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Association Between Dry Eye Disease and Depression: A Population-Based Study

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Abstract:

Objective: To evaluate the prevalence and potential association between dry eye disease (DED) and depression in a population-based cohort from northern India.

Material and Methods: A cross-sectional study was carried out with 306 participants from northern India, utilizing two well-established tools: the Patient Health Questionnaire-9 (PHQ-9) to measure depression and the Dry Eye Questionnaire-5 (DEQ-5) to assess the symptoms of DED. The survey was conducted online through Google Forms. We determined the prevalence of depression among individuals with DED and categorized the severity of depression based on PHQ-9 scores into the following groups: asymptomatic (0–4), mild (5–9), moderate (10–14), moderately severe (15–19), and severe (≥20).

Results: Many participants frequently experienced a lack of interest or pleasure in activities (63.7%) and feelings of sadness and hopelessness (52%). Most alarmingly, daily thoughts of self-harm or being better off dead were reported by 28.6%. A significant proportion of participants, 82.2%, reported experiencing depressive symptoms. Most experienced moderately severe (31.0%) and severe (34.0%) depressive symptoms. A strong positive Pearson correlation was obtained between DED and depression ($r=0.84$, p-value<0.05), highlighting a significant association between ocular discomfort and mental health.

Conclusion: The findings indicate a significant association between dry eye disease and a higher likelihood of experiencing depression, particularly at moderate to severe levels. This highlights the importance of comprehensive patient assessments, which should include mental health evaluations, especially for those dealing with dry eye disease.

Keywords: depression, dry eye disease, Patient Health Questionnaire

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Introduction

Dry eye disease (DED), often referred to as keratoconjunctivitis sicca, affects millions of people worldwide. It's particularly well-researched in developed nations, where it's acknowledged as a significant public health challenge[1]. Those suffering from DED frequently deal with uncomfortable symptoms such as dryness, a gritty or burning sensation in their eyes, pain, light sensitivity, and the feeling that something is lodged in their eye. These symptoms can complicate daily activities like reading, using screens, or driving, ultimately diminishing one's quality of life. Beyond the personal discomfort, DED also imposes a financial strain due to treatment costs and decreased work productivity[2]. Dry eye symptoms and clinical signs are used to diagnose DED; however, there is typically little association between them[3]. Questionnaires are among the best tools for diagnosing DED because they allow us to hear directly from patients about their symptoms[4]. One of the most popular and widely used tools for this purpose is the Ocular Surface Disease Index (OSDI)[5]. Other commonly used questionnaires include the McMonnies Questionnaire, the Standardized Patient Evaluation of Eye Dryness (SPEED), the Symptoms Assessment in Dry Eye (SANDE), and the Dry Eye Questionnaire (DEQ-5)[6]. The DEQ-5 is a more straightforward version of the original Dry Eye Questionnaire, featuring just five questions. It zeroes in on symptoms like discomfort and dryness that tend to worsen later in the day, the intensity of these symptoms, how often the eyes feel watery, and how frequently discomfort and dryness occur. Each question is rated on a scale from 0 to 4, making it easier for clinicians to quickly gauge the presence and severity of dry eye symptoms.

Depressive disorders are common in the general population, particularly in primary care and general hospital settings[7]. Depression is linked to serious impairments in physical, social, and occupational functioning, as well as higher utilization of healthcare[8]. In many diseases, such as coronary heart disease, depressive symptoms are common coexisting issues that have been shown to raise the risk of morbidity and mortality[9]. The Patient Health Questionnaire (PHQ) is a popular screening tool that helps identify and diagnose depression along with other common mental health issues, especially in primary care environments. The validity of the PHQ questionnaire has been discussed in various studies[10,11]. The PHQ depression scale, often called the PHQ-9, is made up of 9 questions that align perfectly with the diagnostic criteria for depressive disorders. Even though it has fewer questions than some other depression scales, it still provides comparable sensitivity and specificity, making it a practical and trustworthy tool for both screening and diagnosing depression[12].

Chronic ocular surface irritation and visual disturbances in DED significantly impact the quality of life and daily tasks of those affected, despite these symptoms being rarely severe. Chronic discomfort related to DED can adversely affect a patient's cognitive functions, mood, and mental health. Several authors, in the past few years, studied the comorbidities related to DED and the relationship between DED and psychiatric disorders[13–16]. However, there are few studies investigating DED and depression focused on the Indian population. This study set out to explore how common depression is among people suffering from DED in northern India.

Material and Methods

In this work, a population-based cross-sectional study using convenience sampling was performed to investigate depressive symptoms among DED patients. The study was conducted between January and July 2023. In this study, information on patients exhibiting symptoms associated with DED was collected from hospital records, and a total of 312 participants responded. However, 6 participants opted out, and thus data from 306 participants were analyzed. A psychiatrist validated the questions

to ensure their authenticity in the context of depressive symptoms, and ethical approval was obtained before conducting the study. PHQ-9 and DEQ-5 were used to assess symptoms of depression and DED, respectively. The data were collected using a single Google form. Informed consent was obtained to use the data for research purposes, and confidentiality was maintained. In addition to the questionnaires, the distributed form also included biographical information, such as age, gender, city, occupational status, educational level, and marital status. The only criterion for inclusion in the study was age greater than 15 years. Exclusion criteria: patients with incomplete patient medical records or those who had undergone ocular procedures within the last year, such as crosslinking, corneal transplantation, or laser-assisted in-situ keratomileusis. The diagnostic criteria were based on the DEQ-5, which assessed the severity and effect of the participants' reported dry eye symptoms. A pilot study was conducted on 25 participants to evaluate the reliability of the data collection procedures before collecting the final data. The responses collected were analyzed using IBM SPSS Statistics version 22.0 (IBM Corp., Armonk, NY).

Results

Baseline characteristics

The demographics of participants revealed a nearly equal distribution of females (53.3%, 169 participants) and males (46.7%, 148 participants). The age distribution was wide, with 10.1% under the age of 25, 36.6% between the ages of 25 and 35, 22.2% between the ages of 35 and 45, 26.8% between the ages of 45 and 55, and 4.3% older than 55 years. The data revealed that 2% of participants completed high school, 9.8% had an intermediate education, 44.8% had a bachelor's, and 43.4% had a master's degree. The majority (68%) were married, with 36.3% being divorced, 8.1% separated, 14.7% widowed, and 35% single. In the realm of employment, a majority of participants (68%) were employed, 32% were unemployed. The study participants' characteristics are detailed in Table 1. This table also highlights their medical history, showing that 89.5% reported having no chronic illnesses, while 10.5% indicated they had one or more chronic conditions. Out of these, 30.4% confirmed not having been previously diagnosed with dry eye, while 69.6% had been diagnosed with dry eye. Concerning whether a participant had refractive errors: 12.4% had myopia, 14.1% had hypermetropia, 24.2% had astigmatism, and 49.3% had no refractive errors. Out of all participants, 93.5% were diagnosed with depression, and the remaining 6.5% were not.

Table 1 Study characteristics of the analysis sample: Including demographic data, chronic disease, diagnosis history, and refractive error

Personal Data/ Variables	Frequency	Percent
Age (years)		
15-25	31	10.1
25-35	112	36.6
35-45	68	22.2
45-55	82	26.8
Above 55	13	4.3
Gender		
Male	143	46.7
Female	163	53.3
Do you suffer from chronic disease?		
Yes	32	10.5
No	274	89.5
Have you been diagnosed with depression?		
Yes	20	6.5
No	286	93.5
Have you been previously diagnosed with dry eye?		
Yes	213	69.6
No	93	30.4
Do you suffer from refractive errors?		
Myopia	38	12.4
Hypermetropia	43	14.1
Astigmatism	74	24.2
No	151	49.3

PHQ-9 Questionnaire data

Table 2 shows the results assessing mental health using the PHQ-9 questionnaire (data with percentages less than 25 are not shown). Notably, a significant proportion of individuals reported little interest or pleasure in doing things at all, with 63.7% of respondents indicating that they felt this way for more than half of the days assessed. Furthermore, 8.5% reported experiencing this symptom nearly every day, suggesting a notable level of consistent and persistent impact on their daily lives. A significant number of respondents expressed emotions of sadness and hopelessness, with 52% saying they felt this way for more than half of the day. Additionally, sleep problems were common, with 15.1% of individuals reporting difficulty sleeping or staying asleep for more than half of the day. Fatigue and low energy levels were also prevalent, impacting 40.2% of participants for more than half the day. Changes in appetite and self-esteem were also evident, with 35.9% and 38.2% of participants, respectively, experiencing these symptoms for more than half the day. Concentration difficulties were reported by 32% of respondents, while motor symptoms like slowed movement or restlessness were noted in 34.4% for more than half a day. Disturbingly, thoughts of self-harm or a desire to be dead were reported by 38.6% of participants nearly every day.

Prevalence of depression and its severity

In this research article, depression severity levels are categorized based on the scores obtained from PHQ-9. The severity of depression is classified according to specific score ranges. A score between 0 and 4 means there's no depression. A score from 5 to 9 suggests mild depression, while a score of 10 to 14 indicates moderate depression. If a score falls between 15 and 19, it reflects moderately severe depression, and scores ranging from 20 to 27 point to severe depression. PHQ-9 data used to assess and compare depressive symptoms are shown in Table 3. Out of 306 participants, 270 had depression. Among those with depression, 37 had mild depression, 34 had moderate depression, 95 had moderately severe depression, and 104 had severe depression.

Table 2 Patient Health Questionnaire (PHQ-9) data (data with a percentage less than 25 is not shown)

Variables	Options	Frequency	Percent
Little interest or pleasure in doing things	More than half the days	195	63.7
Feeling down, depressed, or hopeless	Several days	85	27.8
	More than half the days	159	52.00
Trouble falling or staying asleep, or	Several days	84	27.5
sleeping too much	More than half the days	138	45.1
Feeling tired or having little energy	More than half the days	123	40.2
	Nearly every day	97	31.7
Poor appetite or overeating	Several days	102	33.3
	More than half the days	110	35.9
Feeling bad about yourself or that you are a failure or have let yourself or your family down	More than half the days	117	38.2
Trouble concentrating on things, such as reading the newspaper or watching television	Several days	98	32.0
	More than half the days	98	32.0
Moving or speaking so slowly that other people could have noticed.	More than half the days	105	34.4
	Nearly every day	79	25.8
Thoughts that you would be better off dead, or of hurting yourself	More than half the days	86	28.1
	Nearly every day	118	38.6

Eye discomfort

Figure 1(a) shows the frequency of participants who reported discomfort in their eyes during a typical day over the period of a month. About 12 % reported that they never or rarely have these symptoms. However, 83.9 % reported that they sometimes or frequently have these symptoms. The data showed a broad spectrum of responses, with the highest percentage, 44.4%, indicating that a significant portion of participants frequently experienced eye discomfort. Conversely, the lowest reported percentage, 1.9%, revealed that only a small minority never encountered this discomfort, highlighting that the issue was prevalent among the majority of participants. Figure 1(b) represents the frequency of participants experiencing discomfort within two hours of going to bed, wherein 71.9% had moderately or severely intense symptoms, and about 22% had intense or mild symptoms.

A large percentage, 33%, of individuals experienced moderate to severe eye discomfort before going to bed, whereas the lowest percentage, 6.5%, reported no discomfort, indicating that the problem was prevalent among the majority of participants.

Table 3 Prevalence and severity of depression among participants diagnosed with dry eye disease

Questionnaire	Severity (Score)	Frequency	Percent
Depression (PHQ-9)	No depression (0-4)	36	11.8
	Mild (5-9)	37	12.1
	Moderate (10-14)	34	11.1
	Moderately severe (15-19)	95	31
	Severe (20-27)	104	34
Dry Eye (DEQ-5)	Asymptomatic (0-5)	35	11.4
	Mild to moderate (6-11)	60	19.6
	Severe (≥12)	211	69

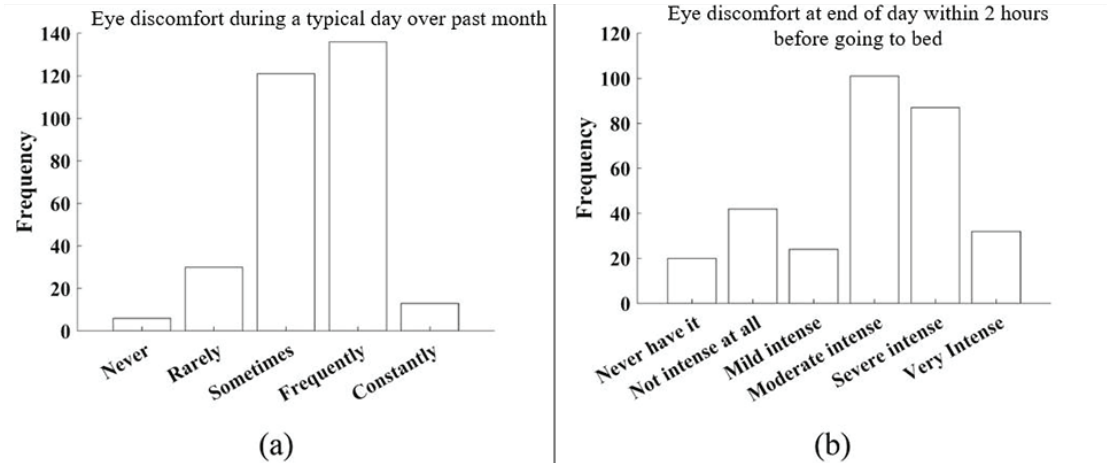

Figure 1 Data were collected on eye discomfort experienced (a) during a typical day over the past month and (b) in the two hours before bedtime

Dryness and excessive watering

Figure 2(a) signifies the frequency of participants experiencing dryness in their eyes during a typical day over the past month. About 18 % revealed that they never or rarely have dryness in their eyes. However, 71.5 % reported that they sometimes or frequently have these symptoms. According to the findings, 43.1% of participants frequently experience dryness in their eyes, while 10.4% suffered similar symptoms on a regular basis. The majority of individuals (42.2%) reported feeling moderately dry at the end of the day, particularly within two hours of going to bed. A significantly smaller number, 7.8%, never experienced any level of dryness. The remaining participants reported experiencing dryness at a mild intensity. Figure 2(b) illustrates the frequency of participants experiencing excessively watery eyes during a typical day over the past month. The data reveal a wide range of responses, with the highest reported frequency being 45.1% for sometimes feeling excessively watery. The lowest reported frequency was only 1.9% for never experiencing this discomfort, indicating that a very small percentage of participants were completely free from this issue.

DED and depression correlation

Figure 3 shows a scatter plot with DEQ-5 scores on the x-axis and PHQ-9 scores on the y-axis for all participants in the study. A strong positive Pearson correlation was obtained between DED and depression ($r=0.84$, p-value<0.05), highlighting a significant association between ocular discomfort and mental health. Additionally, a linear fit line is shown on the scatter plot to illustrate the correlation between depression and dry eye disease. The slope of the line is 1.288, which indicates a positive correlation between DEQ-5 and PHQ-9 scores, suggesting that as the DEQ-5 scores increase (indicating more severe dry eye symptoms), the PHQ-9 scores also tend to increase (indicating more severe depressive symptoms). This correlation suggests that individuals with higher levels of dry eye symptoms are more likely to experience higher levels of depressive symptoms.

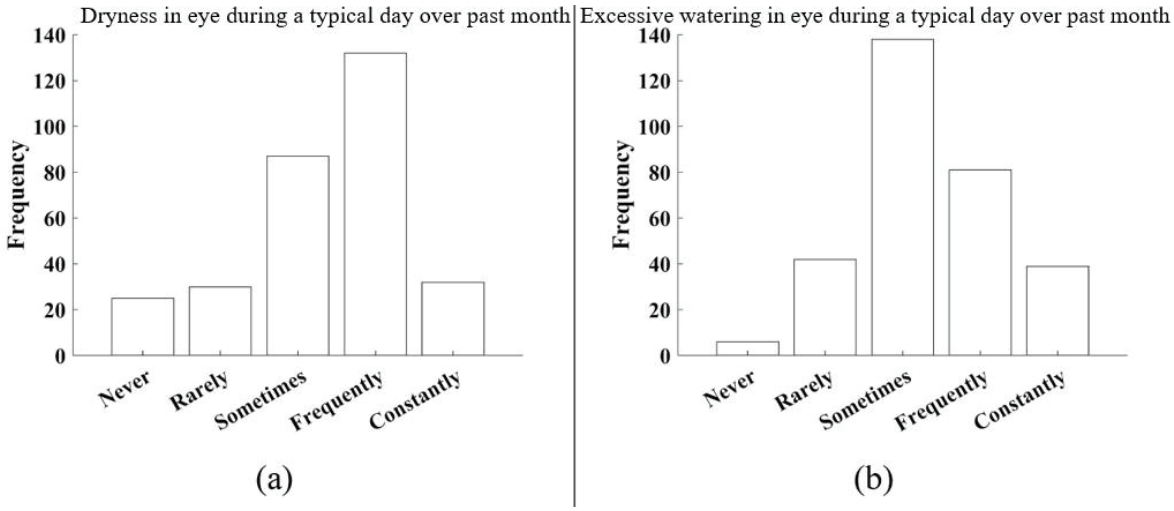

Figure 2 Data on (a) dryness and (b) excessive eye watering experienced during a typical day over the past month

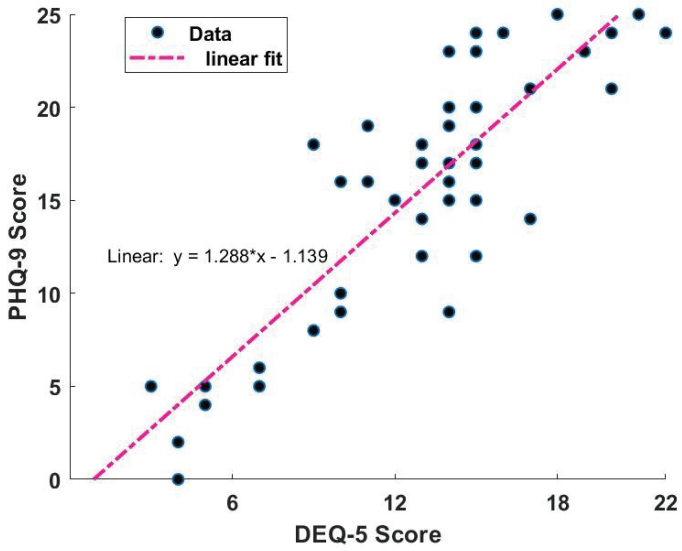

Figure 3 Scatter plot showing the correlation between DEQ-5 and PHQ-9 questionnaire scores

Discussion

Out of 306 participants, a total of 270 were found to have depression, which represents approximately 82.2% of the total population with DED. This high percentage suggests a strong association between DED and depression. Regarding the severity of depression among these participants, it was found that a substantial portion, 31% and 34 %, experienced moderately severe and severe depression, respectively. Table 4 tabulates different studies conducted across the world showing the prevalence and severity of depressive symptoms among different populations using different assessment tools. The results of the present study are also shown for comparison. Asiedu et al. conducted a study in Africa with 211 participants having an average age of 21.6 years. They found that most of the participants reported severe DED symptoms[17]. In the present study, the average age of participants was 38.48 years, indicating more young participants compared to the other studies in Table 4. The mean score of the DEQ-5 results is very similar to a study conducted by Ong et al. in the USA; however, a direct comparison is difficult due to the difference in average age[18].

Recently, a few studies have been conducted to investigate the correlation between DED and depression[19,20]. These findings are consistent with prior studies that found a link between DED and depression. Galor et al. examined the association between DED and psychiatric problems in a veteran population survey and discovered that the presence of depression resulted in a roughly twice as high likelihood of developing DED[14]. Similarly, Fernandez et al. recently discovered an increase in dry eye symptoms in veterans suffering from depression or post-traumatic stress disorder[16]. While depression and DED are known to be correlated, research suggests that the experience of DED symptoms, such as chronic pain and visual disturbance, has a more direct connection to depressive symptoms. There could be various explanations for this association. Firstly, dry eye problems can cause or

worsen depression and anxiety symptoms. Chronic pain has an adverse effect on numerous elements of patient health, particularly cognitive processes and mental health. The relationship between DED and depression operates through multiple interconnected pathways. At the biological level, chronic ocular irritation triggers neuroinflammatory cascades involving pro-inflammatory cytokines (IL-6, TNF-α), which cross the blood-brain barrier and influence mood-regulating neurotransmitter systems[21]. Furthermore, DED has a negative impact on the patient's routine and quality of life as a result of the chronic pain, as well as changes in visual performance and perception of visual function. Psychosocially, DED-related visual symptoms precipitate functional limitations, such as reduced reading capacity, diminished screen tolerance, and impaired social engagement, all of which collectively erode quality of life and amplify depressive symptomatology. Sleep disturbances secondary to ocular discomfort further compromise psychological resilience. These findings have contributed valuable insights into their correlation and shed light on the aspects of eye discomfort and mental well-being.

Over the past few years, several studies have been conducted in the Indian population to investigate the prevalence of depressive symptoms and DED independent of each other[22]. However, the interconnection between them remains less explored. This study utilizes the DED-9 and PHQ-5 questionnaires to assess DED and depression, which may have inherent limitations. Firstly, these tools have a limited scope, potentially missing crucial aspects of these complex conditions, leading to an incomplete understanding. Secondly, relying on self-reported responses introduces subjectivity and the possibility of response bias, where participants may not accurately represent their symptoms. Moreover, the lack of clinical confirmation, such as medical examinations, hinders the accuracy of the findings, as reported symptoms might stem from other underlying health issues. Additionally, many studies using these questionnaires limit the exploration of causality and the dynamic nature of these conditions over time. Lastly, these questionnaires primarily focus on symptoms, neglecting the psychosocial context and environmental factors that play a significant role in the experiences of individuals with DED

Table 4 Comparison of dry eye disease and depression scores with the existing literature

Author, year	Number of participants	Location	Average age (year)	DED Severity (mean±S.D.)		Depression severity (mean±S.D.)	
				Measure	Score	Measure	Score
Wu et al., 2019[23]	106	China	42.52	–	–	PHQ-9	5.2±4.92
Asiedu et al., 2018[17]	211	Africa	21.6	DEQS	Mild 23.22±13.04 Moderate 27.35±12.75 Severe 43.02±19.97	–	–
Bitar et al., 2019[24]	45	USA	65.5	–	–	PHQ-8	6.1±5.5
Kitazawa et al., 2018[25]	40	Japan	61.3	DEQS	52±24.82	–	–
Galor et al., 2015[26]	136	USA	65	DEQ-5	11±5.2	PHQ-9	–
Ong et al., 2017[18]	120	USA	64	DEQ-5	11.33±4.90	PHQ-9	7.27±7.32
Present study	306	India	38.48	DEQ-5	13.08±4.43	PHQ-9	15.71±6.76

S.D.=standard deviation, DEQS=dry eye quality of life score

and depression. These limitations underscore the need for a comprehensive approach, combining questionnaire data with clinical assessments and considering diverse cultural and psychosocial factors for a more accurate understanding of these conditions.

Conclusion

The exploration of DED and depression through cross-sectional studies in northern India has illuminated a significant intersection between ocular health and mental well-being. Out of 306 participants, a total of 270 were found to have depression, which represents approximately 82.2% of the total population with DED. Regarding the severity of depression among these participants, it was found that a substantial portion, 31% and 34 %, experience moderately severe and severe depression, respectively. This questionnaire-based study limits the exploration of causality and the dynamic nature of these conditions over time, as it primarily focused on symptoms, neglecting the psychosocial context and environmental factors. These limitations underscore the need for a comprehensive approach, combining questionnaire data with clinical assessments. These results provide a foundation for developing targeted interventions, raising awareness, and improving the quality of care for individuals suffering from depression and DED.

Conflict of interest

There are no potential conflicts of interest to declare.

References

1. Kojima T, Dogru M, Kawashima M, Nakamura S, Tsubota K. Advances in the diagnosis and treatment of dry eye. Prog Retin Eye Res 2020;78.
2. Cantó-Sancho N. Work productivity among Sjögren's Syndrome and non-Sjögren's dry eye patients: a systematic review and meta-analysis. Archivos de Prevencion Riesgos Laborales 2021;24.
3. Bartlett JD, Keith MS, Sudharshan L, Snedecor SJ. Associations between signs and symptoms of dry eye disease: a systematic review. Clinical Ophthalmology 2015;9.
4. Boboridis KG, Messmer EM, Benítez-Del-Castillo J, Meunier J, Sloesen B, O'Brien P, et al. Patient-reported burden and overall impact of dry eye disease across eight European countries: a cross-sectional web-based survey. BMJ Open 2023;13.
5. Traipe L, Gauro F, Goya MC, Cartes C, López D, Salinas D, et al. Validation of the Ocular Surface Disease Index Questionnaire for Chilean patients. Rev Med Chil 2020;148.
6. Okumura Y, Inomata T, Iwata N, Sung J, Fujimoto K, Fujio K, et al. A review of dry eye questionnaires: measuring patient-reported outcomes and health-related quality of life. Diagnostics 2020;10.
7. Gold SM, Köhler-Forsberg O, Moss-Morris R, Mehnert A, Miranda JJ, Bullinger M, et al. Comorbid depression in medical diseases. Nat Rev Dis Primers 2020;6.
8. Jaffe DH, Rive B, Denee TR. The humanistic and economic burden of treatment-resistant depression in Europe: a cross-sectional study. BMC Psychiatry 2019;19.
9. Vaccarino V, Badimon L, Bremner JD, Cenko E, Cubedo J, Dorobantu M, et al. Depression and coronary heart disease: 2018 position paper of the ESC working group on coronary pathophysiology and microcirculation. Eur Heart J2020;41.
10. Sun Y, Kong Z, Song Y, Liu J, Wang X. The validity and reliability of the PHQ-9 on screening of depression in neurology: a cross sectional study. BMC Psychiatry 2022;22.
11. Kaggwa MM, Najjuka SM, Ashaba S, Mamun MA. Psychometrics of the Patient Health Questionnaire (PHQ-9) in Uganda: A Systematic Review. Front Psychiatry 2022;13.
12. Costantini L, Pasquarella C, Odone A, Colucci ME, Costanza A, Serafini G, et al. Screening for depression in primary care with Patient Health Questionnaire-9 (PHQ-9): A systematic review. J Affect Disord 2021;279.
13. Wang TJ, Wang IJ, Hu CC, Lin HC. Comorbidities of dry eye disease: a nationwide population-based study. Acta Ophthalmol 2012;90.
14. Galor A, Feuer W, Lee DJ, Florez H, Faler AL, Zann KL, et al. Depression, post-traumatic stress disorder, and dry eye syndrome: A study utilizing the National United States veterans affairs administrative database. Am J Ophthalmol 2012;154.

15. Li M, Gong L, Sun X, Chapin WJ. Anxiety and depression in patients with dry eye syndrome. Curr Eye Res 2011;36.
16. Fernandez CA, Galor A, Arheart KL, Musselman DL, Venincasa VD, Florez HJ, et al. Dry eye syndrome, posttraumatic stress disorder, and depression in an older male veteran population. Invest Ophthalmol Vis Sci 2013;54.
17. Asiedu KO, Dzasimatu SK, Kyei S. Impact of dry eye on psychosomatic symptoms and quality of life in a healthy youthful clinical sample. Eye Contact Lens: Sci Clin Pract 2018;44:S404–9.
18. Ong ES, Alghamdi YA, Levitt RC, McClellan AL, Lewis G, Sarantopoulos CD, et al. Longitudinal Examination of Frequency of and Risk Factors for Severe Dry Eye Symptoms in US Veterans. JAMA Ophthalmol 2017;135:116–23.
19. Citradewi AAAD, Widiana IGR, Susila NKN, Djelantik AAAS. Correlation of depression, anxiety and stress level on dry eye disease severity. Int J Health Sci (Qassim) 2022.
20. He Q, Chen Z, Xie C, Liu L, Wei R. The Association Between Dry Eye Disease With Depression, Anxiety and Sleep Disturbance During COVID-19. Front Psychiatry 2022;12.
21. Launay PS, Reboussin E, Liang H, Kessal K, Godefroy D, Rostene W, et al. Ocular inflammation induces trigeminal pain, peripheral and central neuroinflammatory mechanisms. Neurobiol Dis 2016;88:16–28.
22. Dutta G, Rajendran N, Kumar T, Varthya SB, Rajendran V. Prevalence of Depression Among Undergraduate Medical Students in India: A Systemic Review and Meta-Analysis. Cureus 2023.
23. Wu M, Liu X, Han J, Shao T, Wang Y. Association between sleep quality, mood status, and ocular surface characteristics in patients with dry eye disease. Cornea 2019;38:311–7.
24. Bitar MS, Olson DJ, Li M, Davis RM. The Correlation between Dry Eyes, Anxiety and Depression: The Sicca, Anxiety and Depression Study. Cornea 2019;38:684–9.
25. Kitazawa M, Sakamoto C, Yoshimura M, Kawashima M, Inoue S, Mimura M, et al. The relationship of dry eye disease with depression and anxiety: a naturalistic observational study. Transl Vis Sci Technol 2018;7:35.
26. Galor A, Felix ER, Feuer W, Shalabi N, Martin ER, Margolis TP, et al. Dry eye symptoms align more closely to non-ocular conditions than to tear film parameters. Br J Ophthalmol 2015;99:1126-9.