



Assessment of Anxiety, Depression, Self-Esteem, and Quality-of-Life in Patients Undergoing Surgical Removal of an Eye

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Abstract

Objectives: The objective of this study was to compare anxiety, depression, self-esteem, and quality of life in patients who underwent surgical removal of an eye with those of controls as well as to test the correlations of these variables in both groups.

Methods: Beck anxiety inventory (BAI), Beck depression inventory (BDI), 36-item short-form health survey (SF-36), and Rosenberg self-esteem scale were administered to 29 patients with surgical removal of an eye and 30 control subjects.

Results: The patient group had significantly lower scores on physical functioning, role limitations due to physical and emotional problems, pain, and general health perception domains of SF-36, as well as significantly higher BDI ($p=0.004$) scores as compared to controls. The study groups did not differ significantly with respect to BAI scores and energy/vitality, mental health, and social functioning domain scores of SF-36 ($p>0.05$).

Conclusion: This population of monocular patients had similar mental health-related and Beck's Anxiety Inventory scores equivalent to the control group despite the surgical removal of one eye. However, lower scores for some SF-36 domains and higher depression levels in this patient group suggest that psychiatric rehabilitation should be considered after eye removal to improve the psychological outcomes and quality of life in these patients.

Keywords: Anophthalmia, anxiety, depression, evisceration, quality of life, self-esteem levels.

Introduction

Coping problems, concerns of physical appearance, driving difficulties, and depression are among the possible consequences of the detrimental effects of anophthalmia (1,2). Hallucinations related to vision loss, which can be exhausting, can be seen in a small number of patients (3,4). In addition,

loss of eye may lead to phantom pain and headaches (5,6). Gaining better insight into such an experience would help managing the difficulties associated with this condition (7,8).

To avoid mental problems, proper surgical techniques should be employed to obtain optimal cosmetic results in patients requiring eye removal (9). In most instances, orbital implants are used to alleviate orbital volume deficiency, and

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successful restoration of lifestyle function requires acquiring a cosmetically acceptable ocular prosthesis. An ocular prosthesis with good motility can fulfill this requirement in patients with intact eyelids and the conjunctiva (socket). An adequate and successful prosthesis would help preventing the unfavorable effects of surgery on the quality of life (10).

Fear of isolation and inferiority feeling are among the social issues arising after enucleation or evisceration, which are themselves highly distressing and traumatic experiences (11). Some patients can even be overwhelmed by displays of excessive sincerity or frequent offerings of unsolicited help. Aligned with this observation, research employing general health-related quality-of-life metrics like 36-item short form health survey (SF-36) has documented diminished scores among individuals with anophthalmia in comparison to their healthy counterparts (12). However, studies examining mental status, quality of life, and self-esteem in anophthalmic patients reported conflicting results suggesting different levels of mental/physical effects on the lives of these patients (2,12-24).

Given this data, our study aimed to explore the connection between eye removal, psychosocial well-being, and quality of life in individuals with anophthalmia. We employed various established survey instruments in an effort to identify anophthalmic patients who may benefit from additional physical and mental support. In addition, the correlations between different scale scores were tested in both patient and control groups.

Methods

This prospective cross-sectional investigation, carried out between September 2016 and November 2017, obtained approval from the Local Ethics Committee (Ethics Committee for Clinical Studies of the University of Health Sciences, Şişli Hamidiye Etfal Hospital; granted on October 17, 2017; under protocol number 853). The study protocols strictly adhered to the tenets delineated in the Declaration of Helsinki, and all enrolled patients willingly affixed their signatures, providing written informed consent before their inclusion in the study.

Enrollment in the study comprised individuals who had undergone surgical removal of an eye (via enucleation or evisceration) for any medically warranted reason at our Ophthalmology Unit. Inclusion criteria dictated normal best-corrected vision in the unaffected eye and the receipt of a well-fitted ocular prosthesis. Noteworthy facial asymmetry or substantial physical disabilities were grounds for exclusion.

Control subjects were drawn from the general population, meeting the criterion of having better-than-20/40 best-corrected vision in both eyes. A comprehensive questionnaire was administered to all participants, covering sociodemographic aspects such as age, gender, marital status, education, occupation, financial status, eye-related illnesses,

and prior ophthalmic surgeries. In addition, participants completed questionnaires evaluating psychological well-being and quality of life.

The evaluation instruments utilized in this study comprised the Beck anxiety inventory (BAI), originally formulated by Beck et al. in 1988 and adapted to Turkish by Ulusoy et al. in 1998. The BAI is a self-report tool consisting of 21 items, utilizing a 3-point Likert scale. Scores range from 0 to 63, with higher values indicating heightened levels of anxiety. The Beck depression inventory (BDI) utilized in our research was a version translated from the Arabic rendition, focusing on assessing emotional and behavioral aspects of general depression and its impact on health-related quality of life. Developed by Morris Rosenberg in 1965, the Rosenberg self-esteem scale (RSES) gauged self-esteem through ten items on a four-point Likert scale. The SF-36 Health Survey, a comprehensive measure of health status, encompassed eight domains. An SF-36 m score (average of eight domains) \leq median was considered indicative of a poor quality of life outcome.

Statistical Analysis

Statistical analyses were executed using SPSS v.15.0 (SPSS Inc., Chicago, IL, USA). Descriptive statistics were presented for categorical variables in terms of numbers and percentages, while numerical variables were characterized by mean, standard deviation, median, and range. The Mann-Whitney U-test was employed to compare numerical variables between the two independent groups, given the non-normal distribution. Chi-squared testing scrutinized categorical variables, with Monte Carlo simulation applied when prerequisites were unmet. Spearman correlation analysis investigated relationships between numeric variables. Statistical significance was established at a $p < 0.05$.

Results

This research involved 29 individuals (21 male and eight female) who underwent eye removal surgery for diverse reasons (Table 1), and a control group of 30 participants (16

Table 1. Indications for surgery.

Reason for evisceration surgery	Number of patients
Perforation	4
Traumatic pthisis	17
Band keratopathy	7
Infectious disease	2
Endophthalmitis	1
Congenital microphthalmia	1
Absolute glaucoma	1
Retinal detachment	1

male, 14 female). The anophthalmic patient cohort, with an average age of 39.2 ± 15 years, was compared to a binocular control group averaging 36.2 ± 9.1 years. Traumatic phthisis emerged as the predominant indication for surgery, accounting for 50% of cases. Sociodemographic scrutiny (Table 2) exposed noteworthy distinctions in education and income between the patient and control cohorts ($p < 0.001$), with the patient group displaying lower levels of both income and education. In addition, the prevalence of smoking/alcohol use was significantly higher in the patient group compared to the controls ($p = 0.027$).

Elevated scores on the BDI and RSES) were noted in the patient group in comparison to the controls. Furthermore, the patient group demonstrated significantly lower

scores in physical functioning, role limitations due to physical and emotional problems, pain, and general health sensation based on SF-36 (Table 3) ($p = 0.004$, $p = 0.002$, $p = 0.004$, $p = 0.001$, $p = 0.037$, $p = 0.004$, and $p = 0.023$, respectively). No statistically significant variations were observed in BAI scores or SF-36 scores pertaining to vitality, mental health, or social functioning (Table 3) ($p > 0.05$). Despite a significantly higher average RSES score in the patient group, a lesser frequency of high self-esteem was noted in this group (Table 4) ($p = 0.011$).

Within the patient cohort, a statistically significant positive correlation was established between age and Beck anxiety scores ($p = 0.036$). Nevertheless, no statistically significant correlations were discerned between the evaluated scales

Table 2. The socio-demographic data of the patients.

	Patient Group		Control		p
	Avg.±SD	Min-Max	Avg.±SD	Min-Max	
Age	39.2 ± 15.0	18-74	36.2 ± 9.1	25-61	0.785
	n	%	n	%	p
Gender					
Male	21	72.4	16	53.3	0.130
Female	8	27.6	14	46.7	
Education					
Primary school	17	58.6	0	0.0	<0.001
Secondary school	7	24.1	0	0.0	
High school	3	10.3	1	3.3	
University	2	6.9	29	96.7	
Marital Status					
Married	16	55.2	18	60.0	0.708
Single	13	44.8	12	40.0	
Income					
Low	12	41.4	0	0.0	<0.001
Middle	15	51.7	30	100	
High	2	6.9	0	0.0	
Past psychiatric disorders	5	17.2	1	3.3	0.077
Additional diseases	5	17.2	3	10.0	0.472
Psychiatric disorders in the family	4	13.8	1	3.3	0.195
Suicide	4	13.8	0	0.0	0.052
Alcohol/smoking	17	58.6	9	30.0	0.027
Psychiatric diagnosis	6	20.7	1	3.3	0.052
Psychiatric diagnosis					
Anxiety disorder	3	10.3	0	0.0	
Depression	3	10.3	0	0.0	
Mild depression	0	0.0	1	3.3	

Table 3. Beck Anxiety and Depression, SF-36 and Rosenberg Self-Esteem scores in patient and control groups

	Patient Group			Control			p
	Avg.±SD	Min-Max	Median	Avg.±SD	Min-Max	Median	
Beck Anxiety score	10.8±12.6	0-39	5	5.9±7.1	0-33	3.5	0.229
Beck Depression score	11.8±10.7	0-35	9	3.8±4.4	0-18	2	0.004
Self-esteem	1.00±0.63	0-2.17	1.08	0.52±0.33	0-1.25	0.50	0.002
SF36							
Physical Functioning	79.0±25.5	22-100	90	92.5±17.4	25-100	100	0.004
Role Limitations Due to Physical Problems	62.1±33.8	0-100	50	86.7±30.6	0-100	100	0.001
Role Limitations Due to Emotional Problems	63.1±43.1	0-100	100	85.6±32.4	0-100	100	0.037
Energy/Vitality	68.2±20.8	25-100	68	68.4±18.3	15-95	73	0.903
Mental Health	68.5±21.3	24-100	70	71.4±13.4	40-92	76	0.784
Social Functioning	78.0±19.8	37.5-100	75	85.0±15.7	50-100	88	0.171
Pain	72.2±22.7	10-100	80	87.8±15.0	58-100	90	0.004
General Health Perception	58.5±19.2	12-84	58	69.9±14.0	37.5-100	71	0.023

Table 4. Self-esteem values (low, medium and high) in patient and control groups

	Patient Group		Control		p
	n	%	n	%	
Self-esteem					
Low	0	0,0	0	0,0	0,011
Medium	6	20,7	0	0,0	
High	23	79,3	30	100	

and income or education levels (Table 5). Analysis based on gender within the patient group did not unveil statistically significant differences in the assessed scales (Table 6).

The SF36 role limitations due to emotional problems and pain scale mean scores of those patients with past psychiatric disorders were statistically significantly lower than those patients with no psychiatric disorders (Table 7) (p=0.015 p=0.008).

The SF36 energy/vitality sub-scale scores of the patients with additional diseases were statistically significantly lower than those patients with no additional diseases (Table 8).

Table 5. Effect of age, education and income levels on Beck Anxiety and Depression, Self-Esteem and SF-36 scores

	Age		Education		Income	
	rho	p	rho	p	rho	p
Patient Group						
Beck Anxiety score	0.392	0.036	-0.194	0.313	-0.025	0.899
Beck Depression score	0.363	0.053	-0.011	0.954	-0.101	0.603
Self-Esteem	0.134	0.488	0.041	0.834	0.226	0.239
SF36 physical functioning	-0.135	0.484	0.011	0.956	-0.065	0.739
SF36 role limitations due to physical problems	0.055	0.778	-0.175	0.365	0.017	0.930
SF36 role limitations due to emotional problems	-0.190	0.324	0.068	0.726	-0.210	0.274
SF36 energy/vitality	0.035	0.856	-0.062	0.749	-0.261	0.172
SF36 mental health	-0.059	0.762	-0.109	0.574	-0.101	0.603
SF36 social functioning	-0.173	0.370	0.252	0.187	0.068	0.725
SF36 pain	0.163	0.397	-0.190	0.324	-0.294	0.122
SF36 general health perception	0.026	0.894	0.085	0.661	-0.353	0.061

Table 6. Distribution of Beck Anxiety and Depression, Self-Esteem and SF-36 scores according to gender

Patient Group	Gender						p
	Male			Female			
	Avg.	SD	Median	Avg.	SD	Median	
Beck Anxiety score	9.6	11.8	5	14.0	15.0	9	0.433
Beck Depression score	12.5	10.8	10	9.8	10.9	7.5	0.464
Self-esteem	1.76	0.44	2.00	1.88	0.35	2	0.509
SF36 physical functioning	78.7	26.5	95	80.0	24.1	90	0.783
SF36 role limitations due to physical problems	60.7	32.2	50	65.6	39.9	75	0.683
SF36 role limitations due to emotional problems	61.8	42.6	100	66.6	47.2	100	0.807
SF36 energy/vitality	65.5	22.7	65	75.4	13.1	72.5	0.211
SF36 mental health	65.8	20.7	70	75.5	22.5	76	0.240
SF36 social functioning	76.8	19.6	75	81.3	21.1	81.25	0.515
SF36 pain	71.8	24.5	80	73.4	18.5	78.75	0.960
SF36 general health perception	56.2	20.1	58	64.4	16.2	62.4	0.449

Table 7. Distribution of Beck Anxiety and Depression, Self-Esteem and SF-36 scores according to past psychiatric disorders

Patient Group	Past psychiatric disorders						p
	Yes			No			
	Avg.	SD	Median	Avg.	SD	Median	
Beck Anxiety score	18.0	18.5	7	9.3	11.0	4.5	0.284
Beck Depression score	16.0	12.3	18	10.9	10.4	8.5	0.340
Self-esteem	1.80	0.45	2	1.79	0.41	2	0.967
SF36 physical functioning	66.0	31.1	80	81.8	24.0	95	0.098
SF36 role limitations due to physical problems	40.0	37.9	50	66.7	31.9	50	0.156
SF36 role limitations due to emotional problems	19.8	18.1	33	72.2	41.4	100	0.015
SF36 energy/vitality	57.6	24.4	60	70.4	19.8	72.5	0.283
SF36 mental health	64.8	26.0	72	69.3	20.7	67	0.839
SF36 social functioning	65.0	27.1	50	80.7	17.4	75	0.202
SF36 pain	44.5	27.6	35	78.0	17.2	80	0.008
SF36 general health perception	52.4	24.4	45	59.7	18.3	59	0.402

Table 9 shows correlations between the scores on different scales in patients and controls. The two groups exhibited almost similar patterns for the correlations between different scales. In both groups, BAI and BDI scores had significant but weak-moderate correlations. Similarly, BDI and SF-36 m (mean of 8 domains) showed significant but weak correlations. A significant correlation between RSES and SF-36 m was evident only in the patient group.

When patients were categorized as having poor (SF-36

$m \leq$ median [74.4]) and good (SF-36 $m >$ median) quality of life outcome, none of the tested demographical variables (age, gender, post-operative months, education level, marital status, income, family history of psychiatric disorder, history of previous psychiatric disorder, suicide attempt, alcohol-to-bacco-substance use, additional comorbidity, $p > 0.05$ for all) except current presence of a psychiatric disorder was associated with poor quality of life outcome (Odds ratio: 18.7, $p = 0.017$).

Table 8. Distribution of Beck Anxiety and Depression, Self-Esteem and SF-36 scores according to additional diseases

Patient Group	Additional diseases						p
	Yes			No			
	Avg.	SD	Median	Avg.	SD	Median	
Beck Anxiety score	15.6	13.7	11	9.8	12.5	4	0.111
Beck Depression score	14.4	10.7	10	11.2	10.8	8.5	0.418
Self-esteem	1.80	0.45	2	1.79	0.41	2.00	0.967
SF36 physical functioning	1.08	0.77	1	0.98	0.61	1.12	0.862
SF36 role limitations due to physical problems	74.0	28.6	90	80.1	25.3	92.5	0.329
SF36 role limitations due to emotional problems	60.0	37.9	75	62.5	33.8	50	0.952
SF36 energy/vitality	26.6	43.4	0	70.8	39.8	100	0.034
SF36 mental health	75.0	18.7	85	66.8	21.3	66.5	0.433
SF36 social functioning	74.4	18.9	76	67.3	21.9	67	0.562
SF36 pain	76.0	26.0	75	78.4	18.9	75	0.859
SF36 general health perception	74.5	25.1	80	71.8	22.8	78.75	0.725

Table 9. Correlations between the scores on different scales in patients and controls

	Patients			
	BAI	BDI	RSES	SF-36m
BAI	-	r:0.496, p:0.006	r:0.108, p:0.575	r:-0.310, p:0.101
BDI		-	r:0.244, p:0.201	r:-0.471, p:0.010
RSES			-	r:-0.415, p:0.025
SF-36m				-
	Controls			
BAI	-	r:0.610, p:0.002	r:0.139, p:0.463	r:-0.333, p:0.072
BDI		-	r:0.261, p:0.218	r:-0.487, p:0.016
RSES			-	r:0.132, p:0.488
SF-36m				-

Data presented as r, p value. SF-36m, mean SF-36 score representing the average of eight domains; BAI, Beck Anxiety Inventory; BDI, Beck Depression Inventory; RSES, Rosenberg Self-Esteem Scale.

Discussion

Our investigation demonstrated diminished SF-36 scores across multiple domains and heightened levels of depression in individuals with anophthalmia when compared to a control cohort. Typically, individuals undergoing eye removal surgery may encounter varying degrees of challenges in resuming regular daily activities, particularly when acquiring new skills becomes necessary. Notably, all participants in our study exhibited favorable cosmetic outcomes in the anoph-

thalmic eye and maintained normal visual acuity in the unaffected eye. The absence of noteworthy disparities in mental health-related aspects of the SF-36 or BAI scores between the patient and control groups suggests a generally successful adaptation to monocular blindness among these patients, despite the loss of an eye. These findings carry substantial implications, potentially reflecting the overall perspective and resilience of individuals facing such conditions.

We used several measurement tools including the BDI, BAI, RSES, and SF-36 to evaluate the physical functioning and mental health of individuals who underwent surgical removal of an eye, which might be a devastating experience with potential impacts on whole aspects of life. Each patient reacts differently to eye loss, whether expected or sudden. We believe that gaining further insights into the psychological and physical effects of this experience may facilitate the development of more effective therapeutic management strategies in these patients. For example, wearing an ocular prosthesis was shown to have a positive influence on pain and general health domain scores of quality of life in these patients (19).

Numerous studies have highlighted a noticeable absence of significant mental health repercussions in comparable populations, reinforcing findings that counteract the presumed negative impact of eye loss. Anxiety and depression were found to be more prevalent among anophthalmic patients than the general population (24-30). Similarly, we found significantly higher BDI scores among patients than in controls but detected no difference in the BAI scores. It is of note to emphasize that patients in this study had lower financial status; thus, the higher level of depression in the patient group

may be a result of the lower socioeconomic status and education level (22,30-33).

Goiato et al. disclosed that anophthalmic patients, particularly those utilizing an ocular prosthesis, witnessed considerable enhancements in psychosocial well-being following rehabilitation (15). Similarly, Amaro et al. noted recuperation in SF-36 domains 1 year post-surgery for a majority of patients (2). In addition, in a separate study, the mental health-related quality of life subsequent to the surgical removal of one eye was found to be akin to that of the normal binocular group (17). Collectively, these findings challenge preconceptions about the uniformly detrimental psychological consequences of eye removal, underscoring the potential for positive psychosocial outcomes and successful adaptation in affected individuals.

In various studies, elevated scores on generalized anxiety were linked to the female gender, in contrast to our investigation where no statistically significant distinctions were observed between gender groups (16,34,35).

Similarly to our current study, Wang et al. identified trauma as the primary cause of enucleation. Consistent with our findings, they also reported a statistically significant correlation between anxiety and age, along with heightened depression levels in the patient group (36).

Patients in our study exhibited significantly lower scores in five domains of the SF-36 compared to healthy counterparts. These results align with those of a Korean study using the medical domains of the SF-36, demonstrating significant disparities between 48 healthy subjects and 134 patients who underwent surgery (12). Another study noted that the quality of life in choroidal melanoma patients treated with enucleation was inferior to those treated with radiotherapy (14). van Beek et al. similarly found that enucleated patients scored lower in role functioning and physical functioning compared to those treated with radiation therapy, consistent with our outcomes (23). Our results also resonate with the findings of Kraut and Lopez-Fernandez, (37) indicating that individuals with surgical removal of an eye may withdraw from social interactions and face potential job loss. According to their study, depression associated with eye loss correlates with age, gender, family support, and the reason for eye removal.

Two earlier studies by Linberg et al., and Coday et al. explored the recovery process following eye loss using questionnaires (18,38). In the 1998 study, 37% of 125 patients experienced permanent life changes due to eye loss, with 10% encountering workplace issues and 17% reporting anxiety or diminished self-confidence (18). In 2002, a similar questionnaire-based investigation of 58 patients revealed changes in employment (23%), driving status (39%), social life (40%), and challenges with sports and hobbies (50%) in

this population (38). Similar to Coday et al.'s findings, we also identified a significant decline in physical functioning in our patients. While trauma was the predominant reason for surgery in our study, unlike the two aforementioned studies, we observed no differences in social functions between patients and controls in the current investigation. Moreover, no statistically significant variations were found between the patient and control groups in terms of mental health and energy/vitality domains of the SF-36, aligning with the findings of Allen, (32) who highlighted that factors influencing the response to visual loss are not necessarily tied to the level of vision loss, but rather to social situation, personality, and coping skills. Disfigurement studies also indicate that levels of psychosocial distress are not directly correlated with the severity of disfigurement (39,40). In contrast to our study, Shafie and Shelil (22) Reported improved physical functioning, role limitations, and bodily pain after eye removal, though it should be noted that their patient population had a poorer general health status.

According to Banerjee et al., (13) the most prevalent intrapersonal issue after enucleation is related to the loss of self-esteem and self-confidence, parallel to our study where patients exhibited poorer RSES scores.

Several limitations of our study should be acknowledged. First, as a prospective and cross-sectional study, assessments were conducted only once for each participant, limiting our ability to fully comprehend the psychological and physical processes post-surgery. In addition, the financial and educational levels were significantly lower among patients than in controls, potentially confounding the comparisons between these two groups.

Conclusion

This study aimed to enhance our understanding of the psychological well-being and quality of life of patients undergoing eye removal through validated assessment tools. Our results indicate that, while the experience of eye loss is highly variable and unique for each individual, many patients undergo significant psychological changes. Based on these observations, it appears crucial to integrate psychiatric rehabilitation into the recovery process after eye removal to enhance psychological well-being and quality of life.

Disclosures

Ethics Committee Approval: This prospective cross-sectional investigation, carried out between September 2016 and November 2017, obtained approval from the Local Ethics Committee (Ethics Committee for Clinical Studies of the University of Health Sciences, Şişli Hamidiye Etfal Hospital; granted on October 17, 2017; under protocol number 853).

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