EVALUATION OF SOME COMMON GERIATRIC SYNDROMES AND THEIR RELATIONSHIP WITH THE QUALITY OF LIFE AMONG OLDER PATIENTS WITH KNEE OSTEOARTHRITIS

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Abstract

Objectives: To evaluate some common geriatric syndromes and their associations with health-related quality of life (HRQoL) among older people with knee osteoarthritis (OA). ***Methods:*** A cross-sectional descriptive study on 184 older patients with knee OA treated at National Geriatric Hospital from May to August 2022. HRQoL was assessed using the EQ-5D-5L questionnaire. Geriatric syndromes were assessed. ***Results:*** Some common geriatric syndromes in elderly knee OA patients were sleep disorders (72.3%), polypharmacy (54.3%), depression (48.4%), high risk of falls (45.1%), malnutrition and at risk of malnutrition (45.1%), IADL impairment (35.9%), and ADL impairment (32.6%). Cognitive impairment accounted for the lowest proportion (20.7%). There are significant associations between HRQoL and geriatric syndromes (malnutrition, ADL and IADL impairment, high fall risk, cognitive impairment, depression, and sleep disturbance). Patients with the presence of these geriatric syndromes have a poorer quality of life (QoL), in most aspects of HRQoL such as mobility, self-care, usual activities, pain/discomfort, and anxiety/depression). ***Conclusion:*** There was a high prevalence of geriatric syndromes in older people with knee OA. Most of these geriatric syndromes were related to the aspects of the patients' QoL.

Keywords: Health-related quality of life; Elderly; Geriatric syndromes; Knee osteoarthritis.

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INTRODUCTION

Knee OA is the degeneration of cartilage: The pieces of bone and cartilage in the knee are damaged by wear and tear, the surface of the cartilage is rough, with pain inside and around the knee joint, as well as joint stiffness, and decreased range of motion, which ultimately leads to muscle weakness and is the biggest cause of functional disability [1]. Common clinical symptoms include knee pain that is gradual in onset and worse with activity, knee stiffness, and swelling, pain after prolonged sitting or resting, and pain that worsens over time.

A recent analysis of data from the National Health and Nutrition Examination Survey III (NHANES III) found that approximately 35% of women and men aged ≥ 60 years had radiographic OA of the knee. Moreover, OA is recognized as the most common cause of disability in the elderly, with approximately 85% of all knee and hip replacements being due to OA. In Vietnam, roughly 8.5% of people between the ages 40 - 49 had knee OA, compared with 30% between ages 50 - 59, and 61% over the age of 60 [2].

The term "QoL" or more specially "HRQoL" refers to the patient's sense of his or her health or well-being in the broad area of physical, psychological, and social functioning associated with an illness or its treatment. There are many studies demonstrating lower HRQoL scores in patients with knee OA compared to other patients of the same age. Increasing joint pain comorbidity [3] and radiographic disease severity [4] are inversely related to HRQoL in knee OA patients. In addition, population aging increases the occurrence of geriatric syndromes, which also contributes to reducing the QoL of elderly patients. However, data about geriatric syndromes and their associations with HRQoL are still lacking regarding the older population with knee OA in Vietnam. Thus, this study aimed: *To evaluate some common geriatric syndromes and their associations with HRQoL among older patients with knee OA.*

MATERIALS AND METHODS

1. Subjects

184 knee OA patients aged ≥ 60 years old who were being treated at the National Geriatric Hospital from May to October 2022.

* *Inclusion criteria:* Patients aged ≥ 60 years old who were diagnosed with knee OA by doctors with ACR 1986 (American College of Rheumatology) with patients > 50 years old; had the physical and cognitive abilities to do a face-to-face interview.

* *Exclusion criteria:* Patients who have severe or acute diseases, mental diseases, severe dementia, or refuse to participate in this study.

2. Methods

* *Study design:* A cross-sectional descriptive study.

- The sample size is calculated using the formula: $n = (Z_{1-\frac{\alpha}{2}})^2 \frac{p(1-p)}{d2}$

p = 0.95 (Proportion of people with osteoarthritis who have at least one of the 5 dimensions of HRQoL according to EQ-5D-5L) [5].

From the formula, the estimated sample size was 178 knee OA patients.

A total of 184 knee OA patients were recruited in our study.

* *Variables:*

General information: Age, gender, comorbidities.

- Health-related quality of life:

The European Quality of Life-5 Dimensions-5 Level scale (EQ-5D-5L) Questionnaire has two components: the EQ-5D-5L descriptive system and the EQ visual analog scale (EQ-VAS). The descriptive system comprises 5 dimensions (mobility, self-care, usual activities, pain/discomfort, anxiety/ depression), and each dimension has 5 levels: "1 = extreme problems", "2 = severe problems", "3 = moderate problems", "4 = mild problems" and "5 = no problems". The lower the mean score, the more serious the problem.

The EQ visual analog scale (EQ-VAS) records the patient's self-rated health status on the day of the interview on a 20 cm vertical analog scale with 2 endpoints: "0 = The worst health you can imagine" and "100 = The best health you can imagine".

The EQ-5D-5L was validated in the Vietnamese population [6].

- Geriatric syndromes:

Nutritional status was assessed using The Mini Nutritional Assessment Short Form (MNA-SF). The questionnaire includes 6 questions with answers, and nutritional status scores are calculated in total scores. Evaluation: Malnutrition (0 - 7 points), at risk of malnutrition (8 - 11 points), normal nutritional status (12 - 14 points).

Activities of Daily Living (ADL) were assessed using the Katz Index of Independence in Activities of Daily Living. A total score of less than 6 points classifies the person as dependent. Instrumental Activities of Daily Livings (IADLs) include 8 domains of function. A total score of less than 8 points classifies the person as dependent.

The risk of falling was assessed using the Fall risk index-21, which includes 21 yes-no questions. A total score of ≥ 10 points indicates a high risk of falling.

Cognition status was screened using the Mini-Mental State Examination (MMSE) test 59. MMSE is a 30-point questionnaire with a cut-off point of 24 points: Cognitive impairment (≤ 23 points).

Depression was assessed by the Patient Health Questionnaire (PHQ-9). The range of total score is from 0 - 27 points and is divided into 3 levels: 0 - 4 points (no depression), 5 - 14 points (mild depression), and ≥ 15 points (severe depression).

Sleep status was assessed using the Pittsburgh Sleep Quality Index (PSQI). The total score PSQI is calculated by sum of 7 components. A total score ≥ 5 points indicates a sleep disorder.

Polypharmacy was defined as the concurrent use of five or more five types of medication.

** Tools and data collection method:*

Data were collected using a research questionnaire, interviews, diagnosis tests, and medical records at the National Geriatric Hospital.

** Data processing and data analysis:*

Data coding, entry into REDCap, and analysis were done using Statistical Package for Social Science (SPSS) software (version 22.0). Descriptive statistics were adopted to examine characteristic data: Frequency, percentage, and mean. Student T-test and ANOVA were employed to compare proportions and means between groups. Statistical significance was set at $p < 0.05$.

3. Ethics

Study subjects were clearly explained the purpose of the study, and they were willing to participate. Collected data was used for research. The results of the study were proposed to improve the health of the community, not for other purposes. The authors declare to have no conflicts of interest.

RESULTS

1. General characteristics

Table 1. Socio-demographic characteristics of participants (n = 184).

Characteristics		Frequency (n)	Percentage (%)
Age group	60 - 69	66	35.9
	70 - 79	70	38.0
	≥ 80	48	26.1
Gender	Male	30	16.3
	Female	154	83.7
KOA stages	1	36	19.6
	2	82	44.6
	3	52	28.3
	4	14	7.6
KOA duration (year)	< 1	77	41.8
	1 - 5	79	42.9
	> 5	28	15.2
Comorbidities	Hypertension	106	57.6
	Diabetes	66	35.9
	Dyslipidemia	63	34.2
	Osteoporosis	47	25.5
		$\overline{X}$ ± SD	
Age (year) (Min - max)		73.6 ± 8.3 (60 - 94)	
KOA duration (year)		3.6 ± 5.3	

The mean age of participants was 73.6 years with a minimum of 60 and a maximum of 94. Participants were evenly distributed into 3 age groups, 60 - 69

patients (35.9%), 70 - 79 patients (38%), and patients over 80 years old (26.1%). The majority of study participants were female, accounting for 83.7%. Stage 2 knee OA accounted for the highest rate (44.6%). Most patients have had knee OA for less than 5 years. Hypertension was the co-morbidity with the highest rate (57.6%).

2. Characteristics of some common geriatric syndromes

Table 2. Common geriatric syndromes among older patients with knee OA (n = 184).

Geriatric syndromes		Frequency (n)	Percentage (%)
Nutritional status	Malnutrition	11	6.0
	At risk of malnutrition	72	39.1
	Normal nutritional status	101	54.9
ADL dependence		60	32.6
IADL dependence		66	35.9
High risk of falls		83	45.1
Cognitive impairment		38	20.7
Depression	Severe depression	7	3.8
	Mild depression	82	44.6
	None	95	51.6
Sleep disorder		133	72.3
Polypharmacy	≥ 5 types	100	54.3

The rate of some common geriatric syndromes in elderly knee OA patients was 72.3% for sleep disorders, 54.3% for polypharmacy, 48.4% for depression, 45.1% for high risk of falling, 45.1% for malnutrition and at risk of malnutrition, 35.9% for IADL impairment, and 32.6% for ADL impairment. Cognitive impairment accounted for the lowest proportion (20.7%).

3. Characteristics of HRQoL

Table 3. Health-related quality of life (EQ-5D-5L) among older patients with knee OA (n = 184).

	Mobility		Self-care		Usual activities		Pain/ Discomfort		Anxiety/ Depression	
	n	%	n	%	n	%	n	%	n	%
No problems	22	12	57	31	44	23.9	17	9.2	44	23.9
Mild problems	77	41.8	76	41.3	80	43.5	81	44	104	56.5
Moderate problems	66	35.9	40	21.7	52	28.3	72	39.1	26	14.1
Severe problems	17	9.2	8	4.3	5	2.7	12	5.6	10	5.4
Extreme problems	2	1.1	3	1.6	3	1.6	2	1.1	0	0
					$\overline{X}$ ± SD					
EQ-VAS					63.2 ± 15.8					

The prevalences of participants who reported moderate or severe problems in these dimensions of mobility, self-care, usual activities, pain/discomfort, and anxiety/depression were 45.1%, 26.0%, 31.0%, 44.7%, and 19.5%, respectively. The mean EQ-VAS score was 63.2.

4. The association between HRQoL and geriatric syndromes

Table 4. The association between HRQoL and geriatric syndromes (n = 184).

Geriatric syndrome	n	Responding to a problem					EQVAS score $\overline{X}$ ± SD
		Mobility	Self-care	Usual activities	Pain/ Discomfort	Anxiety/ Depression	
Nutritional status							
Malnutrition	11	3.1	3.1	3.3	2.9	3.1	50.0 ± 21.9
At risk of malnutrition	72	3.6	3.8	3.8	3.6	3.9	62.9 ± 13.8
Normal nutrition status	101	3.5	4.1[a]	3.9	3.6[a]	4.1[b]	64.8 ± 15.9
ADL							
Normal	124	3.7	4.2	4.1	3.7	4.1	64.5 ± 16.4
Impaired	60	3.1[b]	3.4[b]	3.3[b]	3.3[b]	3.8[a]	60.6 ± 14.4
IADL							
Normal	118	3.7	4.3	4.1	3.7	4.1	64.5 ± 16.6
Impaired	66	3.2[b]	3.4[b]	3.4[b]	3.3[b]	3.8[a]	61.0 ± 14.3
Fall risk							
Low risks	101	3.8	4.4	4.2	3.7	4.2	67.2 ± 15.5
High risks	83	3.3	3.5[b]	3.5[b]	3.4	3.8	58.4 ± 14.9
Cognitive status							
Normal	146	3.6	4.1	4.0	3.5	4.1	64.1 ± 16.0
Impaired	38	3.3	3.3[b]	3.3[b]	3.6	3.8[a]	59.7 ± 14.7
Depression							
None	95	3.7	4.2	4.1	3.7	4.4	66.9 ± 14.0
Mild	82	3.4	3.7	3.7	3.5	3.7	60.7 ± 14.4
Severe	7	3.1	3.3[b]	3.1[b]	3.57[b]	2.4[b]	41.4 ± 20.3[c]
Quality of sleep							
Normal	51	3.2	3.7	3.7	3.4	4.2	65.7 ± 10.7
Sleep disorder	133	3.7[b]	4.1[b]	3.9	3.6[b]	3.9	62.3 ± 17.3
Comorbidities							
No	7	4.1	4.3	4.3	4.1	4.7	67.9 ± 6.4
Yes	177	3.5	3.9	3.8	3.5	4.0	63.0 ± 16.1
Polypharmacy							
≥ 5 types	84	3.6	4.0	3.9	3.6	4.0	62.9 ± 16.5
< 5 types	100	3.5	3.9	3.8	3.5	4.0	63.5 ± 15.4

(a: $p < 0.05$; b: $p < 0.01$; c: Kruskall Wallis, $p < 0.05$).

There was a significant association between HRQoL and MNA-SF, especially in self-care, pain/discomfort, and anxiety dimensions. Patients who had normal nutrition status got better QoL than the others. Patients who had normal ADL or IADL also had better QoL than the impaired ones. Patients with low fall risks had better QoL than patients with high fall risks, especially in self-care and usual activities. Surveyed participants who had problems with cognitive impairment had a worse QoL than others whose cognitive condition is normal, especially in self-care, usual activities, and anxiety/depression dimensions.

Regarding depression status, there was a significant difference in QoL, the more severe the depression status, the worse the QoL. The more severe the patient's risk of depression, the lower the EQ-VAS score.

There was also a significant difference between QoL and sleep quality in mobility, self-care, and anxiety/depression dimensions. There was no significant difference between QoL and the patient's comorbidities and polypharmacy status.

DISCUSSION

Our study showed the characteristics of geriatric syndromes and their association with HRQoL among older patients with knee OA at the National Geriatric Hospital. In this study, participants who had sleep disorders accounted for the highest proportion with 72.3%. Our results were higher than that of a previous study which showed that 64.9% had deteriorated sleep quality [7]. This difference may be due to the age of participants in the study. The mean age of participants in our study (73.6 ± 8.3 years old) was higher than that in Zheng's study (63.3 ± 7.1 years).

The number of patients using polypharmacy accounted for a higher rate of 54.3%. This is suitable for older people who often have many co-morbidities, so the rate of using multiple drugs at the same time is higher. In our study, some common comorbidities were hypertension (57.6%), diabetes (35.9%), dyslipidemia (34.2%), and osteoporosis (25.5%). This result is similar to the study of Heuberger et al. which showed that 51.1% of the participants used 5 or more drugs [8]. This similarity can be explained that the elderly have many comorbidities, so the use of polypharmacy is understandable.

According to the PHQ-9 scale, the minority of patients suffering from severe depression accounted for 3.8% and 44.6% of patients had mild depression. The results of our study

were different from those of Sugai et al. (2018) in Japan [9]. During a 2-year follow-up of 573 patients with OA aged 65 years and older to evaluate the relationship between knee OA and functional decline and depressive symptoms using the GDS scale, the results showed that 11.9% of patients showed symptoms of depression. The above difference can be explained because our study is a cross-sectional study, while Sugai's study is a longitudinal follow-up study for 2 years. This was an epidemiological study in the community of patients with primary knee OA in Japan.

Nearly half (45.1%) of the participants were presented as high risk of falls. The rate of history of falls within 1 year in our study was lower than in the study of Van Schoor et al. (2020) with 27.7% of patients having a fall once and 9.8% having two falls in the past year in subjects with knee or hip OA [10]. Thus, this could be explained by the fact that this study was conducted in the older population and they had problems with their knee.

People with normal nutritional status accounted for the highest proportion, 54.9% (n = 68). The percentage of patients with malnutrition and at risk of malnutrition were 6.0% and 39.1%, respectively considering the importance of the association among nutritional problems and HRQoL in caring for and promoting the welfare of the elders.

Most subjects had difficulty performing daily living activities and needed support at different levels. The proportion of dependence on the ADL scale was 32.6%, and on the IADL scale was 35.9%. Our results were higher than those reported by Wang et al. with 23.31% of participants having difficulty with ADL/IADL [11]. The difference is because their research subjects are the elderly, who had at least 4 years of knee OA.

In our study, HRQoL was assessed using the EQ-5D-5L. The EQ-5D-5L was validated and can be used in the Vietnamese population. Our results revealed that all these characteristics except polypharmacy affected 1 to 5 dimensions of HRQoL. It all was a negative correlation, which means that the more geriatric characteristics patients experienced, the lower the QoL score patients got. For example, there was a significant difference between QoL and MNA-SF in self-care, pain/discomfort, and anxiety dimensions. Patients who had normal ADL or IADL also had better QoL than the impaired ones. Regarding depression status, there was a significant difference in QoL, the more severe the depression status, the worse the QoL. It was similar to another

study, ADL/IADL difficulty and severe depressive symptoms affected the patient's QoL ($p < 0.01$) [11]. Patients with low fall risks had better QoL than patients with high fall risks, especially in self-care and usual activities. There was also a significant difference between QoL and sleep quality in mobility, self-care, and anxiety/depression dimensions. There was no significant difference between QoL among the patient's polypharmacy status. From all these results, we can understand that each geriatric characteristics such as nutrition status, mental health, or daily activities, etc., all have certain effects on QoL, it can be similar or different to other studies depending on sample size, living conditions, or research subjects.

CONCLUSION

There was a high prevalence of geriatric syndromes in older people with knee OA. Most of these geriatric syndromes were related to the aspects of patients' QoL. This suggests that screening for geriatric syndromes is essential in this population.

REFERENCES

1. Peat G, McCarney R, Croft P. Knee pain and osteoarthritis in older adults: A review of community burden and current use of primary health care. *Ann Rheum Dis*. 2001; 60(2):91-97. DOI:10.1136/ard.60.2.91.

2. Ho-Pham LT, Lai TQ, Mai LD, Doan MC, Pham HN, Nguyen TV. Prevalence of radiographic osteoarthritis of the knee and its relationship to self-reported pain. *PLoS One*. 2014; 9(4):e94563. Published 2014 Apr 10. DOI:10.1371/journal.pone.0094563.

3. Hoogeboom TJ, den Broeder AA, de Bie RA, van den Ende CH. Longitudinal impact of joint pain comorbidity on quality of life and activity levels in knee osteoarthritis: Data from the Osteoarthritis Initiative. *Rheumatology (Oxford)*. 2013; 52(3): 543-546. DOI:10.1093/rheumatology/kes314.

4. Muraki S, Akune T, Oka H, et al. Association of radiographic and symptomatic knee osteoarthritis with health-related quality of life in a population-based cohort study in Japan: the ROAD study. *Osteoarthritis Cartilage*. 2010; 18(9):1227-1234. DOI:10.1016/j.joca.2010.06.001.

5. Martín-Fernández J, García-Maroto R, Bilbao A, et al. Impact of lower limb osteoarthritis on health-related quality of life: A cross-sectional study to estimate the expressed loss of utility in the Spanish population. *PLoS One*. 2020; 15(1):e0228398. Published 2020 Jan 24. DOI:10.1371/journal.pone.0228398.

6. Mai VQ, Sun S, Minh HV, et al. An EQ-5D-5L Value Set for Vietnam. *Qual Life Res*. 2020; 29(7):1923-1933. DOI:10.1007/s11136-020-02469-7

7. Zheng S, Tu L, Cicuttini F, et al. Depression in patients with knee osteoarthritis: Risk factors and associations with joint symptoms. *BMC Musculoskelet Disord*. 2021; 22(1):40. Published 2021 Jan 7. DOI:10.1186/s12891-020-03875-1.

8. Heuberger RA, Caudell K. Polypharmacy and nutritional status in older adults: A cross-sectional study. *Drugs Aging*. 2011; 28(4):315-323. DOI:10.2165/11587670-000000000-00000.

9. Sugai K, Takeda-Imai F, Michikawa T, Nakamura T, Takebayashi T, Nishiwaki Y. Association between knee pain, impaired function, and development of depressive symptoms. *J Am Geriatr Soc*. 2018; 66(3):570-576. DOI:10.1111/jgs.15259.

10. van Schoor NM, Dennison E, Castell MV, et al. Clinical osteoarthritis of the hip and knee and fall risk: The role of low physical functioning and pain medication. *Semin Arthritis Rheum*. 2020; 50(3):380-386. DOI:10.1016/j.semarthrit.2020.02.006.

11. Wang L, Lu H, Chen H, Jin S, Wang M, Shang S. Development of a model for predicting the 4-year risk of symptomatic knee osteoarthritis in China: A longitudinal cohort study. *Arthritis Res Ther*. 2021; 23(1):65. Published 2021 Feb 26. DOI:10.1186/s13075-021-02447-5.