Acute Central Serous Chorioretinopathy and Psychological Parameters: Chicken and Egg Dilemma

Tacettin KURU[1], Fatih ASLAN[2]

ABSTRACT

Purpose: To investigate the relationship between Acute Central Serous Chorioretinopathy (CSCR) and psychological parameters.

Methods: Acute CSCR patients, myopia patients and healthy volunteers compatible in terms of age and gender, were included in the study. Acute CSCR diagnosis is based on clinical evaluation, optic coherence, and fluorescein angiography. All volunteers were evaluated using a sociodemographic form, State Trait Anxiety Inventory (STAI), Beck Depression Inventory (BDI), Health Anxiety Inventory (HAI) and Short Form 36 (SF-36).

Results: We determined a higher mean trait anxiety level in the acute CSCR group ($\bar{x}$ = 44.33), compared to the control ($\bar{x}$ = 36.72, p = 0.048) and myopic ($\bar{x}$ = 35.22, p = 0.021) groups. There was no significant difference between the groups in terms of state anxiety (p = 0.295), depression (p = 0.763), and health anxiety (p = 0.405). In addition, there was no difference between the groups in terms of sub-parameters of quality of life, such as physical functionality (p = 0.925), physical role limitation (p = 0.110), emotional role limitation (p = 0.474), vitality (p = 0.078), mental health (p = 0.532), social functionality (p = 0.335), pain (p = 0.352) and general health (p = 0.074).

Conclusion: Our study results revealed the relationship between acute CSCR and anxiety. This relationship suggests that it is not a natural and temporary stress response caused by having any eye disease.

Keywords: Anxiety, Central serous chorioretinopathy, Depression, myopia, Psychological factors.

INTRODUCTION

Central serous chorioretinopathy (CSCR) is a member of the chorioretinal disorders group involving serous detachment of the neurosensory retina and /or retinal pigment epithelium (RPE). The condition is particularly common in young male patients with no comorbid systemic conditions and symptoms may include lost, distorted or blurred vision and/or black spots in the field of vision. The overall incidence has been reported to be 5.8 per 100,000 people.[1]

Previous studies have reported connections between CSCR and cardiovascular diseases and hypertension, gastro-esophageal diseases and Helicobacter pylori, pregnancy, alcohol use, corticosteroid use and Cushing syndrome, as risk factors.[2,3] Interest in the association between psychological factors and CSCR increased following the first study to show a relation between A-type personality and CSCR, by Yannuzzi.[4] CSCR has been associated with A-type personality, stress, anxiety, depression, alexithymia, stressful life events, maladaptive coping mechanisms, rumination and poor sleep quality.[5-9] However, other studies have reported the exact opposite.[10-13] In addition, the majority of studies examining the relation between CSCR and psychological factors have involved either a control group of healthy volunteers or a mixed patient group.[7,14-16] This situation makes the results difficult to interpret and though the current literature points to a link between CSCR and anxiety, the details of this association and its cause-effect relationship remain unclear**.**

Our aim was to compare myopic patients and healthy controls with CSCR patients to reduce these confounding factors as much as possible as well as to examine the relationship between CSSR and psychological parameters.

1- Uz. Dr., Psychiatry Department of Training and Research Hospital, Alanya Alaaddin Keykubat University, Antalya, Turkey

2- Yrd. Doç. Dr., Ophthalmology Department of Alanya Training Research Hospital, Antalya, Turkey

Received: 21.06.2020
Accepted: 03.09.2020

Ret-Vit 2021; 30: 55-60

DOİ:10.37845/ret.vit.2021.30.9

Correspondence Adress:
Fatih ASLAN
Psychiatry Department of Training and Research Hospital, Alanya Alaaddin Keykubat University, Antalya, Turkey

Phone: +90 532 159 1683
E-mail: fatih.aslan@alanya.edu.tr

MATERIAL AND METHODS

Consecutive acute CSCR patients, myopia patients and healthy controls who had presented to the ophthalmology department of a tertiary hospital in Turkey between May 2018 and June 2019, were included in the study after their consent was obtained. Acute CSCR patients with symptoms such as sudden onset of dim and blurred vision, micropsia, metamorphopsia and central scotoma that had commenced within the previous six weeks were included. The CSCR diagnosis was based on clinical evaluation, optic coherence (RTVue-XR 100 Avanti software v.0.14, Optovue Inc., Fremont, USA) and fluorescein angiography (Topcon TRC 50-EX, Topcon Medical Systems Inc., Oakland, New Jersey, USA).

The relationship between myopia and psychiatric factors has not been revealed yet. For this reason, a third group of myopic patients was formed in addition to healthy controls. Thus, it was aimed to disable psychiatric confounding factors. Since patients with diopter values less than one diopter may not generally require additional devices (spectacles or contact lenses) in their daily lives, and since their functioning in various different spheres, such as greeting others, driving, or watching the TV, may not be affected, such subjects were excluded from the study. In addition, patients with diseases affecting visual acuity and/or foveal structure at ophthalmological examination (such as age-related macular degeneration, diabetic retinopathy, uveitis, or retinal artery occlusion), as well as those with histories of intra-ocular surgery and psychiatric disease, pregnancy, recurrent CSCR and chronic disease, were also excluded.

The study procedures were carried out in accordance with the Helsinki Declaration and the the study protocol was approved by the Alanya Alaaddin Keykubat University Clinical Research Ethics Committee (No. 2018/25 dated 13.04.2018). Participants were informed about the study before commencement, they provided their informed consent and the scales were then completed.

Measurement tools

Sociodemographic Information Form: A sociodemographic form was used to elicit information on subjects, such as their age, gender and marital status.

State-Trait Anxiety Inventory (STAI): Developed by Spielberger et al.[17] in 1970 in order to measure state and trait anxiety, the STAI consists of 40 items and two subscales measuring state and trait anxiety. It supplies measurement using a four-point Likert-type scale and the validity and reliability of the Turkish version were established by Öner and Le Compte.[17]

Health Anxiety Inventory (HAI): The HAI is a self-report scale consisting of 18 items, which was developed by Salkovskis et al. to evaluate health anxiety. Each item is scored from 0 to 3, a high score correspondingly indicating high levels. The reliability and validity of the Turkish version were established by Aydemir et al.[18]

Beck Depression Inventory (BDI): The BDI is a self-report measure of severity of depression consisting of 21 multiple-choice questions. Subjects evaluate on a four-point Likert-type scale ranging from 0-3, wherein high scores indicate increased severity of depression. The reliability and validity of the BDI were established by Hisli.[19]

Short Form-36 (Sf-36): This 36-item test was developed by Ware JE for measuring quality of life. It contains eight sub-dimensions and the scale scores from 0 to 100, with higher scores indicating higher quality of life. The reliability and validity of the Turkish version were established by Koçyiğit et al.[20]

Statistical Analysis

Categorical variables were calculated as frequency and percentage values. Continuous variables have been expressed as mean, standard deviation, and median values. Relations between categorical variables were analyzed using the Fisher-Freeman-Halton test. The Kruskal-Wallis H test was employed to compare variables not meeting normal distribution assumptions among more than two groups. One-Way Analysis of Variance (ANOVA) was applied to compare normally distributed continuous variables among more than two groups. The post-hoc Dunnett T3 test was applied to determine sources of significant variation, and p values < 0.05 were regarded as statistically significant. The data were analyzed using MedCalc Statistical Software version 18 (MedCalc Software BVBA, Ostend, Belgium; http://www.medcalc.org; 2018).

RESULTS

Eighteen patients with acute CSCR, together with 18 myopic patients and 18 healthy volunteers comparable in terms of age and sex, were included in the study. Two patients in the CSCR group were excluded because they had received psychiatric treatment. The CSCR group consisted of seven women (38.88%) and 11 men (61.12%), the healthy control group of nine women (50%) and nine men (50%), and the myopic group of eight women (44.4%) and 10 men (55.5%). Mean ages were 44.83 (±10.65) in the CSCR group, 38.72 (±14.03) in the myopic group and 42.11 (±8.01) in the healthy control group. No statistically significant difference was determined between the groups in terms of age ($p = 0.268$), marital status ($p = 0.108$),

education (p = 0.390), alcohol use (p = 1.0) or chronic disease (p = 0.862; Table 1).

As for occupations, one member of the acute CSCR group (5.56%) was unemployed, three (16.67%) were self-employed, three (16.67%) occupied clerical occupations, whereas four (22.22%) were manual laborers, and seven (38.89%) were domestic workers. For its part, nine (50%) members of the control group occupied clerical occupations, four (22.22%) were manual laborers and five (27.78%) were domestic workers. As for the myopic group, four (22.22%) members were unemployed, five (27.78%) were self-employed, one (5.56%) was a clerical worker, three (16.67%) were manual laborers, and three (16.67%) were students (Table 1).

Comparison of the groups' psychometric scale scores reveals no statistically significant difference in terms of STAI–State (p = 0.295), BDI (p = 0.763), HAI (p = 0.405), physical functioning (p = 0.925), physical role limitation (p = 0.110), emotional role limitation (p = 0.474), vitality (p = 0.078), mental health (p = 0.532), social functioning (p = 0.335), pain (p = 0352) or general health (p = 0.074; Table 2).

The levels of trait anxiety determined with the STAI–Trait however, varied significantly among the groups (p = 0.005). The post-hoc Dunnett T3 test was applied to identify the source of this variation: two-way comparisons revealed higher mean trait anxiety in the CSCR group (χ = 44.33) than in the control (χ = 36.72, p = 0.048) and myopic (χ = 35.22, p = 0.021) groups (Figure 1).

DISCUSSION

The purpose of this study was to compare acute CSCR patients with both myopic and healthy control groups, in terms of psychological parameters. Our aim was to exclude psychological outcomes deriving from the disease by evaluating myopic patients as controls.

Using scales, in previous studies by Conrad [11], the measure of depression symptoms was found to be significantly higher in CSCR patients, compared to healthy controls. One recent population-based retrospective cohort study by Yu-Yen Chen et al.[8], determined a significantly higher risk of emergence of depression in patients with CSCR. However, Elodie Setrouk et al.[10] determined no difference in terms of depression between their CSCR and control groups. In our study, we detected no significant difference in terms of depression scores for the CSCR group with either the myopic or control groups.

Table 1: *Distribution of Demographic Characteristics by Groups.*

		ACSCR		Control		Myopia		p
		N	%	N	%	N	%	
Sex	Female	7	38.88	9	50.00	8	44.44	0.792
	Male	11	61.12	9	50.00	10	55.56	
Marital status	Single	2	11.11	2	11.11	7	38.89	0.108
	Married	15	83.33	15	83.33	10	55.56	
	Divorced	0	0.00	1	5.56	1	5.56	
	Widowed	1	5.56	0	0.00	0	0.00	
Education level	Primary	6	33.33	3	16.67	4	22.22	0.390
	Middle	2	11.11	1	5.56	3	16.67	
	High	5	27.78	2	11.11	4	22.22	
	University	5	27.78	12	66.67	7	38.89	
Alcohol	No	17	94.44	17	94.44	18	100.00	1.000
	Yes	1	5.56	1	5.56	0	0.00	
Chronic disease	None	15	83.33	14	77.78	16	88.89	0.862
	HT	2	11.11	3	16.67	1	5.56	
	DM	1	5.56	0	0.00	1	5.56	
	RM	0	0.00	0	0.00	0	0.00	
	IBD	0	0.00	1	5.56	0	0.00	

p values < 0.05 Fisher Freeman Halton test, Abbreviations: ACSCR: Acute central serous chorioretinopathy, HT: hypertension, DM: Diabetes mellitus, IBS: Inflammatory Bowel Disease, RM: Rheumatic Diseases

Table 2: *Comparison of Parameters by Patient Groups.*

	ACSCR(n=18)	Control(n=18)	Myopia(n=18)	
	Mean+SD Med. (Min-Max)	Mean+SD Med. (Min-Max)	Mean+SD Med. (Min-Max)	p
Age	44.83±10.65 45 (28-65)	42.11±8.01 43 (26-53)	38.72±14.03 35.5 (20-61)	0.268
STAI-S	37±9.3 39.5 (21-52)	33.56±8.9 34 (20-48)	32.33±9.46 30.5 (20-48)	0.295
STAI-T	44.33±10.92 43 (26-64)	36.72±6.41 37.5 (21-46)	35.22±7.72 33.5 (26-53)	**0.005***
BDI	7.06±6.22 6.5 (0-19)	5.22±4.94 3.5 (0-17)	7.17±8.01 4.5 (0-26)	0.763
HAI	16.22±9.21 16.5 (2-32)	12.11±5.43 11.5 (0-22)	12.28±6.13 11.5 (4-29)	0.405
SF-36 Physical Functioning	85±12.83 85 (55-100)	80.83±20.02 90 (35-100)	80.28±23.98 92.5 (25-100)	0.925
SF-36 Physical Role Limitation	66.67±36.38 75 (0-100)	88.89±24.59 100 (25-100)	79.17±32.37 100 (25-100)	0.110
SF-36 Emotional Role limitation	77.77±28.01 83.35 (0-100)	83.34±32.84 100 (0-100)	77.78±34.3 100 (0-100)	0.474
SF-36 Vitality	59.17±21.57 65 (15-90)	73.61±13.81 70 (55-100)	71.11±23.3 75 (35-100)	0.078
SF-36 Mental Health	74.44±16.24 78 (44-96)	77.78±15.84 80 (48-96)	79.78±17.54 84 (52-100)	0.532
SF-36 Social Functioning	74.31±24.43 75 (37.5-100)	83.33±17.15 81.25 (37.5-100)	75±19.17 68.75 (50-100)	0.335
SF-36 Pain	80.56±21.4 88.75- (22.5-100)	90.42±9.79 90 (67.5-100)	88.47±15.37 100 (55-100)	0.352
SF-36 General Health	66.67±17.41 70- (30-90)	79.17±13.2 82.5 (55-95)	71.67±19.85 80 (30-90)	0.074

*p values < 0.05 Kruskal Wallis H test *One-Way Analysis of Variance. Abbreviations: ACSCR:Acute central serous chorioretinopathy, STAI: State-Trait Anxiety Inventory, SF-36:Short form 36, BDI: Beck Depression Inventory, HAI:Health Anxiety Inventory.*

Somatization has been evaluated as a sub-parameter of general scale (SCL-90).[11] The present study has determined no significant difference in terms of healthy anxiety scores between the CSCR patients and the myopic or control groups, and to the best of our knowledge, no previous investigation of health anxiety exists that uses a separate measurement tool in a distinct area of evaluation for CSCR patients.

In a previous study comparing quality of life with a healthy control group, the sub-parameters of quality of life, aside from body pain, were significantly lower in CSCR patients.[21] However, we determined no significant difference in any sub-parameter of quality of life between the CSCR and myopic or control groups.

Previous studies have investigated CSCR and anxiety/stress, reporting higher levels in patients than in the controls.[2, 5, 9, 11] In another recent study, Van Haalen FM et al.[12] determined no difference between CSCR patients and the controls in terms of stress or stress-related problems. Similarly, Elodie Setrouk et al.[10] determined no significant difference in CSCR patients in terms of anxiety. In general terms, previous studies have frequently used healthy controls for comparing psychological parameters.[2, 9, 11, 16, 21]

Physical disease is a risk factor for anxiety and depression.[22] Therefore, having CSSR can cause anxiety or depression. Studies examining factors such as personality traits that may also be present pre-CSCR have reported inconsistent findings.[4, 13] Other studies have investigated patients with non-CSCR mixed ocular diseases or with ocular diseases other than retinal diseases as control groups. However, the presence in a control group of diseases reported to be associated with anxiety such as dry eye makes interpreting the results difficult.[23]

STAI-Trait has frequently been used to measure general anxiety and is also capable of reflecting the personality traits disposed to anxiety. Moreover, anxiety that may

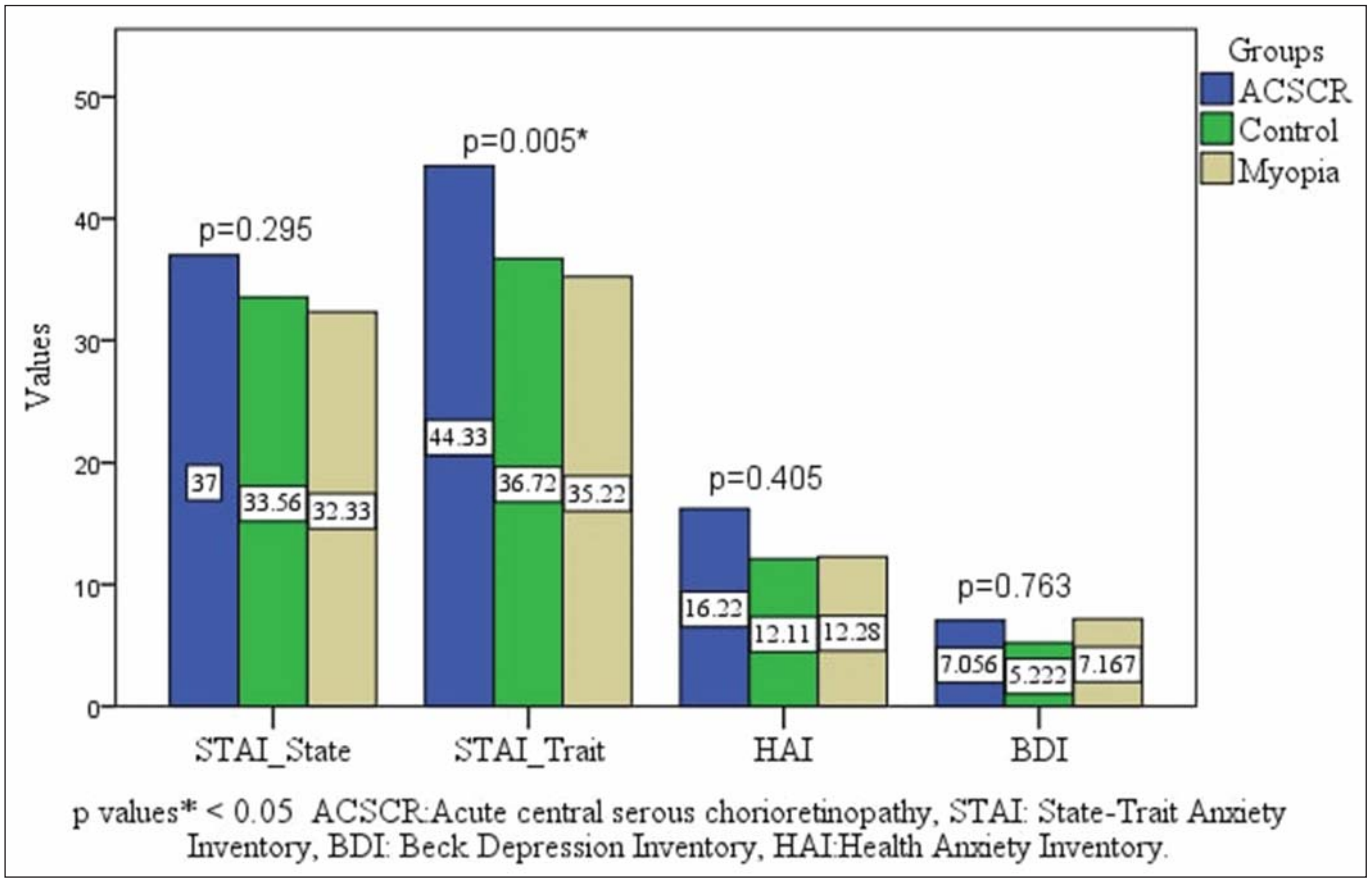

Figure 1: *Comparison of psychological parameters between groups.*

be transient and associated with state or environmental stressful life events such as diagnostic processes is evaluated with the STAI-State scale. Anxiety in our study, which was determined using the STAI-Trait scale, was significantly higher in the CSCR patients than in either the myopic or healthy control groups. The CSCR group enrolled in the present study consisted of patients who had recently had the onset of symptoms and who were undergoing the diagnostic process. The fact that STAI-State shows no difference in the myopic and healthy controls suggests that anxiety in acute CSCR may be a precursor of the disease, rather than a result of it. Our study results support studies that have shown anxiety to possibly be effective in the etiology of acute CSCR.

This study has a number of limitations. First is the relatively low number of patients. The reasons for the low number of cases in our study can be explained by the fact that it was a single-center study, and that we included only acute and newly diagnosed patients into the study group. The study was also limited with regards to its reliance on a self-report measure of psychological parameters. This situation may increase the limits of common method bias. Scales indirectly evaluate the mental concepts measured. Self-report measures may be affected by variables including defensiveness and lack of awareness. Occupational differences are not a direct indicator of individuals' monthly incomes, though the participants' monthly incomes were not considered in this study. Similar to most studies in the literature, the present research is cross-sectional and the nature of this type of study suggests that caution is required in interpreting the results.

CONCLUSION

In conclusion, anxiety in the present study was found to be significantly higher in the acute CSCR group, compared to the myopic and healthy control groups. However, no difference was found among the groups in terms of state anxiety. These findings suggest acute CSCR to be associated with anxiety, that this relationship may not be a transient anxiety related to the burden of disease imposed by acute CSCR, and that stress is already present before the disease, with this being a probable risk factor. Although our results show that acute CSCR is associated with anxiety and that anxiety may not be a transient condition associated with the burden of having a disease, the chicken or egg dilemma is still unclear as their studies in the literature show mixed results. Prospective, epidemiological studies are now needed to determine the direction thereof, of the relationship between CSCR and psychological factors.

REFERENCES

1. Kitzmann AS, Pulido JS, Diehl NN, et al. The Incidence of Central Serous Chorioretinopathy in Olmsted County, Minnesota, 1980-2002. Ophthalmology 2008;115:169-73.
2. Chatziralli I, Kabanarou SA, Parikakis E, et al. Risk Factors for Central Serous Chorioretinopathy: Multivariate Approach in a Case-Control Study. Curr Eye Res 2017;42:1069-73.
3. Nicholson BP, Atchison E, Idris AA, et al. Central serous chorioretinopathy and glucocorticoids: an update on evidence for association. Surv Ophthalmol 2018;63:1-8.
4. Yannuzzi LA. Type-A behavior and central serous chorioretinopathy. Retina 1987; 7:111-31.
5. Agarwal A, Garg M, Dixit N, et al. Evaluation and correlation of stress scores with blood pressure, endogenous cortisol levels, and homocysteine levels in patients with central serous chorioretinopathy and comparison with age-matched controls. Indian J Ophthalmol 2016; 64:803-5.
6. Gelber GS, Schatz H. Loss of Vision Du to Central Serous Chorioretinopathy following Psychological Stress. Am J Psychiatry 1987;144:46-50.
7. Lahousen T, Painold A, Luxenberger W, et al. Psychological factors associated with acute and chronic central serous chorioretinopathy. Nord J Psychiatry 2016;70:24-30. 7.
8. Chen YY, Huang LY, Liao WL, et al. Association between Central Serous Chorioretinopathy and Risk of Depression: A Population-Based Cohort Study. J Ophthalmol 2019;2019:2749296.
9. Ji Y, Li M, Zhang X, et al. Poor Sleep Quality Is the Risk Factor for Central Serous Chorioretinopathy. J Ophthalmol 2018;2018:9450297.
10. Setrouk E, Hubault B, Vankemmel F, et al. Circadian disturbance and idiopathic central serous chorioretinopathy. Graefes Arch Clin Exp Ophthalmol 2016; 254:2175-81.
11. Conrad R, Weber NF, Lehnert M, et al. Alexithymia and Emotional Distress in Patients With Central Serous Chorioretinopathy. Psychosomatics 2007; 48:489-95.
12. van Haalen FM, van Dijk EHC, Dekkers OM, et al. Cushing's Syndrome and Hypothalamic- Pituitary-Adrenal Axis Hyperactivity in Chronic Central Serous Chorioretinopathy. Front Endocrinol 2018;9:39.
13. van Haalen FM, van Dijk EHC, Andela CD, et al. Maladaptive personality traits, psychological morbidity and coping strategies in chronic central serous chorioretinopathy. Acta Ophthalmologica 2019;97:572-579.
14. Tittl MK, Spaide RF, Wong D, et al. Systemic findings associated with central serous chorioretinopathy. Am J Ophthalmol 1999;128: 63-68.
15. Mansour AM, Koaik M, Lima LH, et al. Physiologic and Psychologic Risk Factors in Central Serous Chorioretinopathy. Ophthalmology Retina 2017;1: 497-507.
16. Bazzazi N, Ahmadpanah M, Akbarzadeh S, et al. In patients suffering from idiopathic central serous chorioretinopathy, anxiety scores are higher than in healthy controls, but do not vary according to sex or repeated central serous chorioretinopathy. Neuropsychiatr Dis Treat 2015;11:1131-6.
17. Öner N, Le Compte A. Handbook of state-trait anxiety inventory. Istanbul. Bogazici Univ Press 1985
18. Aydemir Ö, Kırpınar İ, Satı T, et al. Reliability and Validity of the Turkish Version of the Health Anxiety Inventory. Archives of Neuropsychiatry 2013;50:325-31.
19. Hisli N. A study on the validity of Beck's Depression Inventory. Psychol J 1988;6:118-22.
20. Koçyiğit H, Aydemir Ö, Fişek G. Kısa Form-36'nın Türkçe versiyonunun güvenilirliği ve geçerliliği. İlaç ve Tedavi Dergisi 1999; 12:102-6. [Turkish]
21. Sahin A, Bez Y, Kaya MC, et al. Psychological distress and poor quality of life in patients with central serous chorioretinopathy. Semin Ophthalmol 2014; 29:73-6.
22. Clarke DM, Currie KC. Depression, anxiety and their relationship with chronic diseases: a review of the epidemiology, risk and treatment evidence. MJA 2009;190:54-60.
23. Wen W, Wu Y, Chen Y, et al. Dry eye disease in patients with depressive and anxiety disorders in Shanghai. Cornea 2012;31:686-92.