



## OPHTHALMOLOGICAL DISORDERS BASED ON INTERNATIONAL CLASSIFICATION OF DISEASES -10 CRITERIA AND ITS ASSOCIATION WITH DEPRESSION AND ANXIETY

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### ABSTRACT

#### OBJECTIVE

To assess the frequency of anxiety and depression in patients with ophthalmological disorders based on ICD-10 criteria.

#### STUDY DESIGN

Cross-sectional Study

#### PLACE AND DURATION OF THE STUDY

The study was carried out at Department of Ophthalmology, Jinnah Postgraduate Medical Center, in collaboration with Department of Psychiatry and Behavioral Sciences, from September to November 2015.

#### SUBJECTS AND METHODS

160 randomly selected patients suffering from different visual disorders participated in the study. Informed consent was taken and a semi-structured proforma was used to fill the demographic variables as well as the basic complains of ophthalmological disorders, and were placed in different diagnostic categories of ophthalmological disorders as per ICD-10. Hospital anxiety and depression rating scale was applied to assess the anxiety and depression and severity was assessed on Hamilton rating scale for Anxiety and Hamilton rating scale for depression respectively.

#### RESULTS

Out of 160 randomly selected patients 63% were male and 37% female. The mean age  $\pm$ SD was  $44.1 \pm 15.16$ . Our study revealed that 19.4% had depression and anxiety disorder. Although there was no significant relation between specific eye disease and psychiatric ailment; however symptoms like decreased vision and floaters had significant relation with anxiety and depression.

#### CONCLUSION

Decreased vision had significant effect on anxiety and depression irrespective of diagnostic entity of Ophthalmology according to ICD-10. Female gender, increasing age, divorced, widowed / separated, illiteracy and loss of job were found to have significant relation with depression and anxiety disorder.

#### KEY WORDS

Impaired Vision, Eye, Psychiatric disorders

### INTRODUCTION

Eye is one of the most complex organs of our body and its proper functioning is essential for carrying out daily activities. According to world health organization (WHO) approximately 285 million people are visually compromised globally, out of these, 246 million have diminished vision. An estimate of about 90% of world's visually impaired population belong to low socio-economic class.<sup>1</sup> In the light of this, eye diseases have become a cause of great concern associated with decreased functioning and psychiatric symptoms of depression and anxiety.<sup>2</sup>

International Classification of diseases in its VII chapter has mentioned diseases of eye and adnexa with the letter H, and has been divided into 11 categories whereas there are approximately 45 different eye symptoms to present with as per American academy of ophthalmology.<sup>3,4</sup>

Almost all eye disorders result in visual impairment, the most feared disability; as sense of sight is considered most important among sensory input and losing vision has been considered equal to losing a limb.<sup>5</sup> It has long been researched that with increasing age, prevalence of visual impairment increases.<sup>6,7</sup> According to a report, more than 4 million American, with the age of  $\geq 40$  years are either blind or visually impaired.<sup>8</sup>

With such wide range of problems, from sensory impairment to financial burdens, irrespective of age, eye diseases have adverse effects on the quality of life of the patient, resulting in psychological problems. Depression is a known debilitating factor and is responsible for worsening the quality of life of the patients. It is the fourth major cause of disability globally.<sup>9, 10</sup> Associated depression and other psychological symptoms can worsen the prognosis of any physical illness.<sup>11-13</sup> With respect to visual impairment, both anxiety and depression contribute significantly in determining the clinical outcome as well as the prognosis of the patients.<sup>14,15</sup> Thus, it is imperative to evaluate a correlation between different visual disorders and depression or anxiety.

### SUBJECTS AND METHODS

#### Participants

160 randomly selected patients based on previous research<sup>16</sup>, suffering from different ophthalmological disorders were enrolled from outpatient clinic, with 95% confidence interval and 5% absolute precision.<sup>16</sup> Sample size was calculated on least value (12%) using computer program Open Epi version 2. Patients of both genders

reporting to out-patient clinic at Eye Department with various symptoms and were at least 18 years old were included in the study. Patients already diagnosed with any psychiatric illness, or cases with acute presentation, ophthalmological emergencies, and post operative cases were excluded.

**Instruments**

Hospital Anxiety and Depression rating scale (HADS) was used to assess anxiety and depression. HADS consists of 14 items with a 4-point scale (0-3), it is scored as 0 – 7 for normal, 8 – 10 for borderline abnormal and 11-21 for cases.

Hamilton Depression Rating Scale (HAM-D), first 17 item scale was used to assess the severity of depression. Eight items are scored on a 5 point scale (0-4), where as nine items are scored on 3 point scale (0-2). Severity was scored as mild = 8 – 13, moderate = 14 – 18, severe = 19 – 22, and very severe ≥23.

Hamilton Anxiety Rating Scale (HAM-A), 14 items scale was used to assess the severity of anxiety. Each item is scored on a 5 point scale (0-4). Severity was scored as mild = 14 – 17, moderate = 18 – 24, and severe = 25 – 30.

All patients meeting the criteria; underwent a comprehensive eye examination by the consultant ophthalmologist. As per their reporting symptoms they were categorized within different eye disorders according to International Classification of Diseases version 10 (ICD-10), which was recorded on semi structured proforma, along with their socio-demographic details.

**Procedure**

This cross-sectional, observational study was carried out at Department of Ophthalmology, Jinnah Postgraduate Medical Center, in collaboration with Department of Psychiatry and Behavioral Sciences, from September to November 2015. Ethical approval was taken from the institutional review board of the institute. It was a collaborative study between Department of Ophthalmology (Eye ward) and Department of Psychiatry and Behavioral Sciences of JPMC. Written consent was taken from all participants. HADS was applied to all the patients of the study meeting the inclusion criteria and later HAM-A or HAM-D was administered to those who came positive on HADS. All three scales were administered by consultant psychiatrist. The data was entered and analyzed through SPSS version 21. Chi square test was applied for association and P value < 0.05 was taken as significant.

**RESULTS**

Out of 160 randomly selected patients, majority i.e. 63% was male and the rest 37% female. Mean age ± SD of the patients was 44.1±15.16 with the age range of 18 to 60 years, majority of them were within the age bracket of 50 years and above, as mentioned in table 1. Major share of the sample patients were local residents (from Karachi 72.5% and 27.5% were from outside Karachi). More than half of the patients had their education till secondary level (Table 1). Sample of the patient in terms of their language was diverse; however, most of them were married and were employed (Table 1).

**Table 1**  
Factors/variables associated with Psychiatric diseases on Chi square (n=160)

		No. of Subject	Psychiatric Disease		P
			No.	%	
Gender	Male	101	14	13.9	0.021
	Female	59	17	28.8	
Age in years	Under 30	38	1	2.6	0.001
	30 – 49	47	6	12.8	
	50 and above	75	24	32.0	
Marital Status	Single	61	5	8.2	0.001
	Married	73	14	19.2	
	Widow	13	6	46.2	
	Divorced / separated	13	6	46.2	
Education	None	59	16	27.1	0.018
	Primary	29		20.7	
	Secondary	18	5	27.8	
	Matric	19	3	15.8	
	Inter & above	35	1	2.9	
Occupation	Student	16	0	0	0.001
	Govt. / Pvt. Job	50	2	4.0	
	Self employed / Business	20	3	15.0	
	Jobless	17	7	41.2	
	Retired	28	9	32.1	
Mother Tongue	Urdu	45	8	17.8	.752
	Sindhi	35	7	20.0	
	Punjabi	21	6	28.6	
	Balouchi	15	4	26.7	
	Pashto	14	2	14.3	
	Other	30	4	13.3	
Resident	Within Karachi	116	20	17.2	0.268
	Outside Karachi	44	11	25	

Our study revealed 19.4% of the sample had either anxiety or depression, with 11.8 % and 6.3% having mild depression and anxiety respectively (Table 2). The most striking finding of the study that came out incidentally was the significant association (i.e. p-value <0.5) between symptoms of eye diseases and psychiatric comorbidity (Table 4). However, the association between eye diseases as per ICD-10 and anxiety and/or depression was not significant. (Table 4)

**Table 2**  
Severity of Depression and Anxiety

Depression Severity				Anxiety Severity	
Mild		Moderate		Mild	
Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
19	11.8	02	1.3	10	6.3

**Table 3**  
Frequency of Eye symptoms, Diseases (ICD-10) and Psychiatric diseases

	Frequency	Percentage
<b>EYE SYMPTOMS</b>		
Decrease vision / Floaters	78	48.8
Routine / follow-up (post surgery, laser)	45	28.1
Redness, Pain, swelling	19	11.9
Itching, foreign body sensation	18	11.3
<b>EYE DISEASES WITH ICD-10</b>		
H00-H06 Disorders of eyelid, lacrimal system and orbit	27	16.9
H10-H13 Disorders of conjunctiva	11	6.9
H15-H22 Disorders of sclera, cornea, iris and ciliary body	10	6.3
H25-H28 Disorders of lens	27	16.9
H30-H36 Disorders of Choroid and retina	47	29.4
H40-H42 Glaucoma	10	6.3
H43-H45 Disorders of vitreous body and globe	6	3.8
H46-H48 Disorders of optic nerve and visual pathways	1	0.6
H49-H52 Disorders of ocular muscles, binocular movement, accommodation	15	9.4
H53-H54 Visual disturbances and blindness	6	3.8
<b>PSYCHIATRIC DISEASES</b>		
Depression	21	13.1
Anxiety	10	6.3

**Table 4**  
Association of eye symptoms and disease with Psychiatric disease on chi square

Eye Symptoms	No. of Subject	Psychiatric Disease		P
		No.	%	
Decrease vision	78	21	26.9	0.043
Routine / follow-up (post surgery, laser)	45	7	15.6	
Redness, Pain, swelling, itching, foreign body sensation	37	3	8.1	
H00-H06 Disorders of eyelid, lacrimal system and orbit				0.043
H10-H13 Disorders of conjunctiva	11	1	9.1	
H15-H22 Disorders of sclera, cornea, iris and ciliary body	10	1	10.0	
H25-H28 Disorders of lens	27	8	29.6	
H30-H36 Disorders of Choroid and retina	47	11	23.4	
H40-H42 Glaucoma	10	1	10.0	
H43-H45 Disorders of vitreous body and globe	6	0	0	
H46-H48 Disorders of optic nerve and visual pathways	1	0	0	
H49-H52 Disorders of ocular muscles, binocular movement, accommodation	15	4	26.7	
H53-H54 Visual disturbances and blindness	6	0	0	

When association of anxiety and depression with different variables was observed, gender, age, marital status, education and occupation came out as significant, i.e. with p-value <0.05. However, language and place of residence were non significant.

### DISCUSSION

We found that 19.4% of our subjects aged 18 or more years, with different ophthalmological disorders were either depressed or had anxiety. Our data revealed a significant association between sign and symptoms related to eye diseases and psychiatric illness, with a p-value of <0.05. However, the association between ophthalmological disorders as per ICD-10 and psychiatric co-morbidity was not significant. The present study findings demonstrating the co-existence of symptoms of eye pathology and associated anxiety and/or depression is well in line with published literature.18-20,23

When association of anxiety and depression with different variables was observed, gender, age, marital status, education and occupation were significantly associated with p-value <0.05. This finding is in line with Evans et al.'s study, who in 2007 reported a higher occurrence of depression in patients with impaired visual acuity than those with no visual defects with 13.5% (95% CI, 11.5%–15.4%; p< 0.001) of the participants with impaired visual acuity being depressed, that is, they scored higher on the Geriatric Depression Scale (GDS).18 Likewise, Carabellese et al. also revealed an association between impaired vision and increased risk of depression and/or anxiety in a large-scale study of adults living in the community.18 However, many of these studies attributed the increased risk of depression to reduced capacity to carry out daily activities. People with diminished vision are more likely to experience difficulties with functioning, which in turn leads to anxiety and depression. In a study, it was reported that when Activities of Daily Living were controlled, it significantly reduced the association between impaired vision and depression levels in the subjects.18, 20 A possible explanation is that functional impairment acted as an attributing factor in increasing the risk of depression and anxiety in these patients with impaired vision.

Our study failed to find evidence of an association of any specific eye pathology with increased levels of depression and anxiety. In contrast, M. Li et al. in 2011 revealed that patients with diagnosed cases of Dry Eye Syndrome had higher levels of anxiousness and depression as compared to the control group with P-value < 0.001 for both anxiety and depression.21 His results are in agreement with Erb et al.'s study, which also found that patients with diagnosed cases of primary keratoconjunctivitis (pKCS) were more depressed than those without pKCS.22 The possible explanation for the contradictory results is that the above mentioned studies focused on a single eye disease whereas, our study did not target any specific eye-associated pathology.

The present study is the first study, to our understanding, that has explored the association between depression and anxiety with impaired vision in an out-patient public sector hospital on the basis of different diagnostic categories of ophthalmological disorders as per ICD-10 diagnostic criteria. Although there wasn't any significant relation between specific ophthalmological diagnosis as per ICD-10 and psychiatric co-morbidity; however, symptoms like decreased vision and floaters had significant relation with the anxiety and depression. In accordance to our study, Augustin et al. in 2007

reported increased prevalence of severe depression of 7.6% in patients with loss of visual acuity with age.<sup>2</sup> However, in contrast to our study, this study also showed that anxiety was unrelated to the loss of visual acuity. Furthermore, higher scores of depression was strongly associated with the severity of the visual impairment ( $P < 0.006$ ), but not total anxiety scores. A possible explanation for this difference is that Augustin et al. findings are based on subjects with already diagnosed ophthalmological diseases with a mean of 2.3 years' disease duration while the present study is based on subjects with untreated and undiagnosed ophthalmological problems who reported to out-patient department of eye ward with various symptoms of eye pathology. Our study is well supported by Eramudugolla et al.'s study reporting significant correlation between eye ailment and symptoms of depression (Spearman's  $\rho = 0.102$ ,  $p < 0.01$ ). It also reported significant correlation between anxiety and eye-related pathologies ( $\rho = 0.08$ ,  $p < 0.05$ ).<sup>23</sup> Similarly, Barry and Rovner reported that subjects with impaired vision were more at risk of having symptoms of depression as compared to those with intact vision (29.7% vs. 8.5%; OR = 4.6, 95% CI = 2.2, 9.6).<sup>24</sup> They also reported significant correlation between depression and functional disability due to impaired vision (OR = 9.7, 95% CI = 4.9, 19.2). They suggested that by addressing depression in patients with visual acuity impairment, we can reduce functional disability associated with depression.

### LIMITATIONS

Ophthalmological disorders are correlated with depression, and can to a great extent effect quality of life of the patients, making it a critical health concern for ophthalmologists. If patients with severe ophthalmological diseases are referred to psychiatrists, to address the risk of increased depression and anxiety, ophthalmologists may enhance their patients' quality of life. Treatment of depression and/or anxiety in patients with visual impairment may also improve the prognosis and the clinical outcome of patients.

### CONCLUSION






The results of the study indicated that hope is a positive predictor of compassion satisfaction and a negative predictor of burnout. The study shows that developing the trait of hope in physicians and psychologists can enhance their performance, which then leads to better care outcomes for patients. In order to improve the quality of the Pakistani medical system, it is imperative to improve the conditions and support offered to medical health care providers.

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