Factors Influencing Quality of Life in Elderly Patients Undergoing Total Knee Replacement Surgery

Phichpraorn Youngcharoen[1], PhD, RN; Suparb Aree-Ue[1], PhD, RN; Nanthikarn Saengthorn[2], MNS, RN

[1]Ramathibodi School of Nursing, [2]Department of Surgical Nursing, Faculty of Medicine Ramathibodi Hospital, Mahidol University, BKK, THAILAND.

Correspondence: phichpraorn.you@mahidol.edu

Background

- Total knee replacement is one of the most common treatment for elderly patients with severe knee osteoarthritis.

- Due to severe postoperative-pain, patients undergoing total knee replacement surgery typically suffered to perform physical activities, which resulted in developing depressive symptom and negatively affected their quality of life.[1-2]

- Complications could then lead to poor satisfaction and quality of life.[3-4]

- Previous studies have focused on comparison in pain intensity level[5] and level of physical activities[6] from pre to post-operation; however, no study examines a relationship among pain intensity level, physical activities, depression, and quality of life, especially at 6 week after surgery, a short term period to promote rehabilitation.

- The results in this study could provide direction to develop an intervention in order to reduce pain and depressive symptom as well as enhancing physical activities, which can then lead to improvement of patients' quality of life.

Purpose

The aim of this study was to examine pain intensity, physical activities, depression in predicting elderly patients quality of life at 6 week after undergoing total knee replacement surgery.

Methods

Design

A non-experimental, associational, cross-sectional design was used in this study.

Sample and Settings

100 elderly patients undergoing total knee replacement surgery at a tertiary care hospital in Bangkok, Thailand.

Inclusion criteria: Patients who were
a) older adults whose age 60 years or older.
b) diagnosed with knee osteoarthritis by physicians.
c) able to understand and communicate in Thai.
d) no cognitive impairment (determined by the Mini-Cog[7], with a score higher than 3)

Exclusion criteria: Patients who had postoperative complications, including
a) loosening total knee arthroplasty.
b) developing deep vein thrombosis.

Measures

The Numeric Rating Scale (NRS)[8]: Patients were asked to select a number from zero (no pain) to ten (pain as much as it could be) that best represents their pain at 6 week after surgery.

The Modified Barthel Activities of Daily Index-Thai version[9]: The Barthel ADL includes 9 items assessing patients' activities of daily living. Each item is rated from 0 (unable to perform) to 2 or 3 (able to perform independently). Possible score ranged from 0 to 18. Higher score represents higher level to perform activities of daily living. Content validity index of this instrument was .78. Cronbach Alpha coefficients was .80 in this study.

The Thai Geriatric Depression Scale-15 (GDS-15)[10]: The GDS included 15 items assessing depressive symptom. Response options were true or false. Possible score ranged from 0 to 15. If the total score is higher than 5, it indicates depressive symptom. Construct validity of the GDS was confirmed through factor analysis. Cronbach Alpha coefficients was .77 in this study.

The Osteoarthritis of Knee Hip Quality of life questionnaire-Thai version (OAKHQOL)[11]: The OAKHQOL includes 43 items assessing quality of life in five aspects, including physical activities, mental health, pain, social support, and social functioning. Each item is rated from 0 (best quality of life) to 10 (worst quality of life). Possible score ranged from 0 to 430. Then, the score were normalized from 0 to 100. Higher score indicates better quality of life. Construct validity of the OAKHQL was confirmed through factor analysis. Cronbach Alpha coefficients was .93 in this study.

Data Analysis

- Descriptive statistics (Mean, SD, and Frequency) were used to describe study variables.
- Pearson's correlation coefficients were used to identify relationships among age, gender, body mass index, pain intensity level, physical activities, depression, and quality of life. However, point biserial correlation coefficients were used to identify relationship among gender and other study factors.
- Multiple linear regression were used to understand predicting factors of quality of life.

Results

Table 1 Descriptive statistics of study variables (N = 100)

Variables	N	Percent	Possible score	Actual score	Mean	S.D.
Gender						
Male	14	14				
Female	86	86				
Age (years)				60-91	70.56	7.04
Body mass index (kgs/m²)				20.50-44.80	27.78	4.16
Pain intensity level			0-10	0-9	3.49	2.08
Physical activities			0-18	11-18	16.06	1.09
Depression			0-15	1-11	7.92	1.71
Quality of life*			0-100	42.44-100	70.43	11.03

Note. The raw score was normalized to 0-100

Table 2 Correlations among study variables.

Variables	1	2	3	4	5	6	7
Gender	1.00						
Age	-.02	1.00					
Body mass index	.20*	-.13	1.00				
Pain intensity level	.22*	.05	-.04	1.00			
Physical activities	-.14	-.40**	-.16	-.16	1.00		
Depression	-.17	.03	.14	.14	.11	1.00	
Quality of life	-.13	-.12	-.09	-.62**	.33**	-.13	1.00

Note. *p <.01, **p<.05; Point biserial correlation coefficients were used to identify relationship among gender and other study factors.

Table 3 Multiple linear regression of selected factors in predicting elderly patients undergoing total knee replacement surgery quality of life (N = 100)

Variables	b	SE	Beta (β)	t	p-value
Gender	.05	2.60	.05	.55	.583
Age	-.01	.13	-.007	-.09	.931
Body mass index	-.30	.21	-.11	-1.44	.153
Pain intensity level	-3.11	.43	-.59	-7.25	.000
Physical activities	2.45	.87	.24	2.82	.006
Depression	-.43	.51	-.07	-.85	.398

Constant (a) = 53.34, Multiple R = .68 R^2 = .46, R^2adj = .42, Overall F = 13.20**

Conclusion

- Our results were consistent with findings in previous studies in which high pain intensity level and low ability to perform physical activity at 6 week after surgery affected poor quality of life.[1]

- However, depression was not a significant factor in predicting quality of life, which could be explained by the fact that although patients had mild depressive symptom, good outcome after surgery representing by a high score on patients' quality of life could eliminate effect of depression.

- Patients' quality of life were not predicted by gender, age, and body mass index, which consistent with a previous study.[12] It is possible that most older adults participated in this study were young old. A positive outcome from total knee replacement surgery' may minimize pain and improve physical function in both male and female patients who had different level of body mass index.

Implications

- Nurses should assess pain intensity level of pain intensity as well as providing pharmacological and non-pharmacological pain management to the patients undergoing total knee replacement surgery.

- It is necessary to have an intervention program to appropriately manage pain after discharge as well as promoting physical activities for this population. This will then lead to enhancement of patients' quality of life.

- Longitudinal study should be conducted to continually follow up the effect of pain and physical activities on elderly patients undergoing total knee replacement surgery' quality of life.

Acknowledgements

References

1. Herrero-Sanchez MD, Garcia-Inigo Mdel C, Nuno-Beato-Redondo BS, Fernandez-de-Las-Penas C, Alburquerque-Sendin F. Association between ongoing pain intensity, health-related quality of life, disability and quality of sleep in elderly people with total knee arthroplasty. Cienc Saude Coletiva 2014; 19: 1881-88.
2. Hyun CW, Kim BR, Han EY, Kim SR. Preoperative physical performance predictors of self-reported physical function and quality of life in patients scheduled for total knee arthroplasty. J Phys Ther Sci 2016; 28: 3220-26.
3. Canovas F, Dagneaux L (2018). Quality of life after total knee arthroplasty. Orthop Traumatol-Sur 2018; 104: S41-S46.
4. da Silva RR, Santos AA, de Sampaio Carvalho Júnior J, Matos MA (). Quality of life after total knee arthroplasty: systematic review. Rev Bras Ortop 2014; 49, 520-7.
5. Wylde V, Beswick AD, Dennis J, Gooberman-Hill R. Post-operative patient-related risk factors for chronic pain after total knee replacement: a systematic review. BMJ Open 2017; 7: e018105.
6. Almeida GJ, Khoja SS, Piva SR. Physical activity after total joint arthroplasty: a narrative review. Open Access J Sports Med 2018; 9: 55-68.
7. Trongsakul S, Lambert R, Clark A, Wongpakaran N, Cross J. Development of the Thai version of mini-cog, a brief cognitive screening test. Geriatr Gerontol Int 2015; 15: 594-600.
8. McCaffery M., Pasero C. Pain: Clinical manual. St Louis, MO: Mosby; 1999.
9. Jitapunkul S, Kamolratanakul P, Ebrahim S. The meaning of activities of daily living in a Thai elderly population: Development of a new index. Age Ageing 1994; 23: 97-101.
10. Wongpakaran, N. & Wongpakaran, T. Prevalence of major depressive disorders in long-term care facilities: A report from northern Thailand. Psychogeriatrics 2012; 12: 11-17.
11. Aree-Ue S, Belza B, Saraboon Y, Youngcharoen P. Effects of a multicomponent strategy trial (MUST) program on health outcomes in overweight and diabetic older adults with knee osteoarthritis. Orthop. Nurs. In press 2019.
12. Papakostidou I, Dailiana ZH, Papapolychroniou T, Liaropoulos L, Zintzaras E, Karachalios TS, Malizos KN. Factors affecting the quality of life after total knee arthroplasties: A prospective study. BMC Musculoskel Dis 2012; 13: 116.