Evaluation of the Prevalence of Dry Eye And Associated Risk Factors in Patients From a University Outpatient Clinic

Avaliação da Prevalência de Olho Seco e Fatores de Risco Associados em Pacientes de um Ambulatório Universitário
Evaluación de la Prevalencia de Ojo Seco y Factores de Riesgo Asociados en Pacientes de un Ambulatorio Universitario

RESUMO
Objetivo: Avaliar a prevalência e a gravidade dos sintomas de olho seco em pacientes do de um ambulatório universitário, correlacionando-os com fatores de risco associados. **Métodos:** Estudo transversal observacional com 120 indivíduos, aprovado pelo Comitê de Ética (CAAE: 82353924.9.0000.5134). Os dados foram obtidos por meio do questionário OSDI, aplicado durante atividades de extensão da liga de Oftalmologia. **Resultados:** A mediana de idade foi de 51 anos, com predominância do sexo feminino (70%). Dos participantes, 69 (58%) apresentaram escore compatível com olho seco: leve (17%), moderado (16%) e grave (67%). Apenas 19% tinham diagnóstico oftalmológico prévio. Fatores associados à gravidade incluíram menopausa (p = 0,035), uso de antidepressivos (p = 0,030), antialérgicos (p = 0,027), dislipidemia (p = 0,043) e cirurgia ocular (p = 0,034). Atividades como leitura, assistir TV e uso de computador foram significativamente afetadas. **Conclusão:** A prevalência dos sintomas foi alta, com impacto funcional importante e subdiagnóstico frequente.
DESCRITORES: Doença do Olho Seco; Oftalmologia; Triagem; Fatores de risco.

ABSTRACT
Objective: To estimate the prevalence and severity of dry eye symptoms in patients from an outpatient clinic, correlating them with associated risk factors. **Methods:** Cross-sectional observational study with 120 individuals, approved by the Research Ethics Committee (CAAE: 82353924.9.0000.5134). Data were collected using the OSDI questionnaire during activities by the academic Ophthalmology group-study. **Results:** The median age was 51 years, with a predominance of females (70%). According to OSDI scores, 69 (58%) had results compatible with dry eye: mild (17%), moderate (16%), and severe (67%). Only 19% had a previous diagnosis. Factors associated with severity included menopause (p = 0.035), antidepressants (p = 0.030), antihistamines (p = 0.027), dyslipidemia (p = 0.043), and ocular surgery (p = 0.034). Reading, watching TV, and computer use were significantly impacted. **Conclusion:** Dry eye symptoms were highly prevalent, underdiagnosed, and associated with multiple risk factors, highlighting the importance of early screening and intervention.
DESCRIPTORS: Dry Eye Disease; Ophthalmology; Screening; Risk Factors.

RESUMEN
Objetivo: Evaluar la prevalencia y la gravedad de los síntomas de ojo seco en pacientes de um ambulatório universitário, correlacionándolos con factores de riesgo asociados. **Métodos:** Estudio observacional transversal con 120 individuos, aprobado por el Comité de Ética en Investigación (CAAE: 82353924.9.0000.5134). Los datos se obtuvieron mediante la aplicación del cuestionario OSDI durante actividades de extensión de la liga académica de Oftalmología. **Resultados:** La mediana de edad fue de 51 años, con predominio del sexo femenino (70%). Según los puntajes del OSDI, 69 (58%) presentaron resultados compatibles con ojo seco: leve (17%), moderado (16%) y grave (67%). Solo el 19% tenía diagnóstico previo. Factores asociados a mayor gravedad fueron menopausia (p = 0,035), uso de antidepresivos (p = 0,030), antihistamínicos (p = 0,027), dislipidemia (p = 0,043) y cirugía ocular (p = 0,034). Actividades como leer, ver televisión y usar computadora fueron significativamente afectadas. **Conclusión:** Los síntomas de ojo seco fueron prevalentes y subdiagnosticados, destacando la necesidad de detección precoz e intervención dirigida.
DESCRIPTORES: Enfermedad del Ojo Seco; Oftalmología; Cribado; Factores de Riesgo.

DOI: 10.36489/saudecoletiva.2025v15i97p15984-15997

RECEIVED: 05/12/2025 **APPROVED:** 05/27/2025

How to cite this article: Carvalho IL, Orefice JL, Rubatino ALL, Braga MEA, Marques FFL, Souza JS. Evaluation of the Prevalence of Dry Eye And Associated Risk Factors in Patients From a University Outpatient Clinic. Saúde Coletiva (Edição Brasileira) [Internet]. 2025 [acesso ano mês dia];15(97):15984-15997. Disponível em: DOI: 10.36489/saudecoletiva.2025v15i97p15984-15997

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INTRODUCTION

Dry eye disease (DED) was redefined by the Dry Eye Workshop II (DEWS-II) as a multifactorial disease of the ocular surface characterized by a loss of tear film homeostasis and accompanied by ocular symptoms, in which tear film instability and hyperosmolarity, ocular surface inflammation and damage, and neurosensory abnormalities play etiological roles. [1]

The Tear Film & Ocular Surface Society (TFOS) highlights the plurality of symptoms present in this ocular condition, which includes ocular discomfort, foreign body sensation, red eye and tearing. Less common symptoms are pruritus and photophobia. The condition is usually bilateral, chronic and worsens throughout the day. [2]

There are several risk factors associated with DED, the most studied being female gender, advanced age, use of contact lenses, excessive exposure to screens, as well as the presence of allergies and systemic diseases. [3]

Dry eye affects a significant percentage of the population, mainly women over 40 years of age, and the application of questionnaires with the aim of identifying the existence of dry eye is of great relevance in clinical practice. 3 There are several questionnaires that can be used to screen for possible cases of dry eye, with emphasis on the Ocular Surface Disease Index (OSDI), which quantitatively assesses dry eye in a simple, fast and effective way, at a low cost. It is a valid and reliable instrument for measuring the severity of dry eye and its effects on the patient's vision. [4]

The OSDI, developed by the Outcomes Research Group of Allergan Inc (Irvine, California), is a 12-item questionnaire designed to provide a rapid assessment of the ocular irritation symptoms present in dry eye disease and their impact on vision-related functionality. The initial items were generated from patient feedback collected over several years of clinical studies conducted by Allergan Inc, from several quality of life instruments, and from suggestions from clinical investigators. [5]

The aim of the study is to evaluate the prevalence and risk factors associated with dry eye in patients being monitored at a university outpatient clinic, and to correlate the main risk factors associated with this condition.

METHOD

This is an observational, cross-sectional study conducted at an outpatient clinic of the Unified Health System (SUS), located in Belo Horizonte, Brazil, from June 2024 to May 2025. The sample consisted of 120 consecutively selected patients, all undergoing medical follow-up at the outpatient clinic during the established period. Participation was voluntary, upon signing the Free and Informed Consent Form. The research was approved by the Research Ethics Committee (CAAE: 82353924.9.0000.5134).

The study included patients of both sexes, aged 18 years or older, undergoing outpatient follow-up at the institution, and who agreed to provide the necessary data and answer the research questionnaires. Individuals with cognitive impairment and/or who were unable to manage their own health care were excluded.

Data collection was performed during extension activities of the Academic League of Ophthalmology (OFTALMOLIGA), through

DOI: 10.36489/saudecoletiva.2025v15i97p15984-15997

the application of printed questionnaires. The main instrument used was the Ocular Surface Disease Index (OSDI), validated by Schiffman et al. (2000), intended for screening symptoms of Dry Eye Disease (DED). The questionnaire has good specificity (83%) and reasonable sensitivity (60%) for this purpose. It consists of 12 questions, with answers from 0 to 4, where 0 corresponds to "no day of the week", 1 to "1 to 2 days a week", 2 to "3 to 4 days a week", 3 to "5 to 6 times a week" and 4 "7 days a week". The final OSDI score is calculated using the formula: [(sum of the scores of the answered questions) × 100] / [(number of answered questions) × 4], resulting in a value between 0 and 100, directly proportional to the severity of the symptoms. The scores are classified as follows: mild (13–22 points), moderate (23–32 points) and severe (33–100 points). The Portuguese version of the instrument has been validated, demonstrating good reliability and agreement.

In addition to the OSDI, a complementary questionnaire was applied, developed by Pereira, L.A., in his work "Epidemiology of Dry Eye Disease: a field study using a symptom questionnaire", aimed at obtaining demographic data (age, sex), symptom questionnaires and information on risk factors associated with the disease. The risk factors addressed were: diabetes, menopause, rheumatological diseases, leprosy, trachoma, chemotherapy/radiotherapy, eye surgery, use of contact lenses, thyroid diseases, use of computer or cell phone for 2 hours or more, use of antidepressants (chronic and/or in the last 30 days), use of antihistamines (chronic and/or in the last 30 days), chronic pelvic pain (pain below the navel for more than 3 months), fibromyalgia, dyslipidemia. The symptoms questionnaire addressed three questions with the possibility of a yes or no answer: "Do your eyes feel dry?", "Do your eyes feel irritated?", "Have you ever been diagnosed with Dry Eye?".

Data collection was carried out by directly approaching patients at the outpatient clinic reception, at which time they were invited to participate in the outreach activity linked to the research. The activity aimed to allow contact between callers and patients to provide guidance on the importance of regular follow-up with an ophthalmologist in cases of symptoms associated with dry eye and to elucidate the possible causes associated with this condition.

The statistical analysis of the database included descriptive and inferential procedures. Qualitative variables were expressed in absolute and relative frequencies (percentages), while quantitative variables were described by median and interquartile range, considering the possibility of non-normality in the distribution. For comparison between groups, Student's t-test was used when the distribution was considered normal; in the absence of normality, equivalent non-parametric tests were applied, such as the Mann-Whitney test. The association between qualitative variables was assessed by the chi-square test or, when appropriate, by Fisher's exact test. The significance level adopted was 5% ($p < 0.05$).

RESULTS

The study population consisted of a sample of 120 patients undergoing medical follow-up at the Ambulatory of Medical Sciences (ACM - MG). Of these, 84 (70%) were women and 36 (30%) were men, with a total mean age of 51 years (age range 38 - 63 years).

Regarding the initial symptom questionnaire (TABLE 1), dry eyes and irritated eyes, both symptoms were reported as always occurring by 29 patients (24%). Irritated eyes were described as a frequently presented symptom by a greater number of patients (20%) than dry eyes (12%). 97 (81%) of the participants had no previous diagnosis of dry eye at the time of the survey, and 23 (19%) had.

Table 1: Response to the symptom questionnaire applied in a university outpatient clinic in Minas Gerais, Brazil in 2024-2025.

Question	Never	Rarely	Often	Always
Do your eyes feel dry?	54 (45%)	25 (21%)	12 (10%)	29 (24%)
Do your eyes feel irritated?	33 (28%)	34 (28%)	24 (20%)	29 (24%)

Source: prepared by the author, research data.

Regarding risk factors (TABLE 2), the use of a computer or cell phone for 2 hours or more per day was the most common, being present in 71 people in the study population (59%). After the use of screens, the most reported risk factors were: menopause (36%), use of antidepressants in the last 30 days (39%), dyslipidemia (32%) and diabetes (26%). The risk factors not reported by any individual were a history of leprosy and a history of trachoma, and the least described were a history of chemotherapy or radiotherapy (3.4%).

DOI: 10.36489/saudecoletiva.2025v15i97p15984-15997

Table 2: Frequency of possible risk factors associated with dry eye disease in a university outpatient clinic in Minas Gerais, Brazil in 2024-2025.

Risk factor	No	Yes	Does not apply
Diabetes	89 (74%)	31 (26%)	-
Menopause	42 (35%)	43 (36%)	35 (29%)
Rheumatological Diseases	110 (92%)	10 (8.3%)	-
Leprosy	120 (100%)	0	-
Trachoma	120 (100%)	0	-
Chemo or Radiation	115 (97%)	4 (3.4%)	-
Eye Surgery	103 (86%)	17 (14%)	-
Contact lenses	112 (93%)	8 (6.7%)	-
Thyroid	102 (85%)	18 (15%)	-
Use of computer/cell phone 2 hours or more per day	49 (41%)	71 (59%)	-
Use of antidepressants (chronic and/or in the last 30 days)	81 (68%)	39 (33%)	-
Use of antiallergics (chronic and/or in the last 30 days)	102 (85%)	18 (15%)	-
Chronic Pelvic Pain (below the navel for more than 3 months)	96 (81%)	23 (19%)	-
Fibromyalgia	113 (94%)	7 (5.8%)	-
Dyslipidemia	79 (68%)	38 (32%)	-

Source: prepared by the author, research data.

Regarding the OSDI (TABLE 3), the most common discomfort reported in the week prior to the questionnaire was sensitivity to light, with the following frequencies: every day (32% of the sample), 5 to 6 days a week (7.6% of the sample) and 1 to 2 days a week (14% of the sample). The sensation of sand in the eyes was the least reported symptom, with 62% of patients denying the presence of the symptom. Regarding the daily activities affected, reading was most frequently reported, with the frequency of every day (23% of the sample), 5 to 6 days a week (2.5% of the sample) and 1 to 2 days a week (6.7% of the sample), while watching television was the most frequent, with the frequency between 3 and 4 days a week. Regarding eye discomfort or discomfort in the week prior to the questionnaire, caused by environmental factors, exposure to dry environments was the most common cause of discomfort in patients (44%), especially during all days of the week (15%). The presence of air-conditioned places was the least likely to cause visual impacts (67%). Wind caused discomfort in 42% of patients and was the most common symptom during all days of the week (18%).

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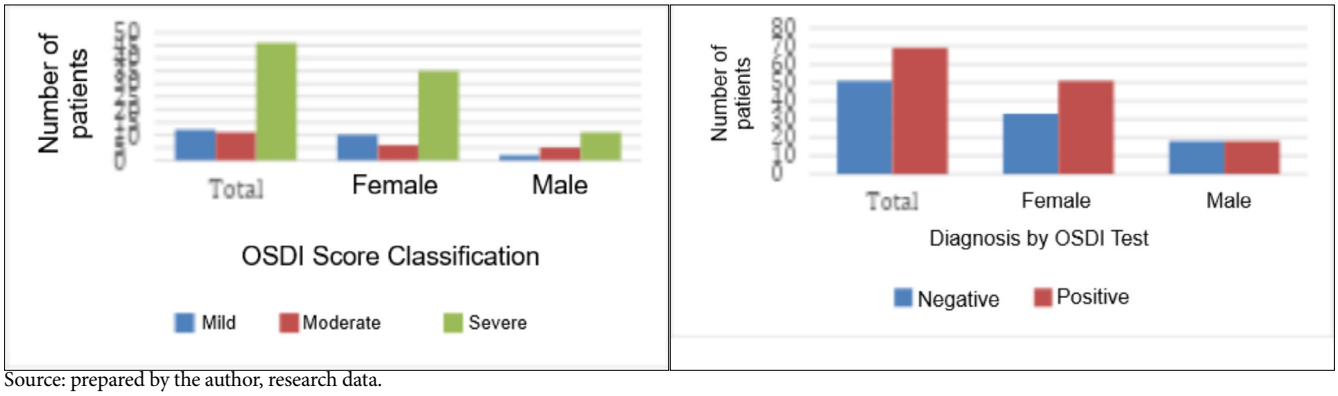
Table 3: OSDI test responses in a university outpatient clinic in Minas Gerais, Brazil in 2024-2025.

Symptoms in the last week	0	1	2	3	4
Brightness	48 (40%)	17 (14%)	7 (5.9%)	9 (7.6%)	38 (32%)
Feeling of sand	74 (62%)	10 (8.3%)	12 (10%)	7 (5.8%)	17 (14%)
Burning	70 (58%)	11 (9.2%)	15 (13%)	8 (6.7%)	16 (13%)
Blurred vision	58 (49%)	13 (11%)	10 (8.4%)	7 (5.9%)	31 (26%)
Poor vision	72 (61%)	5 (4.2%)	7 (5.9%)	6 (5.1%)	28 (24%)
Activities impacted by the eyes	0	1	2	3	4
Reading	75 (63%)	8 (6.7%)	5 (4.2%)	3 (2.5%)	28 (23%)
Driving at night	69 (58%)	2 (1.7%)	1 (0.8%)	0	4 (3.3%)
Using the computer or ATM	89 (74%)	6 (5.0%)	0	1 (0.8%)	10 (8.3%)
Watching TV	91 (76%)	2 (1.7%)	7 (5.8%)	2 (1.7%)	15 (13%)
Discomfort or discomfort in the last week	0	1	2	3	4
Wind bothers the eyes	69 (58%)	11 (9.2%)	10 (8.3%)	8 (6.7%)	22 (18%)
Dry places bother the eyes	67 (56%)	14 (12%)	10 (8.3%)	9 (7.5%)	18 (15%)
Air-conditioned places bother the eyes	80 (67%)	13 (11%)	5 (4.2%)	4 (3.3%)	15 (13%)

Source: prepared by the author, research data.

Of the 120 patients, 69 patients (58%) presented results compatible with the DED, with emphasis on the severity of the reported conditions: 67% (n = 46) were classified as severe, 16% (n = 11) as moderate, while only 17% (n = 12) were classified as mild cases (TABLE 4).

Table 4: SCORE classification by sex in a university outpatient clinic in Minas Gerais, Brazil in 2024-2025.



Source: prepared by the author, research data.

DOI: 10.36489/saudecoletiva.2025v15i97p15984-15997

DISCUSSION

The present study revealed a high prevalence of symptoms related to Dry Eye Syndrome (DES) in a diverse outpatient population, with emphasis on the severity of symptoms and their functional impact. Of the 120 individuals evaluated, 58% presented results compatible with the condition, with emphasis on the severity of the reported conditions: 66.7% (n = 46) were classified as severe, 16% (n = 11) as moderate, while only 17.4% (n = 12) were classified as mild cases. This data suggests not only the high frequency of the condition, but also a possible underdiagnosis, since only 19% reported a previous clinical diagnosis, which reinforces the relevance of active screening in outpatient settings, especially in populations potentially neglected in terms of preventive ophthalmological care.

The mean age of the sample was 52 years, with a tendency for severity to increase in older groups, although without statistical significance, this finding is consistent with data from other studies, which show a higher prevalence of the condition in older patients. It is conservatively estimated that between 10% and 20% of the population over 40 years of age currently has Dry Eye Disease, a condition recognized as a growing public health problem, with increasing prevalence related to global population aging. [6] Furthermore, the predominance of women (70%) is also in line with data from the literature, which shows that women have twice the rate of the disease compared to men. Thus, there is a higher prevalence of dry eye in women, especially after menopause, being one of the most relevant associations. [7] This correlation between female sex and DED is mediated by the regulatory effects of sex steroids, as well as hormones from the hypothalamic-pituitary axis and the thyroid on the lacrimal functional unit and the immune system. [8]

The data obtained revealed statistically significant associations between the severity of DED symptoms and several clinical and symptomatic variables. Menopause, for example, showed a significant association with the severity of symptoms (p = 0.035). Among patients with a severe score, 52% were in menopause, compared to 25% in the mild group. This finding reinforces the influence of hormonal changes, especially the reduction of estrogen and androgen on tear stability and ocular surface health, contributing to the development or worsening of DED.

Another risk factor identified was the use of medications such as antidepressants and antihistamines. The use of antidepressants was significantly more prevalent in the group with a positive diagnosis (42%) compared to the group with a negative diagnosis (20%), with a p-value of 0.010. It was also statistically associated with higher OSDI scores (p = 0.030), with 50% of individuals with a severe score using this medication, in contrast to only 8.3% in the mild group. Regarding the use of systemic antihistamines (p = 0.027), half of the patients in the mild group used these medications, compared to 15% in the severe group. This relationship can be explained by the antagonistic action on peripheral muscarinic receptors, with a reduction in the aqueous production of tears by the lacrimal glands and a decrease in the secretion of mucin by the goblet cells. 6 The data highlight the importance of detailed drug history in patients with ocular symptoms.

History of previous ocular surgery was also associated with disease severity (p = 0.034), with 36% of patients in the moderate group and 13% in the severe group reporting such history, compared to no cases (0%) in the mild group. Ocular procedures, such as cataract, refractive and strabismus surgeries, are associated with worsening dry eye symptoms. These procedures can cause damage to corneal innervation, instability of the tear film and reduction of reflex tear production, in addition to affecting goblet cells and ocular surface structures. Evidence indicates an increase in inflammatory mediators (such as IL-6 and TNF-α) in the tear film after ocular surgeries, which contributes to inflammation and ocular discomfort. Even interventions considered less invasive can cause subtle neurosensory changes that perpetuate symptoms. [9]

The presence of dyslipidemia was another factor significantly associated with symptom severity (p = 0.043), present in 45% of patients with a severe score, compared to 8.3% in the mild group. Disorders in lipid metabolism can compromise the quality of the lipid layer of the tear film, increasing tear evaporation and predisposing to evaporative dry eye. Similarly, a significant association was observed with the presence of chronic pelvic pain (30% in the positive group vs. 4% in the negative group; p < 0.001) and fibromyalgia (10% vs. 0%; p = 0.020).

Although the reduction in corneal sensitivity and the damage caused by Diabetes Mellitus in patients are widely discussed, the association between this pathology and Dry Eye Disease (DED) did not present a statistically significant correlation (p = 0.6), as also observed in other studies previously carried out in Brazil. [10]

Factors such as rheumatological diseases (p > 0.9), use of contact lenses (p = 0.6), thyroid disease (p = 0.6) and fibromyalgia (p = 0.5) did not show statistically relevant results, which differs from the evidence of previous studies that point to these conditions as possible hindrances in tear production and, consequently, aggravators of DED. The heterogeneity of the disease is notable, as environmental, dietary and lifestyle factors can influence the triggers of the condition. [11]

Regarding screen use, the study findings corroborate the literature, as 59% (n=71) of participants indicated spending more than 2 hours a day on electronic devices, reinforcing the hypothesis that DED symptoms are strongly impacted by this factor.

Finally, it was observed that the discomfort caused by DED was more prevalent in the group classified as severe. Symptoms of burning eyes were present

DOI: 10.36489/saudecoletiva.2025v15i97p15984-15997

in 37% (n=17) of severe cases, while blurred vision and poor vision were reported by 62% (n=28) and 56% (n=25) of patients, respectively. These data highlight the importance of effective treatment to improve patients' quality of life.

CONCLUSION

Dry eye disease is among the most frequent diagnosis in ophthalmology, and the OSDI questionnaire is widely used in clinical practice for a rapid assessment of signs and symptoms.

The results of the study demonstrate a significant prevalence of symptoms compatible with Dry Eye Disease (DED) in an outpatient sample, with emphasis on the predominance of severe cases and significant impairment of daily activities. Factors such as menopause, use of antidepressants and antiallergics, dyslipidemia and history of previous eye surgery were significantly associated with the severity of symptoms, reinforcing the multifactorial nature of the disease.

The functional impact of the disease on the quality of life of patients, with impairment of daily activities such as reading, driving and screen use, highlights the importance of preventive strategies, systematic screening and appropriate referral to an ophthalmologist. The diagnostic underreporting observed, even in the face of high symptomatology, highlights a significant limitation in the clinical identification of this condition.

Thus, the application of OSDI as a screening tool in a university extension context proved to be fast, inexpensive and viable in identifying relevant symptoms, especially in individuals without a previous ophthalmological diagnosis. This approach may represent a cost-effective strategy for early detection of DED in secondary care settings to guide more specialized and individualized ophthalmological follow-up.

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ACKNOWLEDGMENTS, FINANCIAL OR TECHNICAL SUPPORT, DECLARATION OF FINANCIAL AND/OR AFFILIATION CONFLICTS OF INTEREST:

The authors would like to thank the Faculdade Ciências Médicas de Minas Gerais, especially the Liga de Oftalmologia (OFTALMOLIGA) for the institutional support for this work. They declare that the research was financed with their own resources, without receiving external support from funding agencies. There are no financial or affiliation conflicts of interest to be declared.