ASSOCIATED FACTORS WITH HEALTH-RELATED QUALITY OF LIFE IN OSTEOPOROSIS PATIENTS

Nguyen Thi Hoai Thu [1,2,], Nguyen Lan Anh[2], Nguyen Trung Anh[1,2], Tran Viet Luc[1,2]*
1. Hanoi Medical University
2. National Geriatric Hospital

DOI: 10.47122/VJDE.2023.64.11

ABSTRACT

Objective: To assess the association between health- related quality of life and related factors in osteoporosis patients at the National Geriatric Hospital. **Method:** The study is cross-sectional descriptive study. A total of 141 osteoporosis patients aged from 60 years was recruited. Data were collected using the EQ-5D-5L questionnaire, general information and geriatric syndromes. **Results:** The mean of quality of life were more likely to be higher in the patients who: lower age patient ($p<0.001$), good marital status ($p<0.05$), good sleep quality ($p<0.001$) , minimal depression ($p<0.001$), independence in function status ($p<0.001$), normal nutrition status ($p<0.001$) and low risk fall ($p<0.001$). **Conclusion**: The proportion of patients with osteoporosis who have decreased quality of life is still increasing. Appropriate care aims to help patients develop effective strategies for accepting the disease and coping with it.

Keywords: *osteoporosis, quality of life, ED-5D-5L*

Correspondence: Nguyễn Thị Hoài Thu
Submission date: .....August 2023
Revised date: 12th August 2023
Acceptance date: 30th September 2023
Email: nththu.bvlk@gmail.com

INTRODUCTION

According to the World Health Organization (WHO), osteoporosis affects 6.3% of men over 50 and 21.2 % of women in the same age group worldwide. Based on the global male and female population, this means that around 500 million men and women may be affected [1]. In 2019, 32 million people aged 50 and up in Europe (European Union plus Switzerland and the United Kingdom) are estimated to have osteoporosis, accounting for 5.6% of the total European population aged 50 and up, or roughly 25.5 million women (22.1% of women aged 50) and 6.5 million men (6.6% of men aged 50) [1]. Worldwide, osteoporosis causes more than 8.9 million fractures annually, resulting in an osteoporosis fracture every 3 seconds [2]. 1 in 3 women over age 50 will experience osteoporosis fractures, as will 1 in 5 men aged over 50 [3].

Measuring health-related quality of life has become an important issue in health service research and in clinical trials involving osteoporosis. Studies evaluating the quality of life of osteoporosis patients have been interested and performed in many parts of the world.

The primary purpose of treatment is to improve the quality of life through reducing disease effects. The number of studies about QoL in patients with osteoporosis in Vietnam is little and rare, just only in one gender, another subject or in psychology while there are many in the world. The assessment of quality of life is also useful in epidemiologic studies to estimate the burden of disease and

to evaluate the cost-effectiveness of different treatment scenarios in health care policy [4]. Therefore, we conducted this study to evaluate the assocation between related factors with health related-quality of life in osteoporosis.

METHOD AND MATERIALS

Study design

The study is cross-sectional descriptive study.

Study subject, sampling and sample size

Older inpatients and outpatients from 60 years old were being examined and treated at National Geriatric Hospital

Included criteria

- Patients who were diagnosed with osteoporosis by specialist doctor according to the International Osteoporosis Foundation's criteria [5]
- Patients who had already been diagnosed with and received treatment for osteoporosis before
- Patient were able to interview, have the physical and cognitive abilities to do a face-to-face interview
- Patients and patient's family agreed to participate in the study (agree to answer questions regarding general health and disease status according to the outline proposed by the researcher)

Excluded criteria

- Patients or families refused to participate in the study.
- Patients who were unwilling to participate in any part of study
- Patients with mental disorders, dementia, paralysis, other psychotic disease or not enough cognitive ability to respond to the interview
- Patients did not understand Vietnamese and inability to communicate

Sampling

Convenience sampling

The sample size is calculated using the formula: $n = \left(Z_{1-\frac{\alpha}{2}}\right)^2 \frac{p(1-p)}{d^2}$

n: study sample size;

α: statistical significance level, with α = 0,05; (Z1- α/2) = 1,96

p = 0.25 (Prevalence of osteoporosis patients with reduced quality of life according to Ngo Van Quyen's study) [6]

d = expected error (d = 0.08).

From the formula, the estimated sample size was 109 patients.

Location and time

Inpatients and outpatients at National Geriatric Hospital. The research was conducted from July to October 2022.

Tools and data collection method

Data were collected by using designed tools included: General information, EuroQoL 5 Dimensions 5 levels (EQ-5D-5L) and EQ VAS scale. Data were collected by using research questions through interview and medical record at National Geriatric Hospital.

General information: age, gender, occupation, marital status, highest level of education, smoking, drinking alcohol, BMI, living area.

Health related quality of life: There are 5 demensions including mobility, self-care, usual activities, pain/discomfort, anxiety/depression and EQVAS.

Level of quality of life

Levels	Total score	Classify
1	21 – 25	Very high
2	16 – 20	High
3	11 – 15	Average
4	6 – 10	Poor
5	5	Very poor

Related factors

Charlson index and number of medication to evaluate comorbidity and polypharmacy.

Sleep quality: Pittsburgh Sleep Quality Index (PSQI) is a self-rated questionnaire to assess sleep quality and disturbances over the past one month period. The nine-item questionnaire forms the score components: habitual sleep, sleep latency, sleep duration, sleep disturbances, sleep medication use, daytime dysfunction, subjective sleep quality. [7]

Depression symptoms: Patient Health Questionnaire - 9 (PHQ-9) : PHQ-9 is the major depressive disorder module of the full PHQ.[8]

The scale has 9 items about problems during the past 2 weeks and every-item

were marked:

√ Not at all = 0

√ Several days = 1

√ A half of days = 2

√ Every day = 3

Nutrition: Mini Nutritional Assessment – short form (MNA – SF) is a screening scale with six questions included: dietary questionnaire, subjective assessment (food intake, neuropsychological problems/acute disease), mobility and anthropometry (BMI, weight loss).

Evaluation:

+ If MNA-SF score is less than 8, the patient is malnutrition.

+ If MNA-SF score is in range 8 – 11, the patient at risk of malnutrition.

+ If MNA-SF score is greater than 11, it is no malnutrition [9]

Instrumental Activities of Daily Livings (IADLs): 8 domains of function include: Ability to use telephone, shopping, food preparation, housekeeping, laundry, mode of transportation, responsibility for own medication and ability to handle finance. Participants are scored according to their highest level of functioning in that category. A summary score ranges from 0 (low function, dependent) to 8 (high function, independent). Maximum of a normal healthy person is 8 points, less than 8 points classifies the person as dependent [10]

Activities of Daily Livings (ADLs): The Index ranks adequacy of performance in the six functions of bathing, dressing, toileting, transferring, continence, and feeding. Clients are scored yes/no for independence in each of the six functions [11]. A summary score ranges from 0 (impaired function) to 6 (normal function).

Risk of fall (Fall 21 items): Each item received a score of 1 (risk present) or 0 (risk absent), and the sum of all items ranged from 0 (low fall risk) to 21 (high fall risk), with higher scores indicating higher risk of falls. A cut-off point of 9/10 on the 21-item FRI-21 is useful for early detection of fall risk.

Data processing and data analysis

- The process of data coding, entry into Redcap and analysis was done by using Statistical Package for Social Science (SPSS) software (version 20).

- Descriptive statistics were adopted to examine characteristic data: frequency, percentage, mean. Inferential statistics was done to perform comparisons between groups: t-Test, Chi-square, Multivariable regression.

- Statistical significance was accepted at the 95% confidence level ($p<0.05$)

RESULTS

A total number of 141 older osteoporosis patients were selected for this study. After completing the data analysis, the demographic and baseline characteristics of the participants were shown below.

Table 1: General information (n=141)

Characteristics		Frequency (n)	Percentage (%)
Gender	Male	8	5.7
	Female	133	94.3
Aged group	60-74	85	60.3
	≥75	56	39.7
	Mean age ± SD	**73.12 ± 8.62**	
Marital status	Married	118	83.7
	Single/widowed/divorced	23	16.3
Living status	With family	132	93.6
	Alone/others	9	6.4
Living area	Urban	71	50.4
	Rural	70	49.6
Mean BMI±SD		21.92 ± 2.96	

Demographic details of patients in this study are shown in table 3.1. Among 141 participants, the percentage of females (94.3%) was higher than that of males (5.7%). The mean age of the patients was 73.12±8.62 with a minimum of 60 and a maximum of 97. The age was separated into two groups: 85 people (60.3%) from 60 to 74 and 56 people (39.7%) more than 75 years old. (**Table 1**).

Table 2: Geriatric characteristic of osteoporosis patients (n=141)

Characteristics	Classification	Frequency (n)	Percentae (%)
Instrumental activities of daily living (IADL)	Dependent	49	34.8
	Independent	92	65.2
Physical activity daily living (ADL)	Impaired	49	34.8
	Normal	92	65.2
Comorbid diseases	≥ 5 diseases	16	11.3
	< 5 diseases	125	88.7
Polypharmacy	<5	112	79.4
	≥ 5	29	20.6
Nutritional status	Malnourished	10	7.1
	Risk of malnutrition	55	39.0
	Normal	76	53.9
Sleep quality	Good sleep	37	26.2
	Bad sleep	104	73.8

Characteristics	Classification	Frequency (n)	Percentae (%)
Depressive symptoms	Minimal or none	73	52.0
	Mild	45	32.0
	Moderate	17	12.0
	Moderately severe	6	4.0
Charlson index score (Mean ± SD)		**0.89 ± 1.09**	

The majority 104 participants (73.8%) classified bad sleep based on PSQI, and 37 people (26.2%) show they have good sleep.

The mean of total EQ-5D-5L score was 18.30 ± 3.79. This value was considered an average on a 25-point scale.

Table 3: Association between EQ-5D-5L by demographic variable (n=141)

Characteristics	Total EQ-5D-5L score		
		Mean ± SD	**p**
Age	60-74	19.75 ± 2.96	<0.001
	≥ 75	16.13 ± 3.89	
Gender	Male	17.51 ± 3.29	0.538
	Female	18.35 ± 3.82	
Marital status	Married	18.65 ± 3.53	0.013
	Single/Widowed/Divorced	16.52 ± 4.58	
Living status	With family	18.42 ± 3.79	0.504
	Others	16.67 ± 3.64	
Living area	Urban	18.34 ± 3.29	0.917
	Rural	18.27 ± 4.23	
Occupation	Retired	18.47 ± 3.95	0.252
	Still working	17.51 ± 2.84	

The age was divided into 2 groups: 60-74 years old and ≥75 years old with a gradual total quality of life score ($p<0.01$), therefore there was statistical significant association between quality of life and age. There was no significant difference in the QoL of patients with osteoporosis compared to the gender ($p>0.05$), level of education ($p>0.05$). Patient who had better marital status experienced better HRQoL than who had single/ widowed/ divorced ($p<0.05$). There was no significant difference in the QoL of patients compared to the living area, living status and occupation.

Table 4: Association between EQ-5D-5L by general characteristics (n=141)

Characteristics	Total EQ-5D-5L score		
		Mean ± SD	**p**
Sleep quality	Good sleep	20.35 ± 4.04	<0.001
	Bad sleep	17.58 ± 3.43	
Depressive symptoms	Minimal or none	19.59 ± 3.80	<0.001
	Mild	17.35 ± 3.18	
	Moderate	15.41 ± 3.35	
	Moderately severe	16.67 ± 2.94	
Nutrition status	Normal	19.00 ± 3.81	0.016
	Risk of malnutrition	17.82 ± 3.72	
	Malnutrition	15.71 ± 2.54	
Risk of fall	Low risk	19.44 ± 3.52	<0.001
	High risk	17.18 ± 3.73	
Comorbid diseases	<5	18.44 ± 3.84	0.238
	≥ 5	17.25 ± 3.29	
Polypharmacy	<5	18.47 ± 3.90	0.302
	≥ 5	17.66 ± 3.28	

According to the PSQI scale, the number of people who had a good sleep was higher average QoL than who had poor sleep. Thus, there was significant association between quality of sleep and quality of life (p<0.01).

The PHQ-9 scale showed that the number of patients with minimal or none depression (19.59 ± 3.80) had a high quality compared with mild depression (17.35 ± 3.18), moderate depression (15.41 ± 3.35) and moderately severe depression (16.67 ± 2.94). Thus, there was association between depression and quality of life. This association was statistic significant (p<0.001). there was significant association between nutrition status (p=0.016), risk of fall (p<0.001) and quality of life. There was no statistically significant difference in the quality of life of patients with poly pharmacy (p=0.302) and comorbid diseases (p=0.238).

DISCUSSION

This study was conducted in 141 people from 60 to 97 years old. Most of people belonged to the age group 60-79 years with 60.3%. The mean age of participants was 73.12 ± 8.62. This finding is closely agree with other studies such as Ivana Tadic (2012) found the mean of age was 71.87 ± 8.57 and 71.9 ± 11.1 years in the study of Ramirez Perez (2007) [12]. This result similar with Dolan, P., Torgerson, D., & Kumar Kakarlapudi, T. (1999), the average age of the 50 patients was 71.46 years with a standard deviation of 8.39 [13] 92. This result is higher than the study of Si, Lei; Tu, Liudan; Xie, Ya (2020) (mean age ± SD = 63.4 ± 10.1) but lower than the study of Barbara Jahelka when the average age was 79.3 ± 85 [14] 94 and study of Schmidt K, Hübscher M, Vogt L, et al. (mean age ± SD = 74 ± 8.3 years). This difference in result could be from difference of sample size between studies.

The results of this study of ours are quite similar to the study results of the author Raimunda Silva et al. in 2010 which showed that the fall rate of women with osteoporosis was 51%. In addition, the research results of author Nguyen Thi Phong (2017) reported that 49% had a high risk of falling in the

study [15] 109. These results further confirm the prevalence of fall risk. In a study in Aug. 2013 of Sule Sahin Onat, Sibel Unsal Delialioglu, Seda Bicer and Sumru Ozel, when assessed 154 patients with osteoporosis admitted to their outpatient clinic, the proportion of patients with sleep disorder and good sleep quality was 42.4% and 57.8%, respectively [16]. This study's result was higher than the result of the research of Sule Sahin Onat due to the reason may be explained by different research subject. The study results are nearly similar to the study of older adults (≥65) receiving home care (n = 309) in 2014 of Kiesswetter, Eva with a risk of malnutrition of 41%. While this prevalence of risk of malnutrition and malnourished was respectively 35.5% and 10.3% in the research of Franca Genest, Dominik Rak et al [17].

Health-related quality of life in osteoporosis patients could be affected by a lot of factors. In this sudy, the researcher found that increased age was associated with significant declines in physical component summary score. The total of EQ-5D-5L of group 60-74 (mean ± SD=19.75) was higher than group ≥ 75 years old (mean ± SD = 16.13 ± 3.89). Increasing age were associated with a lower EQ-5D-5L index score ($p<0.001$) according the study of Grochtdreis, T., Dams, J., König, H.-H., & Konnopka, A [18]. This result was similar to the our study result. Osteoporosis is caused by the aging process of osteoblasts, causing an imbalance between bone destruction and bone formation, which increases with age. Therefore, age is a risk factor for osteoporosis of patients, the older the patient, the higher the rate of decline in quality of life.

The research conducted that the difference was not static significant between 2 genders ($p>0.05$). The study indicated that women had quality of life better than men. It can be explained as men tend to have more osteoporosis-related complications and higher mortality after osteoporotic fracture than women.

The results of this study suggest that approximately 28% of geriatric outpatients are at the risk of malnutrition, the MNA-SF and that poor nutritional status has a significant association with quality of life [19], malnutrition can adversely affect the well-being of older persons mainly by causing a decline in functional status, worsening of existing medical problems and even increases in mortality. Good nutrition promotes health-related quality of life (HRQOL) by averting malnutrition, preventing dietary deficiency disease and promoting optimal functioning [20] .

CONCLUSION

The proportion of patients with osteoporosis who have decreased quality of life is still increasing. Appropriate care aims to help patients develop effective strategies for accepting the disease and coping with it.

Conflict of interest

The authors have no conflict of interest.

REFERENCE

1. Kanis, J.A., et al., SCOPE 2021: a new scorecard for osteoporosis in Europe. Arch Osteoporos, 2021. **16**(1): p. 82.

2. Johnell, O. and J.A. Kanis, An estimate of the worldwide prevalence and disability associated with osteoporotic fractures. Osteoporos Int, 2006. **17**(12): p. 1726-33.

3. Kanis, J.A., et al., Long-term risk of osteoporotic fracture in Malmo. Osteoporos Int, 2000. **11**(8): p. 669-74.

4. Lips, P., van Schoor, N.M. Quality of life in patients with osteoporosis. Osteoporos Int 16, 447–455 (2005).

5. Phelan EA, B.S., Grothaus L, Balch S,

Larson EB. , Association of incident dementia with hospitalizations. JAMA, 2012. **307**(2): p. 165-72.

6. Vuong Diem Khanh D, V.V.T., Ho D, Tran BT, Dinh Tuyen H, Dinh Hue H, et al., Prevalence of dementia among the elderly and health care needs for people living with dementia in an urban community of central Vietnam. Vietnam J Public Health, 2015. **3**(1): p. 16-23.

7. Nguyen TTT, T.T., McFarland PL, et al., Dementia Prevalence Among Older Hospitalized Patients in Vietnam and Dementia Understanding of Their Caregivers. Aging Med Healthc, 2019. **10**(4): p. 128-132.

8. Jutkowitz E, K.R., Gaugler JE, MacLehose RF, Dowd B, Kuntz KM, Societal and Family Lifetime Cost of Dementia: Implications for Policy. J Am Geriatr Soc, 2017. **65**(10): p. 2169-2175.

9. Organization, W.H. Dementia: a public health priority. 2012; Available from: http://apps.who.int/iris/bitst ream/10665/75263/1/9789241564458_eng.pdf?ua=1

10. Lalic S, S.J., Ilomaki J, Wimmer BC, Tan EC, Robson L, Emery T, Bell JS., Polypharmacy and medication regimen complexity as risk factors for hospitalization among residents of long-term care facilities: a prospective cohort study. J Am Med Dir Assoc, 2016. **17**(1067).

11. Donna McCabe, D., APRN-BC, GNP, Katz Index of Independence in Activities of Daily Living (ADL). The Hartford Institute for Geriatric Nursing, New York University Rory Meyers College of Nursing, 2019 Best Practices in Nursing Care to Older Adults(Issue Number 2, Revised 2019).

12. Ramirez Perez E., Clark P., Wacher N.H., et al. (2008). Cultural adaptation and validation of the Quality of Life Questionnaire of the European Foundation for osteoporosis (QUALEFFO) in a Mexican population. Clin Rheumatol, 27(2), 151-161

13. Dolan, P., Torgerson, D. & Kumar Kakarlapudi, T. Health-Related Quality of Life of Colles' Fracture Patients . Osteoporos Int 9, 196–199 (1999)

14. Schmidt K, Hübscher M, Vogt L, et al. [Influence of spinal orthosis on gait and physical functioning in women with postmenopausal osteoporosis]. Der Orthopade. 2012 Mar;41(3): 200-205

15. Nguyễn Thị Phóng, Điều trị tỉ lệ ngã và các yêu tố liên quan ở bệnh nhân khoa lão bệnh viện đai khoa quận Đống Đa, Hà Nội. Khóa luận tốt nghiệp bác sĩ y khoa. Hà Nội, Đại học Y hà Nội; 2017 at the Department of Geriatrics - Dong Da General Hospital

16. Onat, Sule Sahin, et al. "Effects of sleep quality on quality of life in patients with osteoporosis/ Osteoporotik hastalarda uyku kalitesinin yasam kalitesine etkisi." Turkish Journal of Osteoporosis, vol. 19, no. 2, Aug. 2013, pp. 32+. Gale Academic OneFile

17. Genest, F.; Rak, D.; Bätz, E.; Ott, K.; Seefried, L. Sarcopenia and Malnutrition Screening in Female Osteoporosis Patients-A Cross-Sectional Study. J. Clin. Med. 2021

18. Grochtdreis, T., Dams, J., König, HH. et al. Health-related quality of life measured with the EQ-5D-5L: estimation of normative index values based on a representative German population sample and value set. Eur J Health Econ 20, 933–944 (2019).

19. Zekeriya Ülger, Meltem Halil, Işılay Kalan, Burcu Balam Yavuz, Mustafa Cankurtaran, Evrim Güngör, Servet Arıoğul, Comprehensive assessment of malnutrition risk and related factors in a large group of community-dwelling older adults, Clinical Nutrition, Volume 29, Issue 4, 2010, Pages 507-511, ISSN 0261-5614

20. Eleni Amarantos, Andrea Martinez, Johanna Dwyer, Nutrition and Quality of Life in Older Adults, The Journals of Gerontology: Series A, Volume 56, Issue suppl_2, October 2001, Pages 54–64