

Efficacy of Knee Arthroplasty on the Outcomes of Knee Osteoarthritis in Iranian Elderly Individuals

Abstract

Background: Knee osteoarthritis is a common musculoskeletal condition in elderly individuals. This survey was conducted with the aim to identify the problems of this group of patients for compilation of healthcare programs targeted at determining the outcome of osteoarthritis before and 3 months after knee arthroplasty. **Materials and Methods:** In the present cross-sectional study, 150 elderly individuals who had volunteered for knee arthroplasty were selected through nonrandomized sampling and were evaluated using the Knee Osteoarthritis Outcome Score (KOOS) questionnaire and a demographic characteristics form before and 3 months after the surgery via nonparametric statistical tests (Wilcoxon, Mann-Whitney U, and Kruskal-Wallis tests). **Results:** The mean (SD) age of the study subjects was 64.40 (7.20) years. A significant difference was observed between the mean scores of all subscales (pain with $Z=10.62$, knee pain/knee stiffness with $Z=10.54$, daily activity with $Z=10.62$, sport with $Z=2.95$, and quality of life with $Z=10.48$) before and after knee arthroplasty based on Wilcoxon test (<0.05). The results of the Mann-Whitney U test showed a significant statistical relationship between the difference in the mean score of daily activities and history of opium consumption ($Z=1.90$, $p < 0.05$) as well as that between knee pain/knee stiffness and gender ($Z=2.57$, $p < 0.05$) and educational level ($Z=2.11$, $p < 0.05$). **Conclusions:** Knee arthroplasty and history of opium consumption were correlated with improvement of patients' performance in their daily activities, and gender (women) and educational level (unread) were correlated with improvement of the score of the knee pain/knee stiffness subscale.

Keywords: Arthroplasty, Iran, knee, osteoarthritis

Introduction

Osteoarthritis is the most common type of knee arthritis that plays a major role in performance disabilities. Long-term disabilities exert destructive impacts on patients' lives (such as lack of movement, undermined independence of the individual, and problems in execution of daily activities) and lead to social seclusion, limitations in recreational, sports, and occupational activities, and reduced revenue.^[1] Obesity is a known risk factor for osteoarthritis of the knee, and weight loss has been shown to slow the progression of the disease. Conditions such as sleep apnea, malnutrition, vitamin D deficiency, and depression are associated with decreased function and poor results.^[2] More women than men (3.5 times) suffer from this condition, which imposes some limitations on joint movement and the resultant pain limits patients' performance

in many activities; this condition causes disabilities in elderly women of the community.^[3] Physical disability is a major clinical issue in knee osteoarthritis and is identified through difficulty with execution of activities requiring movement.^[4]

Osteoarthritis disorders and symptoms cause limitations in activities such as walking, going upstairs, sitting, bending, or lifting objects. Such performance limitations may be interpreted as limitations in social contributions. Problems in housekeeping, shopping, traveling, exercising, and working are some of these limitations.^[5] Various studies have shown that knee arthroplasty is one of the successful therapeutic procedures which alleviate pain and improve patients' performance and movement.^[2,6] Moreover, it has proven to be a reasonable and affordable therapeutic intervention.^[7] Sahaf *et al.* conducted a study to determine the relationship of age, body mass, educational

Roya Hamedi¹,
Parand Pourghane¹,
Roya
Mansour-Ghanaei^{1,2},
Zahra
Atrkar-Roushan³

¹Department of Nursing, Zeynab (P.B.U.H) School of Nursing and Midwifery, Guilan University of Medical Sciences, Rasht, Iran, ²Gastrointestinal and Liver Diseases Research Center, Guilan University of Medical Sciences, Rasht, Iran, ³Department of Biostatistics Sciences, Guilan University of Medical Sciences, Rasht, Iran

Address for correspondence:
Dr. Parand Pourghane,
Guilan, Langroud, Shahid
Sheikhi Street, Department of
Nursing, Zeynab (P.B.U.H)
School of Nursing and
Midwifery.
E-mail: pourghanep@gmail.com

Access this article online

Website: www.ijnmrjournal.net

DOI: 10.4103/ijnmr.IJNMR_23_19

Quick Response Code:



This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

For reprints contact: WKHLRPMedknow_reprints@wolters kluwer.com

How to cite this article: Hamedi R, Pourghane P, Mansour-Ghanaei R, Atrkar-Roushan Z. Efficacy of knee arthroplasty on the outcomes of knee osteoarthritis in Iranian elderly individuals. *Iran J Nurs Midwifery Res* 2021;26:245-51.

Submitted: 27-Feb-2019. **Revised:** 27-Apr-2019.

Accepted: 03-Aug-2020. **Published:** 17-May-2021.

level, depression, physical activities, and gender with the likelihood of osteoarthritis in elderly individuals, and reported that age and gender have a significant relationship with osteoarthritis, and women were more exposed to this condition than men.^[8] Physical activity also had a significant relationship with the risk of suffering from knee osteoarthritis, and the number of inactive elderly individuals suffering from knee osteoarthritis was higher than that of healthy elderly individuals. An increase in individuals' educational level was associated with a decrease in the likelihood of knee osteoarthritis, and individuals holding a pre-diploma degree were more likely to suffer from knee osteoarthritis.^[9]

In the other hand in 2.02 of cases of knee arthroplasty, patients passed away or suffered from severe postoperative complications such as pulmonary embolism and septic shock within 30 days after their surgery.^[7] Matsuda *et al.* evaluated patients' satisfaction and ability after knee arthroplasty, and reported that measuring patients' satisfaction level is quite difficult and the majority of patients had problems with the execution of their daily activities despite not reporting any symptoms.^[10] However, improvement of the movement range of joints played a significant role in patients' satisfaction and the fulfillment of their expectations from this medical procedure.^[11]

As osteoarthritis is specific to old age, gerontology has only received attention in the past recent years, and as Guilan Province has the oldest population of the country, the aim of this study was to assess elderly individuals' capabilities in the execution of daily activities prior and after knee arthroplasty in Guilan, Iran, as a first step toward identifying nursing problems and the issues of these patients. It is hoped that this study may help the maintenance of more realistic objectives in the compilation of healthcare programs regarding pre-surgery and post-surgery complications, which are relatively frequent after total knee arthroplasty and can range from minor to catastrophic. The purpose of this study was to determine the efficacy of knee arthroplasty on the outcomes of knee osteoarthritis for the care of Iranian elderlies.

Materials and Methods

This cross-sectional survey was performed at the 200-bed Rasoul Akram Hospital of Rasht, Iran, which is the only hospital in Guilan Province (north of Iran) and is affiliated with the Social Security Organization (SSO). One of the specialized medical services offered in this hospital is knee arthroplasty that is conducted by SSO orthopaedics in 2017. The inclusion criteria for this cross-sectional study were being 60 years of age, volunteering for knee arthroplasty, being referred to Rasoul Akram Hospital of Rasht in May 2017, and being referred to women's and men's wards under the hospitalization instructions of the orthopedist based in the clinic of Rasoul Akram Hospital for the afore-mentioned surgery. The population size was

determined as 150 individuals as per the administered trial plan with a Confidence Interval (CI) of 95% and test power of 90%. The participants were selected using a nonaccidental and purposive method. The exclusion criteria included being less than 60 years of age, suffering from knee trauma due to accidents, having had a previous knee surgery, and suffering from cognitive problems.

Three months after total knee arthroplasty on the base of survey method, a questionnaire of Knee Injury and Osteoarthritis Outcome Score (KOOS) is used for the evaluation of knee injury and osteoarthritis outcomes. The KOOS contains 42 patient-centered questions that examine 5 patient-related concepts including pain (9 questions), other patient-related symptoms (7 questions), daily activities (17 questions), sports and recreational activities (5 questions), and Quality of Life (QOL) with regard to knee problems (4 questions). The questions are scored based on a 5-point Likert scale. The maximum score of the KOOS is 100; the score range of 0–33.30, 33.40–66.30, and 66.40–100 illustrated “severe/bad,” “medium,” and “good/low” outcome, respectively. Saraiipoor *et al.* examined the reliability and validity of this questionnaire among an Iranian population in 2006. Based on the obtained Cronbach's alpha coefficient (0.76), the internal consistency of all subscales proved to be high, except for the symptoms subscale which had a medium level internal consistency with a Cronbach's alpha of 0.40; this showed that the items of each subscale examine an individual concept. The standard deviation of the questionnaire, which denotes the test-retest (reliability) of the Farsi version of the questionnaire, was higher than the acceptable level of 0.70. Thus, the foregoing questionnaire may be employed for examining the health status of individuals suffering from knee osteoarthritis and the efficacy of various medical treatments for these individuals in Iran.^[12]

Then, the demographic characteristics form and KOOS questionnaire were completed by the researcher in the hospital as per responses provided by the patients. The patients were then contacted through phone call 3 months after their knee arthroplasty and the post-surgery questionnaire was then filled out by the researcher as per the provided responses. This study was conducted from May to September 2017. During the study, 2 of the study subjects were excluded from the study due to infection and death. These 2 subjects were replaced by 2 other subjects. All patients spoke Persian and none of them had hearing loss, and we did not have any problem in communicating with them.

Time, age, gender, and educational level were regarded as background variables, and occupation, utilization of movement aid, and opium consumption-related variables were regarded as intervening variables. Moreover, knee pain/knee stiffness, pain, daily activities, exercising and recreational activities, and QOL were regarded as dependent

variables. Mean and standard deviation and percentage of relative frequency were used for the descriptive analysis of the data, and Wilcoxon, Mann-Whitney, and Kruskal-Wallis tests were employed for the inferential analysis of data considering their abnormally. The data were analyzed in SPSS software (version 20, IBM Corporation, Armonk, NY, USA). All *p* values <0.05 were considered significant.

Ethical consideration

The researcher provided some information and explanations on the objectives, stages, and duration of the study, and also stressed the confidentiality of the obtained information. Then, informed consent was obtained from the elderly individuals and they were assured that could freely attend or leave the study at any point of the study (as per the ethical conditions of Guilan University of Medical Sciences, Guilan). The present study is the result of the program ratified under the code IR.GUMS.REC.2017.98.

Results

Among the study subjects, 84.70% were aged between 60 and 70 years, and 15.30% were older than 70 years of age. The mean (SD) age of the study subjects was 64.4 (7.20) years. The minimum and maximum ages were 60 and 83 years, respectively. Illiterate patients constituted 70.70% of the population, and 29.30% of the participants were literate. In addition, 83.30% of the population were employed (housewives were regarded as employed individuals), 2% were unemployed, and 14.70% were retired. Movement aid were utilized by 60% of the study population, and 40% of the participants did not use any type of movement aid. Moreover, 30.70% of the population had a history of opium consumption for relieving the pain of osteoarthritis, and 69.30% did not have a history of opium consumption. The obtained results showed a significant difference in the scores of the knee pain and complaints, stiffness, daily activities and QOL subscales (*df* = 149, *p* < 0.001) pain with *Z*=10.62, knee pain/knee stiffness with *Z*=10.54, daily activity with *Z*=10.62, and QOL with *Z*=10.48), and exercising and recreations subscales (*df* = 149, *p* < 0.05) (exercising and recreation with *Z*=2.95) before and after surgery [Table 1]. Mann-Whitney U test results illustrated a significant

relationship between opium consumption and execution of daily activities with *p* = 0.04 (*Z*=1.90, *p* < 0.05), educational level with *p* = 0.03 (*Z*=2.11, *p* < 0.05), gender with *p* = 0.01 (*Z*=2.57, *p* < 0.05), and knee complaint/knee stiffness. With regard to the execution of daily activities [Table 2], the most problematic issues for patients were (in a descending order) execution of heavy household duties (85.30%), shopping (82.70%), going upstairs (76%), going downstairs (74%), standing up from a sitting position (64%), getting on and off a car (61.30%), standing (56.70%), walking on a flat surface (55.30%), bending and lifting objects (46.00%), lying on a bed (45.30%), getting out of a bed (43%), sitting (41.30%), execution of light household duties (39.0%), taking a bath (38%), putting on socks (29.30%), taking off socks (26.70%), and getting on and off the toilet seat (26.70%).

Patients' problems 3 months after the surgery were (in a descending order) execution of heavy household duties (20.70%), execution of light household duties (16.0%), shopping (7.30%), taking off socks (6.70%), getting off a bed and going downstairs (2.70%), bending and lifting objects (2%), walking on a flat surface and getting on and off a car (1.30%), and lying on a bed and standing (0.70%). No problems were reported regarding taking a bath, sitting down, putting on socks, and getting on and off a toilet seat.

The majority of study subjects (57.30%) were at a medium level with regard to knee complaint/knee stiffness before surgery, and 90.70% were at a low level in this subscale after the surgery [Table 3]. Among the participants, 74.70% reported severe pain before the surgery, and 80.70% reported low level of pain after the surgery. In the daily activities subscale, 79.30% were at a severe level before the surgery, and 80% were at a good level after the surgery. With regard to the exercising and recreation subscale, 99.30% were at a severe level before the surgery, and 98.70% were at a poor level after the surgery. In the QOL subscale, 82.70% were at a poor level before the surgery, and 74.70% were at a medium level after the surgery. According to the obtained results, in the pre-surgery stage, the subscales of exercising and recreation, QOL, daily

Table 1: The central indices of Knee Osteoarthritis Outcome Score before and after knee arthroplasty

Central Indices Osteoarthritis Outcome Score	Pain before surgery	Pain after surgery	Complaint and stiffness before surgery	Complaint and stiffness after surgery	Daily activity before surgery	Daily activity after surgery	Exercising and recreation before surgery	Exercising and recreation after surgery	Quality of life before surgery	Quality of life after surgery
Mean (SD)	22 (17)	77 (17)	41 (17)	86 (12)	23 (15)	76 (16)	1 (5)	2 (7)	24 (8)	52 (13)
Minimum	0	22	0	42	0	22	0	0	0	25
Maximum	88	100	85	100	80	100	50	60	50	93
<i>p-Value*</i>	0.001		0.001		0.001		0.03		0.001	

*Wilcoxon test

Table 2: The mean(SD) difference of osteoarthritis outcomes before and after knee arthroplasty as per demographic properties of the study population

The mean (SD) difference of osteoarthritis outcomes	Age		Gender		Educational Level			Movement Aid			Occupation			Opium Consumption			
	60-70	Over 70	Female	Male	Literate	illiterate	p**	Yes	No	p**	Employed	Unemployed	Retired	p***	Yes	No	p**
Daily activities	53 (18)	52 (19)	0.82	0.85	0.98	0.98	0.43	53 (18)	53 (17)	0.94	54 (18)	36 (19)	51 (17)	0.23	57 (16)	51 (18)	0.04
Knee complaints and stiffness	44 (20)	42 (19)	0.85	0.85	0.01*	0.01*	0.03*	45 (19)	43 (20)	0.70	46 (18)	47 (10)	36 (25)	0.42	46 (21)	43 (19)	0.40
Pain	55 (20)	54 (19)	0.91	0.91	0.22	0.22	0.37	56 (20)	54 (20)	0.63	56 (19)	40 (23)	55 (23)	0.47	58 (21)	54 (20)	0.30
Exercising and recreation	1.1 (4.8)	1 (5)	0.23	0.23	0.56	0.56	0.93	1 (6)	0.5 (2)	0.67	1.32 (5)	0	0	0.45	1 (5)	0.9 (4)	0.26
Quality of Life	28 (14)	27 (16)	0.38	0.38	0.87	0.87	0.66	28 (14)	26 (14)	0.23	28 (14)	20 (14)	27 (15)	0.63	29 (15)	27 (14)	0.35

*p<0.05. **Mann-Whitney U test. ***Kruskal-Wallis test

activities, pain, and knee complaint and stiffness emerged in a descending order in terms of the severity of subscales. In the post-surgery stage, the subscales of exercising and recreation, QOL, pain, daily activities, knee complaint and stiffness emerged in a descending order in terms of the severity of subscales. It appears that exercising plays a minor role in the life of elderly individuals in Guilan as patients' performance was quite poor before and after knee arthroplasty.

Discussion

Osteoarthritis causes limitations in patients' physical activities, social life, and family relationships.^[13] Its progressive nature and resulting pain and disability bears dramatic impacts on individuals' capability in the execution of their daily activities.^[14,15] The conducted studies indicate that knee arthroplasty results in decreased pain and improved performance of patients^[3]; however, it is not clear in which areas of daily activities the greatest problems are posed for these patients, in which areas they are of the highest and lowest capabilities, and in which areas an incapability must be regarded as uncommon after receiving healthcare services, and thus, deserve follow-ups and interventions.

The present study revealed that after knee arthroplasty, the score of execution of daily activities was significantly higher compared to the pre-surgery stage, which indicates the efficacy of this treatment in terms of the execution of daily activities by patients; this was in accordance with the results of the studies by Seo *et al.*^[16] and Skou *et al.*^[17] QOL is defined as an individual's level of satisfaction with his/her life and capabilities in the execution of his/her daily activities.^[18]

Level of knee pain and performance are among factors determining the QOL of patients suffering from osteoarthritis.^[11] Gawel *et al.* showed that explicit performance improvements are achieved in patients regarding walking, going upstairs, standing, and twisting.^[19] In line with the present study results, Motifard and Miramirkhani also showed that arthroplasty improves patients' physical performance^[20]; however, Schroer *et al.* showed that despite improvements in all approaches, the patients went through explicit performance reductions after knee arthroplasty.^[21] Papakostidou *et al.* also showed that patients' performance was not satisfactory despite reductions in pain and depression 6 weeks after knee arthroplasty.^[22] Franklin *et al.* reported that one-third of patients faced movement limitations 12 months after knee arthroplasty.^[23] Kauppila *et al.* reported reduced scores of knee performance in one-tenth of patients 12 months after knee arthroplasty.^[24] The above results are not in accordance with those obtained in the present study. Because 1.30% of our patients had issues in walking and getting on and getting off a vehicle, such a discrepancy might be due to

Table 3: Frequency of Knee Osteoarthritis Outcome Score before and after surgery in terms of severity

Severity Outcome	Low Scores (66.4-100) (n %)	Medium Scores (33.4-66.3) (n %)	High Scores (0-33.3) (n %)	Total (n %)
Pain before surgery	5 (3.31)	33 (22.25)	112 (74.44%)	150 (100%)
Pain after surgery	112 (80.70%)	35 (17.30%)	3 (2%)	150 (100%)
Knee complaints and stiffness before surgery	13 (8.70%)	86 (57.30%)	51 (34%)	150 (100%)
Knees complaints and stiffness after surgery	136 (90.70%)	14 (9.30%)	0 (0%)	150 (100%)
Daily activities before surgery	5 (3.33%)	26 (17.38%)	119 (79.30%)	150 (100%)
Daily activities after surgery	125 (80%)	28 (18.74%)	2 (1.26%)	150 (100%)
Exercising and recreation before surgery	0 (0%)	1 (0.73%)	149 (99.32%)	150 (100%)
Exercising and recreation after surgery	0 (0%)	2 (1.30%)	148 (98.70%)	150 (100%)
Quality of life before surgery	0 (0%)	26 (17.24%)	124 (82.76%)	150 (100%)
Quality of life after surgery	23 (15.24%)	112 (74.76%)	15 (10%)	150 (100%)

the use of different tools, ranking systems, and intervening variables. Osteoarthritis reduces levels of performance, impacts the role patients play in their community, and reduces their QOL. Sahaf *et al.* reported a significant relationship between physical activity and the chances of knee osteoarthritis, and a higher number of inactive elderly individuals suffering from knee osteoarthritis compared to healthy elderly individuals.^[8] However, as indicated by Skinner *et al.*, the age of patients did not have much impact on the level of performance improvement after knee arthroplasty.^[3] This present study indicating that gender and age are not linked with execution of daily activities. Franklin *et al.* reported that the majority of patients were women and older than control group and reported movement limitations after knee arthroplasty.^[23] Matsuda *et al.* also found that performance of activities after knee arthroplasty was linked with patients' age,^[10] which is not in accordance with the findings of the present study. Such a difference might be associated with emotional support received by the patients from Iranian family members after the surgery.

The results obtained on relative frequencies of execution of daily activities showed that the patients dealt with execution of heavy household duties, shopping, going downstairs, standing from a sitting position, standing, walking on a flat surface, lifting objects, lying on a bed, getting out of bed, executing light household duties, putting on socks, and getting on or off a toilet seat as their main pre-surgery problems in a descending order. These findings are in accordance with those obtained by Neal *et al.*^[25] and Chapple *et al.*^[26] that indicate that the majority of problems faced by patients before the surgery are related to outdoor activities, which might affect individuals' social relations and cause psychological disorders. Thus, educational, familial, social, and financial support sources should be taken into consideration in pre-surgery healthcare programs. However, none of the patients had any problems 3 months after knee arthroplasty with regard to taking a bath, sitting, putting on socks, and getting on or off a toilet seat. Thus,

any reports on any of the above-listed items might be rooted in the surgery procedure, and thus, follow-ups should be implemented. Furthermore, 20% and 16% of patients still have problems with regard to execution of heavy and light household duties, respectively; thus, patients' post-surgery capabilities should be explained to the patients so that they do not harbor any unrealistic expectations. Evidently, realistic objectives increase patients' post-surgery satisfaction and facilitate the self-care process.

Constant pain after knee arthroplasty is one of the major clinical problems to the extent that some of the patients did not report any signs of improvement after knee arthroplasty. In the study conducted by Pinto *et al.* on the existing differences between the prevalence of constant pain after knee and hip arthroplasty, it was revealed that patients who had received knee arthroplasty had experienced more pain than those who had received hip arthroplasty.^[27] Thus, the reduction of pain is necessary for faster rehabilitation, and achieving a suitable movement range as well as better results.^[28] This might explain the finding that opium consumption has a significant relationship with the mean difference in execution of daily activities subscale. Katz *et al.* reported that Nonsteroidal Antiinflammatory Drugs (NSAIDs) such as naproxen have greater efficacy than narcotic pain medications in the treatment of pain resulting from osteoarthritis,^[29] which is not in line with the results obtained by this study. It appears that opium consumption can affect the execution of daily activities, but as opium is an intervening variable, other biological reasons might account for this significant relationship.

Joint stiffness is one of the symptoms of knee osteoarthritis, which appears in less than 30 min after a period of activity, and thus, limits movement.^[30] It is quite difficult to etiologically explain such cases, and lack of infection in the member of surgery^[31]; however, it is one of the factors disrupting the execution of daily activities and QOL. According to the result of the present study, there is a significant relationship between the knee complaint/knee stiffness subscale and the demographic variables

of gender and educational level (P lower than 0.05); the mean difference in the knee complaint/knee stiffness subscale score was higher in women than men, which is in accordance with the findings of Sahaf *et al.*^[8] Moreover, the mean difference in the knee complaint/knee stiffness subscale score before and after knee arthroplasty was higher in illiterate individuals than in literate individuals. These findings are contrary to those obtained by Franklin *et al.*^[23] and Van der list *et al.*^[23,32] One of the reasons that might account for such discrepancy is that Iranian women refer to the doctors to a greater extent, and their access to information is limited by their illiteracy, which in turn leads to decreased expectations and acceptance of disability. Furthermore, the results indicate the efficacy of knee arthroplasty in terms of exercising and recreational activities, but no significant relationship was observed between this variable and the demographic variables including age, gender, education, occupation and utilization of movement aid, and opium consumption.

Keeny *et al.* found that more men than women are capable of exercising and execution of activities after knee arthroplasty,^[33] but Neal *et al.* did not find any relationship between gender and exercising subscale.^[25] However, factors like patients' sports level prior to the surgery, suffering from other diseases that prohibit exercising, and surgeon's advice against exercising after arthroplasty might not have been taken into consideration in these studies.^[21] Chapple *et al.* showed that exercising can improve knee performance in these patients, and thus, does not have any relationship with the progress of the condition.^[26] No significant relationship was observed between exercising and recreation subscale and demographic variables; however, considering the significant difference between the mean exercising score before and after knee arthroplasty, and considering the fact that sports activities do not play a major role in the life of Iranian elderly individuals, it seems that education on a healthy lifestyle should be considered as one of the priorities in clinical trainings.

Pain and knee joint function are factors that determine QOL in patients with knee osteoarthritis.^[2] Pain improvement has a close correlation with achieving a better QOL score.^[33] Total knee arthroplasty can provide an overall improvement in patients QOL.^[2] Skinner *et al.* reported that the nonagenarian population made improvements in functional outcomes, and their satisfaction rate following total knee arthroplasty was comparable with that achieved in a younger cohort over 2 years following surgery.^[22] This finding is in line with that obtained in our study.

The findings of this study help nurses to better understand the problems of these patients before and after the surgery, provide a better care plan for these patients, and accelerate the process of patient rehabilitation, thus reducing the length of hospital stay, saving human resources and reducing costs, increasing client satisfaction, and ultimately improving the QOL of this group of patients.

The present study was extracted from a master of nursing thesis on geriatric nursing, which was faced with some limitations such as other chronic conditions in elderly individuals, which in itself can impact elderly individuals' capabilities in execution of their daily activities. The study population was selected from one center. Considering the fact that the majority of participants belonged to the working class of society, generalization of the obtained results to the whole society shall present problems. Data collection was conducted through phone calls 3 months after the surgery, which reduces the documentation quality of the responses. It is recommended that in future studies, the participants be selected from a number of different centers and the participants' other chronic diseases be taken into consideration.

Conclusion

The obtained results indicate that knee arthroplasty ameliorates knee pain and stiffness, and has positive effects on execution of daily activities, exercising and recreation, as well as patients' QOL 3 months after the surgery; however, even 3 months after the surgery, 20% of patients had problems (at a higher than medium level) in the execution of their daily activities, mainly with household duties and shopping. These patients did not report any further problems in the execution of some activities including taking a bath, sitting, putting on socks, and getting on or off a toilet seat. Some variables such as gender, occupation, educational level, and utilization of movement aid did not bear any effect on the execution of daily activities 3 months after the surgery, but history of opium consumption exhibited a significant relationship with the improved state of daily activities. It appears that the analgesic effects of edible narcotic drugs consumed by the participants had caused improvements in their performance regarding the execution of daily activities. Gender and educational level also exhibited a significant relationship with knee pain and stiffness; illiterate women compared to men and illiterate individuals compared to literate individuals exhibited higher mean scores in knee complaint/knee stiffness subscales. Based on the results of this study, it is suggested that factors affecting the QOL of elderly patients with knee osteoarthritis before and after total knee arthroplasty and the prevalence and consequences of knee osteoarthritis in the elderly before and after total knee arthroplasty in other provinces be studied.

Acknowledgments

The authors wish to thank all patients who cooperated with us in performing this study.

Financial support and sponsorship

Research and Technology Department of Guilan University of Medical Sciences

Conflicts of interest

Nothing to declare.

References

- Slipen M, Mauricio E, Lipperts M, Grimm B, Rosenbaum D. Objective assessment of physical activity and sedentary behavioral in knee osteoarthritis patient-beyond daily steps and total sedentary time. *BMC Musculoskeletal Disorder* 2018;19:64.
- Lu N, Misra D, Neogi T, Choi Hk, Zhang Y. Total joint arthroplasty and the risk of myocardial infarction- A general population, propensity score-matched cohort study. *Arthritis Rheumatol* 2015;67:2771-9.
- Skinner D, Tadros B, Bray E, Elsherbiny M, Stafford G. Clinical outcome following primary total hip or knee replacement in nonagenarians. *Ann R Coll Surg Engl* 2016;258-64.
- Singh J, Lewallen D. Patient-level improvement in pain and activity of daily living after total knee arthroplasty. *Rheumatology* 2014;53:313-20.
- Baverdi Moghadam E, Shojaedin SS. The effect of eight weeks aerobic training on functional indicators and range of motion in active older men with knee osteoarthritis. *Razi J Med Sci* 2017;24:100-10.
- Tahmasebi M, Motaghi A, Shahrezaee M. Total knee arthroplasty in patient with osteoarthritis: Result of 34 operation. *Tehran Univ Med J* 2009;67:146-50.
- Kamaruzaman H, Kinghorn P, Oppong R. Cost-effectiveness of surgical interventions for the management of the osteoarthritis: A systematic review of the literature. *BMC Musculoskeletal Disord* 2017;18:11-7.
- Sahaf R, Shamsipour-Dehkordi. Parvaneh, Entezari M. The relationship between the risk of osteoarthritis and its predictive factors with emphasis on physical activity. *J Res Rehabil Sci* 2016;12:299-305.
- Ramirez J, Goodman A, Shan K, Jenkins D. Functional improvement and pain relief after total joint arthroplasty. *Orthopedic Proc* 2017;99-B(Supp-5).
- Matsuda S, Kawahara S, Okazaki K, Tashiro Y, Iwamoto Y. Postoperative alignment and ROM affect patient satisfaction after TKA. *Clin Orthop Relat Res* 2013;471:127-33.
- MahmoodiAghdam S, Khademikalantari K, Akbarzadehbaghban A, Rezayi M, Rahimi M, Naimee S. Effect of sustained traction on physical improvement of patients with severe Knee osteoarthritis. *Journal of modern rehabilitation* 2013;7:24-31.
- Saraipoor S, Salavati M, Akhbari B, Kazemnejad A. Article translating localization of knee injury and osteoarthritis outcome (KOOS) questionnaire and verifying the repeatability of the persian version of Iranian patient with knee osteoarthritis. *Rehabilitation* 2007;8:42-7.
- Souza I, Oliveira Neta RS, Gazzola JM, Souza MC. Elderly with knee osteoarthritis should perform nutritional assessment: Integrative literature review. *Einstein (Sao Paulo, Brazil)* 2017;15:226-32.
- Nguyen U, Zhang Y, Zhu Y, Niu J, Zhang B, Felson D. Increasing prevalence of knee pain and symptomatic knee osteoarthritis: Survey and cohort data. *Ann Intern Med* 2011;155:725-32.
- Witjes S, Goutterborge V. Return to sport and physical activity after total and unicompartmental knee Arthroplasty: A systematic review and meta-analysis. *Sport Med* 2016:269-92.
- Seo J-G, Moon Y-W, Cho B-C, Kim S, Hooke Y, Piljang S. Is total knee arthroplasty a viable treatment option in octogenarians with advanced osteoarthritis. *Knee Surg Relat Res* 2015;27:221-7.
- Skou ST, Roos EM, Laursen MB, Rathleff MS, Nielsen LA, Simonsen O, *et al.* A randomized, controlled trial of total knee replacement. *N Engl J Med* 2015;373:1597-606.
- Mazloun V, Khayambashi K, Rahnama N. Comparing the effects of therapeutic exercise and hydrotherapy on pain severity and range of motion in patients with hemophilia: A randomized controlled trial. *Armaghane Danesh Yasuj Uni Med Sci* 2013;8:430-41.
- Gawel J, Fibiger W, Starowicz A, Szwarczy W. Early assessment of knee function and quality of life in patients after total knee replacement. *Ortop Traumatol Rehabil* 2010;12:329-37.
- Motififard M, Miramirkhani F. Effects of total knee replacement on quality of life in 60-70 years-old patients with advanced knee osteoarthritis. *J Isfahan Med Sch* 2012;29:1-6.
- Schroer W, Diesfeld P, Lemarr A, Morton D, Reedy M. Functional outcome after total knee arthroplasty correlate with spine disability. *J Arthroplasty* 2016;31:(9 Suppl):106-9.
- Papakostidou L, Dailiana Z, Papapolychroniou T, Liaropoulos L, Zintzaras E, Karacharlios T. Factors affecting quality of life after total knee arthroplasty: A prospective study. *BMC Musculoskeletal Disord* 2012;13:116.
- Franklin P, Li W, Ayers D. Chitranjan Ranawat Award: Functional outcome after total knee replacement varies with patient attributes. *Clin Orthop Relat Res* 2008;466:2597-604.
- Kaupilla AM, Kylonen E, Ohtonen P, Leppilahti J, Sintonen H, Arpkoski JP. Outcomes of primary total knee arthroplasty: The impact of patient-relevant factors on self reported function and quality of life. *Disabil Rehabil* 2011;33:1659-67.
- Neal F, Fisscher M, Preuss A. Return to sports and recreational activity after unicompartmental knee arthroplasty. *Am J Sport Med* 2007;35:1688-95.
- Chapple C, Nicholson H, Baxter G, Abbott J. Patient characteristics that predict progression of knee osteoarthritis: Asystematic review of prognostic studies. *Arthritis Care Res* 2011;63:1115-25.
- Pinto P, McIntyre T, Ferrero R, Araujo-Soares V, Almeida A. Persistent pain after total knee or hip arthroplasty: Differential study of prevalence, nature and impact. *J Pain Res* 2013;6:691-703.
- Jafari M, Ghasemi G, Zolactaf V, Rahimi M. The effect of pilates exercise on pain outcome and quality of life of the patients total knee replacement. *Sadra Med Sci J* 2015;3:1-12.
- Katz J, Smith S, Collins J, Solomon D, Jordan J, Hunter D, *et al.* Cost-effectiveness of nonsteroidal anti-inflammatory drugs and opioids in the treatment of knee osteoarthritis in older patients with multiple comorbidity. *Osteoarthritis Res Soc Int* 2015;24:409-18.
- Mamarelis G, Hari Sunil Kumar K, Khnduja V. Timing of manipulation under anaesthesia after total knee arthroplasty. *Anu Transl Med* 2015;3:316-20.
- Yoo J-H, Oh JC, Oh HC, Park S-H. Manipulation under anesthesia for stiffness after total knee arthroplasty. *Knee Surg Relat Res* 2015;27:233-9.
- Van der List J, Chawla H, Zuiderbaan HA, Pearle AD. The Role of preoperative patient characteristics on outcomes of unicompartmental knee arthroplasty: A meta- analysis critique. *J Arthroplasty* 2016;31:2617-27.
- Keeny J, Nunley R, Wright R. Are younger patients undergoing TKAs appropriately characterized as active? *Clin Orthop Relat Res* 2014;472:1210-6.