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EFFECTS OF VIDEO-BASED EDUCATION PROGRAM ON PAIN, PHYSICAL FUNCTION, AND QUALITY OF LIFE IN PATIENTS WITH TOTAL KNEE REPLACEMENT

Total Diz Protezi Olan Hastalarda Video-Temelli Eğitim Programının Ağrı, Fiziksel Fonksiyon ve Yaşam Kalitesi Üzerine Etkileri

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ABSTRACT

This study aimed to examine the effects of a video-based education program on pain, physical function, and quality of life in patients with total knee replacement and to explore their perceptions of the intervention. In this study, mixed methods were used. The intervention group (n= 40) patients were given the Video Based Education Program, whereas control group patients were given usual care (n=43). Data were evaluated using the WOMAC Index and Short Form-36 Health Survey. Data were collected at the postoperative sixth week and third month. After the quasi-experimental study data were collected, eleven patients were interviewed by in-depth interview method. While statistically significant differences were determined among patients in terms of pain, physical functioning, physical role, social functioning, emotional role, and mental component summary ($p<0.05$), no significant differences were determined in terms of stiffness, general health, vitality, and physical component summary ($p>0.05$). Five themes were identified after qualitative analyses. The video education seems to positively affect the participants' pain, physical function, and quality of life. Because patients have difficulty in remembering information and need support in applying the taught information, it may be recommended that the education is given to the patients be visual and interactive during the perioperative process.

Keywords: Nursing, Total knee replacement, Video education.

ÖZ

Bu araştırmada total diz protezi olan hastalarda video tabanlı bir eğitim programının ağrı, fiziksel fonksiyon ve yaşam kalitesi üzerindeki etkilerinin incelenmesi ve müdahaleye ilişkin algılarının belirlenmesi amaçlandı. Bu çalışmada karma yöntem (mix) kullanılmıştır. Girişim grubu hastalara (n= 40) Video Temelli Eğitim Programı verilirken, kontrol grubu hastalara (n=43) olağan bakım verildi. Veriler, WOMAC İndeksi ve SF-36 Yaşam Kalitesi ölçekleri kullanılarak değerlendirildi. Veriler postoperatif altıncı hafta ve üçüncü ayda toplandı. Yarı deneysel çalışma verileri toplandıktan sonra on bir hastayla derinlemesine görüşme yöntemiyle görüşüldü. Hastalar arasında ağrı, fiziksel işlevsellik, fiziksel rol, sosyal işlevsellik, emosyonel rol ve zihinsel bileşen özeti açısından anlamlı farklılıklar saptanırken ($p<0.05$), tutukluk, genel sağlık, canlılık ve fiziksel bileşen özeti açısından anlamlı fark saptanmadı ($p>0.05$). Kalitatif analizler sonucunda beş tema belirlendi. Video eğitiminin, katılımcıların ağrılarını, fiziksel fonksiyonlarını ve yaşam kalitelerini olumlu yönde etkilediği görülmektedir. Hastaların bilgiyi hatırlamakta güçlük çekmesi ve öğretilen bilgiyi uygulamada desteğe ihtiyaç duyması nedeniyle perioperatif süreçte hastalara görsel ve interaktif eğitim verilmesi önerilebilir.

Anahtar kelimeler: Hemşirelik, Total diz replasmanı, Video eğitimi.

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INTRODUCTION

Knee osteoarthritis is prevalent among adults aged 65 or older, which accounted for 33.6% (12.4 million people) of the total population in the United States. For patients suffering from osteoarthritis who does not respond to medical treatment, total knee replacement (TKR) is the most effective surgical procedure (Robert, 2014). A total of 757.000 TKR procedures were performed in the United States, and osteoarthritis (719.150 people) accounted for 95% of those surgeries (United States Bone and Joint Initiative, 2017). Following TKR surgery, patients typically obtain functional knee range of motion and report increased quality of life and improved performance in daily life activities (L. Shan, B. Shan, Suzuki, Nouh, & Saxena, 2015). Nevertheless, patients with TKR may experience postoperative complications, readmission to hospital, falls, and reduced function (Belmont et al., 2016; Welsh et al., 2017). Providing preoperative education in patients with TKR results in an increase in compliance and satisfaction with the treatment; physiological and psychological improvement in the postoperative period; an increase in independent roles and functions; and a decrease in anxiety, hospital stay, and postoperative complications (Louw, Diener, Butler, & Puentedura, 2013a; O'Donnell, 2015).

Patient education can help patients to reduce health issues and develop positive health behaviors (Peker Vermisli, Yılmaz, & Baydur, 2020). Several methods are used in patient education; it was generally categorized into three, namely, (1) verbal, (2) use of written materials, and (3) use of multimedia (video, CD-ROM, or DVD). Video-supported patient education is more advantageous than written material-supported or verbal one. Audio-visual materials are remarkable and can be easily repeated by patients. Patient education supported by multimedia is also more useful for those with limited literacy (Abu Abed, Himmel, Vormfelde, & Koschack, 2014; Ihrig et al., 2012). It has been found that video-based education is particularly effective in identifying treatment options, making decisions for informed consent, and increasing knowledge (Donoghue et al., 2014). Some studies reported that video-based education is effective in-patient outcomes, but some also revealed that it is not (Dyson, Beatty, & Matthews, 2010; Edwards, Mears, & Lowry Barnes, 2017; Haines et al., 2009; Ihrig et al., 2012; Peker Vermisli et al., 2020). Further, there are studies on video-based nurse visits, motivational interviews, and in-person professional education for children and adult patients (Habibzadeh, Milan, Radfar, Alilu, & Cund, 2018; Haddad, Saleh, & Eshah, 2018; T. Sørlie, Busund, J. Sexton, H. Sexton, & Sørlie, 2007). Video-based education were found to have a positive effect for those who had spinal surgery, coronary bypass and

thoracic surgery (Habibzadeh et al., 2018; Shao et al., 2019; Zarei, Valiee, Nouri, Khosravi, & Fathi, 2018) . Our search for studies investigating the relationship between the video-based education program (VBEP) and the quality of life in patients who were undergoing TKR demonstrated a gap in the literature. The results of this study are also expected to contribute to the nursing literature. This mixed methods study aimed to investigate the effects of VBEP on pain, physical function, and quality of life in patients who had TKR. A secondary aim was to examine their perceptions of the intervention.

We hypothesized that (1) the Western Ontario and McMaster Universities (WOMAC) score (pain, stiffness, and physical function) would be significantly better in patients with TKR who received the VBEP than in those who received usual care. (2). Quality of life would be significantly better in patients with TKR who received the VBEP than in those who received usual care.

MATERIAL AND METHOD

This is a mixed-method study that involves a quasi-experimental study design and a descriptive qualitative evaluation of the intervention. Intervention group patients were given the VBEP for patients with TKR, whereas control group patients were given usual care (written material education). The data were collected between June 2014 and December 2017 in a university hospital in Turkey. The participating hospital and the Non-Invasive Clinical Research Ethics Committee approved the present study (April 04, 2013, numbered 2013/12-14, 854-GOA). Patients also provided written consent.

Sample

The sample of the present study comprised patients who were undergoing TKR surgery. The inclusion criteria were as follows: volunteering to participate in the study, being over 18 years old, having a diagnosis of osteoarthritis, having indications for TKR, having undergone unilateral knee replacement for the first time. The following participants were excluded from the study: those not participating in the whole VBEP and whose planned TKR was postponed after they participated in the first (preoperative) part of the VBEP.

The sample size was calculated using the data of the quality of life in the total knee replacement in the study conducted by Nunez et al. (2006). In this study, the effect size was calculated using the sub-dimension of the quality of life scale with the G Power 3.1 program. The study required a minimum sample size of intervention group= 36, control group= 36 participants, and was calculated with a T-test based on a probability of $\alpha = 0.05$, the effect

size of 0.60, and a power level of 1-β = 0.9. Considering that the sample loss would be 20%, the purpose was to reach at least 44 intervention groups and 44 control groups. Post hoc power analysis was performed using t-test analysis in independent groups with a 95% confidence interval and p=0.05 significance level. The result of the power analysis demonstrated that this study's power was sufficient. The study was completed with 43 patients (control group) and 40 patients (intervention group) (Figure 1).

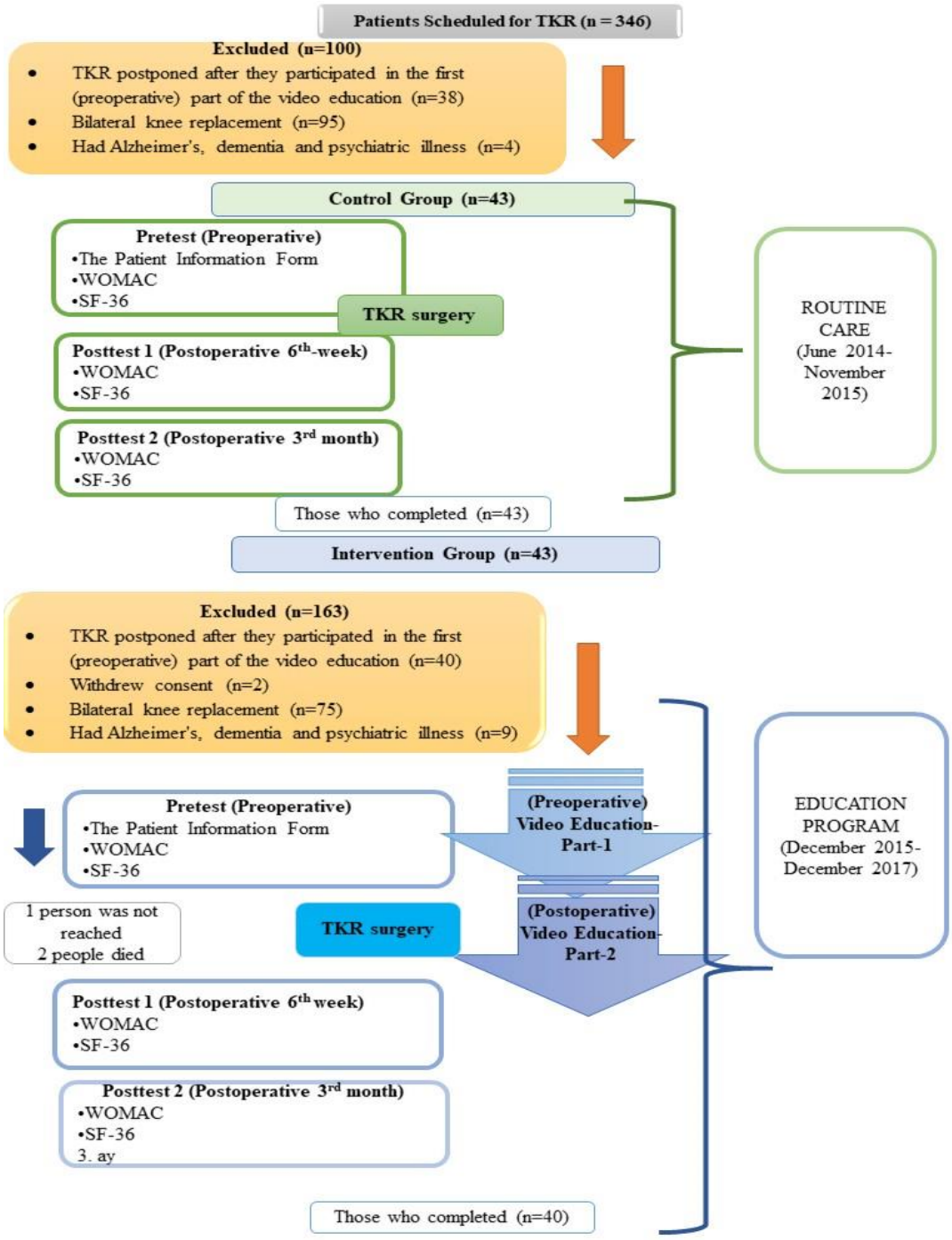

Figure 1. Enrollment of the Participants for the Study

A descriptive qualitative research method was used to evaluate the process and experiences of patients who received VBEP for TKR surgery. After the final data were collected in the 3rd month using a semi-experimental method, qualitative research was performed using a purposeful interviewing method in the intervention group. Eleven patients were interviewed in this study because qualitative research is considered complete when sample size reaches a saturation point in the data. Patients were selected to participate in a semi-structured interview to obtain their perceptions regarding the intervention.

Procedure

Data were collected from patients who underwent total knee replacement surgery by a single physician in the orthopedic clinic of a university hospital. The first mobilization of the patients after surgery was performed by a physiotherapist at the discretion of the surgeon. Subsequent mobilizations were carried out by the physiotherapist and the nurses. After THR and TKR, 3X1000 mg (Paracetamol) and 3X75 mg (Diclofenac Sodium) were routinely used in the orthopedic clinic (intervention and control groups). The patient's pain was assessed every hour for eight hours after surgery and then every four hours. If pain was present, mild opioids were administered intramuscularly. In this study, education was carried out when the patients had no pain.

The control group received usual care for surgery (written material education) from the participating hospital. The intervention group was given VBEP by the researcher. The VBEP comprised two phases: VBEP Part-1 and VBEP Part-2. Table 1 indicates VBEP content. Video-based patient education program comprises video presentations, interactive interviews, questions and answers, and repetition. The patients who watched the video-based education with the first researcher were allowed to ask questions, and the sections that were not understood were repeated. Education was given to patients individually.

Table 1. Content of Video-Based Education Program (VBEP)

Time	VBEP	Content of Video
Preoperative (a day- a week before)	**VBEP Part-1** (Face-to-face interview technique, interactive with researcher (questions were answered, and repetitions were made) **Video time**: 13 min **VBEP:**30–40 min	**Preparations the patient has to make at home in the preoperative and postoperative period** (preparations to prevent falling, kitchen preparation, etc.) **Hospital procedures** (the situations that will be encountered at admission, clinical orientation) **Preparation for surgery** (routine preoperative information such as shower, preoperative skin preparation, pain management, breathing exercises, fasting time, etc.) **TKR surgery and operating room** **Early postoperative period** (pain management, presence of drain and urinary catheter, neurovascular monitoring, cold application, drug use, etc.)
Postoperative (3rd–7th days)	**VBEP Part-2** (Face-to-face interview technique, interactive with researcher (questions were answered, and repetitions were made) **Video:**14 min **VBEP**:40–50 min	**Early postoperative period** (ROM exercise, mobilization, pain management, cold application, drug use, etc.) **Postoperative complications** **Home care** (bathing, traveling, sex, driving, drug use, pain management, psychosocial support, nutrition, etc)

The video was prepared by two researchers who conducted the study. Two nurses, two physicians, and three academics working in the field of TKR provided expert consultation on the content of scenarios included in education and the suitability of the education for patients undergoing TKR. After deciding on the suitability of the educational content, the video was filmed by the first author. The video visualization was reviewed by a specialist in this field (Radio-Television and Cinema Department). A preliminary study was conducted on three patients, and their opinions were taken. After all, revisions were made, VBEP was given to the patients individually by the first author of the present study.

In the preoperative period, baseline data were collected from patients using the Patient Information Form, WOMAC, and SF-36 scales. Post-test results were obtained from patients with WOMAC and SF-36 scales at the sixth week and third month after VBEP (Figure 1). The data from the intervention and control group patients were collected in three different periods by the researcher reading the questions to each patient with a face-to-face interview method. –To compare the preoperative period (Pre-test) with the postoperative period, the times for collecting data were determined as the 6th week (Post-test 1), because it was the

period where patients undergoing TKR began to gain independence and were able to carry out daily life activities (cooking, cleaning, and other household chores) on their own. The 3rd month (Post-test 2), because it was the period where patients undergoing TKR gained independence in quality of life and daily activities (physical exertion, including driving, housekeeping, and shopping). The patients were invited to the outpatient clinic for follow-up at 6 weeks and 3 months after TKR surgery at which time they were asked to complete the WOMAC and SF-36 (Figure 1).

Data Collection

The Patient Information Form included items questioning the patient's age, gender, body mass index (BMI), etc.

The Western Ontario and McMaster Universities (WOMAC) OA Index is one of the most commonly used scales for the disease-specific assessment of patients with osteoarthritis. The WOMAC index was developed by Outcome Measures in Rheumatology Clinical Trials (OMERACT) in OA patients in 1982, then reviewed and revised. The WOMAC OA index, whose validity and reliability was assessed by Tüzün et al. (2005) in Turkey (Tüzün, Eker, Aytar, Daşkapan, & Bayramoğlu, 2005), consists of three subscales and 24 questions: pain (5 questions), stiffness (2 questions), and physical function (17 questions). In the section of the scale that evaluates physical function, difficulties in doing certain daily life activities such as climbing stairs, sitting, and standing was inquired (Tüzün et al., 2005).

The Short Form-36 Health Survey (SF-36) is the most frequently used instrument to measure health-related quality of life (Ware & Sherbourne, 1992). The SF-36 is composed of 36 items and 8 subscales as follows: physical functioning, physical role, bodily pain, vitality, general health, social functioning, emotional role, and mental health. The possible range of scores for each subscale is 0-100. The 8 subscales can be categorized into 2 constructs as follows: physical component summary (PCS) and mental component summary (MCS).

Qualitative data were collected from June 2016 to October 2017 through a semi-structured form and in-depth interviews. The semi-structured interview form was prepared by taking into consideration the opinions of three nurse academicians experienced in qualitative research. The experts who were consulted have participated in education, courses, and conferences on orthopedics and the qualitative research method and have publications in this field. In-depth interviews were conducted by asking sub-questions in semi-structured interview form. The semi-structured interview form consisted of two main questions. There were sub-questions under each main question. This gave the participant an opportunity to ask

questions aimed at the purpose of the interview. After the participants were informed about the purpose of the study, they were told that the interviews would be audio recorded and that the researcher would take notes. Each interview lasted approximately 15 minutes. The introduction section included the purpose and features of the interviews. Two main questions and subquestions were asked to the participants.

What do you think about the video-based education program (VBEP)?

What do you think about performing the VBEP? Via video?"

Data Analysis

All quantitative data were analyzed using IBM SPSS Statistics for Windows Version 22.0 (IBM Corporation, Armonk, NY, USA). To assess whether the data had a normal distribution, the Kolmogorov–Smirnov test was used. To compare the SF-36 and WOMAC index scores of the participants in the intervention and control groups during the pre-intervention follow-up, a t-test was used. While the two-factor ANOVA was used to compare the intervention and control groups in terms of their pre- and post-intervention mean scores, the one-factor ANOVA with repeated measures was used to compare intra-group scores. The simple and multiple linear regression analyses were performed to assess how the scales used in the study affected each other.

Qualitative data were analyzed using the content analysis method (Creswell, Hanson, Clark Plano, & Morales, 2007). The content analysis, in which two researchers continuously compared obtained data, was used to analyze the data. The researcher transcribed the voice recordings on the day of the interview without making any alterations. Concepts were determined, relationships between the concepts were revealed, and a list of codes was generated. The codes were gathered under the same heading, and themes were determined. According to themes, the codes were revised and themes were reviewed. Relationships between themes were described and interpreted (Creswell et al., 2007). Data analysis was made by one more researcher for research validation. The researchers discussed interpretations from the data to ensure that themes were fully developed.

RESULT

The results showed that no statistically significant difference was determined between the patients in the intervention and control groups in terms of their clinical and sociodemographic characteristics (Table 2). No statistically significant difference was determined between the intervention and control groups in terms of their pain, stiffness,

physical function, and quality of life at the baseline (p=0.445, p=0.181, p=0.200, p=0.882, p=0.259).

Table 2. Socio-Demographic Characteristics of Patients in Intervention and Control Group

Variables	Intervention (n=40) X±SD	Control (n=43) X±SD	Test	p
Age	66.38±9.6	69.16±8.51	t = 1.402	0.165
BMI	33.01±5.38	31.69±5.64	t = -1.082	0.281
Gender	**n** %	**n** %		
Female	37 (92.5)	36 (83.7)	X^2= 1.507	0.316
Male	3 (7.5)	7 (16.3)		
Marital status				
Married	25 (62.5)	27 (62.8)	X^2= 0,001	0,978
Single	15 (37.5)	16 (37.2)		
Education				
Primary school	37 (92.5)	32 (74.4)		
Junior high school	1 (2.5)	5 (11.6)	X^2= 4,640	0,081
Senior high school	2 (5.0)	6 (14.0)		
Occupation				
Housewife	35 (87.5)	37 (86.0)		
Government Officer	1 (2.5)	-	X^2= 1.300	0.620
Retired	4 (10.0)	6 (14.0)		
The person lived with				
Son / daughter	8 (20.0)	15 (34.9)		
Spouse	24 (60.0)	25 (58.1)	X^2= 4.321	0.115
Alone	8 (20.0)	3 (7.0)		
Type of housing				
Apartment	21 (52.5)	27 (62.8)	X^2= 0.900	0.343
Private house	19 (47.5)	16 (37.2)		
Stairs				
Yes	27 (67.5)	30 (69.8)	X^2= 0.050	0.824
No	13 (32.5)	13 (30.2)		
Chronic disease				
Yes	30 (75.0)	28 (65.1)		
No	10 (25.0)	15 (34.9)	X^2= 0.962	0.327
Reason for having surgery				
Pain	2 (5.0)	8 (18.6)	X^2= 3.620	0.090
Pain+loss of function	38 (95)	35 (81.4)		
Onset of the osteoarthritis				
<1 year	1 (2.5)	7 (16.3)		
1-3 years	10 (25.0)	8 (18.6)	X^2= 4.554	0.104
≥4 years	29 (72.5)	28 (65.1)		
Surgery site				
Right knee	24 (60.0)	25 (58.1)	X^2= 0.030	0.863
Left knee	16 (40.0)	18 (41.9)		

X^2=Chi square test
t = Independent groups t test
Fisher corrected $\chi 2$ was used because the expected number was below 5. p >0.05

While there was a statistically significant difference between the intervention and control groups in terms of their WOMAC pain, physical function, and total score (p=0.000,

p=0.000, p=0.000), there was no statistically significant difference between them in terms of their WOMAC stiffness (p=0.922) (Table 3).

Table 3. Comparison of the WOMAC Index Mean Scores in the Intervention and Control Groups

Time Group	**Preoperative** $\bar{x}$ **± SD**	**Postoperative 6th week** $\bar{x}$ **± SD**	**Postoperative 3rd month** $\bar{x}$ **± SD**		**F***	**p****
WOMAC pain						
Intervention	15.83±3.37	6.53±3.61	4.07±2.21		254.15	**0.000***
Control	15.23±3.58	14.86±2.05	7.46±2.85		158.77	**0.000***
				Group	52.59	**0.000***
t	-0.775	13.066	5.967	**Time**	345.28	**0.000***
p	0.445	**0.000***	**0.000***	**Group*time**	72.49	**0.000***
WOMAC stiffness						
Intervention	5.02±0.34	1.23±1.75	0.07±0.04		124.34	**0.000***
Control	3.69±0.40	1.88±1.87	0.34±0.07		121.38	**0.000***
				Group	0.01	0.922
t	-0.276	1.657	2.601	**Time**	193.07	**0.000***
p	0.181	0.101	0.173	**Group*time**	13.24	0.813
WOMAC Physical Function						
Intervention	58.30±8.71	30.00±11.33	21.38±11.03		124.51	**0.000***
Control	54.76±9.39	52.09±7.70	28.13±9.93		192.48	**0.000***
				Group	38.04	**0.000***
t	- 0.075	-10.583	2.981	**Time**	329.81	**0.000***
p	0.200	**0.000***	**0.004***	**Group*time**	46.78	**0.000***
WOMAC Total						
Intervention	79.17±12.14	37.76±2.29	25.53±12.52		181.28	**0.000***
Control	73.69±13.46	68.83±10.2	35.95±11.85		192.48	**0.000***
				Group	28.33	**0.000***
t	0.066	11.796	3.867	**Time**	406.98	**0.000***
p	0.200	**0.000***	**0.000***	**Group*time**	65.46	**0.000***

F = One-factor ANOVA with repeated measures,
t = Independent groups t test
*p <0.05
WOMAC= The Western Ontario and McMaster Universities (WOMAC) OA Index

The analysis of the quality of life subscale scores according to the difference between the intervention and control groups over time (baseline, postoperative sixth week and third month) is provided in Table 4. To determine whether there was a difference between the mean scores the patients obtained from the quality of life subscales, two-factor ANOVA with repeated measures was used. At the end of the analysis, a statistically significant difference was determined in terms of physical functioning, pain, vitality, and emotional role scores (p=0.000, p=0.026, p=0.009, p=0.000). The analysis of the mean scores the subscales of the quality of life scale revealed a significant difference in terms of the difference in terms of physical functioning, physical role, vitality, social functioning, PCS, MCS (p=0.001, p=0.005, p=0.004, p=0.000, p=0.036, p=0.001).

Table 4. Comparison of the SF-36 Quality of Life Scale Mean Scores in the Intervention and Control Groups

Time Group	Preoperative $\bar{X}$ ± SD	Postoperative 6th week $\bar{X}$ ± SD	Postoperative 3rd month $\bar{X}$ ± SD		F	p
Physical Functioning						
Intervention	23.20±13.93	41.12±19.43	46.62±14.60		34.13	**0.000***
Control	19.41±12.35	24.88±10.93	32.32±11.91		23.00	**0.000***
				Group	23.96	**0.000***
t	-0.084	-4.735	-4.901	**Time**	56.07	**0.000***
p	0.412	**0.000***	**0.000***	**Group*time**	7.39	**0.001***
Physical Role						
Intervention	72.43±28.55	75.50±28.19	67.5±26.06		10.16	**0.003***
Control	56.97±27.99	57.97±27.99	62.67±23.66		0.88	0.352
				Group	3.19	0.800
t	1.090	-2.516	0.948	**Time**	2.18	0.143
p	0.311	**0.014***	0.346	**Group*time**	8.19	**0.005***
Bodily Pain						
Intervention	31.02±15.50	42.37±6.15	38.75±8.74		8.86	**0.000***
Control	28.69±15.52	35.11±18.96	33.65±13.58		2.30	0.129
				Group	5.12	**0.026***
t	0.248	3.417	-0.434	**Time**	8.64	**0.001***
p	0.343	**0.001***	0.665	**Group*time**	2.83	0.070
General Health						
Intervention	51.30±6.64	53.15±6.80	53.75±2.46		2.25	0.112
Control	49.32±8.32	51.95±8.30	53.37±3.70		4.67	0.113
				Group	1.51	0.222
t	-0.068	-0.715	-0.543	**Time**	6.70	**0.002***
p	0.946	0.477	0.589	**Group*time**	0.33	0.713
Vitality						
Intervention	42.82±9.65	52.52±9.31	54.12±8.15		27.09	**0.000***
Control	49.53±9.31	48.75±9.53	52.44±8.95		2.38	0.130
				Group	7.12	**0.009***
t	1.153	3.279	-0.893	**Time**	24.70	**0.000***
p	0.113	**0.002***	0.374	**Group*time**	8.68	**0.004***
Social Functioning						
Intervention	35.25±19.20	54.68±11.90	63.12±13.85		57.01	**0.000***
Control	40.98±27.04	41.27±20.14	62.20±17.78		55.36	**0.000***
				Group	0.62	0.433
t	0.954	-3.657	-0.260	**Time**	98.33	**0.000***
p	0.219	**0.000***	0.795	**Group*time**	15.17	**0.000***
Emotional Role						
Intervention	88.03±24.76	88.33±24.51	86.66±19.68		0.14	0.711
Control	71.16±30.29	61.16±30.29	62.01±34.56		3.11	0.085
				Group	44.53	**0.000***
t	1.601	-6.116	-3.953	**Time**	1.42	0.236
p	0.308	**0.000***	**0.000****	**Group*time**	2.65	0.107
Mental Health						
Intervention	43.69±9.64	64.50±27.08	59.30±8.34		**17.86**	**0.000***
Control	48.65±10.39	53.20±9.34	53.58±8.28		2.66	0.110
				Group	3.84	0.053
t	1.239	-2.575	-3.131	**Time**	24.703	**0.000***
p	0.252	**0.012***	**0.002***	**Group*time**	9.23	**0.001***
Physical Component Summary						
Intervention	49.31±28.62	55.08±21.07	56.28±26.44		1.72	0.187
Control	50.72±25.06	45.27±22.35	44.15±26.00		1.71	0.186
				Group	2.34	0.130
t	-0.150	-2.053	-2.105	**Time**	0.05	0.996

p	0.882	0.043	0.038	**Group*time**	3.44	**0.036***
Mental Component Summary						
Intervention	49.83±26.42	59.79±20.98	59.46±22.13		4.19	**0.022***
Control	40.14±26.86	40.88±25.31	41.19±25.49		3.66	0.056
				Group	7.90	**0.006***
t	1.136	-3.689	-3.475	**Time**	0.01	0.982
p	0.259	**0.000***	**0.001***	**Group*time**	7.82	**0.001***

F = One-factor ANOVA with repeated measures,
t = Independent groups t test
* p <0.05

The analysis of the relationship between the variables of the study revealed a significant negative correlation between the WOMAC total score and intervention (r=−0.79, p=0.000). There was a significant negative correlation between the quality of life subscale, mental summary score, and WOMAC total score (r=−0.33, r=−0.42, p=0.000, p=0.000). There was also a significant positive correlation between the intervention and physical and mental summary scores of the quality of life scale (r=0.22, r=0.37, p=0.000, p=0.000) (Table 5).

Table 5. Relationship between Variables

	1	**2**	**3**	**4**
1. WOMAC Total	1.000			
2. VİDEO-BASED EDUCATION PROGRAM	**-0.791****	1.00		
3. SF-36 Physical Component Summary	**-0.336****	**0.222***	1.00	
4. SF-36 Mental Component Summary	**-0.426****	**0.379****	**0.702****	1.00

** Significant at p <0.01
* Significant at p <0.05
WOMAC= The Western Ontario and McMaster Universities (WOMAC) OA Index
SF-36= The Short Form-36 Health Survey

Table 6 shows the relationship between the WOMAC score and the PCS and MCS in the intervention group. Three models were created according to the variables. When the level of significance corresponding to the F value was examined, it was found that the established models were statistically significant (p=0.000). In the first model, the intervention group was included. This variable accounted for 62.6% of the WOMAC total score. In this model, there was a reverse correlation between the intervention and the WOMAC total score (β=-0.79). Multiple regression analysis in model 2 found that there is a moderately significant negative relationship between WOMAC and SF-36 Physical Component Summary of the participants (β=-0.16, p=0.01) and 2% of factors that affect WOMAC levels are explained by Physical Component Summary (F=75.273, p=0.000). Model 3 found that there is not a significant relationship between WOMAC and the Mental Component Summary of the participants (β=-0.04, p=0.62).

Table 6. Relationship between the Mean WOMAC Index Score and Intervention, Quality of Life Physical Component Summary, Mental Component Summary

Variable	Model 1			Model 2			Model 3		
	β	t	p	β	t	p	β	t	p
Intervention (VIDEO EDUCATION)	-0.79	-11.64	0.00*	-0.75	-11.16	0.00*	-0.74	-10.36	0.00*
SF-36 Physical Component Summary				-0.16	-2.48	0.01*	-0.13	-1.46	0.14
SF-36 Mental Component Summary							-0.04	-0.49	0.62
R	0.791			0.808			0.809		
R^2	0.626			0.644			0.641		
F	135.703			75.273			49.792		
p	0.000*			0.000*			0.000*		

* The intervention group was coded as "2" and the control group as "1".
Model 1: Intervention (Video Education)
Model 2: Intervention (Video Education), SF-36 Physical Component Summary
Model 3: Intervention (Video Education), SF-36 Physical Component Summary, SF-36 Mental Component Summary
SF-36= The Short Form-36 Health Survey

Qualitative Results

The mean age of the patients participating in the qualitative part of the study was 67.8 ± 2.1 years. Of them, all were female and married, 11 were housewives, and 7 had undergone TKR on the right knee. The opinions of the patients who took part in the VBEP included five themes as follows.

Realistic Information Prepared for Surgery and Satisfaction

Most patients stated that they felt better after the surgery because they had participated in the VBEP and that they received realistic information regarding what would happen during the TKR.

"...Thanks to our video education, it seemed as if I had experienced it before and I was experiencing it again, like a movie trailer... It all seemed to like you told me. I had no idea.

Self-efficacy Development

Many of the patients expressed that knowing how to do activities of daily living after TKR improved them and made them feel more independent.

"I knew I wouldn't walk right after surgery, but I was able to carry out my chores gradually"

"It felt like I was going to be a bedridden patient; you said to me "you could do your chores" and showed how I could. Even the neighbors were surprised when I myself prepared the meals or anything.

Benefits of Visual Education

Patients were pleased that they were given VBEP and that because it was visual it helped them retain what they learned in mind in a better way. Of the patients, those with previous surgical experience compared their TKR experience with their previous experience.

"Five years ago, I had surgery, but nobody told me anything... They handed in a piece of paper when I was discharged, but nobody asked me if I understood what was on the paper"

Overcoming Fear of Surgery

Patients stated that they were afraid of having surgery due to the fear of surgery and death, but that after the education, they overcame their fear (their fear decreased).

"Well, you're already afraid of surgery, I was picking up my belongings before you came, I did not want to have the operation. You made me watch the video, I regained my morale; there was no fear whatsoever…"

"I was afraid of losing my knee, my feet. When you showed the operation on the video, I said "is this the surgery?" I thought it was much more serious. As you know, I walked right after the surgery; it wasn't like I was all that scared."

Satisfaction of Interaction with the Researcher

The patients expressed that they were glad to continuously interact with the researcher while receiving the VBEP. The patients emphasized that they were very pleased that they were given the opportunity to ask questions during video education, that there were repetitions on points they did not understand, and that the researcher established a good interaction with them.

"Well, just don't give me a video and I think you'd better come home too... You gave the video but we want not only to hear your voice but also to see you in home care"

DISCUSSION

In this study, the mean scores obtained from the WOMAC index and its pain and physical function subscales by the patients in the intervention group who had the *VBEP* were lower than those of the patients in the control group. It was found that the *VBEP* applied to the individuals played a very important role in the model developed to explain the effect of the variables used in this study on the factors affecting the WOMAC total score (62.6%). Several studies on this issue support the findings of our study and indicate that video preoperative education reduces WOMAC total score and pain (Jeon & Park, 2016; Louw, Diener, Butler, & Puentedura, 2013b). It was indicated that, because of the preoperative

education, patients performed everyday tasks more easily that their functional limitation decreased, and that their knee joint range of motion was greater (O'Donnell, 2015). In the present study, it was believed that the patients in the experimental group had lower pain and physical function scores because the researcher gave them in-person professional education and facilitated opportunity to share concerns and ask questions with direct and immediate response. Studies have shown that video-based visits and interviews with healthcare professionals reduce the pain of patients (Jeon & Park, 2016; Louw et al., 2013b).. In studies conducted on this issue, it was determined that the quality of life, physical function, and activities of daily living improved in patients who were trained with written education materials (Dash, Palo, Arora, Chandel, & Kumar, 2017; Demir & Erdil, 2013). However, it was determined that patients who received video-based education had a decrease in pain and a positive effect on quality of life compared with those who received written material education (Demir & Erdil, 2013; Koekenbier et al., 2016). In the study conducted by Demir et al. (2013) (Demir & Erdil, 2013), it was stated that preoperative structured education with nurses increased the quality of life of patients.

In our study, we found a statistically significant difference between the two groups at the sixth week in terms of their mean scores for the physical role, pain, and vitality subscales, there was no difference at the postoperative third month. This similarity in the third month was probably because the VBEP was not repeated, and the patients did not receive continuous care. VBEP is provided interactively with the patient. Active time spent with the nurse may have facilitated learning and improved daily living activities. The lack of a difference in the quality of life third month means score between the experimental and control groups may be related to the fact that the video-based education program is not performed after surgery. In the learning process, not the short-term retention of the information in mind but the organization of knowledge in its own dynamics with frequent and meaningful repetitions over long periods of time, in other words, representing the information in schemas increases its retention in memory (Edwards et al., 2017).

It was determined that emotional role and mental summary scores of the patients having undergone TKR in the intervention group were higher than those of the patients in the control group. The changes in the mental health, emotional role subscales, and mental summary scores indicate that the VBEP positively affected patients' self-esteem at both the postoperative sixth week and third month. Many patients suffer from depression and anxiety due to osteoarthritis (Bradshaw, Hariharan, & Chen, 2016). Similarly, in this study, the patients' preoperative quality of life mental scores were low and increased after the surgery.

Patients having undergone TKR are known to experience fear of falling, anxiety about not being able to recover, and anxiety about undergoing reoperation (Robert, 2014; Turhan Damar, Bilik, Karayurt, & Ursavas, 2018). Visual and video education given preoperatively is reported to positively affect patients' postoperative psychological statuses (O'Connor, Brennan, Kazmerchak, & Pratt, 2016). It is known that face-to-face visits and video preoperative educations performed by healthcare professionals reduce anxiety and feel better (Habibzadeh et al., 2018; Zarei et al., 2018). Edwards et al. (2017) emphasized the importance of adhering to the principles of adult education in education and enabling the health professional to express himself by sparing time for the patient.(Edwards et al., 2017). In our study, that the participants knew what they were likely to experience after surgery thanks to the VBEP may have increased their mental summary scores.

In the qualitative phase of this study, the patients stated that they had more information regarding their condition and treatment after VBEP, and that they learned the correct information. They also stated that they made arrangements in their home with the given education or put their knowledge into practice. Studies show that there is a positive relationship between patient education and their satisfaction (Mcdonald et al., 2014). Preoperative education (video-based, web-based, or multimedia), visits, preoperative preparations, and discharge educations increase patient satisfaction (Wischer, Oermann, Zadvinskis, & Kinney, 2018).In the present study, the patients expressed their satisfaction with the VBEP. According to the patients' statements, the information presented in the VBEP positively contributed to their understanding and learning. One of the factors contributing to the patients' satisfaction of the VBEP was that the program was prepared and presented in accordance with the guidelines of education. Another essential factor that contributes to the patients' satisfaction in the present study was that education was interactive with a healthcare professional. Giving the patients the opportunity to ask questions and give feedback may have made them feel valued. The patients stated that they were pleased that the VBEP was given via video education because it contributed to the retention of the information in mind.

Patients stated that they knew how to perform postoperative activities of daily living and that they performed those activities independently. Multimedia, video, and animation education methods are known to be effective in improving postoperative functional, psychological, and social recovery of patients with TKR. It is stated that education increases patients' functional well-being and improves their social relations. By promoting patients' autonomy and self-efficacy, education increases their self-care abilities and thus enables them to maintain their self-care (Lim, Yobas, & Chen, 2014). Moreover, in this study, the

participants stated that they did not have enough knowledge about the operation, that they were afraid of being dependent on others, but that their fear lessened after the education they were given, and that they performed their postoperative self-care and activities of daily living without any fear. This result shows that VBEP helped the patients overcome their fear of being dependent on others. Fear of being dependent on others is one of the most common types of fear experienced by patients undergoing orthopedic surgery. Therefore, it is essential that the video education should include information to support patients' independence. In this study, the patients emphasized that the information provided during the program helped them adapt to their postoperative lives.

In this study, video education program included pre- and post-operative pain management, mobilization, planning of daily living activities, exercises, and home care. The pre-operative education content of the study was similar to the literature, and it was determined that it contributed to the pain management and functional status of the patients. The information on mobilization, nutrition, daily life activities given in the post-operative video education program led to an increase in the quality of life. The education content used in the study is similar to the literature, and patients have good postoperative pain management, improved functional status and quality of life (Demir & Erdil, 2013; Edwards et al., 2017; Timmers et al., 2019). The educational content of the studies in the literature is similar to our study, and this study also reveals the effect of video training, which is a visual material method.

CONCLUSION

In this study, WOMAC pain and functional scores of the patients in the intervention group VBEP TKR decreased. In addition, the intervention group patients' scores for the physical functioning, vitality, physical role, social functioning, and mental health subscales of the quality of life increased. Because patients have difficulty remembering information and need support in applying the taught information, it may be recommended that the education is given to the patients be visual and interactive during the perioperative process. In the present study, VBEP occurred during the preoperative and postoperative time for TKR, and there was no education interview again after discharge. Home care or counseling nursing for post-discharge care with patients will positively affect patient outcomes. With the progress of technology and the increase in the knowledge level of the elderly, online and technological education are more important. For future studies, it should be suggested that the effectiveness of different education methods such as web and online education in the older patient with

TKR be evaluated. Moreover, conducting studies in which continuous education practices are performed in the elderly after postoperative discharge can be learned.

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