A RETROSPECTIVE STUDY TO ASSESS THE PREVALENCE OF DRY EYES AND DRY SKIN AMONG THE RURAL POPULATION ATTENDING OUTPATIENT DEPARTMENT AT TERTIARY CARE TEACHING HOSPITAL IN WESTERN INDIA

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INTRODUCTION

While the primary function of the eye is vision, it is often overlooked that the ocular surface is an integral part of the overall body surface, which is predominantly composed of skin. Notably, both the eye and the skin play a crucial role in protecting themselves from drying and maintaining proper hydration. This shared responsibility highlights the parallel function performed by these two components of the body surface.

Dry eye is a significant medical issue with a growing prevalence worldwide. Over the past three decades, awareness of dry eye disease (DED) has substantially increased [1]. This condition poses a considerable public health concern as it leads to fatigue, ocular discomfort, and visual disturbances that greatly impact individuals’ quality of life. DED has an impact on everyday activities, occupational productivity, as well as numerous areas of physical, social, and psychological functioning [2, 3].

Geographical location, climatic circumstances, and lifestyle factors do have an impact on the occurrence of DED. DED has a reported prevalence that ranges from 5% to 35%. In a recent study in North India, the DED prevalence was reported to be 32%, with 81% of cases being classified as severe based on symptoms. In contrast, a study from South India reported an incidence rate of 1.46% for DED. These variations in prevalence highlight the importance of considering regional factors when studying and managing dry eye disease [4, 5].

Skin disorders are prevalent among the general population and can vary in severity and duration. They encompass a wide range of conditions, from mild and temporary ailments to chronic disorders. These skin disorders can have a substantial impact on individuals, leading to significant disability that is comparable to the effects seen in diseases affecting other vital organs. The appearance and severity of skin disorders may be impacted by the everyday usage of skin care products [6, 7]. According to age-standardized years lived with disability, skin diseases placed 10th and cardiovascular diseases 12th, respectively, in the 2017 global burden of illness survey [8]. The most prevalent skin condition is dry skin (xerosis cutis), which is more prevalent in women and elderly persons. Prevalence ranges from 5.4% to 85.5% [9].

Additionally, a large number of individuals, particularly women, experience dry skin and often resort to using cosmetics to alleviate the associated discomfort. DS, although not classified as a disease, is commonly perceived as a condition rather than an illness. It is characterized by insufficient hydration in the outermost skin layer, known as the epidermis, resulting in a lack of the appropriate amount of water. To prevent the outer layer of skin from losing water, sebaceous glands on the skin generate an oily substance known as sebum at the same time that meibomian glands produce meibum. Skin that doesn’t produce enough sebum dries out and loses water, giving off a DED-like feeling. The new definition describes the dry eye as a multifactorial disease that is brought on by various interconnected factors that affect the tear film’s homeostasis, including age, sex, gender, hormonal imbalance, environmental factors, inflammation, iatrogenic, neurogenic, lid disorders, low blink rate, allergies, vitamin A deficiency, and psychological factors. Many of them also contribute to dry skin. Age causes a reduction in sebum production. Additionally, too much sebum may be removed from the skin by excessive bathing, showering, or scouring. The same illness can also be brought on by dry indoor air, exposure to the wind and sun, diabetes or skin allergies, thyroid gland diseases, Sjögren’s syndrome, or other drugs. Consequently, the two diseases have a lot of characteristics [10, 11].
The fact that women experience DED and dry skin more commonly than males and older individuals is one of the conditions' most salient characteristics. Furthermore, just being a woman increases your risk of developing DED significantly [2]. The goal of the current study is to comprehend how dry eyes (DE) and dry skin (DS) are related.

**MATERIALS AND METHODS**

**Study type**

Non-experimental descriptive analytical design with a quantitative retrospective approach.

**Study period**

Outpatient department (OPD) data were extracted from the database from the period spanning 1 Jan 2018 to 31 Dec 2022. Demographic characteristics, Case reports, and clinical data were assessed among the cohort of patients with a diagnosis of Dry eyes and Dry skin in the respective calendar year.

**Study population**

The researcher identified patients with a diagnosis of dry eyes and dry skin at any time during the study period. A diagnosis of dry eyes and dry skin was based on a clinical evaluation of the doctors documented in the patient’s medical record.

**Sample selection criteria**

The study comprised the medical data of individuals between the ages of 18 and 60 who were attending skin and eye OPD. However, records of patients in the pediatric age range and records of individuals who were attending OPDs other than the skin and eye OPDs were not included in the study.

**Data source**

This retrospective observational study used clinical data from approximately two thousand hospital patients. In accordance with ethical guidelines and to ensure the protection of participant’s rights, this study received formal approval from the institutional review board (IRB)-IRC/Fac/Res/10/2019. The patients who were attending to the eye and skin OPD of the selected hospital of the study period were taken in the study. The records of the selected eye and skin OPD patients were used to achieve the study objective.

The data includes the demographic characteristics (i.e., Age and Gender of the patients), Case reports, and clinical data, which shows dry eyes and dry skin conditions.

**Statistical analysis**

**Prevalence calculations**

The prevalence calculation was based on approximately two thousand patients’ data who were attending the selected hospital OPD, as the number of people with confirmed dry eye and dry skin per 2000 (1000+1000) patients recorded during the study period.

Demographic Variables, an association of demographic variables with dry eyes and dry skin, and a relationship between dry eyes and dry skin. The analysis of the demographic variables is done by the use of descriptive statistics i.e., with the frequency and percentage.

The core study objective is to find out the relationship between dry eyes and dry skin is evaluated by using inferential statistics i.e., by using Spearman correlation calculation and by using the Chi-Square test. The association of demographic variables with dry eyes and dry skin is evaluated by using the Chi-square test, too.

**RESULTS**

**Study population**

Of 2000 (1000+1000) individuals registered in the database during the period of 1 Jan 2018 to 31 Dec 2022, we identified 678 patients (n=1000) with dry eyes and 790 patients (n=1000) with dry skin as the hospital eye and skin OPD records between the study duration.

**Prevalence of dry eyes and dry skin**

The prevalence of Dry eyes and Dry Skin was calculated by using the formula of,

\[
\text{Prevalence} = \frac{\text{No. of people in sample with characteristic}}{\text{Total no of people in sample}} \times 100
\]

The dry eyes and dry skin prevalence based on the recorded data in the hospital OPD in the study duration (i.e., 1 Jan 2018 to 31 Dec 2022) evaluated that 67.8% was the prevalence rate of dry eyes and 79% was the dry skin.

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<th>Table 1: Distribution of respondents according to demographic characteristics, n=2000 (1000+1000)</th>
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<td>Demographic characteristics</td>
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<tr>
<td>1. Age in years</td>
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<td>2. Gender</td>
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In the ophthalmic group Majority of 835 (83.5%) respondents belonged to the 21-40 y of age followed by 94 (9.4%) belonging to 2-0 y and 71 (7.1%) belonging to ≥40 y. In the dermatology group, the majority of 742 (74.2%) belong to 21-40 y of age followed by 198 (19.8%) belonging to ≥40 y and 60 (6%) belonging to ≥2 0 y of age group (table 1). In the ophthalmic group, the majority of 519 (51.9%) respondents were male and 481 (48.1%) were females. In the dermatology group, the majority of 612 (61.2%) were male and 388 (38.8%) were females (table 1).

<table>
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<tr>
<th>Table 2: Assessment of the relationship between dry eyes and dry skin, n=2000 (1000+1000)</th>
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<tr>
<td>Spearman correlation</td>
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<td>Dry eyes Vs dry skin</td>
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Spearman correlation, p<0.05; there is a strong positive correlation between dry eyes Vs dry skin i.e., r = 0.74 with a p-value is<0.05 (table 2).

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<th>Table 3: Association of dry eyes and dry skin, n= 2000 (1000+1000)</th>
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<td>Dry Eyes</td>
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Chi-square test S = Significant Association p<0.05, the dry eyes and dry skin have a significant association with each other, reflecting a chi-square value of (8.34) with a p-value of 0.0038 (table 3).
These findings have emphasized the importance of light on its lipid structure and stratum corneum organization, as well as increased tear film osmolarity are key elements in the diagnosis of DE [13, 14]. While DE has various risk factors, including age, gender, environmental factors, and systemic diseases, the association with dry skin suggests a potential shared mechanism involving impaired barrier function and inflammation [11, 12]. In the present study, the enrolled sample was of dry skin 790(79%) and 310(31%) did not have dry skin.

DE disease is a common condition worldwide, affecting approximately 11.59% of the global population [15]. The prevalence of symptomatic DE disease, characterized by DE symptoms, is estimated at 9.12%, with a higher prevalence in women (9.5%) compared to men (6.8%) [12]. Additionally, the prevalence of signs of DE disease, such as ocular surface abnormalities, is estimated to be 35.2% globally [12]. These prevalence rates indicate a significant number of individuals experiencing DE symptoms and signs. Based on the prevalence, the present study finds the relationship in the form of an association between DE and DS. The observed prevalence of dry eyes is higher than the reported prevalence in the study conducted.

Association of level of dry skin with selected demographic variables (table 5).

Chi-square test S = Significant NS = non-significant p<0.05

DE disease is a common condition worldwide, affecting approximately 11.59% of the global population [16]. The prevalence of symptomatic DE disease, characterized by DE symptoms, is estimated at 9.12%, with a higher prevalence in women (9.5%) compared to men (6.8%) [12]. Additionally, the prevalence of signs of DE disease, such as ocular surface abnormalities, is estimated to be 35.2% globally [12]. These prevalence rates indicate a significant number of individuals experiencing DE symptoms and signs. Based on the prevalence, the present study finds the relationship in the form of an association between DE and DS. The observed prevalence of dry eyes is higher than the reported prevalence in the study conducted.

Association of level of dry skin with selected demographic variables such as gender (4.76) showed a significant association with dry eyes at 0.05 level of significance; it depicted that there is an association between dry eyes with selected demographic variables (table 4).

Chi-square test S = Significant NS = non-significant p<0.05

Association of level of dry skin with selected demographic variables in the ophthalmic group, the chi-square value of the demographic variables such as gender (4.76) showed a significant association with dry eyes at 0.05 level of significance; it depicted that there is an association between dry eyes with selected demographic variables (table 4).

Chi-square test S = Significant NS = non-significant p<0.05

Association of level of dry skin with selected demographic variables in dermatology group, the chi-square value of the demographic variables such as gender (4.76) showed significant association with dry skin at 0.05 level of significance, it depicted that there is an association between dry skin with selected demographic variables (table 5).

Chi-square test S = Significant NS = non-significant p<0.05

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Dry eyes and dry skin are two conditions that often occur together and may share underlying causes. While they are separate conditions, there is evidence to suggest an association between them. Several studies have explored the connection between dry eyes and dry skin, highlighting common pathophysiological factors and risk factors.

Dry skin, also known as xerosis, is characterized by a deficiency of water in the stratum corneum, the skin's outermost layer [15]. Recent investigations into the pathophysiology of dry skin have shed light on its lipid structure and stratum corneum organization, as well as natural moisturizing substances and the peripheral nervous system [15]. These findings have emphasized the importance of physiological lipids and carefully selected humectants in emollients designed for dry skin [15]. The reduced presence of these components in dry skin can lead to impaired barrier function and water loss, contributing to the development of dryness and itchiness.

In the present study, the enrolled sample was of dry skin 790(79%) and 210(21%) do not have dry skin.

DE is a multifactorial condition of the ocular surface marked by a defect of the tear film's homeostasis, which can cause eye discomfort and possible ocular surface damage [13, 14]. Inflammation and increased tear film osmolarity are key elements in the diagnosis of DE [13, 14]. While DE has various risk factors, including age, gender, environmental factors, and systemic diseases, the association with dry skin suggests a potential shared mechanism involving impaired barrier function and inflammation [11, 12]. In the present study, the enrolled sample was of dry eye 678(67.8%) and 322(32.2%) do not have dry eyes.

DE disease is a common condition worldwide, affecting approximately 11.59% of the global population [16]. The prevalence of symptomatic DE disease, characterized by DE symptoms, is estimated at 9.12%, with a higher prevalence in women (9.5%) compared to men (6.8%) [12]. Additionally, the prevalence of signs of DE disease, such as ocular surface abnormalities, is estimated to be 35.2% globally [12]. These prevalence rates indicate a significant number of individuals experiencing DE symptoms and signs. Based on the prevalence, the present study finds the relationship in the form of an association between DE and DS. The observed prevalence of dry eyes is higher than the reported prevalence in the study conducted.

The association between DE and DS highlights the importance of maintaining proper hydration and barrier function in both the skin and ocular surface. The association between dry eyes and dry skin can be attributed to several factors. One of the primary causes is the dysfunction of the meibomian glands, responsible for producing the lipid layer of tears that prevents excessive evaporation. In both dry eyes and dry skin, this lipid layer may be compromised, leading to increased water loss and dryness [12].

Dry eyes and dry skin have been associated with each other in various studies. A clinical-based survey conducted on undergraduate students found a significant association between subjective DE symptoms and various clinical tests and the symptoms of dry eyes [12]. Another cross-sectional research involving participants with and without DE symptoms revealed a positive correlation between dry eyes and dry skin [13]. The study utilized self-perceptions of skin dryness and objective measurements, including sebumeter readings. It was found that subjects without dry eye symptoms reported oilier facial skin and had higher sebumeter scores compared to those with dry eyes [13]. Furthermore, logistic regression analysis confirmed the independent association between dry eyes and dry skin. These findings suggest that individuals experiencing dry skin may also have ocular dryness and vice versa. For the early diagnosis and treatment of both ocular and skin dryness, paying close attention to these symptoms may be essential, improving the patient's quality of life.
life [13]. Understanding the shared mechanisms and addressing both dry eyes and dry skin concurrently can lead to more effective management strategies and improved patient outcomes. The above citations are further supported by the results obtained in the present study, in this retrospective study, we observed the positive association between dry eyes and dry skin among the selected population of OPDs in a selected hospital. Level of dry eye severity and some demographic factors in the ophthalmology group. At the 0.05 level of significance, the chi-square value of the demographic variables, such as Gender (4.76), demonstrated a significant link with dry eyes. This indicated that there is a relationship between dry eyes and certain demographic variables.

Association of level of dry skin with selected demographic variables in dermatology group, the chi-square value of the demographic variables such as age (52.57) showed significant association with dry skin at 0.05 level of significance, it depicted that there is an association between dry skin with selected demographic variables.

The findings of the current research support the existing evidence regarding the prevalence of DE and DS. The study provides additional confirmation that these conditions commonly occur and coexist. By examining a larger sample size or a specific population, the research reinforces the understanding that dry eyes and dry skin are prevalent issues that warrant attention and comprehensive management. These findings contribute to the growing body of knowledge on the prevalence of dry eyes and dry skin, further emphasizing the need for proactive measures and appropriate interventions to address these common conditions.

The study is limited to records of persons between the age group of 18 to 60 years and who were attending skin and eye OPD at selected hospital.

**CONCLUSION**

Within our study, which focused on selected OPDs, we discovered a significant and noteworthy positive association between dry eyes and dry skin. The research findings indicated that individuals experiencing dry skin were more likely to also exhibit symptoms of dry eyes, suggesting a potential connection between these two conditions. The study involved careful examination and analysis of data collected from the selected population, allowing us to establish a clear correlation between dry eyes and dry skin within this specific group of patients. These findings contribute to a growing body of evidence supporting the existence of a link between dry eyes and dry skin, emphasizing the importance of considering both conditions when assessing and managing patients.

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**AUTHORS CONTRIBUTIONS**

Kiran Dange has planned the study, collected the data, and wrote the manuscript. Kanchan Rathore has analyzed the data and reviewed the manuscript. Gaurav Patil has analyzed the data.

**CONFLICT OF INTERESTS**

Declared none

**REFERENCES**