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Original Research Article

Prevalence and Associated Factors of Depression and Anxiety Among Newly Diagnosed Retinopathy Patients: A Cross-Sectional Study

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Abstract:

Background: Retinopathy is a complication of chronic diabetes mellitus and other systemic diseases. This often impacts the patient's mental health, especially in newly diagnosed conditions. Depression and anxiety are commonly prevalent among these individuals due to the threat of loss of vision, disease burden, and reduced quality of life. We undertook this study to understand the prevalence and associated factors for developing psychological conditions.

Methods: This study included patients newly diagnosed with various retinopathies. The diagnosis of retinopathy was done using an ophthalmoscope. The validated [Hospital Anxiety and Depression Scale (HADS), and Generalized Anxiety Disorder 7-item (GAD-7) scale for anxiety] were used to assess symptoms of depression and anxiety. These are widely used and validated self-report measures. Other Relevant Factors: Questions related to social support, coping mechanisms, perceived impact of retinopathy on daily life, and access to healthcare services.

Results: The study included 100 participants (62 males, 38 females; mean age: males 62.55 ± 5.3, females 61.25 ± 8.54 years). Retinopathy prevalence increased with age, with the 61–70 age group most affected. Socioeconomic analysis revealed higher prevalence in lower socioeconomic classes. Diabetic retinopathy (44%) was most common, followed by hypertensive retinopathy and age-related macular degeneration (AMD). Anxiety and depression levels, assessed via HADS and GAD-7 scales, showed moderate/severe anxiety in 33% of hypertensive retinopathy cases and 29% of diabetic retinopathy cases. Depression was moderate/severe in 14–17% of these groups. AMD cases exhibited milder anxiety and depression symptoms.

Conclusion: In conclusion, this study highlights a significant prevalence of anxiety and depression among patients with various retinopathies, particularly diabetic and hypertensive retinopathy. Diabetic retinopathy was the most common, followed by hypertensive retinopathy, with cases predominantly in older age groups and lower socioeconomic classes. Moderate to severe anxiety was observed in 29–33% of diabetic and hypertensive retinopathy patients, while 14–17% exhibited moderate to severe depression.

Keywords: Retinopathy, Anxiety, Depression, Diabetic Retinopathy, Hypertensive Retinopathy.

Introduction

Retinopathy, a non-inflammatory disease of the retina, is one of the major causes of visual impairment and blindness worldwide [1]. The retina is a light-sensitive tissue situated at the back of the eye that passes light to the brain through electrical impulses. Injury to this delicate tissue impairs vision, from mere haziness and floaters to vision loss or even blindness. In addition to the physical well-being of patients, retinopathy also has a severe impact on psychological health and Quality of Life. Diabetic retinopathy (DR) and age-related macular degeneration (AMD) are the most common conditions. Retinopathy is a diabetic complication, as chronic high blood sugar levels affect retinal blood vessels [2]. This results in leakage, obstruction, and neovascularization, with complications, such as macular edema, retinal hemorrhage, and vision loss. AMD, on the other hand, is a degenerative condition affecting the macula, the central part of the retina responsible for

sharp, detailed vision [3]. It primarily affects older adults and is characterized by the breakdown of light-sensitive cells in the macula, leading to progressive central vision loss. Another type of retinopathies includes hypertensive retinopathy (caused by hypertension), retinopathy of prematurity (in premature babies), and central retinal vein occlusion (obstruction of blood flow in retinal veins).

It is well known that a retinopathy diagnosis evokes certain feelings, such as fear, anxiety, and depression, because of the threat of vision loss. Mental reactions intensify when managing underlying diseases, such as diabetes or hypertension superimposes these reactions [4]. Seeing is an important aspect in that it affects one's ability to do things independently, get out, and mix with people, and self-esteem in that, due to retinopathy, one ends up being isolated and becomes psychologically disturbed. Therefore, depression and anxiety are commonly prevalent in retinopathy [5]. Depression is characterized by a patient having a low mood for long periods, lack of energy, and poor concentration, while anxiety entails excessive and persistent worrying, fear, and physical signs such as a pounding heart and tense muscles [6]. These disorders are more likely to develop in patients with chronic conditions, especially if the conditions lead to disability and lower quality of life. Psychological distress and vision impairment correspond to each other according to the available research. Various studies have shown that people with vision disabilities have a higher prevalence of depression and anxiety [7-9]. Despite years of investigation into the social consequences of vision loss on the psyche, data on the psychological ramifications of this new retinopathy are sparse. The initial period is particularly stressful as patients adjust to the condition and the way they change their lives. Identifying the risk indicators of depression and anxiety in newly diagnosed patients and understanding the extent of these disorders is important for implementing treatment. Therefore, this study was done to assess the psychological effects of a new retinopathy diagnosis. With awareness of the rates of depression and anxiety and the inquiry of relevant risk variables, we will be able to identify those who may be at risk. This will help enhance their psychological health and, hence, a healthy and improved quality of life through early intercessions.

Material and Methods

This cross-sectional study was done in the Department of Ophthalmology in coordination with the Department of Psychiatry, Institute of Medical Sciences. Institutional ethical approval was obtained for the study after duly following the proforma for human research based on the Helsinki Declaration. Written consent was obtained from all the participants of the study after explaining the nature of the study in vernacular language.

The diagnosis of retinopathy was done using an ophthalmoscope involving a detailed examination of the retina to identify abnormalities. The Pupil dilation with mydriatic drops to enhance retinal visualization. The ophthalmoscope is used to inspect retinal structures, including blood vessels, optic discs, and macula. Diabetic Retinopathy: Microaneurysms, hemorrhages, exudates, neovascularization. Hypertensive Retinopathy: Arteriolar narrowing, cotton-wool spots, flame-shaped hemorrhages. Age-Related Macular Degeneration (AMD): Drusen deposits, pigmentary changes. *Retinitis Pigmentosa*: Dark, clumped pigment deposits in the peripheral retina, resembling bone spicules were used to identify the type of retinopathy.

Inclusion Criteria

1. Patients with newly diagnosed with various retinopathies
2. Aged 18 and above
3. Conscious and able to speak
4. Willing to participate in the study voluntarily

Exclusion Criteria

1. Patients with acute cardiovascular disease
2. Patients with acute cerebrovascular disease
3. Severe infections
4. Patients with dementia and other mental ill-nesses who may not follow the instructions
5. Lactating or pregnant females.

Data Collection: Data were collected using a structured questionnaire administered by trained research personnel. The questionnaire consisted of the following sections:

Socio-demographic Information: Age, gender, ethnicity, education level, marital status, employment status, income level.

Clinical Information: Type of retinopathy, duration of diagnosis, visual acuity (best-corrected visual acuity in both eyes), presence of other comorbidities (e.g., diabetes, hypertension), treatment received for retinopathy.

Depression and Anxiety Assessment: The validated [Hospital Anxiety and Depression Scale (HADS), and Generalized Anxiety Disorder 7-item (GAD-7) scale for anxiety] were used to assess symptoms of depression and anxiety. These are widely used and validated self-report measures. Other Relevant Factors: Questions related to social support, coping mechanisms, perceived impact of retinopathy on daily life, and access to healthcare services.

Statistical Analysis: Descriptive statistics (frequencies, percentages, means, standard deviations) were used to summarize the socio-demographic and clinical characteristics of the study participants and the prevalence of depression and anxiety. The prevalence of depression and anxiety was calculated as the proportion of participants scoring above the established cut-off points on the respective scales. Chi-square tests and t-tests/ANOVA were used to examine the associations between socio-demographic and clinical factors and the presence of depression and anxiety. A p-value of <0.05 was considered statistically significant. All data analyses were performed using.

Results

A total of 100 cases which included 62 males and 38 females were included in the study based on the inclusion and exclusion criteria. The mean age of the males in the study was 62.55 ± 5.3 years and for the females, the mean age was 61.25 ± 8.54. Table 1 presents the age and sex distribution of 100 retinopathy cases included in a study. There is a clear trend of increasing retinopathy prevalence with age. The largest number of cases (31) falls within the 61-70 age group, followed by the >70 age group (26 cases). The younger age groups (18-20, 21-30, and even 31-40) have considerably fewer cases. This suggests that retinopathy is more common in older adults, which aligns with the known epidemiology of conditions like age-related macular degeneration (AMD) and the increased risk of diabetic retinopathy with longer diabetes duration.

Table 1: Age and sex-wise distribution of cases of retinopathy included in the study

Age group	Male	Female	Total
18 – 20	1	0	1
21 – 30	2	1	3
31 – 40	4	3	7
41 – 50	8	5	13
51 – 60	12	7	19
61 – 70	19	12	31
> 70	16	10	26
Total	62	38	100

Table 2 presents the socioeconomic status (SES) distribution of cases of retinopathy. The most striking observation is the uneven distribution of retinopathy cases across the SES classes. The "Upper Lower" class has the highest frequency (40 cases), followed by the "Lower Middle" class (25 cases). The "Upper" class has the fewest cases (5), and the "Lower" class has 10 cases. A significant majority of the participants (75 out of 100) belong to the "Lower Middle" and "Upper Lower" classes. This suggests a strong association between lower socioeconomic status and the occurrence of retinopathy in this study sample. This pattern suggests that individuals with lower SES may be at a higher risk of developing retinopathy.

Table 2: Showing the Socioeconomic distribution of the cases of retinopathy included in the study

SES Class	Total Score	Frequency
Upper	26 – 29	5
Upper Middle	16 – 25	20
Lower Middle	11 – 15	25
Upper Lower	5 – 10	40
Lower	< 5	10
Total	-	100

Table 3 shows the distribution of retinopathies included in the study population we found that diabetic retinopathy was common in 44% of cases followed by hypertensive retinopathy. AMD showed a slight male predominance (4 males vs. 3 females), all the cases of AMD were above 70 years of age in this study. Retinal Vein Occlusion: Shows a slight female predominance (2 males vs. 3 females), but again, the numbers are very small. Other retinopathies included Retinitis Pigmentosa (RP) in three male cases and one female case and One male showed central artery occlusion.

Table 3: Distribution of type of retinopathy in the cases of the study

Retinopathy Type	Male	Female	Total
Diabetic Retinopathy	28	16	44
Age-Related Macular Degeneration (AMD)	4	3	7
Hypertensive Retinopathy	24	13	37
Retinal Vein Occlusion	2	3	5
Retinitis pigmentosa (RP)	3	1	4
Central Artery occlusion	1	0	1
Total	62	38	100

Table 4 presents data on anxiety and depression levels in male patients using the Hospital Anxiety and Depression Scale (HADS). Out of 28 patients were studied. 20 had normal/mild anxiety, and 8 had moderate/severe anxiety. 24 had normal/mild depression, and 4 had moderate/severe depression. This group has the largest sample size and a noticeable proportion exhibiting moderate to severe anxiety (8/28 or ~29%) and a smaller proportion with moderate to severe depression (4/28 or ~14%). Age-Related Macular Degeneration (AMD): Out of the AMD 4 patients 3 had normal/mild anxiety, and 1 had moderate/severe anxiety. All 4 had normal/mild depression. Out of 24 patients of hypertensive retinopathy 16 had normal/mild anxiety, and 8 had moderate/severe anxiety. 20 had normal/mild depression, and 4 had moderate/severe depression. Similar to the DR group, a significant portion shows moderate/severe anxiety (8/24 or ~33%), and a smaller portion shows moderate/severe depression (4/24 or ~17%). Hypertensive Retinopathy: 24 patients were studied. 16 had normal/mild anxiety, and 8 had moderate/severe anxiety. 20 had normal/mild depression, and 4 had moderate/severe depression. Similar to the DR group, a significant portion shows moderate/severe anxiety (8/24 or ~33%), and a smaller portion shows moderate/severe depression (4/24 or ~17%). Retinal vein occlusion was found in 2 patients and both had normal/mild anxiety, 1 had normal/mild depression, and 1 had moderate/severe depression. Retinitis Pigmentosa (RP): 3 patients were found. 2 had normal/mild anxiety, and 1 had moderate/severe anxiety. 2 had normal/mild depression, and 1 had moderate/severe depression. The small sample size limits the conclusions.

Table 4: Hospital Anxiety and Depression Scale in males of the study

Retinopathy	Frequency	HADS-A (Normal /Mild)	HADS-A (Moderate /Severe)	HADS-D (Normal /Mild)	HADS-D (Moderate/ Severe)
Diabetic Retinopathy	28	20	8	24	4
Age-Related Macular Degener-ation (AMD)	4	3	1	4	0
Hypertensive Retinopathy	24	16	8	20	4
Retinal Vein Occlusion	2	0	2	1	1
Retinitis pigmentosa (RP)	3	2	1	2	1
Central Artery occlusion	1	0	1	0	1

Table 4 presents data on anxiety and depression levels in male patients using the Hospital Anxiety and Depression Scale (HADS). Out of 28 patients were studied. 20 had normal/mild anxiety, and 8 had moderate/severe anxiety. 24 had normal/mild depression, and 4 had moderate/severe depression. This group has the largest sample size and a noticeable proportion exhibiting moderate to severe anxiety (8/28 or ~29%) and a smaller proportion with moderate to severe depression (4/28 or ~14%). Age-Related Macular Degeneration (AMD): Out of the AMD 4 patients 3 had normal/mild anxiety, and 1 had moderate/severe anxiety. All 4 had normal/mild depression. Out of 24 patients of hypertensive retinopathy 16 had normal/mild anxiety, and 8 had moderate/severe anxiety. 20 had normal/mild depression, and 4 had moderate/severe depression. Similar to the DR group, a significant portion shows moderate/severe anxiety (8/24 or ~33%), and a smaller portion shows moderate/severe depression (4/24 or ~17%). Hypertensive Retinopathy: 24 patients were studied. 16 had normal/mild anxiety, and 8 had moderate/severe anxiety. 20 had normal/mild depression, and 4 had moderate/severe depression. Similar to the DR group, a significant portion shows moderate/severe anxiety (8/24 or ~33%), and a smaller portion shows moderate/severe depression (4/24 or ~17%). Retinal vein occlusion was found in 2 patients and both had normal/mild anxiety, 1 had normal/mild depression, and 1 had moderate/severe depression. Retinitis Pigmentosa (RP): 3 patients were found. 2 had normal/mild anxiety, and 1 had moderate/severe anxiety. 2 had normal/mild depression, and 1 had moderate/severe

depression. The small sample size limits the conclusions.

Table 5: Hospital Anxiety and Depression Scale in females of the study

Retinopathy	Frequency	HADS-A (Normal /Mild)	HADS-A (Moderate /Severe)	HADS-D (Normal /Mild)	HADS-D (Moderate/ Severe)
Diabetic Retinopathy	16	6	10	8	8
Age-Related Macular Degeneration (AMD)	3	2	1	3	0
Hypertensive Retinopathy	13	10	3	11	2
Retinal Vein Occlusion	3	1	2	1	2
Retinitis pigmentosa (RP)	1	1	0	1	0
Central Artery occlusion	0	0	0	0	0

Table 5 depicts the HADS scores among the female cases with different retinopathies included in the study. In the diabetic retinopathy group out of 16 patients, 6 had normal/mild anxiety, and 10 had moderate/severe anxiety. Depression scores showed 8 had normal/mild depression, and 8 had moderate/severe depression. In Age-Related Macular Degeneration (AMD) out of 3 patients. 2 had normal/mild anxiety, and 1 had moderate/severe anxiety. All 3 had normal/mild depression. In hypertensive retinopathy, we found 13 patients out of which 10 had mild anxiety and 3 had moderate to severe anxiety. Similarly, 11 were found to have mild depression and 2 had moderate to severe depression. Retinal Vein Occlusion: out of 3 patients. 1 had normal/mild anxiety, and 2 had moderate/severe anxiety. 1 had normal/mild depression, and 2 had moderate/severe depression. Retinitis Pigmentosa (RP): 1 patient. This patient had normal/mild anxiety and depression.

Table 6: Generalized Anxiety Disorder 7-item (GAD-7) scale scores in the cases of the study

GAD-7 Category	Gender	Minimal (0-4)	Mild (5-9)	Moderate (10 -14)	Severe (15 -21)
Diabetic Retinopathy	Male	3	11	10	4
	Female	1	4	8	3
Age-Related Macular Degeneration (AMD)	Male	1	3	0	0
	Female	1	2	0	0
Hypertensive Retinopathy	Male	4	10	8	2
	Female	3	3	3	4
Retinal Vein Occlusion	Male	0	1	1	0
	Female	0	1	1	1
Retinitis pigmentosa (RP)	Male	1	1	1	0
	Female	0	1	0	0
Central Artery occlusion	Male	1	0	1	0
	Female	0	0	0	0

Table 6 presents data on anxiety levels in male and female patients with various retinal diseases, using the Generalized Anxiety Disorder 7-item (GAD-7) scale. Diabetic Retinopathy (DR): In males, most of the patients had mild (11) and moderate (10) anxiety categories a small number had a severe category of anxiety. Similarly, for females, we found moderate anxiety category (8), followed by mild (4), and then severe (3). Only 1 female had minimal anxiety. This suggests a considerable anxiety burden in both male and female DR patients, with a tendency towards moderate levels. Hypertensive Retinopathy: the majority of males were in the mild category followed by the moderate category. In females, there were (4) in the severe category of anxiety, and equal numbers in minimal, mild, and moderate (3 each) were found. For other Retinopathies (AMD, Retinal Vein Occlusion, RP, Central Artery Occlusion) we found moderate levels of anxiety in males and females.

Discussion

The current cross-sectional study aimed at examining the prevalence and determinants of depression and anxiety among newly diagnosed patients with retinopathy. We evaluated the HADS and GAD-7 scales' effectiveness in determining the psychological effects of distinct retinal diseases, with varying gender differences. The results of this study showed that HADS data (Tables 4 and 5) showed that a considerable number of patients with DR experienced moderate to severe anxiety. It was also found that the proportion was higher in females as compared to males (62.5% vs. ~29%). This shows that there were sex-specific differences in the psychological impact of DR. The level of depression was almost similar in both genders in

relation to DR. This was in agreement with research findings showing that women are more likely to experience anxiety disorders as compared to men [10-12]. This aligns with epidemiological data indicating that women are approximately 1.7 times more likely than men to report a lifetime history of major depressive episodes [13]. Additionally, it may be influenced by the sociocultural roles of women in these countries, including work and household responsibilities, child care, psychological challenges, and limited social support.

In a similar study by Ling Xu et al. [5] in China in 200 patients of DR they found prevalence of depression was 25% and anxiety was 13.5% cases. Wang et al. [14] analyzed the existence of depressive symptoms in patients with T2DM and reported that 24.8% of these patients had depression. In this study, we found that anxiety was higher because vision impairment and potential for vision loss were impacting the individual's quality of life and leading to emotional distress, reduced independence, and social isolation. The observed association between retinopathy and anxiety/depression is consistent with existing literature. The GAD-7 data (Table 6) provided a more detailed understanding of anxiety severity. This study found 8.3% of males with severe anxiety and 30.8% of females with hypertensive retinopathy had severe anxiety. The age-related macular degeneration did not have any case of moderate or severe anxiety in both genders. This could be due to the age of the patients we found all the cases of AMD in the age group above 70 years in the study.

Vision impairment and the potential for vision loss can significantly impact an individual's quality of life, leading to emotional distress, reduced independence, and social isolation [15]. These factors can contribute to the development of anxiety and depressive symptoms. The higher prevalence of anxiety observed in our study, compared to depression, aligns with findings from other studies investigating the psychological impact of chronic medical conditions [16]. Anxiety is often a primary response to uncertainty and perceived threat, which are common experiences for individuals facing a new diagnosis of a potentially vision-threatening condition. The results of a large cross-sectional analysis involving 5104 patients DAWN study involving 13 countries across the globe including Asia, Australia, Europe, and North America, found that 41% of adults with type 2 diabetes experienced poor psychosocial well-being. India and Japan represented Asia in this study [17]. Similarly, research conducted in Malaysia among 169 type 2 diabetes patients reported anxiety prevalence at 31.4% and depression at 40.3% [18]. We found only a few cases of Retinal Vein Occlusion, RP, and Central Artery Occlusion during the period of this study. This was because of the lesser prevalence of these cases in the general population. The few numbers of cases of (AMD, Retinal Vein Occlusion, RP, and Central Artery Occlusion) represent a significant limitation of this study. This restricts our ability to draw firm conclusions about the psychological impact of these specific conditions. Future research with larger samples is crucial to confirm these preliminary observations and explore the unique challenges faced by individuals with these less common retinopathies. Furthermore, the cross-sectional design of our study limits our ability to establish causal relationships. Longitudinal studies are needed to investigate the temporal relationship between retinopathy diagnosis and the onset and course of anxiety and depression.

Conclusion

In conclusion, this study highlights a significant prevalence of anxiety and depression among patients with various retinopathies, particularly diabetic and hypertensive retinopathy. Diabetic retinopathy was the most common, followed by hypertensive retinopathy, with cases predominantly in older age groups and lower socioeconomic classes. Moderate to severe anxiety was observed in 29–33% of diabetic and hypertensive retinopathy patients, while 14–17% exhibited moderate to severe depression. Anxiety levels varied across retinopathies, with a notable burden in both genders, particularly in diabetic and hypertensive retinopathy. These findings underscore the need for comprehensive mental health screening and interventions in managing patients with retinopathy.

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