

The Effect of Education Planned According to Health Literacy Level on Functionality, Problems Experienced, and Quality of Life in Patients Undergoing Total Knee Replacement A Nonrandomized Comparison Group Intervention Study

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Total knee arthroplasty procedures significantly improve guality of life for persons with debilitating pain. It is essential to plan patient education according to the level of health literacy. This nonrandomized comparison group intervention study examines the effect of education planned according to health literacy level on functionality, postoperative problems (pain and anxiety), and guality of life in patients who undergo total knee replacement. During the study, patients in the intervention group (n = 51) were provided with the planned patient education according to their health literacy level, whereas patients in the comparison group were given routine care (n = 51). Patients in the postoperative intervention group experienced fewer problems (p < .05). Education tailored to patients' health literacy levels had a positive effect on their functionality and guality of life (p < .05). Our findings suggest planning education according to patient health literacy levels may have a positive influence on functionality, postoperative problems, and quality of life among patients undergoing total knee replacement.

oday, total knee arthroplasty (TKA) procedures are considered the best treatment option when conservative methods such as anti-inflammatory or physical therapy fail (Beard et al., 2019). However, the advanced age of the majority of patients, the presence of comorbidities, and the use of doublesided prostheses cause individuals to experience many physiological and psychological problems such as a decrease in functionality, pain, and anxiety in the healing process McDonall et al., 2016; Nygaard et al., 2021; Skogö Nyvang et al., 2019; Timmers et al., 2019). Such problems cause a decrease in quality of life, rehospitalization, increased morbidity and mortality, and increases in treatment and maintenance costs (Berman et al., 2016; Johansson Stark et al., 2016). On the other hand, with the developments in healthcare in recent years, the discharge period after TKA has decreased to 0-3 days (Wainwright et al., 2020). This imposes more responsibility in the postoperative period, especially on patients and their relatives, to undertake care and to facilitate recovery (McDonall et al., 2016). Along with care and treatments, patient education is crucial in controlling all these situations (Eloranta et al., 2016; Hovik et al., 2018; Kennedy et al., 2017). Authors of a Cochrane systematic review emphasized the positive effects of education given to TKA patients on patient care and suggested that it provides motivation to cope with a surgical trauma, reduces anxiety, and improves functionality and quality of life (McDonald et al., 2014). By providing information regarding realistic expectations, patient education can help patients cope more easily with recovery (Edwards et al., 2017).

Nurses educate patients in this challenging process that significantly affects their movement ability and daily life activities (Huber et al., 2020). However, for the education to be effective, it is critical that the provided information is easy to read and understand; that is,

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suitable for the patient's health literacy level (Edwards et al., 2017; Huber et al., 2020). Health literacy is the degree to which individuals have the capacity to obtain, understand, and apply the basic health information and services required to make appropriate health decisions (Furlough et al., 2020). Health literacy is vital to individuals' understanding of surgical situations and is considered the best indicator of the individual's health status (Edwards et al., 2017; Furlough et al., 2020; MacLeod et al., 2017). Nevertheless, the literature confirms that health literacy can often be low (Furlough et al., 2020; Hadden et al., 2018; MacLeod et al., 2017; Özkan, 2018). Yet, low health literacy is associated with difficulties in understanding, perceiving, and interpreting health information, adapting to the treatment process, and communicating with health professionals, as well as decreased patient satisfaction and rehospitalization (Broderick et al., 2021; Gustafsdottir et al., 2022; Rohringer et al., 2021). For optimum understanding and harmony, patient education materials should contain elements like paintings and drawings aimed at health literacy levels corresponding to the sixth or seventh grade or lower levels (Edwards et al., 2017). However, most instructional material prepared in orthopaedics has an advanced level of readability that patients cannot understand, indicating that little attention was paid to health literacy levels (Eltorai et al., 2016; Marshall et al., 2019; Mehta et al., 2018; Rosenbaum et al., 2015).

Patient education that is developed in accordance with the patient's level of health literacy, will improve individuals' understanding and clinical outcomes such as functionality, postoperative problems, and quality of life (Broderick et al., 2021; Hadden et al., 2018). In this context, educational materials that use simple language and short sentences, avoid medical terms, and increase the readability with explanatory figures will reduce physical and psychosocial problems related to surgery experienced in TKA patients (Eltorai et al., 2016; Gustafsdottir et al., 2022; Rohringer et al., 2021; Rosenbaum et al., 2015).

Although previous studies in the literature have examined the effect of patient education, this study is unique in planning the patient education in accordance with health literacy. An easy-to-read and understandable patient education plan, suitable for the needs of patients, will reduce the stress experienced by patients, increase the likelihood of their active participation in their own care, reduce the problems experienced with the surgery, and increase the functionality and quality of life. In addition, delivering adequate patient education to patients using their educational roles will, in turn, contribute to the development of nursing roles. The primary aim of the study was to evaluate the effect of health literacy level-based patient education in TKA patients on their quality of life. The secondary aim was to determine its influence on functionality and problems experienced.

Methods

DESIGN AND SETTING

The research was a nonrandomized comparison group intervention study. The study sample was recruited from

the Orthopedics and Traumatology Clinic of a patient education and research hospital in a metropolis of Turkey between June 2018 and September 2019. In order to conduct the study, written permission was obtained from the ethics committee (dated April 14, 2018, and numbered 14574941-199-27487) and the hospital (dated April 27, 2018, and numbered 41303261-799). Verbal and written consent was obtained from the patients.

PARTICIPANTS

The sample of the study consisted of 102 patients who met the inclusion criteria of the research. Inclusion criteria for the study included: (1) having total knee prosthesis surgery for the first time; (2) not having a history of psychiatric problems; (3) being literate; and (4) agreeing to participate in the research. Exclusion criteria included: (1) having a previous knee prosthesis surgery and (2) having a history of a psychiatric disorder. The withdrawal criteria were repeat surgery, postoperative delirium, and voluntary withdrawal.

The sample size was calculated using the G Power 3.0.10 software package as 102 (0.5 effect size at 95% confidence level, 80% power) (51 in the comparison group and 51 in the intervention group). The sample was selected using random sampling. To prevent the interaction of the participants with each other, first data of the comparison group were collected, and then data of the intervention group were collected.

MEASUREMENT INSTRUMENTS

Each participant in the study completed the Patient Information Form, Turkish Health Literacy Scale-32, Functional Evaluation Form, Patient Learning Needs Scale, Knee Evaluation Survey, Recovery Forms, and the quality of life scale.

Patient Information Form

The Patient Information Form is a 27-question form that evaluates sociodemographic characteristics, knowledge about the disease, and the need for information. The form was filled out during admission to the clinic.

Turkish Health Literacy Scale-32

The Turkish Health Literacy Scale-32 (TSOY-32) is a valid and reliable scale prepared based on the Turkish adaptation of the European Health Literacy Scale (Asoy-TR) (Okyay & Abacıgil, 2016). The scores obtained from the scale are between 0 and 50; 0–25 is insufficient, and >42–50 is excellent health literacy. The general internal consistency coefficient of the scale in this study was 0.964. The form was filled out during admission to the clinic, before the surgery.

Functional Evaluation Form

The Functional Evaluation Form was developed by Jergeesten et al. to determine the functional status of patients with knee and hip surgery and was used for the first time in Turkey by Aydın et al. (1992). The highest score that can be obtained on the survey is 100. The increase in points indicates the improvement of

functionality. Its Cronbach α value in the study was 0.864. The form was filled out during admission to the clinic, before the surgery, right before discharge, and 6 weeks post-discharge.

Patient Learning Needs Scale

The Patient Learning Needs Scale (PLNS) is a 50-item scale developed by Bubela et al. (1991), and its Turkish validity reliability studies have been carried out by Çatal and Dicle (2008). The maximum score that can be obtained from the scale is 250, and the increase in score refers to the patient's perception of learning needs. In this study, the Cronbach α value was 0.945. The form was filled out during admission to the clinic, before the surgery.

Knee Evaluation Survey

The Knee Evaluation Survey is a reliable form created by Yıldız using the Oxford knee evaluation score (Yıldız, 2011). The increase in average scores indicates negative knee recovery. In this study, the Cronbach α value was 0.731. The form was filled out during admission to the clinic, before the surgery, right before discharge, and 15 days and 6 weeks post-discharge.

Recovery

Recovery Forms were created to assess the problems experienced by patients in the clinic and at home during postsurgical recovery (Cavanaugh et al., 2020; McDonall et al., 2016; Nygaard et al., 2021; Potter et al., 2016; Timmers et al., 2019). The forms were filled out at discharge (7 questions), and 15 days (11 questions) and 6 weeks post-discharge (8 questions).

Quality of Life Scale (SF-36)

The 36-item Short Form Survey (SF-36) was developed by Ware in 1992, and its Turkish validity and reliability study was conducted by Koçyiğit et al. (1999). There are eight subscales, each scored between 0 and 100. Higher scores suggest higher quality of life. In this study, the Cronbach α value of the subscales was between 0.794 and 0.891. The form was filled out during admission to the clinic, right before discharge, and 6 weeks post-discharge.

IMPLEMENTATION PROCESS OF RESEARCH

The implementation process of the research consisted of three stages: the preparation of educational materials, preimplementation of data collection tools, and implementation of the research. The language of the study was Turkish.

PREPARATION OF EDUCATIONAL MATERIAL

Before assembling the patient education booklet, the subjects on which the patients required education were determined from the open-ended questions in the PLNS and the Patient Information Form. Their health literacy levels were determined using the TSOY-32. Then, the booklet was prepared in accordance with the data obtained (Berman et al., 2016; Eloranta et al., 2016;

Grant et al., 2017; Hoviz et al., 2018; Kazan and Görgülü, 2017; Lewis et al., 2014; McDonald et al., 2014; Potter et al., 2016; Ramkumar et al., 2019; Smith & Radford, 2016; Wainwright et al., 2020). The patient education booklet consists of three sections: The first section gives general information about TKA, preoperative preparation, and surgery day; the second section is on the postoperative first, second, and third days; the third section is on recovery at home. The booklet was designed in accordance with the opinions of seven experts who worked or specialized in the field of orthopaedics. The suitability of the written material was evaluated in terms of compliance, information quality, content, and readability by the experts using the DISCERN measurement tool and Atesman readability formula. The material had an Atesman value of 71.7 (readability: easy, education level: fifth to sixth grade) and was found appropriate in terms of content and quality. When creating the booklet, the figures suitable for the content were drawn by an artist who avoided the use of distracting colors. The photographs were taken by a specialist photographer, who was guided by researchers. The booklet text was in Arial font and an easily readable font size; it was printed on A3 size paper that was folded in half (A4 size).

PREIMPLEMENTATION OF DATA COLLECTION TOOLS

The preliminary implementation took place between April and June 2018 and was conducted with five patients who underwent TKA and met the inclusion criteria. No changes were made to the questionnaires and patient education booklet after the preimplementation. Patients included in the preimplementation were not included in the study.

IMPLEMENTATION OF THE RESEARCH

In order to prevent interaction between the patients in the comparison (i.e., control) and intervention groups, the first 51 patients were assigned to the comparison group and the second 51 patients were assigned to the intervention group between June 2018 and September 2019. Before surgery, at admission to the clinic, patients filled out the Patient Information Form, TSOY-32, PLNS, Functional Evaluation Form, Knee Evaluation Survey, and Quality of Life Scale. After surgery, just before discharge, patients filled out the Functional Evaluation Form, Knee Evaluation Survey, Discharge Data Collection Form, and Quality of Life Scale. On the postoperative day 15, that is, at 15 days post-discharge, patients filled out the 15-day Recovery Data Collection Form and Knee Evaluation Survey. At postoperative week 6, that is, at 6 weeks post-discharge, patients filled out the Functional Evaluation Form, Knee Evaluation Survey, 6-week Recovery Data Collection Form, Quality of Life Scale.

Research Implementation in the Comparison Group

In the perioperative process, no other treatment except for routine care was provided. At the time of the study, there was no standard checklist or protocol for TKA patient education. Information content generally included

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TABLE 1. DESCRIPTION OF PA	TIENTS (<i>N</i> = 102)				
	Compariso	n Group (<i>n</i> = 51)	Intervention	n Group (<i>n</i> = 51)	Statistical
Variable	п	%	п	%	Probability
Age					
40–60	12	23.5	15	29.4	$\chi^2 = 0.201$
≥61	39	76.5	36	70.6	$p = .654^{a}$
Gender					
Female	45	88.2	40	78.4	$\chi^2 = 1.129$
Male	6	11.8	11	21.6	$p = .288^{b}$
Level of education					
Literate	23	45.1	20	39.2	$\chi^2 = 1.209$
Primary school	25	49.0	25	49.0	$p = .564^{a}$
Secondary education	3	5.9	6	11.8	
Employment status					
Unemployed	49	96.1	49	96.1	$\chi^{2} = 0.01$
Employed	2	3.9	2	3.9	$p = 1.000^{b}$
Living arrangement					
Living alone	7	13.7	-	-	$\chi^2 = 8.978$
With spouse and children	43	84.3	47	92.2	$p = .011^{\text{b}}$
With relatives	1	2.0	4	7.8	
Type of the house					
Detached	12	23.5	6	11.8	$\chi^2 = 1.687$
Apartment	39	76.5	45	82.4	$p = .194^{a}$
Toilet					
European-style toilet	47	92.2	49	96.1	$p = .678^{\circ}$
Turkish-style toilet	4	7.8	2	3.9	
Chronic disease					
No	15	29.4	14	27.5	$\chi^2 = 0.01$
Yes	36	70.6	37	72.5	$p = 1.000^{b}$
Smoking	18	Q/L 1	/8	Q/L 1	1 0000
llor	40	5 0	48	5 0	$p = 1.000^{\circ}$
0361		J.J	<u> </u>	J.J	-
	X (SD)	wedian [IQK]	X (SD)	wedian [IQK]	-
Health Literacy Scale	22.05 (6.86)	23.1 [8.4]	22.15 (5.69)	21.4 [9.5]	Z = -0.605 $p = .545^{d}$
	X (SD)	Median [Min-Max]	X (SD)	Median [Min-Max]	-
PLNS total	198.18 (20.85)	200.0 [148.0-250.0]	200.71 (19.42)	200.0 [151.0-250.0]	Z = -0.376 $p = .707^{d}$

Note. IQR = interquartile range; PLNS = Patient Learning Needs Scale.

^bContinuity correction.

^cFisher exact test.

^dMann–Whitney U (Z-table value) test.

mobilization, infection, drug use, exercise, and control schedule.

Research Implementation in the Intervention Group

The prepared booklet was given to the patients in the first meeting and patient education was performed using various educational methods such as presentation, question– answer, demonstration, and application. The patient education was divided into three sections and was carried out in an area suitable for group education. The first patient education session took place upon admission to the clinic, that is, before the surgery. The second patient education session took place upon return to the clinic after surgery, and the third took place just before discharge.

EVALUATION OF DATA

Statistical analysis of the data obtained from the research was conducted using the SPSS (IBM SPSS Statistics 24) software. Frequency schedules and descriptive statistics were used to interpret the data. Independent sample *t* test, Mann–Whitney *U*, Wilcoxon, Spearman correlation coefficient, Pearson χ^2 , continuity correction, and Fisher exact test statistics were used.

^aPearson χ^2 test.

TABLE 2. PROBLEMS EXPERIENCED BY P	PATIENTS IN THE P	OSTOPERATIVE CLIN	ıc (<i>N</i> = 102)		
	Comparison (Group $(n = 51)$	Intervention (Group (<i>n</i> = 51)	Statistical
Problems	п	0/0	п	%	Probability
Pain in the surgical site	46	90.2	51	100.0	$p = .056^{\circ}$
Swelling/redness/discharge/itching in the surgical site	7	13.7	-	-	p = .013ª
Swelling/numbness/itching	2	3.9	1	2.0	$p = 1.000^{\circ}$
Bleeding	14	27.5	14	27.5	$\chi^2 = 0.01$ $p = 1.000^{b}$
Having trouble standing up	1	2.0	_	_	$p = 1.000^{\circ}$
Problem lifting knee	3	5.9	_	_	$p = .243^{\circ}$
Problem (pain) with walking	3	5.9	5	9.8	$p = .715^{a}$
Continuity correction					

^aContinuity correction. ^bFisher exact test.

Results

Data were collected from 102 participants undergoing TKA. The majority of the participants were 61 years and older, female, literate, and primary education graduates. Patients in the intervention and comparison groups showed homogeneous distribution in terms of age, gender, education level, working status, home, toilet, chronic illness, and smoking (p > .05). The average TSOY-32 score was 22.05 ± 6.86 in the comparison group and 22.15 ± 5.69 in the intervention group. The average total PLNS score of the patients was 198.18 ± 20.85 in the comparison group and 200.71 ± 19.42 in the intervention group. Groups had homogeneous distribution in terms of TSOY-32 and PLNS score averages (p > .005) (see Table 1).

Patients in the comparison group experienced swelling/redness/discharge/itching in the surgical area, but those in the intervention group did not (p < .05). In the intervention group, 100% of participants experienced postoperative pain; however, only 90.2% in the comparison group experienced pain (p > .05) (see Table 2).

The intervention group patients experienced more pain problems at 15 days and 6 weeks post-discharge (p < .05) but had less swelling\redness\discharge in the surgical area, swelling\numbness\itching in the leg and fewer problems in knee lifting, walking, and drug use periods. Compared to the comparison group, the intervention group patients felt better at 15 days and 6 weeks post-discharge and were more likely to return to a normal life at 6 weeks (see Table 3).

According to the Knee Evaluation Survey at 15 days and 6 weeks after postoperative discharge, the comparison group patients had higher average scores for ability to take a bath on their own, ability to put on their socks, limping while walking, and lower average scores for knee pain (p < .05) (see Table 4).

In the intervention group, maximum walking, climbing stairs, daily work, transportation, and lower extremity maintenance averages were lower at discharge but were elevated in the sixth week (p < .05) (see Table 5).

According to the Quality of Life Scale, the average general health perception and physical function

subdimension scores of the intervention group patients were higher than those of the comparison group at the sixth week (p < .05) (see Table 6).

Discussion

The aim of the study was to determine the effect of patient education planned according to the level of health literacy in patients with TKA on postoperative functionality, postoperative problems, and quality of life. This study reveals that health literacy level-based education in patients with TKA is effective in increasing the quality of life and functionality and reducing postoperative problems. Indeed, the positive effects of patient education in TKA patients have also been reported in other studies in the literature. However, these studies did not take health literacy levels into consideration (Moyer et al., 2017; Sveinsdottir et al., 2021; Timmers et al., 2019).

Similar to the literature, the health literacy level of the participants was found to be low (Furlough et al., 2020; Hadden et al., 2018; MacLeod et al., 2017; Okyay & Abacıgil, 2016). Individuals with low health literacy not only have difficulty understanding, interpreting, and expressing health-related information but also understanding the patient education given and adapting to the treatment process (Diviani et al., 2015; Mehta et al., 2018; Özkan, 2018; Rosembaum et al., 2015). It is, therefore, important to tailor patient education to the health literacy level of the patient. The fact that the prepared patient education booklet was at the fifth to sixth class levels indicates its suitability to all levels of health literacy. Similar to the findings of other researchers, the mean PLNS scores of patients in both groups suggested a high need for information (Başaran & Yılmaz, 2015; Orgun & Sen, 2012; Sendir et al., 2013). The shortened hospital stay nowadays imposes more responsibility on the patient and their relatives during the postdischarge period (Soyer et al., 2018).

It was determined that the patients in the intervention group had fewer problems in the postoperative clinic and during the postdischarge period (see Tables 2 and 3). Patients may experience different levels of physical and psychological problems in the early stages after

TABLE 3. PROBLEMS EXPERIENCED BY PATIENTS ON THE 1	15тн Day	AND SIXTH W	EEK POSTOPE	ration (N =	102)					
		15th	Day				Sixth Wee	ek		
	Comp (<i>n</i> =	arison 51)	Interv (n =	ention = 51)	Statistical Analvsis	Comp	arison 51)	Interve $(n =$	ention 51)	Statistical Analvsis
Variable	и	0/0	и	0/0	Probability	и	0/0	и	%	Probability
Pain in the surgical site	22	43.1	49	96.1	$\chi^2 = 31.328$ $p = .01^a$	24	47.1	50	98.0	$\chi^2 = 30.767$ $p = .01^a$
Swelling/redness/discharge in the surgical site Itching	-	2.0	I	I	$p = 1.000^{b}$	Ļ	2.0	I	I	$p = 1.000^{b}$
Swelling/numbness/itching in the leg	6	17.6	-	2.0	$\chi^2 = 5.433$ $p = .02^a$	6	17.6	2	9. 9	<i>p</i> = .051 ^b
Problem lifting knee	ß	9.8	I	I	$p = .056^{b}$	I	I	I	I	
Problem (pain) with walking	m	5.9	I	I	$p = .243^{\rm b}$	2	3.9	-	2.0	$p = 1.000^{b}$
Duration of medicine use	7	13.7	I	I	$p = .013^{\rm b}$	I	I	I	I	
Comparison of current health status with preoperative period Feeling better Not feeling better	36 15	70.7 29.3	45 6	88.2 11.8	$\chi^2 = 4.882$ $p = .087^a$	44 7	86.3 13.7	46 5	90.2 9.8	$\chi^2 = 1.378$ $p = .502^a$
Comparison of current health status with preoperative period ${}^{\!$	د 42	82.4	47	92.2	$\chi^2 = 7.067$ $p = .029^a$	45	88.2	48	94.2	$\chi^2 = 15.697$ $p = .01^a$
Status of returning to normal life Yes No	5 46	9.8 90.2	3 48	5.9 94.1	р = .715 ^b	22 29	43.1 56.9	38 13	74.5 25.5	$\chi^2 = 9.107$ $p = .03^a$
*Continuity correction. ^b Fisher exact test. ^B Between 0 and 10 points; 0 point much worse; 10 points m	nuch better	: Grouping was	made accord	ling to the scol	e given by the patien.	its.				

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TABLE 4. ME	AN KNEE EVA	ILUATION QL	JESTIONNAIRE,	, PATIENT SCC	ORES ($N = 1$	02)								
	Before S	Surgery		Discharge	e Status		Postoperativ	e 15th Day		Postoperative	Sixth Week			
	Comparison	Intervention		Comparison	Intervention	-	Comparison	Intervention		Comparison	Intervention			
Variable	$\frac{(n = 51)}{X} (SD)$	$\frac{(n = 51)}{X} (SD)$	Analysis Probability	$\frac{(n = 51)}{\overline{X}}$	$\frac{(n = 51)}{\overline{X} (SD)}$	Analysis Probability	$\frac{(n = 51)}{\overline{X}}$	$\frac{(n = 51)}{X} (SD)$	Analysis Probability	$\frac{(n=51)}{X}$ (SD)	$\frac{(n=5 1)}{X}$ (SD)	Analysis Probability	pa	p^{b}
Knee pain	4.94 (0.24)	0.00 (0.00)	Z = -1.749 $p = .080^{\circ}$	4.86 (0.41)	4.98 (0.14)	Z = -1.956 $p = .051^{\circ}$	4.39 (0.57)	4.88 (0.33)	Z = 4.799 $p = .01^{\circ}$	3.72 (0.42)	4.25 (0.48)	Z = -2.540 $p = .011^{\circ}$	Z = -6.308 $p = .000^d$	Z = -6.008 $p = .000^{d}$
Ability to	3.20 (0.83)	2.69 (0.76)	Z = -3.105	3.22 (0.73)	2.75 (0.63)	Z = -3.254	3.22 (0.67)	2.51 (0.64)	Z = -4.995	2.45 (0.58)	2.31 (0.58)	Z = -1.049	Z = -4.134	Z = -2.754
their own			p = .002 ^c			<i>p</i> = .001 ^c			<i>p</i> = .01 ^c			p = .294 ^c	p000 ⁻ = d	<i>p</i> = .006 ^d
Ability to put	2.69 (0.73)	2.41 (0.67)	Z = -1.677	2.69 (0.65)	2.37 (0.63)	Z = -2.220	2.59 (0.5)	2.22 (0.50)	Z = -3.511	2.00 (0.75)	1.69 (0.70)	Z = -2.132	Z = -4.289	Z = -4.057
			p = .094 ^c			<i>p</i> = .026 ^c			$p = .01^{\circ}$			<i>p</i> = .033 ^c	^b 000. = d	b= .000 ^d
Ability to	4.33 (0.68)	4.22 (0.70)	Z = -0.852	4.41 (0.64)	4.22 (0.61)	Z = -1.678	4.86 (0.45)	4.39 (0.67)	Z = -4.335	4.02 (0.95)	3.59 (0.90)	Z = -2.372	Z = -2.062	Z = -3.654
their own			p = .394 ^c			<i>p</i> = .093€			$p = .01^{\circ}$			<i>p</i> = .018 ^c	$p = .039^{d}$	^b = .000 ^d
Limping while	4.49 (0.64)	3.78 (0.88)	Z = -4.521	4.43 (0.61)	3.73 (0.60)	Z = -5.495	3.92 (0.91)	3.53 (0.64)	Z = -2.934	3.20 (0.87)	2.71 (0.83)	Z = -2.924	Z = -5.353	Z = -4.747
Walkling			<i>p</i> = .01 ^c			<i>p</i> = .01 ^c			<i>p</i> = .003 ^c			<i>p</i> = .003 ^c	^p 000 [·] = <i>d</i>	^b = .000 ^d
Knee pain in	4.31 (0.81)	3.59 (0.73)	Z = -4.476	4.25 (0.69)	3.55 (0.70)	Z = -4.629	3.02 (0.88)	3.00 (0.57)	Z = -0.439	2.53 (0.99)	2.71 (0.76)	Z = -1.149	Z = -5.859	Z = -4.603
night			<i>p</i> = .01 ^c			<i>p</i> = .01 ^c			p = .660 ^c			p = .251 ^c	^b 000. = <i>q</i>	b = .000 ^d
aThe differenc bThe differenc dMann–Whitn dWilcoxon (Z-t	e between the e between the ey U (Z-table v able value) tes	e preoperativi e preoperativi alue) test. st.	e and postope e and postope	rative sixth-we rative sixth-we	eek comparisc eek interventi	on group score on group scor	es. es.							

TABLE 5. PRE	OPERATIV	E AND PC	STOPERAT	IVE FUNC	TIONAL EVALU		UESTIONN	aire Me.	AN SCOR	ES							
		Before	Surgery				Discharg	e Status			Pos	toperativ	e Sixth We	ek			
	Comp (<i>n</i> =	arison = 51)	Interv€ (<i>n</i> =	ention 51)		Compa (n =	arison 51)	Interve (n =	ention 51)		Component Comp	arison 51)	Interve (n =	ntion 51)			
Variable	<u>X</u> (SD)	Median [IQR]	<u>X</u> (SD)	Median [IQR]	Analysis Probability	<u>X</u> (SD)	Median [IQR]	<u>X</u> (SD)	Median [IQR]	Analysis Probability	<u>X</u> (SD)	Median [IQR]	<u>X</u> (SD)	Median [IQR]	Analysis Probability	p^{a}	p^{b}
Maximum walking	5.57 (2.13)	4.0 [4.0]	6.35 (1.98)	8.0 [4.0]	Z = -1.846 $p = .065^{\circ}$	4.16 (0.78)	4.0 [0.0]	4.00 (0.00)	4.0 [0.0]	Z = -1.421 $p = .155^{\circ}$	7.14 (1.66)	7.0 [0.0]	8.75 (2.37)	8.0 [0.0]	Z = -3.785 $p = .01^{\circ}$	Z = -3.651, $p = .000^d$	Z = -4.518 $p = .000^{d}$
Climb up stairs	5.33 (4.71)	8.0 [8.0]	6.20 (4.03)	8.0 [8.0]	Z = -0.785 $p = .433^{\circ}$	1.65 (3.41)	1.0 [0.0]	0.16 (1.12)	0.0 [0.0]	Z = -2.864 $p = .004^{\circ}$	8.23 (3.24)	8.0 [4.0]	9.56 (1.97)	9.0 [4.0]	Z = -2.020 $p = .043^{\circ}$	Z = -3.409 Z $p = .001^{d}$	z = -4.270 $p = .000^{d}$
Daily routines	3.76 (2.93)	6.0 [6.0]	2.08 (3.02)	0.0 [6.0]	Z = -2.822 $p = .005^{\circ}$	0.35 (1.43)	0.0 [0.0]	0.00 (0.00)	0.0 [0.0]	Z = -1.749 $p = .080^{\circ}$	5.41 (1.81)	6.0 [0.0]	5.92 (1.44)	6.0 [0.0]	Z = -1.668 $p = .095^{\circ}$	Z = -3.300 Z $p = .001^{d}$	z = -5.373 $p = .000^d$
Transportation	6.51 (1.74)	6.0 [0.0]	7.57 (1.97)	7.0 [4.0]	Z = -2.749 $p = .006^{\circ}$	5.88 (0.84)	6.0 [0.0]	6.08 (0.56)	6.0 [0.0]	Z = -1.407 p = .159 ^c	8.12 (2.02)	8.0 [4.0]	9.69 (1.09)	10.0 [0.0]	Z = -4.416 p = .01 ^c	Z = -3.536 Z $p = .000^{d}$	z = -5.196 $p = .000^{d}$
Lower extremity care	8.31 (2.75)	9.0 [4.0]	9.41 (1.80)	10.0 [0.0]	Z = -2.586 $p = .010^{\circ}$	5.45 (2.16)	6.0 [0.0]	4.00 (2.86)	5.0 [6.0]	Z = -2.817 $p = .005^{\circ}$	9.57 (1.66)	0.0 [0.0]	10.00 (0.00)	10.0 [0.0]	Z = -2.030 $p = .042^{c}$	$Z = -2.560$ $z = -2.010^d$	z = -2.333 $p = .020^{d}$
Total	50.51 (13.77)	51.0 [18.0]	53.88 (14.22)	55.0 [22.0]	t = -1.217 $p = .227^{e}$	26.94 (7.04)	28.0 [9.0]	19.53 (4.76)	20.0 [6.0]	Z = -5.479 $p = .01^{\circ}$	64.57 (11.35)	69.0 [11.0]	71.33 (6.49)	72.0 [7.0]	Z = -3.101 $p = .002^{\circ}$	Z = -4.770 Z $p = .000^d$	z = -5.948 $p = .000^{d}$
Note. IQR = ir ^a Difference bet ^b Difference ber ^c Mann–Whitne ^d Wilcoxon (Z-ti ^e Independent s	terquartile ween pre w U (Z-tab able value) ample t te	e range. operative operative ble value) †) test. est.	and posto and posto test.	perative s perative s	ixth-week com ixth-week intel	parison g vention g	roup score	es.									

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TABLE 6. PREC	PERATIVE	AND PO	STOPERATI	IVE QUALI	TY OF LIFE SCA	NLE MEAN	N SCORES	(N = 1)	02)								
		Before	Surgery				Discharg	e Status			Po	stoperativ	e 6th Wee	×			
	Comp (n =	arison = 51)	Interví (n =	ention = 51)	I	Compa (n =	151)	Interve $(n =$	ention 51)		Compa (n=)	arison 51)	Interve $(n = 5$	ntion 51)			
Variable	<u>X</u> (SD)	Median [IQR]	<u>X</u> (SD)	Median [IQR]	Analysis Probability	<u>X</u> (SD)	Median [IQR]	<u>X</u> (SD)	Median [IQR]	Analysis Probability	<u>X</u> (SD)	Median [IQR]	<u>X</u> (SD)	Median [IQR]	Analysis Probability	Pa	ρ^{b}
Physical function	3.43 (7.91)	0.0 [5.0]	4.71 (7.03)	0.0 [5.0]	Z = -1.088 $p = .277^{c}$	0.20 (1.40)	0.0	0.00	0.0	Z = -1.000 $p = .317^{c}$	24.51 (11.14)	25.0 [15.0]	40.98 (17.97)	45.0 [25.0]	Z = -5.033 $p = .01^{\circ}$	Z = -5.924 $p = .000^{d}$	Z = -5.959 $p = .000^{d}$
Physical role	96.57	100.0	100.00	100.0	Z = -1.749	92.16	100.0	96.08	100.0	Z = -1.42	62.75	100.0	41.17	0.0	Z = -1.194	Z = -4.456	Z = -5.386
difficulty	(15.83)	[0.0]	(0.00)	[0.0]	$p = .080^{\circ}$	(24.74)	[0.0]	(19.60)	[0.0]	$p = .155^{\circ}$	(48.82)	[100.0]	(49.71)	[100.0]	p = .232 ^c	$p = .000^{d}$	$p = .000^{d}$
Emotional role	62.85	100.0	41.18	0.0	Z = -2.169	36.60	0.0	43.14	0.0	Z = -0.569	15.69	0.0]	5.88	0.0	Z = -1.797	Z = -4.461	Z = -3.838
difficulty	(48.83)	[100.0]	(49.70)	[100.0]	$p = .030^{\circ}$	(47.73)	[100.0]	(50.02)	[100.0]	$p = .569^{\circ}$	(35.49)		(23.76)	[0.0]	p = .072 ^c	$p = .000^{d}$	$p = .000^{d}$
Vitality	40.10	40.0	44.51	50.0	Z = -2.146	43.82	50.0	45.20	50.0	Z = -0.832	45.59	50.0	47.65	50.0	Z = -1.332	Z = -3.059	Z = -2.126
	(10.97)	[20.0]	(8.50)	[10.0]	p = .032 ^c	(10.18)	[10.0]	(7.81)	[10.0]	$p = .406^{\circ}$	(8.29)	[5.0]	(6.03)	[0.0]	p = .183 ^c	$p = .002^{d}$	$p = .033^{d}$
Mental health	57.49	56.0	54.04	52.0	Z = -2.296	55.84	52.0	52.94	52.0	Z = -1.911	57.10	52.0	54.90	52.0	Z = -0.686	Z = -0.231	Z = -0.802
	(8.80)	[12.0]	(6.76)	[4.0]	p = .022 ^c	(6.83)	[8.0]	(3.80)	[0.0]	$p = .056^{\circ}$	(8.27)	[12.0]	(5.94)	[8.0]	p = .493 ^c	$p = .817^{d}$	$p = .423^{d}$
Social	17.65	12.5	15.93	12.5	Z = -0.480	18.87	12.5	15.69	12.5	Z = -1.358	41.42	37.5	39.71	37.5	Z = -1.218	Z = -5.458	Z = -6.066
functionality	(13.50)	[12.5]	(6.65)	[0.0]	$p = .631^{\circ}$	(12.09)	[12.5]	(7.00)	[0.0]	p = .174 ^c	(14.68)	[12.5]	(8.91)	[12.5]	$p = .223^{\circ}$	$p = .000^{d}$	$p = .000^{d}$
Pain	20.20	22.5	26.23	32.5	Z = -2.358	19.66	22.5	27.06	32.5	Z = -3.176	48.03	55.0	48.87	55.0	Z = -0.722	Z = -5.765	Z = -5.444
	(14.81)	[32.5]	(12.24)	[22.5]	$p = .018^{c}$	(14.27)	[32.5]	(10.26)	[0.0]	p = .001 ^c	(12.66)	[12.5]	(13.27)	[0.0]	$p = .471^{\circ}$	$p = .000^{d}$	$p = .000^{d}$
General health	36.76	40.0	36.27	40.0	Z = -0.128	39.51	45.0	35.78	40.0	Z = -2.863	45.00	45.0	47.45	50.0	Z = -2.049	Z = -4.268	Z = -5.463
perception	(10.81)	[10.0]	(7.60)	[10.0]	p = .898 ^c	(9.86)	[10.0]	(7.64)	[10.0]	$p = .004^{\circ}$	(7.00)	[5.0]	(7.37)	[5.0]	$p = .01^{\circ}$	$p = .000^d$	$p = .000^{d}$
<i>Note.</i> IQR = int ^a Difference beth ^b Difference beth ^c Mann–Whitney ^d Wilcoxon (<i>Z</i> -tal	erquartile veen preo veen preo v U (Z-tabl ole value)	range. pperative a pperative a le value) te test.	and postop and postop est.	berative six	tth-week compa tth-week interve	arison gro ention gro	up scores oup score	. 10									

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TKA surgery (Akıncı & Kapucu, 2020; McDonald et al., 2014; Mover et al., 2017; Sveinsdottir et al., 2021). The fact that the intervention group had fewer problems in the study suggests that the education planned according to the level of health literacy is effective. However, patient education did not affect the pain status of the patients. In the review of McDonald et al. (2014), the preoperative patient education provided to patients undergoing knee replacement caused no significant difference in pain severity between the groups. In a randomized controlled study conducted by Wilson et al. (2016), patients in the experiment group received brochures, individual teaching sessions, and telephone support preoperatively and there was no significant difference in postoperative pain intensity between the groups. In the systematic review prepared by Louw et al. (2013), preoperative patient education was found to have a limited effect on reducing patient pain. However, contrary to these studies, there are also studies showing that patient education reduces pain (Chen et al., 2013; Reslan et al., 2018; Szeverenyi et al., 2018). In the present study, although intervention group patients stated that they experienced more pain, they were also more likely to have returned to a normal life routine at six weeks (see Table 3). This suggests that tailored health education can also have a psychologically positive effect. Education enables patients to have realistic expectations, reduces anxiety, and makes them psychologically stronger, prepared, and motivated (Skogö Nyvang et al., 2019; Szeverenyi et al., 2018).

The lower mean knee evaluation score of the intervention group patients during the postoperative recovery period (see Table 4) and the higher mean functional evaluation score at the sixth week (see Table 5) indicate that the functionality increased at a higher rate in the intervention group. According to these results, we think that one reason for the increase in functionality is the curative effect of total knee replacement alone, and the other reason is the effective patient education given. Studies in the literature also suggest that education increases the functionality in patients undergoing TKA (Johansson Stark et al., 2016; McDonall et al., 2016; Timmers et al., 2019; Wainwright et al., 2020).

The higher general health perception and physical function subscale mean scores of the intervention group (p < .05), and the improved postoperative scores of intervention group patients in physical function, vitality, social functionality, pain, and general health perception (p < .05) suggest that patient education is effective (see Table 6). Similarly, a Cochrane systematic review found that TKA patient education increases quality of life (McDonald et al., 2014). In their randomized controlled study, Timmers et al. (2019) also reported that the quality of life of TKA patients increased with patient education.

Limitations

This study was limited by the fact that it was conducted in a single center and follow up was only to 6 weeks post-operation. The study was also limited by the high average Knee Evaluation Survey scores in the comparison group.

Conclusion

The findings of the study demonstrate that the education planned and tailored to TKA patients' health literacy levels can lead to an increase in postoperative functionality, fewer problems during recovery, and positive changes in the quality of life. Moreover, this study will guide nurses in educational planning, which is an essential part of care.

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