

Effects of Blinking Exercise Application on Anxiety and Eye Dryness among Elderly Patients

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Abstract

Background: Eye dryness is a common health problem among older adults which negatively impacts their quality of life. Anxiety is an important risk factor for dry eye disease. So, this study aimed to determine the effects of blinking exercises application on anxiety and eye dryness among elderly patients. **Aim:** To determine the effects of blinking exercises application on anxiety and eye dryness among elderly patients. **Design:** A quasi-experimental research design (Pre/post-test) to achieve the aim of this study was used. **Setting:** The study was conducted in ophthalmology outpatient clinics at Sohag University Hospital, Egypt. **Sample:** A convenient sample of 100 elderly patients who complained of dry eye was selected from the previously selected setting within six months. **Methods:** Three tools were used: (I) A structured interview questionnaire sheet involving personal and medical profiles, (II) a State-Trait Anxiety Inventory, and (III) an Ocular Surface Disease Index (OSDI) questionnaire. **Results:** The current study revealed that there was a highly statistically significant difference and reductions in anxiety mean scores pre and post-blinking exercises application with a high statistical significance difference P value ($P = <0.001$). It was found that the severity of eye dryness improved after blinking exercises application with a high statistical significance difference P value < 0.001 . **Conclusion:** Blinking exercises application had significant positive effects on decreasing anxiety mean scores and eye dryness among elderly patients. **Recommendation:** Health education and training should be provided regularly regarding eye blinking exercises in different healthcare settings for patients with the availability of related posters, brochures, and handouts given to them. It is important to apply Blinking exercises application as a complementary treatment for elderly patients to reduce anxiety and eye dryness among elderly patients.

Keywords: Anxiety, Blinking exercises, Eye dryness, elderly patients.

Introduction

Dry eye disease, one of the most prevalent eye conditions in contemporary culture, is a complicated, progressive, chronic ocular surface condition. According to recent research, the global prevalence of dry eye illness is estimated to be between 5 to 50%, with Asians having a far greater frequency than Westerners. The loss of tear film homeostasis, which is a crucial protective and refractive layer for the ocular surface, is a hallmark of dry eye illness. As a result, this instability may worsen patients' quality of life and ability to do their jobs professionally by causing visual impairment, eye pain, ocular surface inflammation, and even corneal perforation in those with dry eye disease as well as bringing a great burden to both medical security and socioeconomic systems (Uchino et al., 2023).

Dry eye illness is an increasingly common eye ailment that poses a serious public health risk, especially to older persons, as it impairs their quality of life (Zhang et al., 2022). This eye condition develops when there is insufficient tear production or excessive evaporation of the tears that are produced. Tears are essential for

keeping the eyes comfortable and healthy. According to Hynneklev et al., (2022), they lubricate, nourish, and shield the cornea and surrounding tissues.

Dry eyes are caused by several changes brought on by aging. Because the lacrimal glands, which create tears, alter with age, people tend to produce fewer tears. Furthermore, when exposed to digital screens, blinking frequency and completeness are decreased, which compromises meibum secretion and dispersion, causes instability in the tear film, and ultimately results in dry eye illness (Craig et al., 2017).

The risk factors for dry eye illness have been found in numerous studies to include advanced age, feminine sex, smoking, and anxiety. Among these, anxiety has garnered a lot of interest due to its unique significance in affecting the management and treatment of progressive and chronic dry eye illness. In comparison to healthy controls, several extensive retrospective studies, cohort studies, and meta-analyses have demonstrated that patients with dry eye disease typically have elevated levels of anxiety and depression. Despite the proposal of several multidisciplinary collaboration strategies, such as referral to psychiatrists, ophthalmologic doctors still lack effective approaches

to manage and intervene with dry eye disease patients' anxiety and depression (**van der Vaart et al., 2022**).

According to **Uchino et al. (2023)**, two major factors contributing to dry eye include prolonged gazing and high tear evaporation from electronic screens. DE is a multifactorial ocular surface illness that is typified by dyshomeostasis of the tear film and related symptoms such as inflammation, injury, and anomalies in the nervous system of the eyes. Between 5 and 50% of people have it. According to **Li et al. (2022)**, a person's productivity can be adversely affected by symptoms such as pain, dryness, itching, redness, foreign body sensation, and sensitivity, which can greatly impair an individual's capacity to carry out everyday chores.

The financial toll of DE-related productivity loss is also becoming increasingly noticeable; studies reveal that the average cost of treating dry eye symptoms is \$11,302 per person, with indirect expenditures making up the majority of these overall expenses. Concurrently, many investigations have discovered that patients with dry eye have a noticeably higher frequency of worry and despair **Wan et al., (2020)**. In almost 40,000 outpatients over the age of 18, research by **van der Vaart et al., (2022)** found a correlation between dry eye, anxiety, and depression. After evaluating the mental health of 639 Sjögren's syndrome patients, **Lendrem et al. (2022)** discovered that 49.4% of the group under observation had anxiety or depression symptoms. Additionally, **Ayaki et al., (2020)** reported that 730 people using the Hospital Anxiety and Depression Scale (HADS) and showed that dry eye patients scored significantly higher than non-DE patients.

Conditions like dry eye illness that are made worse by using digital devices are becoming more common as the world's older population grows and life expectancy increases. This pattern is leading to increased expenses for eye care visits, prescription drugs, and decreased productivity at work (**Zhang et al., 2022**). Dry eye disease has been linked to symptoms such as burning and itching of the ocular surface, photosensitivity, ocular hyperemia, and intermittent blurred vision. In addition to making it difficult to work and do daily tasks, severe types of dry eye illness are linked to anxiety and depression (**Aljarousha et al., 2021**).

To maximize the treatment plan within the concept of "Narrative Evidence-Based Medicine," particularly for chronic illness, qualitative research has been suggested as an effective means of understanding patients' psychological conditions, including their experiences and feelings during sickness. In addition to traditional treatment, several studies have identified the psychological factors that should be considered when

addressing a variety of illnesses, such as antenatal distress, inflammatory bowel disease, fibromyalgia, primary Sjögren's syndrome, and primary open-angle glaucoma. These studies have also provided insights into the causes of low mood and coping mechanisms. Qualitative studies concentrating on patients with dry eye illness are relatively scarce, nevertheless. To provide resources for assessing the anxiety and sadness of patients with dry eye illness, we investigated the anxiety in these individuals through qualitative interviewing in this study to improve the management and treatment of dry eye disease patients in the future (**Johnson, 2019**).

Blinking exercises are an easy, non-pharmacological technique that cost-effectively integrates into daily routines (**Kim et al., 2021**). It is also very successful in increasing the percentage of functional meibomian glands in people with dry eye—these are the oil glands that sit around the edge of the lids where the lashes are located. The exercises involve closing the eyes and applying gentle pressure to the closed eyelids for more than two seconds. This should be done several times an hour throughout the day (**Christianto and Purwito, 2022**). Decreased blinking may result in more discomfort and dryness because each blink lubricates and clears the ocular surface of debris (**Marshedi and Alshamrani, 2022**).

Nurses are essential in preventing and treating dry eyes because they help patients reduce risk factors such as air conditioning, dust, and smoke exposure. Additionally, they address innate impulses to inhibit eye rubbing, which exacerbates inflammation, and lessen blinking while concentrating. In addition, nurses teach senior patients in ophthalmology clinics and units the importance of blink exercises and explain the correct technique, length, and frequency of these exercises (**Hadavand et al., 2019**).

Significance of the Study:

Anxiety in patients with dry eyes has been the subject of numerous recent investigations. On the other hand, nothing is known about the psychological variables that influence these two ones in DE patients. According to estimates, the prevalence of dry eye illness is increasing globally, with estimates ranging from 6.8% to 69% (**Bbott et al., 2024**). This is a major issue for many countries. 32.1% to 62.4% was the estimated prevalence in Saudi Arabia; 6.8% to 28% in Egypt; 69% in Palestine; 52% in Jordan; 27.2% in Iraq; 30% in the United Arab Emirates; 28.5% in Tunisia; 36.4% in Lebanon; and 40% in Libya were the estimated prevalences (**Aljarousha et al., 2021**).

Dry eye disease is a prevalent health concern among older adults, associated with numerous adverse

effects. Globally, the prevalence of dry eye syndrome among adults aged 65 and older was estimated at 43.79% (Bbott et al., 2024). In a study conducted by Aziz et al. (2020) at outpatient clinics across multiple hospitals in Egypt Ain Shams University Hospital and Al Watany Eye Hospital in Cairo, Saint Mary Hospital in Qena, and Aswan Eye Center in Aswan a total of 603 eyes were examined. Of these, 290 belonged to male participants and 313 to female participants. The age of participants ranged from 18 to 94 years, with a mean age of 50.06 ± 19.06 years. The study found a high prevalence of Dry Eye Disease, affecting 77.6% of the eyes examined (468 eyes). With a growing elderly population and increasing life expectancy worldwide, dry eye is anticipated to remain a primary reason for visits to ophthalmology clinics (Bbott et al., 2024). Given that dry eye disease is a leading cause for elderly individuals seeking eye care and increased hospital visits, hence, this study aimed to assess the effect of blinking exercises on alleviating eye dryness and enhancing the quality of life among older adults.

Aim of the Study:

To determine the effects of blinking exercises application on anxiety and eye dryness among elderly patients through:

- Assessing anxiety levels among elderly patients who complain of eye dryness.
- Assessing eye dryness among elderly patients pre and post-blinking exercises application.
- Evaluating the effect of blinking exercises application on anxiety and eye dryness among elderly patients

Research Hypothesis:

H1: Blinking exercise applications will decrease anxiety mean scores among elderly patients.

H2: Blinking exercise application will improve eye dryness among elderly patients.

Subject and Methods

Research design: -

A quasi-experimental research design (Pre/post-test) to achieve the aim of this study was used.

Setting:

The study was conducted in ophthalmology outpatient clinics at Sohag University Hospital, Egypt.

Sample:

A convenient sample of 100 elderly patients who

complained of dry eye was selected from the previously selected setting within six months.

Tools for data collection:

Three tools were utilized to collect the data for this study:

Tool I: Structured interview questionnaire sheet: It was developed by the researchers after reviewing the related literature and included the following two parts:

Part (1): Personal characteristics of the studied elderly patients such as age, sex, residence, occupation before retirement, and level of education.

Part (2): Included medical data such as history of cataracts, glaucoma, conjunctivitis, and keratomileusis and present history (onset and duration of the eye dryness disease). Also, involved questions to assess risk factors of eye dryness among the participants as; smoking status, using heating and cooling equipment such as air conditioners and electric heaters, being exposed to air pollution, using computers, and using many drugs as antibiotics used for long time more than six months which affect eye health.

Tool (II):- State-Trait Anxiety Inventory

Spielberger (1972) created the State-Trait Anxiety Inventory, a self-assessment tool made up of brief statements, to determine the degree of State-Trait Anxiety. Twenty items asked respondents to explain how they felt about a specific scenario and set of circumstances, including how they felt about the situation they were in. Both direct and reverse separation of phrases is used in this section. In the computer environment, the SPSS program was used to score the data. For the direct and reversed expressions, two different scales were initially created. The weighted total score for negative expressions was deducted from the weighted total score for direct expressions, after being positive for direct expressions and negative for negative questions respectively.

Scoring system:

The scale items measure the level of State-Trait Anxiety and are scored as follows: "none" (1), "some" (2), "many" (3), and "entirely" (4). The highest score obtained is 80 and the lowest score is 20.

Tool III: Ocular Surface Disease Index (OSDI) questionnaire (Grubbs et al., 2014):

The Ocular Surface Disease Index (OSDI) is a valuable tool for evaluating dry eye disease due to its simplicity and accessibility. It is the most widely used symptomology questionnaire in the dry eye community. The OSDI evaluates both the frequency

of symptoms and their impact on daily life. It covers five ocular-related symptoms (sensitivity to light, grittiness, pain/soreness, blurred vision, and poor vision), four quality-of-life questions regarding limitations in activities (reading, night driving, using a computer or ATM, and watching TV), and three items assessing discomfort from environmental triggers (wind, humidity, and air conditioning). Each of the 12 items is scored on a scale of 0 to 4, where 0 indicates no symptoms and 4 indicates symptoms occurring continuously.

Scoring system:

The OSDI provides a total score and three subscale scores: vision-related symptoms (five items), ocular symptoms (four items), and environmental triggers (three items).

The participant's responses on a 5-point Likert scale (between all of the time (4), most of the time (3), half of the time (2), some of the time (1), and none of the time (0)) and the combined scores of the three subscales are aggregated, then multiplied by 25, and finally divided by the number of questions answered to derive the final OSDI score. Scores of 0-12 indicate normal OSDI, 13-22 indicate mild OSDI, 23-32 indicate moderate OSDI, and 33-100 indicate severe OSDI (Lisa et al., 2014).

Fieldwork:

One hundred elderly patients with dry eyes participated in the study. Three days a week, from 9 a.m. to 12 p.m., the researchers visited the previously chosen locations. Six months, from the beginning of January 2023 to the end of July 2023, were used to collect the data. Each interview took between forty and fifty minutes to complete.

The actual study was divided into three phases:

I-Preparatory phase:

Before starting the study, a review of the literature regarding current and past available literature was done to prepare the educational booklet in Arabic language. An official letter of approval was obtained from the Dean of the Faculty of Nursing to the directors of outpatient clinics in Sohag University Hospitals to carry out the study. The letter includes permission to carry out the study and explains the purpose and nature of the study.

Data collection involved face-to-face interviews with participants diagnosed with eye dryness in the previously mentioned setting. Initially, researchers gathered personal information and medical profiles. Subsequently, The State-Trait Anxiety Inventory to detect the State-Trait Anxiety level, the third tool, which included the Ocular Surface Disease Index

(OSDI) questionnaire to assess the presence and severity of eye dryness,

Validity of the tools:

Five experts, including two professors in the field of gerontological nursing, one in the field of psychiatry, and two professors in the field of community health nursing, evaluated the tools' content validity as well as their clarity, comprehensiveness, appropriateness, and relevance. By the panel verdict, no changes were made to guarantee sentence clarity and content appropriateness. Based on a composite disease severity score and a physician's assessment, the OSDI was found to be valid in differentiating between dry eye illnesses that were classified as normal, mild to moderate, and severe. Additionally, there was a strong correlation found between the OSDI and the following measures: patient impression of symptoms, the McMonnies questionnaire, the National Eye Institute Visual Functioning Questionnaire, the physical component summary score of the Short Form-12, and the use of artificial tears (Schiffman et al., 2000).

Reliability of the tools:

State-Trait Anxiety Inventory reliability is considered good with Cronbach's alpha of 0.87 for the total score. An acceptable internal consistency level for the OSDI questionnaire measured by Cronbach's- α was revealed. All questions showed good internal consistency. Test-retest reliability analysis revealed good stability (interclass correlation coefficient, $r=0.832$, $P<0.001$). The construct validity for the questionnaire was also high (Schiffman et al., 2000).

A pilot study

To assess the clarity and feasibility of the data collection tools, a pilot study was conducted on 10% (10 elderly patients) of the total sample. To produce the final form of the tools, no modifications were made. Elderly patients who were included in the pilot study were included in the main study.

Ethical considerations:

The directors of the chosen setting were consulted before the study started to outline its purpose and get their support. The ethics committee of the College of Nursing approved the proposed research. To gain older patients' cooperation, informal consent was gained. The aim and anticipated results of the investigation were articulated. Patients were briefed about the purpose of the trial. The chosen older patients were advised that they might leave the study at any moment, for any reason, and that participation was completely voluntary.

They also received assurances that the information they provided would be kept confidential and used only for study.

II-Implementing Phase:

During this phase, an explanation of the procedure and the purpose of the study was given to the elderly patients. The educational sessions about blinking exercises were implemented for the elderly patients who were divided into small training 25 groups with 5 elderly patients for each group.

An educational booklet was developed by the researchers based on the review of relevant literature and available resources and was given to every elderly patient as a handout which included two theoretical and one practical part.

- A. **Theoretical part:** includes knowledge about the disease, causes, signs and symptoms, risk factors, complications, and preventive measures of eye dryness disease.
- B. **Practical part:** Include different types and steps of eye blinking exercises such as (Eye gaze exercise, Right and left eye movement exercise, eye rise and fall exercise, eye-crossing exercise, eye control exercise, eye pressure exercise, eye rotation exercise, and eye relaxation exercise).

Three sessions were needed for each group each session took about 1- 2hrs.

- The 1st session included (definition, causes, signs & symptoms, risk factors, complications).
- The 2nd session included (prevention, and management of eye dryness).
- The 3rd session covered the recommended exercises for reducing eye dryness including (Eye gaze exercise, Right and left eye movement exercise, eye rise and fall exercise, eye-crossing exercise, eye control exercise, eye pressure exercise, eye rotation exercise, and eye relaxation exercise). This session continued for 2 hours and the objective of this session was to enhance eye coordination, flexibility, and relaxation through targeted exercises following these instructions:

Eye Exercise Routine: Pre, During, and Post-Session Instructions

Preparation:

- **Environment:** Choose a well-lit room with minimal distractions.
- **Warm-up:** Blink several times to moisten the eyes and relax facial muscles.
- **Posture:** Sit comfortably with the back straight and shoulders relaxed.
- **Materials:** Ensure any required materials (e.g.,

a distant object for gaze exercises) are ready.

During the Session: each exercise had specific instructions

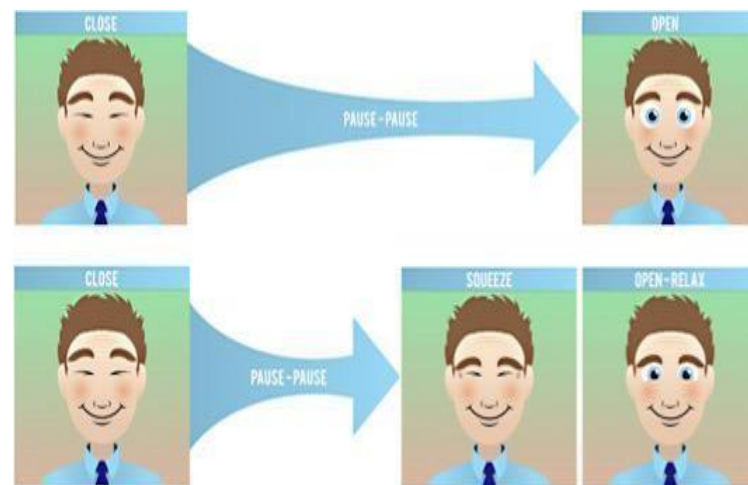
Post-Session:

- **Reflection:** Take a moment to reflect on how the eyes feel after the exercises.
- **Hydration:** Ensure adequate hydration to keep eyes lubricated.
- **Rest:** If the eyes feel tired, consider resting them or using lubricating eye drops.
- **Regular Practice:** Consistency is key; aim to incorporate these exercises into the routine regularly for best results.
- The investigators used discussion, PowerPoint presentation demonstration, and re-demonstration, handouts, posters & and videos as teaching methods. At the end of each session, the investigator provided an opportunity for participants to ask questions for clarification and then summarized the key points covered during the session.
- After the implementation session for blinking exercises, each participating group was instructed to perform the same exercises at home at least twice daily for one month.

BLINKING SEQUENCE:

CLOSE-PAUSE-PAUSE-OPEN-RELAX

CLOSE-PAUSE-PAUSE-SQUEEZE-OPEN-RELAX



Frequency:

- To be completed every 20 minutes, 20 X a day to improve muscle memory.
- Use an audible signal (egg timer, phone, or computer alarm) to remind you.

- Free iPhone App: Donald Korb Blink Training

Exercise instructions:

- Close both eyes normally, pause for 2 seconds, and open. Note: To check your blink, place your finger gently on the bone to the outside corner of one eye. When you are blinking “normally”, you should feel very little movement from the muscles around your eye.
- Close the eyes normally again, pause for 2 seconds, and then aggressively squeeze the lids together (as if you are trying to crack a walnut with your lids) for 2 seconds. Open both eyes.
- Repeat every 20 minutes, 20 X a day.

III- Evaluation phase:

A posttest was done for participants after one month to determine the effects of blinking exercises application on anxiety and eye dryness among elderly patients by using the second and third tools as post-tests that were used in the pre-test.

Administrative design:

To conduct this study, administrative approval was acquired via a letter from the director of the department that was previously chosen at Sohag University.

Statistical design:

The statistical software program SPSS version 22 was used for data entry and statistical analysis. For quantitative factors, computer software was used to show the data using descriptive statistics in the forms of percentage, mean, and standard deviation. The internal consistency of the generated tools was evaluated for reliability using the Cronbach alpha coefficient. When using the Chi-square test for analysis of variance, a P-value of less than 0.05 is deemed significant.

Results:

Table (1): Shows that 68% of the studied elderly patients were aged more than 65 years with a mean age of 67.77 ± 7.89 , 55% of them were female and 39% were not working. Also, results reflected that 49% and 57% of the elderly patients were illiterate and from rural areas respectively.

Figure (1): Demonstrated that 60% of the studied elderly patients had cataracts.

Figure (2): Clarified that 80% of the studied elderly patients suffered from eye disease from 1-2 weeks in duration and 20% of them had duration of dry eye disease more than 2 weeks.

Table (2): Illustrates that 100% of the studied elderly patients were exposed to air pollution, 92 % of them didn't use a telephone or computer, and 73% of them used many drugs.

Table (3) shows that there was a highly statistically significant difference and reduction among the studied elderly patients regarding their anxiety means scores pre and post-blinking exercises application at p-value < 0.001 .

Figure (3) shows that there was a significant reduction among the studied elderly patients regarding their total anxiety level pre and post-blinking exercises application, while 25% of the studied elderly patients had severe total anxiety level pre-application that declined to be no one had severe total anxiety level post application.

Figure (4) shows that 33% of the studied elderly patients had normal severity of eye dryness pre-blinking exercises application by using Ocular surface disease index (OSDI) pre-application that improved to 77% among them post-application.

Table (1): Elderly patients distribution according to their data (N=100).

Socio-demographic data	No.	%
Age (years)		
60 to 65 year	35	35.0
>65 year	65	65.0
Mean+SD	67.77 ± 7.89	
Sex		
Male	45	45.0
Female	55	55.0
Current Occupation		
Manual work	37	37.0
Sedentary work	13	13.0
Heavy work	11	11.0
Not work	39	39.0
Level of education		

Illiterate	49	49.0
Read & Write	14	14.0
Primary school	19	19.0
Preparatory school	9	9.0
Secondary school	5	5.0
University education	4	4.0
Residence		
Urban	43	43.0
Rural	57	57.0

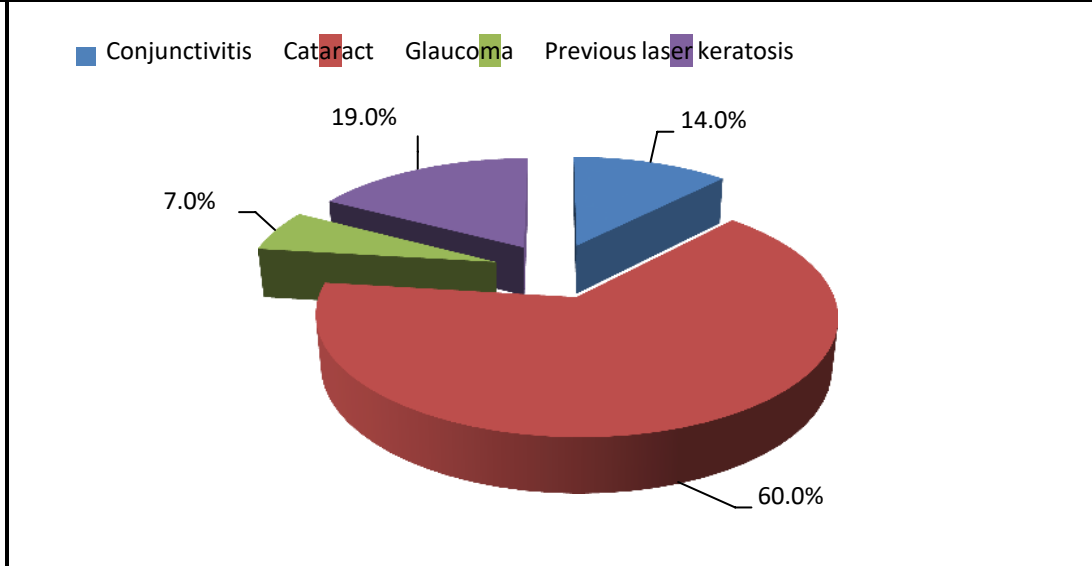


Figure (1): Elderly patients distributed according to the medical history of the participants (N=100)

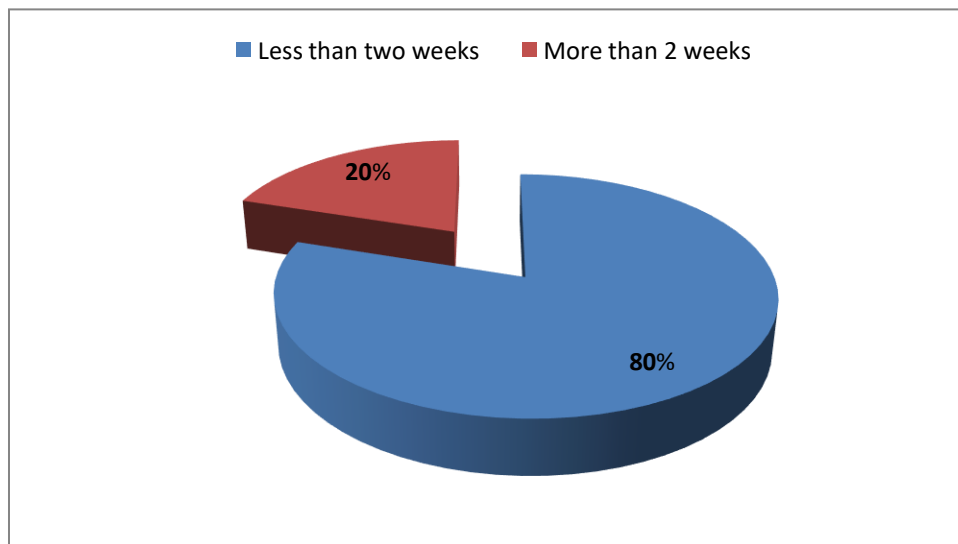


Figure (2): Elderly patients distribution according to their duration of eye dryness (N=100).

Table (2): Elderly patients distribution according to risk factors of eye dryness (N=100).

Risk factors of eye dryness	No.	%
Smoking status		
Yes	44	44.0
No	56	56.0
Do you use heating and cooling equipment as air conditioners and electric heaters?		
Yes	68	68.0

No	32	32.0
Are you exposed to air pollution?		
Yes	100	100
Using the telephone or computer		
Yes	8	8
No	92	92.0
Using many drugs for more than six months		
Yes	73.0	73.0
No	27.0	27.0

Table (3): Comparison between elderly patients regarding their anxiety means scores pre and post-blinking exercises application (n=100)

Items	Pre-blinking exercises application	Post-blinking exercises application	t-test	p-value
Anxiety means scores	41.33 ± 8.22	24.10 ± 2.21	13.32	<0.001*

*= significant at p<0.001 level

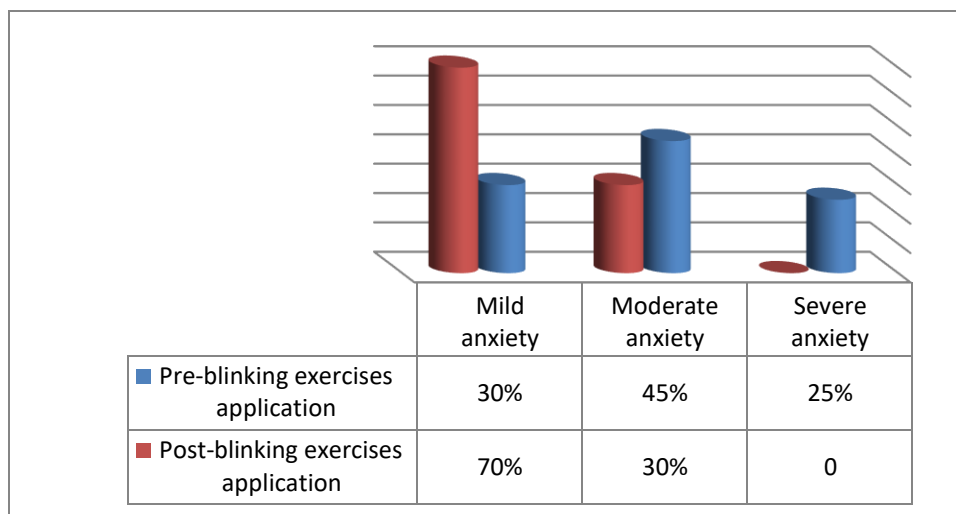


Figure (3): Total anxiety level among the studied elderly patient's pre and post-blinking exercises application (n=100)

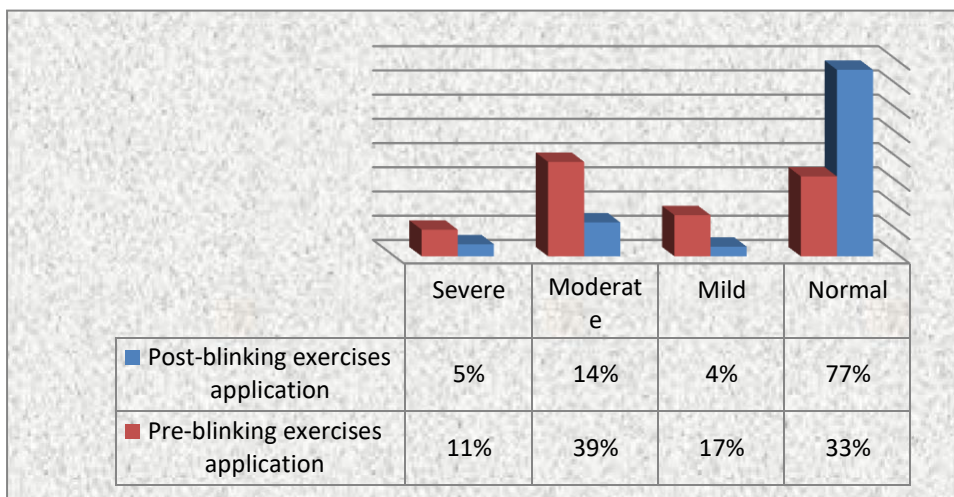


Figure (4): Differences between the severity of eye dryness pre and post-blinking exercises application by using

the Ocular surface disease index (OSDI) among elderly patients (N=100).**Discussion:**

As a major public health concern that primarily impacts the quality of life of older persons, dry eye disease is becoming more widely acknowledged. As a result of insufficient meibum secretion and distribution, unstable tear films, and eventually dry eyes, the extensive use of digital screens has also been connected to decreased blink frequency and incomplete blinking (**Zhang et al., 2020**). Blinking exercises may help improve these ineffective blinking patterns, as suggested by recent research by **Kim et al. (2021)**, which has shown some improvement in objective measures of tear film quality and symptom relief for dry eyes.

Several cross-sectional studies and retrospective studies have demonstrated the association between anxiety and dry eye. The previous study primarily used scales to assess patients' negative emotions and how those emotions affected their quality of life, but to our knowledge, very few studies have used the qualitative method to explore the wide range of psychological states that patients may experience, including depression and anxiety (**Kuang et al., 2021**). Thus, the purpose of this study was to ascertain how applying blinking exercises affected older patients' anxiety and dry eyes.

With a mean age of 67.77 ± 7.89 , it was discovered that almost two-thirds of the elderly patients in the sample under study were over 65 years old. According to our assessment, a healthy ocular surface is typically shielded by adequate tear production and drainage; nevertheless, as we age, inadequacies in both cause dryness. This is strongly supported by (**Wang & Craig, 2019**), who talked about how age-related changes in addition to other risk factors like polypharmacy, androgen deficiency, decreased blink rates, and oxidative stress can predispose older patients to develop dry eye, which reflects higher costs and worse concerns for the patient's well-being.

According to the study's findings, women made up more than half of the sample. As women age and their estrogen and progesterone levels decline, they become more susceptible to dry eyes than men, according to **Sharma & Hindman (2014)**. The tear film, which is essential for preventing dry eyes, is impacted by these hormonal fluctuations in both its amount and quality.

Based on residential data, over 50% of the senior patients were found to reside in rural locations. This implies that those who live in rural regions might be more susceptible to dry eyes because of environmental variables and limited access to healthcare services. This discovery is consistent with the findings of **Vehof**

(2021), who also noted that most of the participants in their study were from rural areas.

Concerning levels of education, Less than half of the elderly patients were illiterate, according to observations. This concurs with (**Sherry, 2020**), who found that a healthy lifestyle and educational attainment were associated with a lower incidence of dry eye. This conflicts with the findings of **Wang & Craig (2019)**, who found no connection between education and ocular dryness. This study supports the findings of **Vehof (2021)** that more than half of the sample under investigation had prior laser keratomileusis. It also showed that three-fifths of the elderly patients had cataracts and that around one-tenth of them had had the procedure done previously.

The current study findings revealed that all of the studied **elderly patients** were exposed to air pollution, most of them don't use telephone or computer, and less than three-quarters of them used many drugs. This can be because their employment doesn't require them to utilize computers. All participants also experienced air pollution, presumably as a result of older participants' exposure to dust and smoke, which can harm their eyes. According to earlier research by **Kim et al. (2021) & Kaštelan et al. (2024)**, these results are consistent.

According to the current study's findings, the older patients' anxiety means scores before and after using blinking workouts showed a highly statistically significant difference and reduction. According to the researchers, it demonstrated the advantages of applying blinking workouts. This study used semi-structured interviews and qualitative analysis to examine the primary reasons for worry in 47 patients with dry eyes. In our research, patients with dry eye illness frequently expressed concerns about being anxious in hospitals. This worry was mostly connected to the inconsistent indications and symptoms of the condition. Similar findings have also been observed in other studies. **Bartlett et al. (2021)** discovered that the signs and symptoms of dry eye were varied, which may have an impact on the accurate assessment of the condition of patients.

With the increasing prominence of electronic social media, people with dry eye illness experience substantial visual impairments that inevitably limit their ability to receive information and decrease their sense of engagement in social and everyday life. Patient-to-patient communication, such as the creation of support groups, should be promoted in addition to professional treatment for mental health issues to help patients with their social anxiety. It has been demonstrated that patient-to-patient communication works better than

doctor-to-patient communication. This could boost patient confidence and compliance regarding sense organ illnesses, particularly for patients with higher educational backgrounds (Downie et al., 2022).

According to the results of the current study, there was a significant decrease in the overall anxiety levels of the elderly patients both before and after they started blinking exercises. However, 25% of the elderly patients had severe total anxiety levels before applying the exercises, and none of them had severe total anxiety levels afterward. From the perspective of the researchers, it validated the efficacy of applying blinking exercises. Additionally, due to its erratic symptoms and indicators, dry eye disease may be classified as a contested illness. As a result, professionals or social workers with sufficient medical training should actively participate in such programs to avoid exacerbating patient-doctor conflicts and exacerbating patients' negative emotions brought on by receiving inaccurate treatment information (Murphy et al., 2020; Kamp et al., 2019). Yeo and Tong (2018) also found that in a qualitative study on coping with dry eye conditions, patients showed more interest in and acceptance of holistic treatments like sports or attention-diverting activities than they did of a single drug.

Cognitive behavior therapy and steam-warming eye masks are two earlier therapies that have been suggested in addition to conventional psychotherapy for raising subjective happiness and lowering the anxiety and depression scores of patients with dry eye disease (Sano et al., 2018; Uchino et al., 2021).

The study found that after using blinking exercises, the Ocular Surface Disease Index (OSDI) scores of the elderly patients under investigation significantly improved. According to the researchers, this demonstrated that the elderly patients under study may effectively reduce their dry eyes with the use of blinking exercises. This could be because older people 65 years of age and older don't use phones, smartphones, or other electronic devices like computers as much as older people 60 to 64 years of age. I.e. This shows that the maintenance of healthy eyes and the production of tears were positively impacted by blinking workouts. According to Sakakura et al. (2023), blinking exercises have a positive effect on lessening the intensity of ocular dryness in older persons. These results are consistent with their findings. An essential component of tears is oil produced by the meibomian glands, which are located around the edges of the eyelids where the lashes are. Tears are kept from evaporating too quickly by this oil, which forms the outer layer of the tear film. Blinking exercises have been shown to improve the lipid layer's quality and prolong the stability of tears before they break up,

which can help reduce the symptoms of dry eyes. This was confirmed in a previous study by (Kim et al., 2021).

Conclusion:

The study indicated that using blinking exercises had a substantial favorable impact on lowering anxiety mean scores and eye dryness among elderly patients, based on the results and hypotheses of the current investigation.

Recommendations:

- The results of the present study are used to make the following recommendations:
- elderly patients should get regular health education and training about eye blinking exercises in a variety of healthcare settings, along with relevant pamphlets, brochures, and posters.
- To help elderly patients with dry eyes feel less anxious, offer them emotional support.
- It is crucial to use blinking exercises as an adjunctive therapy for older individuals to lower their levels of anxiety and dry eyes.
- Encourage the measurement of eye dryness as a standard component of the clinical examination during every visit for elderly patients in ophthalmology clinics to enable early detection, and appropriate care, and hence minimize its adverse effects.
- Replication of the current study on a larger sample from different geographical areas should be done to achieve generalization of the results.

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