Socio-economic investigation of osteoporosis patients

Penyelidikan sosial-ekonomi pasien osteoporosis

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Abstract

Osteoporosis has become a public health problem risk factor worldwide and a deliberate disease that affects both women and men equally. The main objective of this study is to explore the socio-economic status of osteoporosis patients related to the occurrence of osteoporosis— the current study conducted at federal government hospitals in Islamabad. A quantitative research method used to collect data through a well-designed questionnaire. A stratified random sampling technique used to select a sample of 400 osteoporosis patients within 35-80 years. Mann-Whitney U Test applied for a dependent, independent variable, and frequency distribution tables used for univariate analysis. Results showed that osteoporosis patients were spending more money on their household expenditures than health. The socio-economic status of osteoporosis patients is essential for the prevention of osteoporosis and their treatment. Osteoporosis is one of the major global health issues associated with socio-economic status. The present study recommended that the improvement of socio-economic status and increasing the level of education could play a vital role in reducing the risks of osteoporosis.

Keywords: osteoporosis; socio-economic status; bone density; poverty; awareness

Abstrak

Osteoporosis telah menjadi faktor risiko masalah kesehatan masyarakat di seluruh dunia dan penyakit disengaja yang terutama mempengaruhi wanita dan pria. Penelitian ini dilakukan untuk mengeksplorasi status sosial ekonomi pasien osteoporosis yang terkait dengan terjadinya penyakit osteoporosis. Studi ini dilakukan di rumah sakit pemerintah federal di Islamabad. Metode penelitian kuantitatif digunakan untuk mengumpulkan data melalui kuesioner yang dirancang dengan baik. Teknik stratified random sampling digunakan untuk memilih sampel 400 pasien osteoporosis dalam usia 35-80 tahun. Uji Mann-Whitney U diterapkan untuk variabel dependen dan independen dan tabel distribusi frekuensi digunakan untuk analisis univariat. Hasil penelitian menunjukkan bahwa pasien osteoporosis menghabiskan lebih banyak uang untuk pengeluaran rumah tangga mereka daripada kesehatan. Status sosial ekonomi pasien osteoporosis penting untuk pencegahan osteoporosis dan perawatannya. Penyakit osteoporosis adalah salah satu masalah kesehatan global utama yang terkait dengan status sosial ekonomi. Dalam penelitian ini, direkomendasikan bahwa peningkatan status sosial ekonomi dan peningkatan tingkat pendidikan dapat memainkan peran penting untuk mengurangi risiko penyakit osteoporosis.

Kata kunci: *osteoporosis; status sosial ekonomi; kepadatan tulang; kemiskinan; kesadaran*

Introduction

Osteoporosis has become an essential public health problem worldwide with an estimated occurrence of over 200 million, of whom about forty-four million belong to the United States (Reginster & Burlet 2006). It estimated about 9.9 million humans in Pakistan have osteoporosis, of whom 7.2 million are women. It estimated that about forty million Pakistanis have osteopenia with equal distribution among men and females. It anticipates the occurrence of osteoporosis in Pakistan rise in the coming years with an estimated occurrence of 11.3 million in 2020 and 12.9 million in 2050 (Mithal et al. 2009, Ida & Saud 2020). The burden of osteoporosis is tremendously increasing in developing countries (Woolf & Bruce 2005). Among Asian countries, there is a 2-3 fold increase in the incidence of osteoporotic fracture over the past 30 years. According to Mithal & Kaur (2012), in Pakistan, osteoporosis prevails in 9.91 million people, of whom 72.5% (7.19 million) are female, and these figures expected to rise through 2050 to 12.91 million. There are myriad causes accountable for osteoporosis, such as female sex, family history, low dietary calcium intake, vitamin D deficiency, illicit lifestyle behavior (smoking and alcohol use), and sedentary lifestyle (Akhtar et al. 2016, Sohail et al. 2019).

Osteoporosis is a complex and multifactorial problem, and recognition of modifiable causes is essential to healthier aging and to minimize the care, social, and personal costs of fracture (Langsetmo et al. 2012). Also, patients with any fracture related to osteoporosis may have an unhealthy state of mind and, as a result, may have psychological symptoms such as depression and low self-esteem, i.e., a change in lifestyle and fracture pain due to their physical limitations (Kerr et al. 2017). Fractures in postmenopausal women have an immense economic effect and a substantial budgetary cost on the health system due to expanded usage of clinical services, hospitalization, nursing home requirements, lack of employment, and decreased independence after hip fractures (Gutierrez et al. 2012).

Osteoporosis is amongst the leading health problems that affect both men and women (Fitriani et al. 2019). However, the incidence and prevalence of osteoporosis are more frequent in females than in males. The study examines osteoporosis's burden in the urban setting areas of Sindh amongst females of distinctive age groups to assess the impact of different protecting measures that can minimize the risk of osteoporosis (Khan et al. 2005). Osteoporosis is a predominant and growing public health problem in both sexes, but especially in females (Spencer 2007). It is a systemic skeletal disorder characterized by a reduction of bone mass, deterioration of the bone structure, increasing bone fragility, and growing fracture threat (Mirko 2006). Riaz et al. (2008) stated that it is the leading cause of fractures in the elderly, resulting in pain, disability, expensive rehabilitation, poor quality of life, and death. Habiba et al. (2002) mentioned that developing countries continue to be ill-equipped to manage the burden of the disease. It, coupled with reduced literacy rates and lack of attention to the risk factors and signs and symptoms, results in poor outcomes.

Eachus et al. (1996) examined that socio-economic factors have been recognized as associated factors of chronic diseases such as diabetes and cardiovascular disease. Eames et al. (2004) also mentioned plausible risk factors for health behaviors, such as smoking and alcohol consumption. There are many recognized risk factors for osteoporosis, such as old age, gender, low physique weight, dietary imbalance and dietary habits, family medical history, race, and drinking. Baumann et al. (2007) examined that socio-economic status is the key associated element of chronic diseases, and osteoporosis needs much attention and research. The socio-economic burden, along with direct health costs of osteoporosis causes, has already reached a seriously high level. Social inequalities in health have been recognized for centuries (Kanis et al. 2009), even in generally wealthy Western countries, material deprivation, and poverty are not uncommon (Groffen et al. 2008). Despite the absolute levels of living standard health disparities existing through relative deprivation (Marmot 2001), few people know about the social inequalities in osteoporosis and fractures.

Brennan et al. (2011) conducted systematic reviews of the associations between socio-economic status (income, education, employment and type of residence) and bone mineral density. Bone disorders classified according to impaired bone strength affecting an increased risk fracture are a severe public health problem worldwide. The socio-economic factors of osteoporosis are gradually increasing due to the aging of the world population. Brennan et al. (2011) concluded that there is limited evidence of good quality for social inequalities in mineral density and bone fractures and that further research, ideally cohort studies rather than ecological studies or cases and controls, are needed to clarify the relationships between individual-level indicators and socio-economic status and bone mineral density. The explanation of osteoporosis and fracture requires a social model that would inform the planning of health services and social assistance and would allow public health strategies for the prevention, intervention, and treatment of osteoporosis and fracture to be adequately targeted (Ariadi et al. 2018, Brennan et al. 2011).

Park et al. (2014) estimated that the treatment expenses for osteoporosis in South Korea from 2007 to 2011 amounted to 290 million USD, and the social loss for that period was estimated to be 924 million USD. In the United States, 9.9 million people have osteoporosis, and the medical costs of their treatment will be projected to increase to 2.53 billion USD by 2025. The socio-economic background can also affect the utilization of the healthcare system in a variety of ways. Individuals

with a higher socio-economic position have the personal freedom to obtain easy access to professional healthcare and healthcare services. In contrast, people with lower socio-economic status may also have problems accessing the healthcare system due to economic barriers, in-information disparity, lack of understanding of needs, vulnerable employer support for the use of the healthcare system (time, expense, and transport) and fear of additional fees (Lee et al. 2014).

There are several distorted stereotypes of national health checkup programs, which would be more reliable in low socio-economic status groups. For example, 'national' may also be perceived as more untrustworthy than 'opportunistic' programs, or the 'national health checkup program' may be no longer for healthy people, just for humans with symptoms. Such misperceptions are a barrier for low socio-economic status groups to make use of national health checkups. In addition, socio-economic status is associated with health behaviors such as physical activity, alcohol consumption, cigarette smoking, nutrition, and cure compliance (Shin & Kang 2016), and many researchers have proven the association between economic status and osteoporosis (Kim & Kim 2007). Understanding the connection between socio-economic status and adherence to health checkups would be beneficial for efficiently and adequately directing health policy and distributing restricted public health assets. The purpose of this study is to investigate the association between socio-economic status (household earnings level, occupation, and education) and adherence to health checkups after adjusting for confounding variables in Pakistan's osteoporosis patients between 35-80 and older.

In Pakistan, the recorded prevalence of osteopenia was 34%-72.9%, and osteoporosis was 2.4%-30.90% (Lowe et al. 2008), and it was observed that 30.9% and 45.60% of Pakistani females were osteoporotic and osteopenic (Makhdoom et al. 2014). In 2009, the International Osteoporosis Foundation (IOF) reported that 7.2 million women had osteoporosis in Pakistan out of a total estimated 9.9 million subjects. Moreover, the incidence of osteopenia is estimated to be approximately 40 million in Pakistanis, and both sexes are equally affected by this problem. It is also estimated that the prevalence of osteoporosis in Pakistan would increase to 11.3 million (2020) and 12.91 million (2050). The literature indicates that marital status, educational qualification, type of work, and residence have a substantial effect on bone mass density and the likelihood of fractures. Such aspects ought to be provided due consideration when testing patients for operations and fractures. Numerous literature on the position of education (AlQuaiz et al. 2014, Pluskiewicz et al. 2014), marital status and profession (Vestergaard et al. 2006) is available, which contributes to the differing prevalence of osteoporosis and fracture levels.

In Pakistan, data on epidemiology and demographics of osteoporosis and associated fractures are scarce. It is essential to recognize the main risk factors for osteoporosis. Limited evidence is available on the effect of age, marital status, educational level, profession, and place of living on bone health in our part of the world. This study was, therefore, intended to measure the socio-economic status of osteoporosis patients.

Research Method

The current study was conducted at federal government hospitals in Islamabad, i.e., Pakistan Institute of Medical Sciences (PIMS), National Institute of Rehabilitation and Medicine (NIRM), and Nuclear Medicines Oncology and Radio Therapy Institute (NORI). It was designed to find out the socio-economic factor behind the prevalence of osteoporosis diseases, especially concerning Pakistan. The quantitative research design used to collect the data through a proper design questionnaire comprised of questions related to osteoporosis patients' socio-economic status. Stratified random sampling techniques were used to select the sample of 400 osteoporosis patients from both males and females between the ages of 35-80 years. The collected data were analyzed through SPSS 26 version 2019, for both univariate and bivariate analysis. For univariate analysis as frequency distribution, the central tendency has been used to describe the results in tabulated form. Mann-Whitney U test was applied to check the relationship between dependent and independent variables.

Results and Discussion

Results and discussion provided on the results of the research based on the primary data. It emphasizes the socio-economic status and demographic status of osteoporosis patients, including males and females, in Pakistan.

Socio-economic status of osteoporosis patients in Pakistan

Osteoporosis is one of the major non-communicable diseases that has increased due to vitamin D deficiency and is mostly occurring in older age people. This study aimed to identify the socio-economic characteristics of osteoporosis patients in Pakistan and found there was a significant relationship between the socio-economic status of osteoporosis patients and osteoporosis itself. Socio-economic status is a critical factor in reducing the prevalence of osteoporosis diseases in Pakistan. One of the essential issues for assessing the socio-economic status of patients with osteoporosis was the measurement of income, occupation, and housing status. The level of socio-economic status will improve the quality of their diets, lifestyles, and level of education.

Table 1.
Gender of the respondents

Gender	Frequency	Percentage (%)
Male	137	34.2
Female	263	65.8
Total	**400**	**100.0**

Source: Primary research

Table 2.
Age of the respondents

Age	Frequency	Percentage (%)
35-45	65	16.2
46-55	121	30.2
56-65	122	30.5
66-75	81	20.3
76-85	11	2.8
Total	**400**	**100.0**

Notes: Mean= 1.66, Std. Deviation= .475
Source: Primary research

Table 1 shows that 34.2% of males and 65.8% of females had osteoporosis. The majority of osteoporosis patients were females because, according to available literature and the current results, osteoporosis disease is more common in females then males due to menopause and hormonal changes. Statistical analysis of gender has means 1.66 and standard deviation=475. Gender is an essential variable in a social scene that is variably affected in employing any social or financial phenomenon, and globalization is no longer an exception to it. The variable gender is investigated for this study. In social circumstances, the households are usually headed by the men, and head of the family was the unit for information collection; from the sample, very few households were headed by women due to several unavoidable and unique prerequisites (Nam et al. 2010).

Table 2 describes that 16.2% of respondents of osteoporosis patients belonged to the 35-45 age group, 30.2% were 46-55, 30.5 were 56-65, 20.3 were 66-75, and the rest, 2.8, belonged to the 76-85 age group. The majority of osteoporosis patients were in the 46-55 and 56-65 age groups because osteoporosis is a disease of the elderly, both men and women. The mean age of osteoporosis patients was 2.63, with a standard deviation of 1.063 years. All of the selected osteoporosis patients belonged to the age group between 35-85. Gallagher & John (2008) indicated that the age factor is essential among individuals' various socio-economic status as it affects the quality of life, such as social interaction and livelihood.

Table 3 explains that 17.5% of osteoporosis patients were illiterate, 18.3% were primary, 21.4% were middle, 14.0% were matric, 10.3% were intermediate, 16.2% were graduates, and the other 2.3% were postgraduates. The majority of osteoporosis patients had middle-level education. They are less educated, and, as such, they do not have knowledge and awareness about osteoporosis. Previous literature stated that education is one of the essential characteristics that can affect a person's attitudes and the way of seeing and understanding any particular social phenomenon. In a way, an individual's responses are likely determined by their educational status and, therefore, it is essential to know the educational background of the respondents (Scherr 2007). Tung & Lee (2006) found that education is a vital demographic factor for social development. The development of human resources is influenced by getting an education. The use of technology in education has had a positive impact on the students, educators, as well as the educational system. Officials have observed many positive impacts in the field.

Table 4 describes that 16.8% of osteoporosis patients were doing government jobs, 19.0%were doing the private job, 3.0% were doing agriculture, 7.8% were self-employed, 4.0% were laborers, 46.5% were housewives, and the other 5.8% of osteoporosis patients were unemployed. According to Miech et al. (2003), occupation influences an individual's personality and the ways of seeing problems before them. The quality of life is also determined by the occupation of an individual and the income derived from it. An individual's occupation also socializes them in a way that, in turn, reflects their pattern of behavior and level of understanding of a phenomenon.

Table 3.
The education level of the respondent

Education level	Frequency	Percentage (%)
Illiterate	70	17.5
Primary	73	18.3
Middle	86	21.4
Matric	56	14.0
Intermediate	41	10.3
Graduate	65	16.2
Postgraduate	9	2.3
Total	**400**	**100.0**

Source: Primary research

Table 4.
Occupation of respondents

Education level	Frequency	Percentage (%)
Government Job	67	16.8
Private Job	76	19.0
Agriculture	1	3.0
Self-employed	31	7.8
Labor	16	4.0
Housewife	186	46.5
Unemployed	23	5.8
Total	**400**	**100.0**

Source: Primary research

Table 5 highlights that there is no association between the expenditure of osteoporosis patients and economic burden due to illness because they own expending more on household expenditures than health. The table above shows that osteoporosis patients are spending money on their daily household expenditure to fulfill domestic needs. They are not spending money on their illness due to limited resources, heavy household, and socio-economic burden to maintain their status in society. The statistical Mann-Whitney U test was applied to check the association between the said variables. The result shows no significant (0.5<.541) association between monthly expenditure and economic burden. We accept the alternative hypothesis and reject the null hypothesis.

Table 5.
Association between monthly expenditure and economic burden

Economic burden		N	Mean rank	Sum of ranks
Monthly expenditure	Yes	301	198.51	59750.5
	No	99	206.56	20449.5
Total			**400**	
Test Statistic[a]				
Mann-Whitney U			14299.500	
Wilcoxon W			59750.500	
Z			-.611	
Asymp. Sig. (2-tailed)			.541	

Source: Primary research

The existing literature showed that osteoporosis is a significant and long-term disease that represents a socio-economic burden worldwide, with an estimated nine million osteoporotic fractures in 2000 (Yekefallah et al. 2012). Wiktorowicz et al. (2001) reported that, worldwide, the economic burden of osteoporosis is similar to that seen in Canada. Osteoporosis-related fractures in the United States are responsible for an estimated 19 billion USD in costs, with men accounting for over 25% of the burden. Researchers predicted that, in 2025, osteoporosis and its fractures and costs would grow by more than 48%, resulting in 25.3 billion USD in healthcare costs, with the increasing concern being the fast growth of the disease on the economic burden among the non-white population. These values for both Canada and the United States are a considerable underestimation of the real costs of osteoporosis, as it does not take into account treatment costs for individuals without a history of fracture and indirect costs of lost wages and productivity.

Conclusion

Osteoporosis is one of the severe health problems in the elderly Pakistani population due to many reasons. In the present study, the researcher investigated the socio-economic status of osteoporosis patients. Mann-Whitney U test was applied to check the association between the socio-economic status of osteoporosis patients and the consequences of osteoporosis diseases. The results showed no association between health expenditure of osteoporosis and economic burden due to illness. It is concluded that osteoporosis patients were not spending money on health due to their substantial household expenditures. Socio-economic indicators are essential factors in reducing and increasing the occurrence of osteoporosis diseases. One of the most critical problems in assessing the socio-economic status of people was the measurement of occupation, housing status, and income of individuals. With the improvement of socio-economic status, people are less likely to develop osteoporosis, which will potentially have a preventive role in osteoporosis.

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