ORIGINAL ARTICLE

EXAMINATION OF THE FACTORS AFFECTING THE COGNITIVE LEVELS AND RECOVERY STATUS OF GERIATRIC PATIENTS UNDERGOING SURGICAL INTERVENTION

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Abstract

Introduction: The aim of this study was to examine the factors affecting the cognitive levels and recovery status of geriatric patients who undergo surgical intervention.

Materials and Method: This was a descriptive cross-sectional study that was conducted between December 30, 2021-August 30, 2022 with 250 geriatric patients who underwent major surgical intervention in the cardiovascular, orthopedics, and general surgery departments of a hospital in Turkey. The descriptive data form, postoperative recovery index, and mini-mental state examination were used as data collection forms. The data of the study were collected with geriatric patients who were in the 48–72-hour postoperative period. The data were analyzed using the Statistical Package for Social Sciences 24.0.

Results: The mean age, mini-mental test score and recovery index score of the patients are 69.70±4.81, 24.71±3.07, 2.29±0.33 respectively. It was found that the risk of cognitive impairment increased with increasing age. It was determined that the day of hospitalization before the operation, the application of general anesthesia, the duration of anesthesia, the first mobilization time, the malnutrition, the intensive care stay in the postoperative period made recovery difficult. A negative statistically significant relationship was found between the mini-mental state examination score and postoperative recovery index scores.

Conclusion: Approximately half of the patients were at risk of cognitive impairment, which negatively affected the postoperative recovery process. A comprehensive preoperative evaluation of geriatric patients, provision of optimal nutrition, and early mobilization during the postoperative period will positively affect the recovery process. In-service training on the care of geriatric patients is recommended for healthcare professionals.

Keywords: Aged; Surgery; Postoperative Period; Dementia.

This study was conducted as a master's thesis (2022) in Kutahya Health Sciences University, Institute of Post-graduate Education, Department of Nursing

INTRODUCTION

The need for surgical intervention is increasing due to the increasing health problems of geriatric individuals (1,2). As anesthesia becomes safer and surgical techniques improve, the rate of surgery performed on elderly patients is also increasing. However, elderly patients have higher morbidity and mortality rates in the postoperative period compared to younger patients (2,3). Deterioration in physical functions, comorbidities, and weakness in coping with stress in geriatric patients cause postoperative complications (4). Additionally, a delayed wound healing process due to nutritional deficiency, decrease in intestinal peristalsis, tendency of hemorrhagic shock, decrease in immune functions, sarcopenia, decline in cognitive functions, and impaired functional status can be observed (5).

Cognitive changes are also frequently observed in geriatric individuals undergoing surgical intervention (1). The cause of cognitive changes seen during the postoperative period may be due to the transmission of microemboli that formed during the surgical procedure to the brain, general anesthesia, and analgesia during the postoperative period. Patients with cognitive problems have nutrition, communication, sleep problems and self-care insufficiency (6). In addition, learning, attention and memory are affected in geriatric individuals due to cognitive changes (7,8). Postoperative recovery is a complex process with physiological, functional, and psychological dimensions. The determinants of the patient's recovery process during the postoperative period are cognitive functions, psychological well-being, ensuring physical functions, sleep quality, and pain control (9). Cognitive changes in elderly patients are directly related to the complications that may be encountered during the postoperative period and the patient's discharge time (1). Therefore, postoperative recovery may be difficult in geriatric patients with cognitive impairment.

In the literature, there is no study to date comparing the cognitive changes and recovery status of geriatric patients during the postoperative period. This study was conducted to examine the factors affecting the cognitive levels and recovery status of geriatric patients who undergo surgical intervention.

MATERIALS AND METHOD

Study Design

This descriptive and cross-sectional study was reported according to the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) checklist for cross-sectional studies.

Sample and Procedure

The study population consisted of patients who underwent surgical intervention in the cardiovascular, orthopedics, or general surgery clinics of a university hospital in Turkey from December 30, 2021, to August 30, 2022. The sample of the study consisted of 250 geriatric patients who met the inclusion criteria. These patients were selected by simple random sampling method. The inclusion criteria were; (1) undergoing major surgical intervention (more than 90 minutes) related to cardiovascular surgery, orthopedics or general surgery, (2) being 65 years of age or older, (3) being able to communicate verbally within 48-72 hours after the surgical intervention, (4) being literate and (5) volunteering to participate in the study. The exclusion criteria were (1) not being able to communicate, (2) having any disease (including psychological disorders and dementia) that may affect ability to make decisions, and (3) taking sedatives, antipsychotics, and medications that may affect cognitive state. The power of the study was found to be 95.3% for a sample size of 250 with a 5% margin of error. The G*Power 3.0.1 program was used to perform the power analysis based on the data obtained at the end of the study in order to determine the effect size.

The descriptive data form, postoperative recovery index (PORI), and mini-mental state examination (MMSE) were used as data collection forms. The descriptive data form was prepared by the researchers with the literature and consisted of 25 questions (age, sex, marital status, educational status, body mass index (BMI), smoking and alcohol use, clinical diagnosis, previous surgical intervention, systemic diseases, medications used continuously, preoperative hospital stay, postoperative day, intensive care unit stay, American Society of Anesthesiologists (ASA) score, duration of surgery, type and duration of anesthesia, time to first mobilization, nutritional deficiency, and analgesics used postoperatively). The MMSE was developed by Folstein et al. (1975) (10). The Turkish validity and reliability study was conducted by Güngen et al. (2002) (11). The MMSE consists of categories of recording memory, orientation, attention and calculation, recall, and language. Each question is worth 1 point, and the total score is 30 points. People with scores of 24 or higher are considered to be in normal health, while a score of 23 and below is considered an indicator of cognitive impairment (11). The kappa value of MMSE was determined as 0.92 in the study of Güngen et al. (11). PORI was developed by Butler et al. (2012) and consists of 25 items (12). Its Turkish validity and reliability was conducted by Cengiz and Aygin (2019) (13). It has 5 subdimensions: psychological symptoms, physical activities, general symptoms, bowel symptoms, and appetite symptoms. Scores of the items included in the subdimensions are summed, their averages are calculated, and their subdimension scores are determined. For the PORI total score, all of the items scores are summed and their average is calculated. High scores from the index indicate more difficulty in postoperative recovery, while low scores indicate that postoperative recovery is easier (13) (Figure 1). The Cronbach's alpha value of PORI was determined as 0.96 in the study of Cengiz and Aygin (13). In our study, Cronbach's alpha coefficient was found to be 0.817.

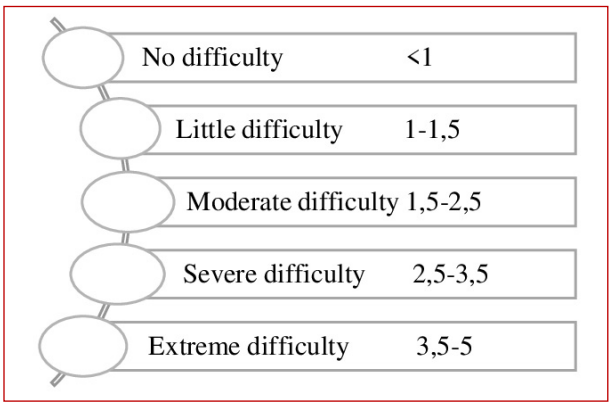

Figure 1. Scoring system for the PORI total score and subdimension scores.

Data Collection

The data of the study were collected via face-to-face interviews with geriatric patients who underwent major surgical interventions for cardiovascular issues, orthopedics, and general surgery and who were in the 48–72-hour postoperative period. Intraoperative information (type and duration of anesthesia, duration of surgery, ASA score) was obtained from the patient file. The average data collection time was 20–25 minutes.

Statistical Analysis

IBM SPSS Statistical Package for Social Sciences 24 (IBM SPSS, New York, USA) was used for statistical data analysis. Frequency tables and descriptive statistics were used to interpret the findings. In descriptive statistics, number (n) and percentage (%) were calculated for categorical data, and mean, standard deviation, median, and minimum and maximum values were calculated for continuous variables. The Kolmogorov-Smirnov test was performed to determine whether the data were suitable for normal distribution. The Mann-Whitney U and Kruskal-Wallis tests were used for two group comparisons. The chi-square test was used to determine the

difference between groups. It was established that there was no missing data among those obtained. In addition, Pearson correlation analysis was performed to examine the relationship between the variables. Statistical significance was accepted at $p< .05$ in all of the analyses performed in this study.

Ethical considerations

Prior to data collection, ethics committee approval (decision dated 22.12.2021 and numbered 2021/17-17) was obtained from the Non-Interventional Clinical Research Ethics Committee of the university, and institutional permission (decision dated 29.11.2021 and numbered 2021/126) was obtained from the hospital. Written and verbal consent were obtained from the patients, and the study was conducted in accordance with the ethical principles of the Declaration of Helsinki.

RESULTS

The mean age of the patients participating in the study was 69.70±4.81 years, the mean duration of surgery was and the mean duration of anesthesia was. It was determined that 62.4% of the patients were female, 67.6% were married, and 72.8% had a first mobilization time of more than 24 hours.

The total PORI score of the patients was 2.29±0.33, and it was determined that they had moderate difficulty in recovery. The mean MMSE score was 24.71±3.07, and 40% of the patients were at risk of cognitive impairment (Table 1).

When the age groups of the patients and MMSE scores were compared, the MMSE scores of those in the 65–69-year age group were higher than those in the ≥75-year age group ($p< .05$). When the sex of the patients and MMSE scores were compared, the MMSE scores of men were higher than those of women ($p< .05$). When the educational attainment of the patients and MMSE scores were compared, the MMSE scores of those with high school and higher educational attainment were significantly higher than those with literate and primary education ($p< .05$) (Table 2).

Table 1. Distribution of Scale Scores (N=250)

Scale		Mean±S.S	Min	Max
Postoperative Recovery Index	Psychological Symptoms	1.53±0.42	1.0	3.8
	Physical Activities	3.96±0.60	2.4	5.0
	General Symptoms	1.54±0.74	1.0	5.0
	Bowel Symptoms	1.22±0.52	1.0	4.0
	Appetite Symptoms	1.80±0.63	1.0	4.0
	PORI - Total	2.29±0.33	1.5	3.6
Mini-Mental State Examination		24.71±3.07	15.0	30.0
		Number	**Percentage**	
Risk of cognitive impairment*		100	40	
No risk of cognitive impairment		150	60	

* MMSE score less than 23

Table 2. Comparison of Sociodemographic Characteristics of Patients with Scale Scores

				MMSE		PORI	
Variable		**n**	**%**	**x̄ ± s.s**	**Median [IR]**	**x̄ ± s.s**	**Median[IR]**
Age	65-69 (1)	149	59.6	25.7 ± 3.04	25.0 [6.0]	2.26 ± 0.32	2.2 [0.4]
	70-74 (2)	59	23.6	24.76 ± 2.86	24.0 [5.0]	2.34 ± 0.36	2.3 [0.4]
	≥75 (3)	42	16.8	23.36 ± 3.15	23.0 [4.0]	2.31 ± 0.33	2.3 [0.5]
	Statistical analysis			χ^2 =8.253 **p=0.016 [1-3]**		χ^2 =2.102 p=0.350	
Sex	Woman	156	62.4	24.27 ± 2.87	24.0 [4.0]	2.28 ± 0.33	2.3 [0.4]
	Male	94	37.6	25.45 ± 3.28	26.0 [5.0]	2.29 ± 0.35	2.2 [0.4]
	Statistical analysis			Z=-2.961 **p=0.003**		Z=-0.093 p=0.926	
Martial Status	Married	169	67.6	24.78 ± 3.19	25.0 [6.0]	2.29 ± 0.32	2.3 [0.4]
	Single	81	32.4	24.57 ± 2.83	24.0 [4.0]	2.28 ± 0.35	2.2 [0.4]
	Statistical analysis			Z=-0.396 p=0.692		Z=-0.591 p=0.554	
Education level	Literate (1)	211	84.4	24.41 ± 3.02	24.0 [5.0]	2.28 ± 0.34	2.2 [0.4]
	Elementary (2)	20	8.0	25.10 ± 2.71	25.5 [5.0]	2.37 ± 0.32	2.2 [0.5]
	High school (3)	19	7.6	27.63 ± 2.52	28.0 [3.0]	2.26 ± 0.29	2.2 [0.3]
	Statistical analysis			χ^2 =18.476 **p=0.001 [1.2-3]**		χ^2 =1.256 p=0.534	
BMI classes	Normal	48	19.2	24.15 ± 3.28	24.0 [6.0]	2.29 ± 0.31	2.3 [0.5]
	Overweight	83	33.2	24.61 ± 3.24	24.0 [5.0]	2.29 ± 0.37	2.2 [0.4]
	Obese	119	47.6	25.01 ± 2.85	25.0 [5.0]	2.28 ± 0.32	2.3 [0.4]
	Statistical analysis			χ^2 =0.678 p=0.410		χ^2 =0.025 p=0.875	
Smoking	Yes	27	10.8	25.19 ± 3.31	24.0 [7.0]	2.30 ± 0.41	2.2 [0.5]
	No	223	89.2	24.65 ± 3.05	25.0 [5.0]	2.29 ± 0.32	2.2 [0.4]
	Statistical analysis			Z=-0.811 p=0.417		Z=-0.203 p=0.839	
Alcohol	Yes	6	2.4	26.33 ± 2.42	27.0 [5.0]	2.21 ± 03.6	2.2 [0.6]
	No	244	97.6	24.67 ± 3.08	24.0 [5.0]	2.29 ± 0.33	2.2 [0.4]
	Statistical analysis			Z=-1.352 p=0.176		Z=-0.489 p=0.647	

MMSE: Mini-Mental State Examination, PORI: Postoperative Recovery Index

When the PORI scores of the patients were compared with the clinics they were treated in, the PORI scores of the patients treated in CVS were higher than those of those treated in orthopedics and general surgery (p< .05). When the intensive care hospitalization status and PORI scores of the patients were compared, the scores of those with intensive care hospitalization were higher (p< .05). When the duration of initial mobilization and PORI scores of the patients were compared, the PORI scores of those who were mobilized after more than 24 hours were higher than other groups (p< .05). When the risk of malnutrition was compared with the PORI scores of the patients, the PORI scores of those with malnutrition risk were higher (p< .05). No statistically significant difference was found between the clinical and operative characteristics of the patients and the mean MMSE scores (p> .05) (Table 3).

Table 3. Comparison of Clinical Characteristics of Patients and Scale Scores

				MMSE		PORI	
Variable		**n**	**%**	**$\bar{x}$ ± s.s**	**Median [IR]**	**$\bar{x}$ ± s.s**	**Median[IR]**
Clinic	Orthopedics (1)	185	74.0	24.65 ± 3.00	25.0 [5.0]	2.27 ± 0.32	2.2 [0.4]
	General surgery (2)	33	13.2	25.24 ± 3.29	25.0 [5.0]	2.22 ± 0.33	2.2 [0.5]
	Cardiovascular sur(3)	32	12.8	24.50 ± 3.32	24.0 [7.0]	2.49 ± 0.33	2.5 [0.3]
	Statistical analysis			χ^2 =1.236 p=0.539		χ^2 =14.240 **p=0.001 [1.2-3]**	
Systemic disease	No	44	17.6	25.45 ± 3.17	26.0 [5.0]	2.23 ± 0.37	2.1 [0.4]
	Yes	206	82.4	24.55 ± 3.04	24.0 [5.0]	2.30 ± 0.33	2.3 [0.4]
	Statistical analysis			Z=-1.772 p=0.076		Z=-1.740 p=0.082	
History of surgery	Yes	205	82.0	24.63 ± 2.96	24.0 [5.0]	2.29 ± 0.33	2.3 [0.4]
	No	45	18.0	25.07 ± 3.58	25.0 [7.0]	2.26 ± 0.33	2.2 [0.5]
	Statistical analysis			Z=-0.928 p=0.354		Z=-0.750 p=0.453	
Which day	Postop 2nd day	153	61.2	24.69 ± 2.98	24.0 [5.0]	2.26 ± 0.34	2.2 [0.4]
	Postop 3rd day	97	38.8	24.74 ± 3.23	25.0 [6.0]	2.33 ± 0.33	2.4 [0.5]
	Statistical analysis			**Z=-0.143 p=0.886**		Z=-2.321 **p=0.020**	
Stay in ICU	No	109	43.6	24.61 ± 2.77	24.0 [5.0]	2.18 ± 0.32	2.1 [0.4]
	Yes	141	56.4	24.79 ± 3.30	25.0 [6.0]	2.38 ± 0.32	2.4 [0.4]
	Statistical analysis			Z=-0.599 p=0.549		Z=-5.196 **p=0.001**	
ASA	II (1)	107	42.8	24.96 ± 2.84	25.0 [4.0]	2.19 ± 0.31	2.2 [0.4]
	III (2)	143	57.2	24.42 ± 3.20	24.0 [5.0]	2.35 ± 0.33	2.4 [0.4]
	Statistical analysis			Z=-1.774 p=0.074		Z=-3.184 **p=0.001**	
Type of anesthesia	General (1)	80	32.0	25.01 ± 3.22	24.5 [6.0]	2.35 ± 0.35	2.4 [0.4]
	spinal (2)	126	50.4	24.76 ± 3.15	25.0 [5.0]	2.23 ± 0.29	2.2 [0.4]
	Combined (3)	44	17.6	24.02 ± 2.46	24.0 [4.0]	2.34 ± 0.38	2.3 [0.5]
	Statistical analysis			χ^2 =3.091 p=0.213		χ^2 =6.956 **p=0.031 [1-2]**	
First mobilization	12 hours and under(1)	14	5.6	25.50 ± 3.59	26.5[7.0]	2.01 ± 0.28	2,0 [0,4]
	13-24 hours (2)	54	21.6	24.63 ± 2.70	24.0[4.0]	2.15 ± 0.31	2,1 [0,3]
	Over 24 hours (3)	182	72.8	24.68 ± 3.14	24.5[6.0]	2.35 ± 0.32	2,3 [0,4]
	Statistical analysis			χ^2 =0.920 p=0.631		χ^2 =28.577 **p=0.002 [1.2-3]**	
Analgesic use	Opioid	39	15.6	25.13 ± 3.35	25.0[5.0]	2.27 ± 0.44	2,3 [0,6]
	Non-Opioid	105	42.0	24.79 ± 3.11	25.0[6.0]	2.25 ± 0.36	2,2 [0,4]
	Both of them	106	42.4	24.48 ± 2.94	24.0[4.0]	2.33 ± 0.25	2,3 [0,4]
	Statistical analysis			χ^2 =1.794 p=0.408		χ^2 =5.786 p=0.055	
Risk of malnutrition	Yes*	61	24.4	24.84 ± 3.20	24.0[6.0]	2.47 ± 0.41	2,5 [0,5]
	No	189	75.6	24.67 ± 3.04	25.0[5.0]	2.23 ± 0.28	2,2 [0,4]
	Statistical analysis			Z=-0.354 p=0.723		Z=-4.491 **p=0.001**	

MMSE: Mini-Mental State Examination, PORI: Postoperative Recovery Index

Table 4. Examination of the Relationships between the Cognitive Level, Recovery State and the Factors Related to the Operation Characteristics

Correlation (N=250)		Mini-Mental State Examination	Postoperative Recovery Index
Preoperative hospital stay	*r*	-0.038	0.233
	p	0.550	**0.001**
Intensive care stay	*r*	0.052	0.334
	p	0.415	**0.001**
Duration of surgery	*r*	0.066	0.158
	p	0.299	**0.012**
Duration of anesthesia	*r*	0.022	0.175
	p	0.728	**0.005**
Age	*r*	-0.201	0.131
	p	**0.001**	**0.038**

r: Spearman correlation

There was a negative, very weak, but statistically significant relationship between MMSE scores and age ($p< .05$). A positive, very weak/weak, and statistically significant correlation was found between the PORI scores of the patients and preoperative hospitalization day, intensive care stay, duration of surgery, duration of anesthesia, and age ($p< .05$) (Table 4).

A negative, very weak, but statistically significant correlation was found between MMSE and PORI scores ($p< .05$) (Table 5).

Table 5. Examination of the Relationship between the Cognitive Level and Recovery State

Correlation (N=250)		Postoperative Recovery Index
Mini-Mental State Examination	r	-0.124
	p	**0.049**

r: Spearman correlation

DISCUSSION

The mean MMSE was 24.71±3.07, and 40% of the patients were at risk of cognitive impairment. In addition, it was determined that the risk of cognitive impairment increased as the age of the patients increased. Previous studies have also reported a decline in cognitive function-based abilities in geriatric individuals with advanced age (7,14). Cognitive changes have also been reported in patients undergoing surgical intervention (15,16). It has been reported that the incidence of cognitive changes in elderly patients undergoing major surgery varies between 20–90% (17,18,19). While these results can be explained as a physiological consequence of aging, surgery-related (neuro) inflammation has also been reported to play an important role in the development of cognitive decline (20). Conditions such as pain, lack of sleep, visual or physical impairment, dehydration, hypoxia, hypercapnia, hypotension, hyperglycemia, unbalanced nutrition, electrolyte imbalance, and blood loss may also cause changes

in cognitive function in geriatric individuals after surgery (15,17).

In this study, it was determined that the patients' postoperative recovery level was at medium difficulty. Although the studies conducted with geriatric individuals undergoing major surgical intervention in the literature are very limited, it is stated that patients in parallel with our study have difficulties in the recovery process during the postoperative period (2,9,13). The postoperative recovery process is complicated by changes in physiological and psychological status and the risk of side effects. It was determined this study that postoperative recovery became more difficult as the patient age increased. Similarly, it has been reported in the literature that recovery becomes more difficult with increasing age (9,21,22). It is thought that psychological-physiological problems and a lack of social support for geriatric patients negatively affect recovery. In this study, as the preoperative hospitalization days of the patients increased, their postoperative recovery was negatively affected. In the study of Ansari et al. (2019), reported that the risk of surgical site infection increased with the long duration of hospitalization during the preoperative period (23). It is thought that the possible flora in the hospital may cause opportunistic infections, especially in older fragile patients, and may negatively affect the postoperative process of these patients.

It was found that patients who underwent cardiovascular surgery and had postoperative intensive care hospitalization had a more difficult recovery process. Geriatric patients are mostly followed up in intensive care due to respiratory failure and cardiovascular diseases and these diseases make recovery difficult and increase mortality (6). Yolcu et al. (2015) also reported that patients who underwent cardiovascular surgery recovered with more difficulty (21). It is thought that the prolonged duration of cardiovascular surgery, use of a heart-lung machine, cross-clamping times, the presence of wounds on the leg and sternum where the saphenous vein was removed, and intensive care hospitalization make it difficult for cardiovascular surgery patients to recover. Additionally, these patients also have chronic diseases. The presence of chronic diseases in geriatric patients increases the ASA score. In the study, a high ASA score was found to more difficult the recovery process. Butler et al. (2012) reported that ASA score affects the patient's recovery process in the postoperative period (16). The presence of comorbidities in most geriatric patients causes high ASA scores and adversely affects their recovery process. This situation delays wound healing and mobilization of patients and increases the need for intensive care. It is also known that patients with high ASA scores are more affected by the negative effects of general anesthesia. In the study found that those with a longer duration of anesthesia and those who underwent general anesthesia recovered more difficulty. It has been reported in the literature that geriatric individuals are more sensitive to anesthetics and more susceptible to postoperative complications, making recovery difficult (6). Moreover it has been reported that the complication rate is higher in patients undergoing general anesthesia and that their duration of intensive care and hospital stay is longer (16). General anesthesia is thought to cause difficulty in the recovery process because it affects all systems and increases the risk of complications. Another factors that negatively affects the recovery process are late mobilization and nutritional deficiency. In total, 72.8% of our patients first mobilized after the first 24 hours during the postoperative period. In the study, it was determined that geriatric patients with a mean score of 3.96±0.60 in the PORI physical activities subscale had the most difficulty in performing physical activities. It was also determined that patients who first mobilized after more than 24 hours had a more difficult recovery than those who first mobilized within a shorter period. Ladurner et al. (2022) found that the earlier mobilization of 237 geriatric patients who underwent femoral neck fracture

surgery reduced postoperative complications (24). Aydın Çil and Yayla (2021) found that the risk of malnutrition in orthopedic surgery patients caused the development of postoperative complications (5). In addition Nogueira et al. (2022) reported that a protein-rich diet accelerated recovery in the postoperative period (25). Since early mobilization and nutrition are positively affects the healing process, patients' mobilization and nutrition should be supported.

In this study, the cognitive level of patients decreases, the postoperative recovery process becomes more difficult. Geriatric individuals in the postoperative period may experience difficulties during the recovery process due to physical limitations, pain, and inability to perform self-care. In addition, cognitive change also negatively affects the recovery process of geriatric individuals. During the aging process, the duration of physical and mental reactions increases and there is a change in cognitive processes (7). The learning process of geriatric individuals changes and they need additional time for learning (7). In addition, loss of concentration and memory is observed in geriatric individuals (8). All these situations may negatively affect the care of individuals who have undergone surgery and their ability to manage the postoperative recovery process. Therefore, the cognitive levels of geriatric patients undergoing surgical intervention should be evaluated with standard tests.

CONCLUSION

In conclusion, in this study, approximately half of the patients were at risk of cognitive impairment, which negatively affected the postoperative recovery process. It was determined that the postoperative recovery process is difficult, and factors such as ASA score, type and duration of anesthesia, and modifiable risk factors, including nutrition and mobilization, affect this process. Nursing care should be planned in line with evidence-based practices by determining the factors that will negatively affect the recovery process after surgical intervention. A comprehensive preoperative evaluation of geriatric patients, provision of optimal nutrition, and early mobilization during the postoperative period will positively affect the recovery process. In-service training on the care of geriatric patients is recommended for healthcare professionals.

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