RESEARCH ARTICLE

CYPRUS
JOURNAL OF MEDICAL SCIENCES

DOI: 10.4274/cjms.2025.2025-48
Cyprus J Med Sci

Assessment of the Postoperative Recovery: A Mixed Methods Study

Nurdan Sarmusakcı[1], Deniz Şanlı[2]

[1]Neurology Intensive Care Unit, İzmir Katip Çelebi University Atatürk Traning and Research Hospital, İzmir, Türkiye
[2]Department of Surgical Nursing, Division of Nursing, Faculty of Health Sciences, İzmir Katip Çelebi University, İzmir, Türkiye

Abstract

BACKGROUND/AIMS: Assessing the postoperative recovery is crucial for expediting healing and optimizing care. The study aims to assess patients' postoperative recovery levels.

MATERIALS AND METHODS: This mixed-methods study was executed in the surgery clinic from March 2022 to February 2023. The study sample consisted of 140 patients for the quantitative method and 12 for the qualitative method. Study data were collected using the postoperative recovery index (PoRI) and a semi-structured interview form. The data were further analyzed utilizing the independent sample t-test and one-way analysis of variance for quantitative analysis, alongside content analysis for qualitative analysis.

RESULTS: For the quantitative analysis section of the study, the mean scores in the sub-dimensions of the PoRI were 3.54±0.80 for the physical activities, 2.38±0.87 for the bowel symptoms, 2.41±0.93 for the appetite symptoms, 2.35±0.74 for the general symptoms, and 3.03±0.84 for the psychological symptoms, whereas the overall index was 2.85±0.55. Differences were determined in patients' sub-dimension and total index scores according to age, body mass index, tobacco use, chronic diseases, and prior surgery, as well as the clinic in which they were hospitalized, type of surgery, and type of anesthesia received ($p<0.05$). The themes developed for the qualitative analysis of the study were perspectives on postoperative complaints and changes, recovery status, factors affecting recovery, perspectives on the results of surgery, and the significance of recovery.

CONCLUSION: Patients experienced considerable difficulty in the overall index throughout the postoperative recovery. Patients reported positive and negative perceptions and perspectives regarding postoperative recovery.

Keywords: Postoperative care, postoperative period, postoperative recovery, recovery

INTRODUCTION

Postoperative recovery is a multidimensional process that influences various conditions, including physical, psychological, social, and economic status. Owing to its multifaceted nature, it is considered a complex process.[1,2] Postoperative recovery involves restoring capacity and homeostasis, leading to normalization.[2]

Therefore, evaluating the level of postoperative recovery is essential for assessing and enhancing perioperative care.[3] Assessing patient outcomes and symptoms via postoperative recovery measurement methods is crucial for expediting postoperative recovery and optimizing nursing care.[4] Incomplete postoperative recovery indicates potential long-term adverse outcomes. The prompt and precise identification of these symptoms facilitates the timely application of interventions that can avert adverse outcomes.[2]

Historically, significant emphasis has been placed on physical symptoms in assessing recovery.[2] Current trends focus on determining the multidimensional aspects of recovery. The study evaluated physical, psychological, and functional dimensions, and has recently

To cite this article: Sarmusakcı N, Şanlı D. Assessment of the postoperative recovery: a mixed methods study. Cyprus J Med Sci. [Epub Ahead of Print]

ORCID IDs of the authors: N.S. 0000-0002-9352-7754; D.Ş. 0000-0001-6076-0317.

Corresponding author: Deniz Şanlı
E-mail: deniz.sanli@ikc.edu.tr
ORCID ID: orcid.org/0000-0001-6076-0317

Received: 21.05.2025
Accepted: 15.07.2025
Epub: 29.09.2025

included cognitive dimensions.[1] Including patient-oriented outcomes in the recovery assessment is critical to evaluating the postoperative recovery.[5]

The multifactorial nature of postoperative treatment and recovery necessitates a multidisciplinary approach to reduce complications and shorten the duration of hospitalization.[6] Nursing care seeks to identify complications and promptly administer appropriate treatment, a crucial aspect of the process.[7] Thus, nurse efficacy in postoperative recovery commences with accurate problem diagnosis, progresses through the delivery of suitable care, and involves implementing diverse recovery techniques.[6]

Throughout the postoperative recovery process, which is influenced by many variables, it is crucial to systematically evaluate the patient using accurate and reliable measurement methods to monitor the patient accurately and diagnose problems early. It is essential to assess the recovery process from the patient's perspective, considering all its dimensions. The study was believed to have the potential to contribute to this process.

Purpose

The study aims to assess patients' postoperative recovery levels. For this purpose, the postoperative recovery status of the patients and changes in their condition based on sociodemographic characteristics and clinical factors were examined through quantitative methods. Subsequently, patients' perceptions and perspectives regarding postoperative recovery were elucidated through qualitative analysis.

MATERIALS AND METHODS

Study Design/Setting

The study was conducted using mixed methods. Thus, a holistic understanding was achieved by combining quantitative and qualitative analysis methods. The mixed method was a concurrent design.[8]

The study was conducted between March 2022 and February 2023 in the surgery clinics of a training and research hospital. These clinics covered various surgeries.

Sample

The study sample consisted of patients who had undergone surgery in the surgical clinics throughout the study term and who satisfied specific inclusion criteria. These criteria included being 18 or older, being on the postoperative first day, and having undergone elective surgery. The stratified sampling method was employed in the quantitative analysis.

The sample size for the quantitative analysis was determined using the G*Power software.[9] The minimum sample size was 130, with an effect size of 0.50, a Cronbach's alpha of 0.05, and a power of 0.80. The quantitative analysis of the study involved 140 patients. The sample size of the qualitative analysis is determined based on the amount of information to be collected from the sample. It is the point at which data saturation occurs.[10] The qualitative analysis of the study was finalized with 12 patients.

Data Collection Tools

Personal information form: The researchers developed the form from the literature. It has 17 items addressing the sociodemographic and clinical characteristics of the patients, including anthropometric traits, health and disease history, and current surgery details.

Postoperative recovery index: PoRI was developed by Butler et al.[4] in 2012. The index comprises 37 items and five sub-dimensions. These are physical activities (basic, advanced), bowel symptoms (lower, upper), appetite symptoms (pleasure, digestion), general symptoms (physical/neuropsychological, sleep), and psychological symptoms (internal, interpersonal). The arithmetic mean calculates the sub-dimension and overall index scores. PoRI has been adapted into Turkish by Cengiz and Aygin[11] with 25 items and five sub-dimensions. Cengiz and Aygin[11] determined Cronbach's alpha values as 0.978 for physical activities, 0.977 for bowel symptoms, 0.971 for general symptoms, 0.983 for craving symptoms, 0.930 for psychological symptoms, and 0.967 for the whole index. The Cronbach's alpha coefficient for the index in the study varies from 0.658 to 0.905 across the sub-dimensions and 0.886 for the overall index.

Semi-structured interview form: The interview technique requires a written form.[9] Consequently, this form was used. Qualitative analysis necessitates trustworthiness. The criteria used to demonstrate the study's trustworthiness are established through credibility, transferability, dependability, and confirmability.[8] The form was structured based on expert opinions. Expert opinions were obtained from three academicians from the field of nursing and two specialist physicians from the field of surgery. The definitive version of the form was established during a pilot interview with two patients. The form consists of an introduction, process steps, interview questions, and the closing sections. The interview questions include what postoperative recovery means to the patient, what they think about postoperative recovery, what changes they experienced after surgery compared to their preoperative condition, how the surgery affected the patient, and whether they had any complaints or problems after the surgery.

Data Collection

For quantitative analysis, a researcher visited all patients in the sample on the first postoperative day to administer the data collection tools. Patients were requested to be assessed in the next 24 hours. The procedure required 10 to 15 minutes.

Qualitative data were collected through in-depth interviews, necessitating a thorough analysis of sensitive subjects . The in-depth interviews aimed to elucidate patients' perceptions, opinions, and experiences concerning their postoperative recovery. The interviews were performed in person based on the questions developed by the researchers. Digital voice recorders were employed to capture the interviews. Furthermore, the researchers documented their observations throughout the interview. The interviews were conducted by the first researcher. There was no observer during the interview. It was determined that the patients participated voluntarily in the interview. An interview plan, including the date and time, was created for the patients who consented to participate. The interviews took place in a tranquil room at the clinics where the patients were and lasted 30 to 45 minutes.

Statistical Analysis

Data analysis using the quantitative method was performed with statistical package for the social sciences 22.0 software. The skewness and kurtosis metrics, Q-Q plot, and normality assessments were used

to evaluate whether the data were normally distributed. Given that the normal distribution assumption was satisfied, an independent samples t-test and one-way analysis of variance (accompanied by the Bonferroni test to determine the group responsible for the difference) were employed. The significance level was established at $p<0.05$.

Content analysis was employed for qualitative analysis. Two researchers coded and documented the data, which was collected through the interviews, on the voice recorder. The data were further statistically analyzed using MAXQDA. Accordingly, the themes, categories/sub-dimensions, and codes were established. Frequency values (f) and patient numbers (p) were used to present the data. Patients were anonymized with codes H1-H12.

Ethical Considerations

Ethical approval for this study was obtained from the Non-Interventional Clinical Studies Institutional Review Board of Izmir Katip Çelebi University (approval number: 0092, date: 24.02.2022). Informed consent was obtained from all participants. Each patient participating in the interview was assigned a numerical code to ensure confidentiality, which was in line with the aims of the qualitative analysis.

RESULTS

Qualitative Analysis Results

37.8% of the patients were 65 years of age and older, 57.9% were male, 41.4% were overweight, 34.3% used tobacco, and 68.6% had chronic diseases. 62.1% of the patients had undergone prior surgery. The distribution of patients by clinic is balanced, with each clinic having 14.3% of the total patients. 89.3% of the patients, had undergone open surgery, while 72.9% had received general anesthesia (Table 1).

The mean scores of the patients on the sub-dimensions and overall of the PoRI was presented in Table 2.

Physical activity scores of patients aged between 55 and 64 (3.80±0.67) and 65 years and over (3.58±0.81) were higher than patients under 45 years of age (3.05±0.68) (f=5.024, p=0.002). Bowel symptom scores of patients aged between 55 and 64 (2.71±0.81) were higher than patients under 45 years of age (2.05±0.84) (f=3.437, p=0.019). Overall index scores of patients aged between 55 and 64 (3.08±0.47) and 65 years and over (3.58±0.51) were higher than patients under 45 years of age (3.05±0.53) (f=5.397, p=0.002). No significant difference was observed in the patients' scores based on their gender. Appetite symptom scores of obese patients (2.63±1.06) were found to be higher than overweight patients (2.19±0.84) (f=3.437, p=0.019). Psychological symptom scores of patients who used tobacco (3.23±0.88) were found to be higher than patients who did not use tobacco (2.92±0.79) (t=2.092, p=0.038). Psychological symptom scores of patients with chronic diseases (3.13±0.83) were found to be higher than those of patients who did not have a chronic disease (2.81±0.80) (t=2.076, p=0.040). Psychological symptom scores of patients who had undergone a prior surgery (3.14±0.82) were higher to than patients who had not undergone a prior surgery (2.83±0.83) (t=2.145, p=0.034).

Significant differences were observed in all sub-dimensions except one and overall index scores of the patients depending on the surgery clinics in which the patients were hospitalized ($p<0.05$) (Table 3).

Table 1. Sociodemographic and clinical characteristics of the patients

Characteristics	n	%
Age ($\tilde{X}$ ± SD ±SD=57.75±15.51)		
<45	26	18.6
45-54	25	17.9
55-64	36	25.7
>65	53	37.8
Gender		
Female	59	42.1
Male	81	57.9
Education		
Illiterate	7	5.0
Literate	12	8.6
Primary/secondary school	69	49.3
High school	42	30.0
University and post-graduate education	10	7.1
Marital status		
Married	113	80.7
Single	27	19.3
Body mass index		
Normal	50	35.7
Overweight	58	41.4
Obese	32	22.9
Tobacco use		
Yes	48	34.3
No	92	65.7
Chronic diseases		
Yes	96	68.6
No	44	31.4
Prior surgery		
Yes	87	62.1
No	53	37.9
The patient was hospitalized		
Neurosurgery	20	14.3
General surgery	20	14.3
Cardiovascular surgery	20	14.3
Otolaryngology	20	14.3
Urology	20	14.3
Orthopedics and traumatology	20	14.3
Plastic, reconstructive, and aesthetic surgery	20	14.3
Type of surgery		
Open	108	77.1
Laparoscopic	32	22.9
Type of anesthesia received		
General	102	72.9
Spinal	36	25.7
Nerve block	2	1.4

n=140. SD: Standard deviation.

Physical activities scores (3.64±0.75, 3.20±0.85, t=2.791, p=0.006), general symptoms scores (2.42±0.71, 2.11±0.75, t=2.117, p=0.036), psychological symptoms scores (3.11±0.85, 2.75±0.70, t=2.158, p=0.033) and overall index scores (2.93±0.53, 2.60±0.56, t=3.076, p=0.003) of the patients who had undergone open surgery were higher than the patients who had undergone a laparoscopic surgery. Physical activities scores (3.66±0.81, 3.21±0.64, t=2.994, p=0.003), general symptoms scores (2.45±0.70, 2.10±0.77, t=2.507, p=0.013), psychological symptoms scores (3.15±0.83, 2.69±0.75, t=2.916, p=0.004), and overall index scores (2.94±0.54, 2.63±0.52, t=3.029, p=0.003) of the patients who had received general anesthesia were higher compared to patients who had received spinal anesthesia.

Qualitative Analysis Results

Six of the patients were younger than 45 years, six were women, six were overweight, five used tobacco, and two had chronic diseases. Three of the patients had undergone prior surgery. The clinics where patients were hospitalized were most commonly neurosurgery (n=4) and general surgery (n=4). Eleven patients had undergone open surgery, and nine received general anesthesia.

Table 4 presents the themes, categories/sub-themes, and codes developed for the study's purposes.

Theme 1. Perspectives on postoperative complaints (f=63): Four categories were developed under this theme. These are physical, psychological, social, and habitual complaints. This theme has been the most cited by patients. Patients were predominantly referred for the group for physical complaints (f=46). Patients' perspectives have predominantly concentrated on the themes of pain (f=12), limitation of mobility (f=11), and fear (f=8). The patients' remarks concerning these codes are delineated below:

"I suffer very severe pain during the exercises designed to enhance my leg mobility and joint function. There were even moments when I feared my leg would detach." (P10: 52 years of age, female, orthopedics and traumatology clinic).

"On the evening of the surgery, the nurses informed me that I should have already gotten up and started walking. The attempt to get up induced such agony that I recall saying, "Perhaps I will be unable to leave my bed for a week." I have sutures; hence, I should avoid exertion. For this reason, my movements are sluggish and restricted. I progress at

Table 2. Patients' mean scores and median scores in pori sub-dimensions

Sub-dimension	X̄	SD	Median	Minimum-maximum
Physical activities	3.54	0.80	3.50	1.50-5.00
Bowel symptoms	2.38	0.87	2.40	1.00-4.80
Appetite symptoms	2.41	0.93	2.25	1.00-5.00
General symptoms	2.35	0.74	2.25	1.00-4.00
Psychological symptoms	3.03	0.84	3.00	1.00-5.00
Overall index	2.85	0.55	2.82	1.68-4.16

n=140. SD: Standard deviation.

Table 3. Comparison of patients' mean scores in pori sub-dimensions based on the clinics they were hospitalized in

Sub-dimension	Clinic							f	p	Bonferroni
	Neurosurgery (a)	General surgery (b)	Cardiovascular surgery (c)	Otolaryngology (d)	Urology (e)	Orthopedics (f)	Plastic surgery (g)			
	X̄ ± SD	X̄ ± SD	X̄ ± SD	X̄ ± SD	X̄ ± SD	X̄ ± SD	X̄ ± SD			
Physical activities	3.70±0.79	3.99±0.63	3.64±0.75	3.31±0.84	3.24±0.46	3.75±0.84	3.12±0.86	3.525	0.003*	b>e b>g
Bowel symptoms	2.08±0.53	3.10±1.11	2.50±0.74	2.34±0.76	2.42±0.78	2.49±0.74	1.71±0.75	5.735	0.000*	b>a b>g c>g f>g
Appetite symptoms	1.94±0.80	2.85±0.88	2.05±0.62	3.20±1.17	2.09±0.76	2.51±0.59	2.26±0.88	6.198	0.000*	b>a c>a d>c d>e d>g
General symptoms	2.44±0.74	2.34±0.61	2.53±0.69	2.50±0.71	1.94±0.67	2.43±0.65	2.28±0.93	1.527	0.174	-
Psychological symptoms	3.34±0.67	3.10±0.80	3.03±0.73	3.18±0.79	2.90±0.90	2.45±0.79	3.20±0.93	2.553	0.023*	a>f
Overall index	2.83±0.49	3.22±0.55	2.88±0.35	2.95±0.64	2.63±0.51	2.88±0.45	2.58±0.63	3.252	0.005*	b>e b>g

n=140, *p<0.05. SD: Standard deviation.

Table 4. Themes, categories/sub-dimensions, and codes of the study

Themes	Categories/sub-dimensions	Codes
Perspectives on postoperative complaints (f= 63)	Physical complaints (f=46)	Limitation of mobility (f=11)
		Gas/intestinal dysfunction (f=2)
		Urinary retention (f=3)
		Loss of appetite/weight loss (f=3)
		Nausea (f=3)
		Difficulty in breathing (f=3)
		Loss of sensation/numbness (f=3)
		Pain (f=12)
		Weakness/fatigue (f=2)
		Insomnia (f=4)
	Psychological complaints (f=14)	Fear (f=8)
		Anxiety (f=6)
	Social complaints (f=2)	Avoiding crowds/going out (f=2)
	Habitual complaints (f=1)	Anxiety about not being able to return to work (f=1)
Postoperative changes (f=16)	Treatment (f=12)	Medication (f=3)
		Dieting/weight loss (f=3)
		Physiotherapy (f=2)
		Using assistive equipment (f=4)
	Changes in lifestyle (f=2)	Making changes in life (f=2)
	Health awareness (f=2)	Self-care (f=2)
Postoperative recovery status (f=19)	Physical recovery (f=7)	Feeling physical recovery (f=2)
		Relief from pain (f=5)
	Psychological recovery (f=8)	Alleviation of fear (f=4)
		Being happy (f=4)
	Social recovery (f=1)	Socialization (f=1)
	Habitual recovery (f=3)	Ability to return to everyday life/work (f=3)
Factors affecting postoperative recovery (f=29)	Patient-related factors (f=13)	Prior surgery (f=4)
		Contact with people who had undergone prior surgery (f=3)
		Paying attention to postoperative care (f=5)
		Believing in recovery (f=1)
	Factors related to patient relatives (f=7)	Support from family/friends (f=7)
	Factors related to healthcare professionals (f=9)	Information provided by health care professionals (f=3)
		Support from health care professionals (f=6)
Perspectives on the results of surgery (f=25)	Service quality (f=18)	Success of the surgery (f=11)
		Satisfaction (f=7)
	Feeling better (f=7)	Feeling good (f=7)
Significance of postoperative recovery (f=20)	Being healthy (f=11)	Relief from difficulties (f=4)
		Regaining health (f=4)
		Returning to everyday life (f=1)
		Ability to take care of oneself (f=2)
	New beginnings (f=9)	Restarting life (f=9)

a slow rate. I am uncertain how much longer I can sustain this." (P11: 37 years of age, male, neurosurgery clinic).

"There were instances when I wept profusely and experienced profound sadness. I was exceedingly apprehensive of what would occur to me. I contemplated extensively regarding my spouse and children. I nearly experienced the fear of death." (P6: 42 years of age, female, general surgery clinic).

Theme 2. Postoperative changes (f=16): Three categories were developed under this theme. These include receiving treatment, changes in lifestyle, and health awareness. Patients' perspectives have predominantly concentrated on the use of assistive equipment (f=4), medications (f=3), and dieting/weight loss (f=3). A patient articulated the perspective on using assistive equipment as follows:

"As I mentioned before, my whole life has been transformed by a new way of living. Now and then, I have to manage a colostomy bag. This induces a sense of melancholy. I have concerns about how I will look, use the bag, and so on. My nurse and physician supplied me with information regarding the use of the bag. Nonetheless, I remain cognizant that a formidable journey is ahead." (P8: 56 years of age, female, general surgery clinic).

Theme 3. Postoperative recovery status (f=19): The categories delineated within this theme are physical recovery, psychological recovery, social recovery, and habitual recovery. Patients' perspectives have predominantly concentrated on the codes of relief from pain (f=5), alleviation of fears (f=4), and being happy (f=4). A patient's statements concerning relief from pain are as follows:

"The most significant outcome of the surgery was the alleviation of the excruciating pain I endured before the procedure. "Currently, I occasionally experience discomfort at the surgical site; however, it is not comparable to the first pain I endured." (P7: 24 years of age, male, general surgery clinic).

Theme 4. Factors affecting postoperative recovery (f=29): Three categories were developed under this theme. These are patient-related factors, patients' relatives, and health care professionals. Patients' perspectives have predominantly concentrated on the codes of support from family/friends (f=7), support from health care professionals (f=6), and paying attention to postoperative care (f=5). Below are patient testimonials concerning these codes:

"My family never left me alone, even for a single day. My physicians always emphasized the significance of mental resilience and drive throughout this procedure. Consequently, my family and friends tried to enhance my well-being." (P6: 42 years of age, female, general surgery clinic).

"The assistance of the physicians, nursing staff, and caregivers sustained my existence and intensified my will to live." (P4: 58 years of age, male, orthopedics and traumatology clinic).

Theme 5. Perspectives on the surgery results (f=20): The categories developed under this theme were service quality and feeling better. Patients articulated remarks highlighting the success of the surgery (f=11), satisfaction (f=7), and feeling good (f=7). One patient remarked on the successful surgery:

"I did not expect such a miracle. It is incredible. Let me say Mashallah." (P10: 52 years of age, female, orthopedics and traumatology clinic).

Theme 6. Significance of postoperative recovery (f=20): The first category recognized under this theme was being healthy, and the subsequent category was new beginnings. Patients said they frequently perceived themselves as having restarted life (f=9). Patients have articulated this vividly as follows:

"Postoperative recovery for me resembles being reborn, crawling anew, walking again, and commencing a new life." (P4: 58 years of age, male, orthopedics and traumatology clinic).

"Surgery is an event that transforms an individual's entire existence. It, however perilous due to the numerous associated risks, is essential for recovery, instilling fear. Life contains pivotal moments, akin to the distinctions before and after a surgical procedure." (P12: 32 years of age, male, neurosurgery clinic).

DISCUSSION

For the study's quantitative analysis, the patient's postoperative recovery status, as well as changes in this recovery status, and the changes in depending on various factors were examined. Patients reported that they experienced extreme difficulty in physical activities, considerable difficulty in psychological symptoms, and the overall index, and moderate difficulty in bowel symptoms, appetite symptoms, and general symptoms.

The conclusion that the patients experienced considerable difficulty in the overall index is similar to the results of studies reporting that the patients experienced considerable difficulty.[11,12] or extreme difficult[13] in general postoperative recovery and partial recovery after surgery.[14] On the other hand, these results contradict those of different studies reporting an overall postoperative recovery above the moderate level.[15-18] The study was conducted in a tertiary training and research hospital. This result may suggest that the problems of patients admitted to the hospital for surgical procedures are complex and that their general health condition is poor. The theme under which the highest number of codes were developed was postoperative complaints, and the patients' views were mainly focused on this within qualitative data analysis. It was concluded that the qualitative and quantitative findings obtained in the study overlapped.

The only sub-dimension in which patients experienced extreme difficulty was physical activities. Surgical procedures may temporarily restrict patients' mobility. The patient's mobility is intentionally limited for a designated term to expedite healing during the inflammatory phase of wound recovery.[7] The study's findings coincide with the information compiled in the literature review. For the qualitative analysis, the second code, under the physical complaints category of theme 1, was a mobility limitation focused on in the patients' views. Qualitative findings supported quantitative findings in this sub-dimension.

The perception of recovery is customized and related to several factors, such as demographic characteristics, preoperative health status, the information provided before the surgery, expectations regarding the surgical procedure's results, and postoperative support.[19,20]

Significant differences were found in all sub-dimensions except for general symptoms and overall index scores, depending on the clinic where the patients are hospitalized. Patients hospitalized in the general surgery clinic experienced more difficulties in physical activities, bowel symptoms, sub-dimensions, and overall index, than those hospitalized in the plastic surgery clinic. The literature review revealed that patients hospitalized in orthopedic clinics recovered significantly more slowly than general surgery patients.[21] Orthopedic patients also recovered more slowly than general surgery patients.[22] The quality of recovery is poorer in patients who have undergone ileostomy, colostomy closure, mastectomy, and splenectomy compared to patients who have undergone hernioplasty, cholecystectomy, and appendectomy.[23] The clinic with the lowest comfort is the urology clinic, whereas the clinic with the highest comfort is the plastic and aesthetic surgery clinic.[24] While recovery takes a few days or weeks after minor surgical procedures, it may take a year or more following major surgical procedures.[3] It can be concluded that the general surgery clinic patients who participated

in the study underwent major procedures, while the plastic surgery patients underwent a minor procedures.

Six themes were identified in the qualitative analysis: perspectives on postoperative complaints, postoperative changes, postoperative recovery status, factors affecting postoperative recovery, perspectives on the surgery results, and significance of postoperative recovery. Postoperative recovery is examined in the literature in four dimensions: physical recovery, psychological recovery, social recovery, and habitual improvement.[19,25] These dimensions referred to in the literature are similar to the categories of physical, psychological, social, and habitual complaints under theme 1, and physical, psychological, social, and habitual recovery under theme 3. The PoRI sub-dimensions used as data collection tools in the quantitative analysis are compatible with the themes, categories, and codes developed within the framework of qualitative analysis. The physical activities sub-dimension is correlated with limitation of movements, nausea, weakness/fatigue codes under theme 1, feeling of physical recovery codes under theme 3, and being able to take care of one's care code under theme 6; the bowel symptoms sub-dimension is correlated with gas/intestinal dysfunction code under theme 1; appetite symptoms sub-dimension is correlated with loss of appetite/weight loss code under theme 1; general symptoms sub-dimension is correlated with weakness/fatigue and insomnia codes under theme 1; psychological symptoms sub-dimension is correlated with anxiety and anxiety about not being able to return to work under theme 1, ability to return to everyday life/work under theme 3 and belief in recovery under theme 4.

Further themes revealed in the qualitative analysis were feeling unwell and feeling well[26]; recovery conditions at home, returning to everyday life and taking part in the care process[27]; the importance of being informed about treatment and recovery, the ability of patients who need assistance to find coping techniques at home, and the difficulty of rehabilitation for patients who receive limited rehabilitative support.[28]

The first theme is the perspectives on postoperative complaints. Two categories were identified under the theme of not feeling well in another study conducted with mixed methods: physical and psychological problems.[26] Throughout the postoperative period, patients may experience issues with respiratory, cardiovascular, urinary, gastrointestinal, musculoskeletal, and neurological functions, pain, discomfort, hypothermia, wound site-related problems, and problems with psychological and social functions.[7,29] This theme being most frequently mentioned in patient statements indicates that patients still experience postoperative problems today despite advances in surgical treatment and care.

Pain is a widespread and vital problem encountered in the postoperative period.[7] The fact that pain is the most frequently mentioned code may indicate that it continues to be a problem today. Relief from pain being the most commonly cited code under theme 3 confirms this conclusion. Effective pain management allows early mobilization.[30] Pain, which is the most frequently expressed complaint in the study, is the cause of movement limitation.

Postoperative recovery status is another theme referred to herein. The following themes were identified within the scope of qualitative analysis: recovery challenges and their impact on physical activity, factors that facilitate and prevent returning to physical activity, physical challenges of assuming pre-surgery social roles, and interventions in health care that may accelerate the return to physical activity.[31] There is consistency in the study between the most frequently mentioned codes pain, limitation of movements, and fear, in the first theme, and relief from pain and decrease in fear level in another theme.

Another theme developed herein are the factors affecting postoperative recovery. The themes identified within the scope of qualitative analysis were the provision of information, customized treatment, standard care, balancing the symptoms and expectations of rapid recovery, and a sense of security at discharge.[32] Patient-related and healthcare professional-, anesthesia-, and procedure-specific factors may also affect postoperative recovery.[19,20] It is concluded that the categories developed under this theme are compatible with the literature. Information support from health care professionals' codes reveals the nurse's role in postoperative recovery.

Surgical outcome is another theme developed herein. Within a mixed-method study, a category of adaptation to the situation was developed under the theme of feeling good, and a code of general well-being was created under it.[26] Patient satisfaction, a multidimensional concept, is paramount in recovery[1], is considered a component of the quality of recovery[33], and is considered a measure of surgical care outcomes.[34] Although not among the interview questions, this thematic content was developed by considering the patients' statements. Thus, the patient's satisfaction with the surgical process was revealed, as suggested in the literature.

The significance of postoperative recovery is the final theme developed herein. During qualitative studies, patients described postoperative recovery as a state that included internal and external pre-requisites that express changes in ordinary life with varying levels of support[27] and a return to core values for all issues in every field, or better.[35] Postoperative recovery is defined as the individual's ability to return to the pre-surgery level or better, regain all functions, and achieve a state of well-being.[3,19,20] The definitions of postoperative recovery mentioned by the patients participating in the study support the definitions in the literature. Patients' definitions of postoperative recovery have been expanded to include nociceptive, psychological, social, cognitive, and satisfaction domains.[36]

Study Limitations

The study has some methodological limitations. It was conducted on patients undergoing surgical procedures in a training and research hospital; therefore, the study results are limited to the specified patients. The findings are also limited to data from patients undergoing surgery throughout the study.

CONCLUSION

Patients reported that they experienced extreme difficulty in physical activities, considerable difficulty in psychological symptoms, and the overall index, and moderate difficulty in bowel symptoms, appetite symptoms, and general symptoms throughout the postoperative recovery process. There are differences in the postoperative recovery status of patients depending on their age, body mass index, tobacco use, chronic diseases, prior surgery, hospitalized clinic, type of surgery, and type of anesthesia received. The themes developed for the study included perspectives on postoperative complaints and surgery results, postoperative changes, recovery status, factors affecting recovery, the significance of postoperative recovery.

In line with these results, it is recommended that clinical nurses address all aspects of recovery in the postoperative period, including physical, psychological, and social improvement, with a holistic approach. It is imperative to support patients in physical activities. Elderly and obese patients who use tobacco, have chronic diseases, have had prior surgery, and have undergone general open surgery under general anesthesia, need to be supported more in relevant aspects. It is further recommended that patients' pain levels be controlled, provided support for mobility, encouraged to cope with their fear, trained on using assistive equipment, and social support systems be activated.

MAIN POINTS

- Patients reported that they experienced considerable difficulty with the overall index throughout the postoperative recovery process. In particular, they experienced extreme difficulty with physical activity.
- It was determined that postoperative recovery varies according to many variables.
- Patients had positive as well as negative perceptions about postoperative recovery.

ETHICS

Ethics Committee Approval: Ethical approval for this study was obtained from the Non-Interventional Clinical Studies Institutional Review Board of Izmir Katip Çelebi University (approval number: 0092, date: 24.02.2022).

Informed Consent: Informed consent was obtained from all participants.

Acknowledgements

The authors thank the patients who participated in the study.

Footnotes

Authorship Contributions

Surgical and Medical Practices: N.S., D.Ş., Concept: N.S., D.Ş., Design: N.S., D.Ş., Data Collection and/or Processing: N.S., Analysis and/or Interpretation: N.S., D.Ş., Literature Search: N.S., D.Ş., Writing: N.S., D.Ş.

DISCLOSURES

Conflict of Interest: No conflict of interest was declared by the authors.

Financial Disclosure: The authors declared that this study had received no financial support.

REFERENCES

1. Borrell-Vega J, Humeidan ML, Bergese SD. Defining quality of recovery - what is important to patients? Best Pract Res Clin Anaesthesiol. 2018; 32(3-4): 259-68.
2. Ferraz SM, Moreira JP, Mendes LC, Amaral TM, Andrade AR, Santos AR, et al. Evaluation of the quality of recovery and the postoperative health status after elective surgery. Braz J Anesthesiol. 2018; 68(6): 577-83.
3. Jaensson M, Nilsson U, Dahlberg K. Methods and timing in the assessment of postoperative recovery: a scoping review. Br J Anaesth. 2022; 129(1): 92-103.
4. Butler SF, Black RA, Techner L, Fernandez KC, Brooks D, Wood M, et al. Development and validation of the postoperative recovery index for measuring quality of recovery after surgery. J Anesth Clin Res. 2012; 3(12): 1-8.
5. Bowyer A, Royse C. The future of recovery - integrated, digitalised and in real time. Best Pract Res Clin Anaesthesiol. 2018; 32(3-4): 295-302.
6. Nilsson U, Gruen R, Myles PS. Postoperative recovery: the importance of the team. Anaesthesia. 2020; 75(1):e158-e164.
7. Hinkle JL, Cheever KH, Overbaugh K. Brunner & Suddarth's textbook of medical-surgical nursing. 15th ed. Philadelphia: Wolters Kluwer; 2021.
8. Creswell JW, Creswell JD. Research design: Qualitative, quantitative, and mixed methods approaches. 6th ed. Thousand Oaks, CA: Sage; 2022.
9. Polit DF, Beck CT. Nursing research: Generating and assessing evidence for nursing practice. 10th ed. Philadelphia: Lippincott Williams & Wilkins; 2016.
10. Collins T, Onwuegbuzie AJ, Jiao QG. Prevalence of mixed methods sampling designs in social science research. Eval Res Educ. 2009; 19(2): 83-101.
11. Cengiz H, Aygin D. Validity and reliability study of the Turkish version of the postoperative recovery index of patients undergoing surgical intervention. Turk J Med Sci. 2019; 49(2): 566-73.
12. Ozmen T. Investigation of postoperative recovery conditions of patients undergoing surgical intervention [master's thesis]. Izmir: Ege University; 2020.
13. Digin F, Kizilcik Ozkan Z. Determination of postoperative recovery status of elderly patients. Online Turk J Health Sci. 2021; 6(3): 413-8.
14. Allvin R, Kling AM, Idvall E, Svensson E. Patient-reported outcome measures (PROMs) after total hip and knee replacement surgery evaluated by the postoperative recovery profile questionnaire (PRP)-improving clinical quality and person-centeredness. Int J Person Cent Med. 2012; 2(3): 368-76.
15. Kara U, Şimşek F, Kamburoğlu H, Özhan MÖ, Alakuş Ü, İnce ME, et al. Linguistic validation of a widely used recovery score: quality of recovery-15 (QoR-15). Turk J Med Sci. 2022; 52(2): 427-35.
16. Karaman S, Arici S, Dogru S, Karaman T, Tapar H, Kaya Z, et al. Validation of the Turkish version of the Quality of Recovery-40 questionnaire. Health Qual Life Outcomes. 2014; 12:8.
17. Shida D, Wakamatsu K, Tanaka Y, Yoshimura A, Kawaguchi M, Miyamoto S, et al. The postoperative patient-reported quality of recovery in colorectal cancer patients under enhanced recovery after surgery using QoR-40. BMC Cancer. 2015; 15:799.
18. Yolcu S, Akin S, Durna Z. Evaluation of patients' recovery status and care needs after orthopedic, cardiac, and general surgery. Health Soc. 2015; 25(3): 33-45.
19. Forsberg A, Vikman I, Wälivaara BM, Engström Å. Patterns of changes in patients' postoperative recovery from a short-term perspective. J Perianesth Nurs. 2018; 33(2): 188-99.
20. Jaensson M, Dahlberg K, Nilsson U. Factors influencing day surgery patients' quality of postoperative recovery and satisfaction with recovery: a narrative review. Perioper Med (Lond). 2019;8:3.
21. Forsberg A, Vikman I, Wälivaara BM, Engström Å. Patients'perceptions of their postoperative recovery for one month. J Clin Nurs. 2015; 24(13-14): 1825-36.
22. Berg K, Kjellgren K, Unosson M, Arestedt K. Postoperative recovery and its association with health-related quality of life among day surgery patients. BMC Nurs. 2012; 11(1): 24.
23. Suerdem B, Totur Dikmen B. Preoperative care dependency and postoperative quality of recovery of the surgical patients. Acta Paul Enferm. 2024; 37.
24. Kubat Bakir G, Yurt S. Evaluation of the comfort level of patients undergoing surgical operations. J Health Soc. 2020; 20(3): 158-65.

25. Allvin R, Berg K, Idvall E, Nilsson U. Postoperative recovery: a concept analysis. J Adv Nurs. 2007; 57(5): 552-8.

26. Nilsson U, Jaensson M, Dahlberg K, Hugelius K. Postoperative recovery after general and regional anesthesia in patients undergoing day surgery: a mixed methods study. J Perianesth Nurs. 2019; 34(3): 517-28.

27. Berg K, Arestedt K, Kjellgren K. Postoperative recovery from the perspective of day surgery patients: a phenomenographic study. Int J Nurs Stud. 2013; 50(12): 1630-8.

28. Phelps EE, Tutton E, Griffin X, Baird J; TrAFFix research collaborators. A qualitative study of patients' experience of recovery after a distal femoral fracture. Injury. 2019; 50(10): 1750-55.

29. Harding MM, Kwong J, Hagler D, Reinisch C. Lewis's medical-surgical nursing. 12th ed. St. Louis: Elsevier; 2023.

30. Kehlet H. Enhanced postoperative recovery: good from afar, but far from good? Anaesthesia. 2020; 75(1): e54-e61.

31. O'Neill L, Bennett AE, Guinan E, Reynolds JV, Hussey J. Physical recovery in the first six months following oesophago-gastric cancer surgery. Identifying rehabilitative needs: a qualitative interview study. Disabil Rehabil. 2021; 43(10): 1396-403.

32. Sibbern T, Bull Sellevold V, Steindal SA, Dale C, Watt-Watson J, Dihle A. Patients' experiences of enhanced recovery after surgery: a systematic review of qualitative studies. J Clin Nurs. 2017; 26(9-10): 1172-88.

33. Heidegger T, Saal D, Nübling M. Patient satisfaction with anaesthesia - Part 1: satisfaction as part of outcome - and what satisfies patients. Anaesthesia. 2013; 68(11): 1165-72.

34. Bruder N, Auquier P. Integration of satisfaction and quality of recovery. Best Pract Res Clin Anaesthesiol. 2018; 32(3-4): 277-86.

35. Royse CF, Chung F, Newman S, Stygall J, Wilkinson DJ. Predictors of patient satisfaction with anaesthesia and surgery care: a cohort study using the postoperative quality of recovery scale. Eur J Anaesthesiol. 2013; 30(3): 106-10.

36. Bowyer A, Royse C. The importance of postoperative quality of recovery: influences, assessment, and clinical and prognostic implications. Can J Anaesth. 2016; 63(2): 176-83.