

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