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Relationships between quality of life and the idea of undergoing anesthesia in patients scheduled for elective surgery

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Abstract

Preoperative anesthesia-related anxiety is a major problem. Our aim was to investigate the effect of the idea of undergoing anesthesia on the quality of life of patients scheduled for elective surgery by evaluating preoperatively and postoperatively. All patients who were referred to the outpatient clinic of the Anesthesiology and Reanimation Department for preoperative assessment from May 2011 to December 2011 were informed about the study plan. Patients were evaluated with the SF-36 scale during their final examination and also after surgery. We found that the postoperative Mental Component Summary (MCS) domain demonstrated statistically significant increase compared to preoperative scores (51.3 ± 12.0 and 50.6 ± 12.7 respectively, p = 0.014). There were no significant differences between the preoperative and postoperative periods in terms of the Physical Component Summary (PCS) domain or any other subdimensions (p>0.005). When evaluated according to age groups, preoperative and postoperative PCS and MCS scores were found to be consistently higher in the 18–35 age group compared to older groups (p <0.05 for all). Higher level of education was also found to be associated with better SF-36 scores in all preoperative and postoperative comparisons of PCS and MCS scores (p <0.001 for all). Patients with physical disability had significantly lower PCS and MCS scores (preoperative and postoperative) compared to those without physical disability (p<0.01 for all). Patients without prior anesthesia experience had significantly higher postoperative PCS scores compared to those who had undergone anesthesia before this study (p = 0.021); all other comparisons were similar.

Keywords: Elective surgery, anesthesia, quality of life

Introduction

Patients scheduled for surgery can experience various types of psychological problems in the preoperative period, including anxiety about receiving anesthesia, worries about the risk of death, fear of disability and being unable to work, fear of losing control over their body, and fear of losing sexual competence. Studies have reported that around 60–80% of patients are anxious in the preoperative period [1, 2].

Informing patients about the anesthesia and intervention to be applied facilitates adaptation and increases coping by providing insight. Many studies have shown that patients feel happier and more peaceful when they are informed in detail about their disease and its treatment. Providing sufficient information also leads to reduced analgesic need, shorter hospital stay and accelerated rehabilitation [3].

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Alone with other reasons, anxiety about receiving anesthesia also increases anxiety and affects the quality of life of patients.

Although survey studies have been conducted to reveal preoperative causes for anxiety and its severity, the effect of the idea of receiving anesthesia on quality of life has not been investigated. Quality of life is a combination of a person's physical, social, psychological, emotional or mental state and is of great importance in health and disease [4]. The World Health Organization (WHO) defines quality of life as a concept that includes the psychological and social functions of the individual as well as physical functions [5]. Due to the increase in life expectancy and the fact that longer life often translates to living longer with chronic diseases, the assessment of quality of life in disease-related conditions has become crucial.

Previous studies have examined the effect of surgical interventions on quality of life. Although there are many studies that have investigated the anesthesia-related concerns of patients, the effect of being scheduled for anesthesia due to a planned elective surgery on patients' quality of life has not been studied. Therefore, here we aimed to investigate the effects of the idea of receiving anesthesia on quality of life in patients scheduled for elective surgery by

evaluating the preoperatively and postoperatively.

Materials and Methods

Approval for the study was obtained from the Ethics Committee of Mersin University Medical Faculty Hospital (Date: 22.04.2011, decision no: 2011/85). All patients that had been scheduled for elective surgeries and were evaluated in the outpatient clinic of our Anesthesiology and Reanimation Department between May 2011 and December 2011 were evaluated for inclusion in the study. A total of 1050 individuals accepted to participate after they were provided with detailed information about the study.

Inclusion criteria were: being aged between 18–75 years, being literate and agreeing to participate. Exclusion criteria were: undergoing non-elective surgery, having any maxillofacial anomaly that would complicate anesthesia, being diagnosed with any major psychiatric disorder (depressive, anxiety-related, bipolar) at any time in their life, having cardiac or neurological diseases that could adversely effect the outcome of surgery or anesthesia, being allergic to any type of anesthetic, having neurological damage (cerebrovascular event, traumatic injury etc.), and being pregnant or continuing to breastfeed.

A standard form, containing information such as, age, gender, educational status, occupation, previous anesthesia experience, presence of psychiatric disease, was filled routinely by patients in the outpatient clinic. In the physical examination of the patients; cervical lordosis, paravertebral muscle spasm and tenderness, tenderness at Arnold points, and range of motion (ROM) were evaluated. Compression test, distraction test and spurling test were applied. Cases with physical disability were recorded. Preoperative ASA (American Society Anesthesiologist) classification of the patients was performed and results were recorded. This classification system that was developed by the American Society of Anesthesiologists is frequently used to determine anesthesia-related risks in combination with other factors, since it enables the prediction of perioperative risks [6]. In our study, this evaluation was performed on the day of anesthesia.

Quality of life assessment

The Short Form-36 (SF-36) was used to measure the general quality of life of the patients. The SF-36 Quality of Life Scale is a short questionnaire with 36 items that can be used for the assessment of individuals with and without disease. This scale evaluates 8 dimensions which can be listed as follows: physical function (PF), social function (SF), physical role (PR), bodily pain (BP), mental health (MH), emotional role (ER), vitality (VT), and general health (GH). The questions of the subscales are weighted and summed and the physical component summary (PCS) and mental component summary (MCS) scores are obtained. All scores range from zero to one hundred. Lower scores correspond to lower health status, while higher scores indicate better health [7]. The SF-36 is a self-assessment scale and its Turkish reliability and validity study has been conducted [8]. The patients were asked to fill the SF-36 questionnaire preoperatively (before the day of admittance for surgery) and postoperatively (immediately before discharge).

Statistical analysis

All analyses were performed on SPSS v21 (SPSS Inc., Chicago, IL, USA). For the normality check, the Shapiro-Wilk test was used. Data are given as mean ± standard deviation for continuous variables. Normally distributed variables were analyzed with two-way repeated measures analysis of variances (ANOVA). Non-normally distributed variables were analyzed with the Wilcoxon Signed Ranks test for repeated measurements. Between-group comparisons of these variables were performed by the Mann Whitney U test or Kruskall Wallis test –depending on the number of groups compared. Pairwise comparisons were performed with the Bonferroni correction method. Analyses with $p<0.05$ values were accepted as statistically significant.

Results

Among the 1050 participants, 54.7% (n=574) were women, 84.1% (n=883) were between the ages of 18–55 years. More than half (57%, n=599) had previous experience with anesthesia. General anesthesia was applied in 94.4% of the cases. The leading clinics in terms of number of surgeries performed on subjects included in this study were: Obstetrics and Gynecology (21.2%), General Surgery (18.5%), Otorhinolaryngology (18.5) and Urology (16%). Together, these clinics were responsible for almost 75% of the surgeries. The summary of patients' characteristics is shown in Table 1.

When comparisons with regard to the quality of life were performed, we found that the postoperative MCS domain (including vitality, social functioning, emotional role, and mental health subdimensions) demonstrated a marginal but statistically significant increase compared to preoperative scores (51.3 ± 12.0 and 50.6 ± 12.7 respectively, $p = 0.014$). There were no significant differences between the preoperative and postoperative periods in terms of the PCS domain or any other subdimensions. Preoperative and postoperative SF-36 scale scores are shown in Table 2.

Next, we evaluated and compared domain scores (PCS and MCS) based on patient characteristics. The results demonstrated that all subgroups were similar when preoperative scores were compared to postoperative scores. This was especially interesting for the fact that patients who did not have prior anesthesia experience also did not have any significant changes in time-bound comparisons ($p = 0.250$ for PCS and $p = 0.509$ for MCS) (Table 3).

There were no gender-related differences in terms of preoperative or postoperative PCS or MCS scores in any comparison. When evaluated according to age groups, preoperative and postoperative PCS and MCS scores were found to be consistently higher in the 18–35 age group compared to older groups ($p <0.05$ for all). There was no significant difference between the 56-75 age group and the 36-75 age group in terms of preoperative and postoperative PCS and MCS scores ($p>0.05$ for all) (Table 3). Higher level of education was also found to be associated with better SF-36 scores in all preoperative and postoperative comparisons of PCS and MCS scores ($p <0.001$ for all). Additionally, although the number of patients with physical disability was comparatively very low (n=50), they had significantly lower PCS and MCS scores (preoperative and postoperative) compared to those without physical disability ($p<0.01$ for all). Patients without prior anesthesia experience had significantly higher postoperative PCS scores compared to those who had undergone anesthesia before this study ($p = 0.021$); all other comparisons were similar. Finally, we also found no differences in any comparison of MCS and PCS scores with regard to the type of anesthesia (Table 3)

Table 1. Summary of patients' characteristics

Gender	Female	574 (54.7)
	Male	476 (45.3)
Age (years)	18-35	421 (40.1)
	36-55	462 (44.0)
	56-75	167 (15.9)
Education	Literate	38 (3.6)
	Primary school	478 (45.6)
	Secondary school	288 (27.4)
	High school or higher	246 (23.4)
Experience of anesthesia	Yes	599 (57.0)
	No	451 (43.0)
Physical problem	Yes	50 (4.8)
	No	1000 (95.2)
ASA classification	1	594 (56.6)
	2	406 (38.7)
	3	49 (4.7)
	4	1 (0.1)
Type of anesthesia	General	991 (94.4)
	Regional	59 (5.6)
Surgical clinic	General surgery	194 (18.5)
	Urology	168 (16.0)
	Cardiovascular surgery	10 (1.0)
	Otorhinolaryngology	194 (18.5)
	Orthopedics and traumatology	106 (10.1)
	Plastic and reconstructive surgery	99 (9.4)
	Neurosurgery	25 (2.4)
	Ophthalmology	22 (2.1)
	Obstetrics and gynecology	223 (21.2)
	Thoracic Surgery	9 (0.9)

Data are given as frequency (percentage)
ASA: American Society of Anesthesiologists

Table 2. SF-36 subscale scores before and after operations.

QoL domains	Period		
	Preoperative	**Postoperative**	**p**
Physical functioning	70.5 ± 27.3	68.6 ± 28.5	0.111
Physical role	56.2 ± 41.7	58.1 ± 40.4	0.289
Bodily pain	36.7 ± 25.5	38.1 ± 28.2	0.212
General health	51.1 ± 12.1	51.6 ± 14.8	0.426
Physical component summary (PCS)	53.6 ± 13.5	54.1 ± 13.5	0.125
Vitality	50.6 ± 12.7	51.1 ± 13.6	0.381
Social functioning	45.0 ± 18.4	43.9 ± 14.7	0.133
Emotional role	54.6 ± 42.0	57.9 ± 40.3	0.067
Mental health	52.1 ± 12.2	52.3 ± 12.1	0.721
Mental component summary (MCS)	50.6 ± 12.7	51.3 ± 12.0	0.014

Data are given as mean ± standard deviation
QoL: Quality of life

Table 3. Comparison of PCS and MCS domain scores based on patient characteristics and time-bound analysis.

		SF-36 QoL domains					
		PCS			MCS		
		Preop	Postop	p-value	Preop	Postop	p-value
Gender	Female (n=574)	53.4 ± 12.7	53.7 ± 13.0	0.693	50.8 ± 12.9	51.1 ± 12.0	0.694
	Male (n=476)	53.8 ± 12.7	54.5 ± 14.1	0.421	50.3 ± 12.6	51.6 ± 11.9	0.102
	p-value	0.634	0.326		0.511	0.506	
Age (years)	18-35 (n=421)	55.7 ± 11.2	56.0 ± 11.9	0.707	51.9 ± 11.8	52.6 ± 11.6	0.386
	36-55 (n=437)	53.1 ± 13.3	53.5 ± 14.0	0.589	49.6 ± 12.8	50.3 ± 11.8	0.401
	56-75 (n=192)	50.2 ± 13.6	51.2 ± 14.8	0.491	49.9 ± 14.3	50.6 ± 12.8	0.614
	p-value	p1<0.001 p2<0.001 p4=0.058	p1=0.002 p2<0.001 p4=0.190		p1=0.017 p2=0.051 p4=0.058	p1=0.015 p2=0.051 p4=1.0	
Education	Literate (n=38)	46.4 ± 11.5	46.0 ± 12.5	0.885	46.0 ± 10.5	43.7 ± 13.0	0.399
	Primary (n=478)	51.2 ± 13.4	52.2 ± 14.8	0.274	48.5 ± 13.4	49.5 ± 12.1	0.226
	Secondary (n=288)	55.5 ± 12.0	55.3 ± 12.1	0.842	50.9 ± 11.9	51.9 ± 11.3	0.302
	High (n=246)	57.2 ± 11.0	57.7 ± 11.2	0.618	54.8 ± 11.6	55.1 ± 11.1	0.770
	p-value	p1=0.147 p2<0.001 p3<0.001 p4<0.001 p5<0.001 p6=0.424	p1=0.051 p2<0.001 p3<0.001 p4=0.003 p5<0.001 p6=0.162		p1=1.0 p2=0.077 p3<0.001 p4=0.031 p5<0.001 p6=0.001	p1=0.045 p2=0.001 p3<0.001 p4=0.031 p5<0.001 p6=0.008	
Experience of anesthesia	Yes (n=599)	53.2 ± 13.0	53.3 ± 13.2	0.895	50.5 ± 13.1	50.9 ± 12.0	0.683
	No (n=451)	54.1 ± 12.3	55.2 ± 13.8	0.250	50.7 ± 12.3	51.8 ± 12.0	0.509
	p-value	0.267	0.021		0.143	0.250	
Physical disability	Yes (n=50)	46.2 ± 11.6	46.2 ± 12.7	1.000	45.1 ± 10.4	46.3 ± 12.0	0.651
	No (n=1000)	54.0 ± 12.7	54.5 ± 13.4	0.074	50.8 ± 12.8	51.5 ± 11.9	0.089
	p-value	<0.001	<0.001		<0.001	0.003	
Type of anesthesia	General (n=991)	53.7 ± 12.8	54.2 ± 13.5	0.088	50.5 ± 12.7	51.3 ± 11.9	0.373
	Regional (n=59)	52.4 ± 11.4	52.4 ± 13.0	1.000	51.3 ± 13.5	51.6 ± 12.8	1.000
	p-value	0.448	0.333		0.637	0.842	

Data are given as mean ± standard deviation. QoL: Quality of life, PCS: Physical component summary, MCS: Mental component summary
Comparisons: p1; category 1 vs category 2, p2; category 1 vs category 3, p3; category 1 vs category 4, p4; category 2 vs category 3, p5; category 2 vs category 4, p6; category 3 vs category 4

Discussion

Pre-anesthetic anxiety is a condition that can negatively affect the quality of life of patients. In this study, in which the preoperative and postoperative quality of life of the patients were examined, it was found that age, educational status and physical disabilities affected the quality of life in both periods. Among these, age and physical disabilities may be factors that are inherently associated with quality of life, but the fact that receiving a higher level of education is also greatly associated with higher quality of life is an important result. The type of anesthesia had no effect on the quality of life.

Although there are many studies examining the preoperative anesthesia concerns of patients, there is very little data on the effect of being subject to anesthesia on the quality of life of patients (regardless of the type of surgery) both in the preoperative and postoperative periods. Therefore, there was very little information in the literature that could be compared with our findings. In previous studies, the quality of life before and after different types of surgeries was examined. Kuan et al. reported that there was no significant change in any of the SF-36 domains before and after endoscopic pituitary surgery. In addition, they reported that tumor size was the only variable that showed a significant relationship with postoperative quality of life scores [9]. Another study reported that the postoperative quality of life of patients reached similar levels with the general population [10]. Mousavi et al. showed that, after rhinoplasty surgery, all scores of the patients except physical functioning and physical role had improved significantly [11]. Shamsaeefar et al. reported that all SF-36 domains, except general health, were significantly improved postoperatively in patients who had undergone liver transplantation [12]. Dacha et al. reported a significant improvement in all dimensions of the SF-36 after pyloromyotomy [13]. Netto et al. showed a significant improvement in all dimensions except for general health and mental health after lumbar spine surgery [14]. Erdivanli et al. reported that all domains except social function and bodily pain improved significantly after septoplasty [15]. When the studies are examined overall, features such as the size and region of the surgical operation to be performed, what it means to the patient, the level of well-being that the operation will provide to the patient, expectations, mood states of the patients, and anxiety levels seem to be the important determinants of quality of life before and after surgery. In our study, the results of all patients undergoing anesthesia were examined without classification according to these variables, since our aim was to determine whether the idea of being subject to anesthesia (with the surgery as an unavoidable confounding effect) had an impact on quality of life. Based on the studies conducted in the literature, and with the guidance of the results of our study, regardless of the type of surgical operation, it is expected that the quality of life will improve, albeit marginally, in the postoperative period compared to the preoperative period.

Age is an important variable that affects almost every aspect of quality of life. In our study, a statistically significant difference was found in the comparison of PCS and MCS scores between age groups, both preoperatively and postoperatively. SF-36 scale scores decreased as age increased, meaning the quality of life was decreasing. According to the results of the Turkish validity and reliability study of WHO Quality of Life Module for the Elderly, the lower quality of life results of elderly people was expected. This may be associated with loss of sensory functions and the inability to perform daily activities, as shown previously [16]. Quality of life studies in healthy individuals or chronic patients also indicate that the quality of life decreases with increasing age [17]. Although there are few studies evaluating the quality of life according to age classification, there is no study examining the effect of anesthesia on the quality of life in the elderly. Although the lower levels of quality of life was apparent in the elderly, their results were consistent at preoperative and postoperative analysis –similar to younger groups.

In our study, no statistically significant difference was found in the comparisons of preoperative and postoperative PCS and MCS scores by gender. In different studies conducted in Finland, Taiwan, Poland, Croatia, Japan and Iran, it was determined that women have lower health-related quality of life compared to men [18-22]. Younossi et al. and Van der Plas et al. stated that the quality of life in patients with liver transplantation does not differ according to gender [23, 24]. From an epidemiological standpoint, the fact that women generally have higher frequency of depression and anxiety disorders than men may result in lower quality of life in women. While Badner et al. attributed this difference to the higher anxiety of women due to separation from their families in surgery [1], Shevde and Panagopoulos and Domar et al. attributed this difference to women's ability to express their surgical concerns more easily than men [25, 26]. In another study, although male patients stated that they felt better emotionally (compared to female patients), vasovagal syncope was found more frequently in men during spinal anesthesia [27]. This may be due to the fact that men do not fully express their feelings in order to show that they are more resilient. There are also studies showing that hormonal differences between genders affect the level of anxiety [28].

Another feature examined in our study was the effect of educational status on quality of life. Both preoperative and postoperative PCS and MCS scores were statistically significantly different according to educational status. As the education level increased, the quality of life of the patients increased. In studies conducted with patients who underwent surgery for renal transplantation, Muehrer and Becker and Matas et al. reported that the quality of life significantly increased with the increase in education level, but no significant relationship was found between educational status and quality of life [29, 30]. On the other hand, Yıldırım determined that there was a significant relationship between education level and quality of life [31]. Different results found in the studies suggested that the personal characteristics of the individual affect the quality of life together with the level of education. However, our results that demonstrate consistently higher levels of quality of life among patients with higher education indicate that individuals with lower education must receive more detailed information in order to reduce peroperative anxiety.

Anxiety associated with various events may decrease when people re-experience such events. In our study, a statistically significant difference was found in the comparison of postoperative PCS scores according to the anesthesia experience of the patients; however, this effect was not present among individuals when MCS scores were compared. However, surprisingly, postoperative PCS scores were higher in patients without prior anesthesia experience.

We attributed this difference to the perception of anesthesia-related outcomes among individuals who had not undergone anesthesia before. In other words, patients who had not undergone anesthesia before could have been expecting worse outcomes, which may have resulted in higher scores when such adverse results were not experienced.

Physical disabilities can also negatively affect quality of life independently. In our study, both preoperative and postoperative PCS and MCS scores were significantly different between groups determined according to the presence/absence of physical disability. Ambulatory difficulties, dependence in daily activities, activity limitation due to chronic pain, and social isolation occur in individuals with chronic physical disabilities, causing a decrease in life satisfaction and quality of life [32, 33]. As expected, in our study, the quality of life determined according to both the PCS score and the MCS score in the preoperative and postoperative period was higher in the patient group without any physical disabilities.

In some other studies, it has been reported that mood states and waiting time before surgery affect the quality of life. Netto et al. reported that patients with postoperative depression symptoms have significantly worse quality of life [14]. In a similar study, Katz et al. also showed that patients with depression symptoms after surgery had more negative results [34]. Desmeules et al. reported that waiting time before knee replacement surgery significantly affected the physical function score [35]. In our study, various such features that may influence quality of life before and after surgery were not examined. The omission of these variables may have led to the selection of patients with more positive or negative characteristics and could have indirectly caused selection bias. However, since the attending physicians of these patients were from other departments before being referred to us for pre-surgical assessment, we could not control or directly assess some of these characteristics, and no additional analysis was performed in our study to rule out these situations.

Although the anxiety levels of the patients were not examined in our study, it was assumed that anxiety was effective in the change in the quality of life before and after anesthesia. As a matter of fact, it has been shown in different studies that anxiety increases before anesthesia [36, 37]. Anxiety, which occurs with the idea of surgical intervention and anesthesia in the preoperative period, can affect the quality of life of patients by negatively influencing vital functions and activities. In a study examining the causes of anesthesia-related anxiety of patients, Shevde and Panagopoulos reported that patients' fear of anesthesiologist's lack of knowledge (45%), lack of experience (43%), the possibility of not waking up (37%) and postoperative pain (34%) were effective on anxiety [25]. While Chew et al. reported pain (39.4%) and not being able to wake up after surgery (18.9%) as the most frequent anxiety-inducing causes before anesthesia [38], another study, by Zvara et al. reported that the most common causes of anxiety were awakening during surgery (51.8%), not being able to wake up after surgery (43.4%) and pain (38%) [39]. Based on the results of these studies and our study, it can be said that anesthesia-related anxiety could have important effects on quality of life, especially in the preoperative period. However, this result was not evident in the MCS scores of patients in the current study. It may be advisable to perform further studies with the addition of state and trait anxiety analysis (via the STAI scale).

Although the effect of the anxiety of anesthesia on quality of life was examined in our study, anxiety-specific results could not be obtained because the anxiety level of the individuals was not examined. The size of the surgical operation, the waiting time for this surgical operation, and the postoperative advantages (life standards, daily activities, socialization, etc.) may have affected both preoperative and postoperative results. These were not examined in our study. Although we attributed the results to the idea of undergoing anesthesia, the idea of undergoing surgery might also have affected the results. Additionaly, we compared only preoperative and early postoperative results. The effects of the idea of receiving anesthesia and surgery on quality of life would probably affect all perioperative period. A comparison of the preoperative scores with late postoperative scores might give different results. We recommend examining the possible effect on all perioperative period in future studies.

Conclusion

Age, educational status and physical disabilities affect both preoperative and postoperative quality of life. Anesthesia experience only affected postoperative PCS scores. The type of anesthesia applied is not associated with any of the domains of quality of life. Although the results of our study are not surprising, it can be said that more accurate and valid results can be obtained by examining the relationship between the type of surgery (minor surgery, major surgery, tumor surgery, any surgery that will result in organ-tissue loss, etc.) and the quality of life in future studies. The addition of anxiety scales may also be beneficial in future studies.

Conflict of interests
The authors declare that they have no competing interests.

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All authors declare no financial support.

Ethical approval
Approval for the study was obtained from the Ethics Committee of Mersin University Medical Faculty Hospital (Date: 22.04.2011, Decision no: 2011/85).

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