Article

Cognitive Behavioral Therapy Improves the Quality of Life for Patients with Mild to Moderate Depression due to Glaucoma or Cataracts: A Retrospective Study

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Abstract

Background: Individuals affected with glaucoma and cataracts are more likely to experience depressive symptoms, which can affect their overall quality of life (QOL) and functioning. Therefore, this retrospective cohort study aimed to evaluate the impact of cognitive behavioral therapy (CBT) on glaucoma or cataracts patients with mild to moderate depression.

Methods: This study included patients with mild to moderate depression resulting from glaucoma or cataracts in our hospital from January 2023 to December 2023. The study participants were divided into an untreated group and a cognitive behavioral therapy group based on different intervention methods. We assessed depressive symptoms using the Center for Epidemiologic Studies Depression Scale (CES-D) and Patient Health Questionnaire-9 (PHQ-9). QOL was evaluated using the Chinese translation version of the European Quality of Life-5 Dimensions scale (EQ-5D), Short Form Health Survey (SF-36), National Eye Institute Visual Function Questionnaire-25 (NEI-VFQ-25), and Hospital Anxiety and Depression Scale-Anxiety (HADS-A). Additionally, cognitive behavioral therapy (CBT) was administered to a subgroup of patients with mild to moderate depression, and the impact of CBT on the well-being of the patients was analyzed.

Results: This study included 3010 individuals, consisting of untreated patients (n = 2151) and those who received cognitive behavioral therapy (n = 859). Post-intervention analysis revealed that compared to baseline, the CES-D scores ($p < 0.001$), PHQ-9 scores ($p < 0.001$), and HADS anxiety subscale scores ($p < 0.001$) were significantly reduced in the CBT group. Furthermore, the CBT group demonstrated a significant increase in EQ-5D scores ($p < 0.001$) and SF-36 mental component scores ($p < 0.001$) post-intervention compared to baseline.

Conclusion: These findings offer significant insights into the prospective effectiveness of CBT in improving depressive symptoms and QOL in individuals with glaucoma or cataracts.

Keywords

cognitive behavioral therapy; quality of life; mild to moderate depression; glaucoma; cataracts

Introduction

Glaucoma and cataracts are among the leading causes of vision impairment and blindness globally, posing substantial challenges for individuals in their visual functioning and daily activities [1–3]. The impact of these conditions extends beyond physical manifestations, with in-

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creasing evidence highlighting the significant association between ophthalmic diseases and mental health issues, particularly depression [4,5]. Studies have reported that individuals with glaucoma and cataracts are more likely to experience depressive symptoms, which can affect their overall well-being and functioning [6–8]. Therefore, it is essential to address depression not only to support mental health but also to improve visual outcomes and maintain a good quality of life (QOL).

Cognitive behavioral therapy (CBT) is widely recognized for its efficacy in addressing depressive symptoms and improving QOL across various populations [9,10]. Individuals with chronic health conditions, such as glaucoma and cataracts, often experience increased depression and reduced overall well-being, emphasizing the need for effective interventions to address these psychological comorbidities [8,11]. In the context of ophthalmic conditions, the impact of depression extends beyond mental health, influencing visual functioning and QOL. Despite this, the potential therapeutic role of CBT in this specific population remains unexplored. Therefore, the objective of this retrospective cohort study is to evaluate the impact of CBT on individuals with mild to moderate depression due to glaucoma or cataracts, focusing on depressive symptoms and QOL outcomes.

Materials and Methods

Study Design

This retrospective cohort study included patients with mild to moderate depression caused by glaucoma or cataracts from January 2023 to December 2023. The patient selection process involved multiple stages to ascertain that their preferences were duly acknowledged and considered. Initially, physicians provided exhaustive information about the available treatment options to each patient in an accessible and clear manner. They comprehensively explained the advantages and possible risks, ensuring that patients fully understood their choices. Subsequently, decisions were made jointly by patients and physicians via candid and inclusive dialogues, where they deliberated over the feasible therapies, factoring in the patient's health status, individual values, and inclinations. Importantly, all decisions adhered to the tenets of medical ethics, ensuring the patient's right to self-determination and informed consent throughout the decision-making process. All procedures were conducted in accordance with the Declaration of Helsinki. This study was approved by the Institutional Review Board and the Ethics Committee of Deyang people's Hospital (approval No. 2024-04-007-H01). This retrospective study waived informed consent as it utilized de-identified patient data, ensuring no potential harm or impact on patient care. The Institutional Review Board approved this exemption, following the regulatory and ethical guidelines associated with retrospective studies.

Eligibility Criteria of the Study Participants

Inclusion criteria for study participants were set as follows: ① Patients diagnosed with primary glaucoma/cataract [12,13], ② those undergoing surgical treatment, ③ patients with disease duration of ≥6 months, ④ patients aged >18 years, ⑤ individuals having normal cognitive functions, capable of understanding and participating in questionnaire surveys, ⑥ those underwent the Center for Epidemiologic Studies Depression Scale (CES-D) or Patient Health Questionnaire-9 (PHQ-9) assessment during hospitalization, identifying mild to moderate depression, and ⑦ those participated in the entire management process with comprehensive medical records.

However, the exclusion criteria included: ① Presence of other severe chronic conditions such as liver or kidney disease, ② previously diagnosed depression patients who received related interventions at the time of visit or before admission, or concurrent other mental disorders, ③ presence of malignant tumors, ④ use of depression-related medications, ⑤ presence of acute eye diseases that could affect the reliability of the study (e.g., severe blepharitis, conjunctivitis, keratitis, or uveitis), ⑥ concurrent severe physical illnesses and ⑦ history of drug or alcohol dependency.

Treatment Approach

The patients with eight weeks of cognitive behavioral therapy (CBT) included the following stages: ① Identifying patient cognitions: The patients were encouraged to express their emotions, behaviors, and thought processes to healthcare personnel through self-expression and communication, helping them identify the cognitive patterns that lead to adverse emotions. ② Shifting patient thought patterns: After identifying the patient's cognition, any erroneous cognitive patterns were assessed based on their conditions and correct thinking patterns were guided in their daily activities. ③ Applying correct thinking patterns: Considering their real-life situations, healthcare personnel instructed patients to apply the transformed thinking patterns in their daily lives and establish rational cognitive thinking patterns.

Data Collection

General Information

The patient's general information was obtained through systematic case retrieval, such as age, duration of depression, presence of diabetes, duration of hypertension, annual family income, visual acuity, type of disease, and the number of cases with bilateral low vision (corrected visual acuity 0.05~0.3).

Depression Rating

All patients were assessed for depressive symptoms and severity using the PHQ-9 before treatment, after receiving treatment, and again after 8 weeks of treatment. The questionnaire uses a 0 to 3, 4-level scoring system, with a total score ranging from 0 to 27. Scores from 0 to 4 suggest no depressive symptoms, 5 to 9 signify mild depressive symptoms, 10 to 14 indicate moderate depressive symptoms, and 15 to 27 indicate severe depressive symptoms. The Cronbach's α score was 0.78 [14].

CES-D was utilized to assess the frequency of current depressive symptoms. This scale comprises 20 items, each scored on a 0 to 3, 4-level system, evaluating the frequency of symptoms experienced in the past week. A total CES-D score of $\leq$15 indicates the absence of depressive symptoms, 16–19 suggests potential depressive symptoms, and $\geq$20 indicates definite depressive symptoms. The CES-D demonstrated high accuracy, with a Cronbach's α value of 0.87 [15].

Quality of Life (QOL) Score

QOL was evaluated using the Chinese translated version of the European Quality of Life-5 Dimensions scale (EQ-5D), encompassing five dimensions of the health description system: mobility, self-care, usual activities, pain/discomfort, anxiety/depression, and the EQ-VAS visual analogue scale. This scale demonstrated a high level of accuracy, with a Cronbach's α of 0.75 [16]. Currently, there are no corresponding utility value conversion tables for the EQ-5D index scores in China. This study used the Japanese Time Trade-Off (TTO) scoring conversion table, resulting in EQ-5D index scores ranging from –0.11 to 1.

The Short Form Health Survey (SF-36) questionnaire includes eight dimensions: physical functioning (PF), role physical (RP), bodily pain (BP), general health (GH), vitality (VT), social functioning (SF), role emotional (RE), and mental health (MH). Each dimension is scored on a scale of up to 100, with higher scores indicating superior quality of life in that domain. The SF-36 demonstrated high accuracy, with a Cronbach's α value of 0.87 [17].

The National Eye Institute Visual Function Questionnaire-25 (NEI-VFQ-25) was utilized to evaluate vision-related QOL in patients following surgery. This questionnaire involves a 5-level scoring system, where 0 signifies "unable to perform" and 4 indicates "able to perform", yielding a cumulative score between 0 and 100. A greater aggregate score was indicative of better postoperative vision-associated quality of life. The NEI-VFQ-25 demonstrated high accuracy, with a Cronbach's α value of 0.89 [18].

Anxiety Score

The Hospital Anxiety and Depression Scale-Anxiety (HADS-A) was primarily used for screening anxiety symptoms in patients at general hospitals. This scale includes seven items, each assessed using a quartile grading system (ranging from 0 to 3), reflecting the patient's experiences over the preceding month. Scores are interpreted as follows: a range of 0–7 indicates no symptoms, 8–10 suggests potential symptom manifestation and 11–21 confirms the presence of symptoms. A HADS-A score of $\geq$8 is the benchmark for evaluating anxiety-related symptoms. This scale demonstrated high accuracy, with a Cronbach's α value of 0.753 [19].

Data Cleaning and Management

Before data analysis, this study implemented a standardized data-cleaning protocol to identify and correct any inconsistencies, inaccuracies, or missing values. This procedure involved thoroughly examining the dataset, removing duplicating records, correcting data entry errors, and appropriately handling missing data entries. Data handling was executed utilizing the datawig and panda libraries in Python 3.6.0, employing deep neural networks to estimate missing values. Missing data were kept below 5% to minimize potential selection bias, with sensitivity analyses performed accordingly. For cases lost to follow-up, outcomes were calculated under worst-case and best-case scenarios. In the absence of substantial discrepancies, it was concluded that lost to follow-up had a negligible effect on the outcomes, enhancing the robustness of the conclusions. The final results were reported subsequently after imputing the missing values.

The Post-Hoc Analysis

To conduct a post hoc analysis within G*Power 3.1.9.7 (University of Dusseldorf; Dusseldorf, Germany), the "Means: Difference between two independent means (two groups)" function based on *t*-tests was selected. The settings were adjusted as follows: a two-tailed test, an effect size (d) of 0.6, and an α error probability of 0.05. Following this, the respective sample sizes for both groups were then entered, and the power (1-β error probability) was computed, resulting in a power of 1.0.

Statistical Analysis

The data were analyzed using SPSS 29.0 statistical software (SPSS Inc., Chicago, IL, USA). Categorical data were presented as [n (%)]. Continuous variables were initially assessed for normal distribution using the Shapiro-Wilk method. Normally distributed continuous data were expressed as ($\bar{x} \pm$ s). A p-value < 0.05 was considered as statistical significance.

Results

Demographic Data and Basic Characteristics of the Study Participants

The study included 3010 participants, 2151 receiving no treatment and 859 receiving CBT. Upon analysis, no statistically significant differences were observed between these two groups regarding age, gender distribution, duration of depression, body mass index (BMI), presence of diabetes, hypertension, ethnicity, marital status, education level, employment status, annual household income, visual acuity, disease type, presence of low vision, family history of depression, and family history of anxiety disorder ($p >$ 0.05, Table 1).

Depression Assessment

There were no significant differences in CES-D scores (p = 0.430) and PHQ-9 scores (p = 0.366) between the untreated baseline group and the untreated group after 8 weeks, indicating no changes in depression levels over 8 weeks (Table 2). Additionally, there were no significant distinctions in CES-D scores (p = 0.159) and PHQ-9 scores (p = 0.361) between the untreated and CBT baseline groups, indicating comparable baseline depression levels. However, post-intervention, the CBT group demonstrated significantly lower CES-D scores ($p < 0.001$) and PHQ-9 scores ($p < 0.001$), indicating a substantial improvement in depressive symptoms following CBT compared to baseline.

Quality of Life

We did not find significant differences between the untreated baseline group and the untreated group after 8 weeks ($p > 0.05$). Similarly, there were no significant differences between the untreated baseline group and the CBT baseline group ($p > 0.05$). However, the EQ-5D scores showed a significant increase post-intervention compared to baseline ($p < 0.001$), indicating enhanced overall quality of life. Additionally, the SF-36 mental component scores demonstrated a significant improvement post-intervention compared to baseline ($p < 0.001$), reflecting enhanced mental well-being following CBT. Furthermore, the HADS anxiety scores showed a significant improvement post-intervention compared to baseline ($p < 0.001$). However, there were no statistically significant differences in the SF-36 physical component scores and NEI-VFQ-25 composite scores when comparing the untreated group to the CBT group at baseline and post-intervention ($p > 0.05$, Table 3).

Discussion

This retrospective cohort study aimed to evaluate the impact of CBT on individuals with mild to moderate depression resulting from glaucoma or cataracts. Depressive symptoms are prevalent in individuals with chronic health conditions such as glaucoma and cataracts, often alleviating quality of life and mental well-being [20–22]. Our findings align with previous research demonstrating the efficacy of CBT in improving depressive symptoms across various populations [23]. The significant reduction in CES-D and PHQ-9 scores post-intervention in the CBT group compared to baseline suggests the potential clinical utility of CBT in managing depression associated with ophthalmic conditions.

In addition to enhancements in depressive symptoms, the post-intervention analysis revealed a significant increase in EQ-5D scores, indicating an overall improvement in QOL following CBT. Individuals with ophthalmic conditions may face reduced participation in activities they previously enjoyed due to vision-related limitations, which can lead to a decrease in overall QOL and an increased risk of developing depressive symptoms [24,25]. CBT includes behavioral activation techniques that encourage individuals to re-engage in meaningful activities and so-

Table 1. Comparison of baseline characteristics between the untreated and CBT groups.

Parameters	Untreated (n = 2151)	Cognitive behavioral therapy (n = 859)	t/χ^2	*p*-value
Age (years)	65.74 ± 5.67	65.82 ± 5.43	0.354	0.724
Gender (male/female) [n (%)]	579 (26.92)/1572 (73.08)	232 (27.01)/627 (72.99)	0.003	0.960
Duration of depression (months)	11.78 ± 3.86	11.95 ± 3.54	1.117	0.264
BMI	24.15 ± 3.15	23.95 ± 3.56	1.514	0.130
Diabetes [n (%)]	258 (11.99)	112 (13.04)	0.621	0.431
Hypertension [n (%)]	538 (25.01)	198 (23.05)	1.279	0.258
Ethnicity [Han, n (%)]	1934 (89.91)	790 (91.97)	3.017	0.082
Marital status			2.508	0.474
Married [n (%)]	1445 (67.18)	598 (69.62)		
Single [n (%)]	275 (12.78)	99 (11.53)		
Divorced [n (%)]	329 (15.3)	118 (13.74)		
Widowed [n (%)]	102 (4.74)	44 (5.12)		
Education level			1.224	0.542
High school or less [n (%)]	1248 (58.02)	515 (59.95)		
Bachelor's degree [n (%)]	731 (33.98)	283 (32.95)		
Higher [n (%)]	172 (8.00)	61 (7.10)		
Employment status			3.576	0.167
Employed [n (%)]	972 (45.19)	411 (47.85)		
Unemployed [n (%)]	486 (22.59)	168 (19.56)		
Retired [n (%)]	693 (32.22)	280 (32.6)		
Annual household income (CNY)			0.995	0.608
≤120,000 [n (%)]	1323 (61.51)	514 (59.84)		
120,000–240,000 [n (%)]	703 (32.68)	297 (34.58)		
≥240,000 [n (%)]	125 (5.81)	48 (5.59)		
Visual acuity (logMAR)	0.42 ± 0.14	0.41 ± 0.15	1.734	0.083
Disease type			4.644	0.200
Advanced glaucoma in both eyes [n (%)]	731 (33.98)	287 (33.41)		
Advanced glaucoma in single eye [n (%)]	430 (19.99)	201 (23.40)		
Advanced cataract in both eyes [n (%)]	688 (31.99)	261 (30.38)		
Advanced cataract in single eye [n (%)]	302 (14.04)	110 (12.81)		
Low vision in both eyes [n (%)]	323 (15.02)	137 (15.95)	0.412	0.521
Family history of depression [n (%)]	258 (11.99)	94 (10.94)	0.657	0.418
Family history of anxiety disorder [n (%)]	473 (21.99)	198 (23.05)	0.398	0.528

CBT, cognitive behavioral therapy; BMI, body mass index; logMAR, Logarithm of the Minimum Angle of Resolution. The exchange rate is 1 USD = 6.48 CNY.

cial interactions, counteracting the potential social isolation and withdrawal commonly associated with vision loss [26,27]. Furthermore, the SF-36 mental component scores demonstrated a statistically significant improvement post-intervention, indicating enhanced mental well-being in the CBT group. These findings are consistent with existing literature highlighting the positive effects of CBT on QOL and mental health outcomes in individuals with various medical conditions [28,29]. CBT aims to identify and modify negative thought patterns and cognitive distortions [30–32]. Individuals with glaucoma or cataracts may experience a sense of loss, fear of progressive vision impairment, and anxiety about the impact of their condition on daily functioning [33,34]. CBT helps individuals challenge and reframe these negative thoughts, developing adaptive strategies to manage the psychological impact of their condition.

These findings indicate that the efficacy of CBT in improving depressive symptoms and QOL in individuals with mild to moderate depression due to glaucoma or cataracts may be due to its ability to alleviate anxiety and improve overall well-being. The structured nature of CBT, which focuses on identifying and modifying negative thought patterns and cognitive distortions, may contribute to the observed improvements [35]. By promoting adaptive coping strategies and challenging negative beliefs related to vision impairment, CBT may mitigate the psychological impact of

Table 2. Assessment of depression between the untreated and CBT groups.

Parameters	U^a	U^b	C^a	C^b	T^a	p^a	T^b	p^b	T^c	p^c
CES-D score	21.15 ± 4.67	21.04 ± 4.12	21.41 ± 4.32	18.98 ± 8.25	0.819	0.413	1.409	0.159	9.484	<0.001
PHQ-9 score	12.74 ± 3.29	12.64 ± 4.26	12.86 ± 3.15	8.96 ± 3.52	0.862	0.389	0.915	0.361	22.442	<0.001

U^a, untreated (baseline) (n = 2151); U^b, untreated (after 8 weeks) (n = 2151); C^a, cognitive behavioral therapy (baseline) (n = 859); C^b, cognitive behavioral therapy (post-intervention) (n = 859); T^a, *t* (U^a vs U^b); p^a, *p* (U^a vs U^b); T^b, *t* (U^a vs C^a); p^b, *p* (U^a vs C^a); T^c, *t* (U^b vs C^b); p^c, *p* (U^b vs C^b). CES-D, Center for Epidemiologic Studies Depression Scale; PHQ-9, Patient Health Questionnaire-9.

Table 3. Quality of life assessment between the untreated and CBT groups.

Parameters	U^a	U^b	C^a	C^b	T^a	p^a	T^b	p^b	T^c	p^c
EQ-5D Score	0.71 ± 0.23	0.72 ± 0.19	0.72 ± 0.26	0.75 ± 0.26	1.555	0.120	1.037	0.300	3.501	<0.001
SF-36 physical component	46.18 ± 3.45	46.24 ± 3.98	45.92 ± 3.67	46.15 ± 3.46	0.528	0.597	1.833	0.067	0.581	0.561
SF-36 mental component	41.85 ± 5.98	42.07 ± 5.07	42.11 ± 5.45	43.11 ± 9.06	1.301	0.193	1.104	0.270	3.986	<0.001
NEI-VFQ-25 composite score	70.97 ± 8.68	70.72 ± 7.93	71.22 ± 8.55	71.36 ± 10.12	0.986	0.324	0.717	0.474	1.841	0.066
HADS anxiety score	11.04 ± 3.15	11.15 ± 2.81	10.84 ± 2.56	10.58 ± 2.43	1.209	0.227	1.655	0.098	5.217	<0.001

U^a, untreated (baseline) (n = 2151); U^b, untreated (after 8 weeks) (n = 2151); C^a, cognitive behavioral therapy (baseline) (n = 859); C^b, cognitive behavioral therapy (Post-Intervention) (n = 859); T^a, *t* (U^a vs U^b); p^a, *p* (U^a vs U^b); T^b, *t* (U^a vs C^a); p^b, *p* (U^a vs C^a); T^c, *t* (U^b vs C^b); p^c, *p* (U^b vs C^b). EQ-5D, European Quality of Life-5 Dimensions scale; SF-36, Short Form Health Survey; NEI-VFQ-25, National Eye Institute Visual Function Questionnaire-25; HADS, Hospital Anxiety and Depression Scale.

ophthalmic conditions, thereby leading to reduced depressive symptoms and enhanced quality of life [26]. CBT aims to break the negative cycle by deconstructing the problems that cause anxiety or fear, helping patients alter negative patterns, enhance mood, and manage worries more effectively. Furthermore, the behavioral activation techniques employed in CBT may facilitate individuals to re-engage in meaningful activities and social interactions, counteracting the social isolation and withdrawal often associated with vision loss [36]. These theoretical observations align with previous research indicating the beneficial effects of CBT on mental health outcomes in various populations [37]. Future investigations utilizing neuroimaging techniques or qualitative assessments could provide further insights into the neurobiological and psychosocial mechanisms through which CBT shows therapeutic effects on individuals with glaucoma or cataracts.

It is important to note that the present study possesses several strengths, including a robust sample size and a comprehensive assessment of depressive symptoms and quality of life using validated measures. Furthermore, the retrospective design enabled the evaluation of real-world clinical outcomes, thereby enhancing the external validity of the findings.

However, there was no correlation between CBT and the SF-36 physical component scores, and NEI-VFQ-25 composite scores. CBT primarily relies on the patient's willpower and focuses on psychological support, so it has minimal effect on physical health. The recovery of visual function needs rehabilitation training and drug treatment. Therefore, the impact of CBT on physical health was not evident.

However, it is crucial to recognize a few limitations of the study. Firstly, the retrospective design limits the ability to draw causal inferences, and the influence of confounding variables cannot be ruled out. Additionally, the absence of a control group and randomization hinders the ability to establish a direct causal relationship between CBT and the observed improvements. Future prospective studies with randomized controlled designs are required to provide further insight into the efficacy of CBT in this population. Another important consideration is the generalizability of the findings. The study cohort primarily consisted of individuals with mild to moderate depression associated with glaucoma or cataracts, which may limit the applicability of the findings to those with severe depression or other ophthalmic conditions. Furthermore, the study was conducted at a single institution, and the demographic characteristics of the sample may not reflect the broader population. Future research should aim to replicate these findings across diverse clinical settings and patient populations to enhance the generalizability of the results.

Conclusion

In conclusion, this retrospective cohort study provides evidence for the potential efficacy of CBT in improving depressive symptoms and QOL in individuals experiencing

mild to moderate depression due to glaucoma or cataracts. The findings highlight the significance of addressing mental health in the context of ophthalmic conditions and suggest the role of CBT as a potential therapeutic modality for this population. Further research, particularly prospective controlled studies, is warranted to confirm these findings and support evidence-based interventions for depression in individuals with ophthalmic conditions.

Availability of Data and Materials

Data to support the findings of this study are available on reasonable request from the corresponding author.

Author Contributions

YL, HZ and JG designed the research study. HZ and CS performed the research. YL, NY and XL collected and analyzed the data. YL and XL drafted the manuscript. All authors contributed to important editorial changes in the manuscript. All authors read and approved the final manuscript. All authors have participated sufficiently in the work and agreed to be accountable for all aspects of the work.

Ethics Approval and Consent to Participate

This study has been approved by the ethics committee of Deyang people's Hospital, approval No. 2024-04-007-H01. All procedures were conducted in accordance with the Declaration of Helsinki. This retrospective study waived informed consent as it utilized de-identified patient data, ensuring no potential harm or impact on patient care. The Institutional Review Board approved this exemption, following the regulatory and ethical guidelines associated with retrospective studies.

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Conflict of Interest

The authors declare no conflict of interest.

References

[1] Bisorca-Gassendorf L, Szurman P, Wenzel M, Januschowski K. Acquired Cataracts. Klinische Monatsblatter fur Augenheilkunde. 2022; 239: 725–738. (In German)

[2] Kang JM, Tanna AP. Glaucoma. The Medical Clinics of North America. 2021; 105: 493–510.

[3] Rong H, Luo Z, Tang M, Tang J, Li K, Yang R, *et al*. Establishment of a Disease Model Using Patient-Specific Induced Pluripotent Stem Cells-Derived Trabecular Meshwork Cells in a Chinese Primary Open-Angle Glaucoma Mega-Pedigree. Discovery Medicine. 2024: 36: 2013–2025.

[4] Parravano M, Petri D, Maurutto E, Lucenteforte E, Menchini F, Lanzetta P, *et al*. Association Between Visual Impairment and Depression in Patients Attending Eye Clinics: A Meta-analysis. JAMA Ophthalmology. 2021; 139: 753–761.

[5] Rasendran C, Imran Y, Talcott KE. Incremental Economic Burden of Depression in Ophthalmic Patients. American Journal of Ophthalmology. 2021; 229: 184–193.

[6] Kang MJ, Do KY, Park N, Kang MW, Jeong KS. The Risk of Major Depressive Disorder Due to Cataracts among the Korean Elderly Population: Results from the Korea National Health and Nutrition Examination Survey (KNHANES) in 2016 and 2018. International Journal of Environmental Research and Public Health. 2023; 20: 1547.

[7] Ramesh PV, Morya AK, Azad A, Pannerselvam P, Devadas AK, Gopalakrishnan ST, *et al*. Navigating the intersection of psychiatry and ophthalmology: A comprehensive review of depression and anxiety management in glaucoma patients. World Journal of Psychiatry. 2024; 14: 362–369.

[8] Stamatiou ME, Kazantzis D, Theodossiadis P, Chatziralli I. Depression in glaucoma patients: A review of the literature. Seminars in Ophthalmology. 2022; 37: 29–35.

[9] López-López JA, Davies SR, Caldwell DM, Churchill R, Peters TJ, Tallon D, *et al*. The process and delivery of CBT for depression in adults: a systematic review and network meta-analysis. Psychological Medicine. 2019; 49: 1937–1947.

[10] Park S, Sato Y, Takita Y, Tamura N, Ninomiya A, Kosugi T, et al. Mindfulness-Based Cognitive Therapy for Psychological Distress, Fear of Cancer Recurrence, Fatigue, Spiritual Well-Being, and Quality of Life in Patients With Breast Cancer-A Randomized Controlled Trial. Journal of Pain and Symptom Management. 2020; 60: 381-389.

[11] Groff ML, Choi B, Lin T, Mcllraith I, Hutnik C, Malvankar-Mehta MS. Anxiety, depression, and sleep-related outcomes of glaucoma patients: systematic review and meta-analysis. Canadian Journal of Ophthalmology. Journal Canadien D'ophtalmologie. 2023; 58: 346–355.

[12] Díez-Álvarez L, Beltrán-Agullo L, Loscos J, Pazos M, Ponte-Zúñiga B, Pinazo-Durán MD, *et al*. Advanced glaucoma. Clinical practice guideline. Archivos De La Sociedad Espanola De Oftalmologia. 2023; 98: 18–39.

[13] Chinese Cataract and Refractive Surgery Society. Chinese guideline for cataract surgery in adults (2023). Zhonghua Yan Ke Za Zhi = Chinese Journal of Ophthalmology. 2023; 59: 977–987. (In Chinese)

[14] Dajpratham P, Pukrittayakamee P, Atsariyasing W, Wannarit K,

Boonhong J, Pongpirul K. The validity and reliability of the PHQ-9 in screening for post-stroke depression. BMC Psychiatry. 2020; 20: 291.

[15] Jiang L, Wang Y, Zhang Y, Li R, Wu H, Li C, *et al*. The Reliability and Validity of the Center for Epidemiologic Studies Depression Scale (CES-D) for Chinese University Students. Frontiers in Psychiatry. 2019; 10: 315.

[16] Yapp LZ, Scott CEH, Howie CR, MacDonald DJ, Simpson AHRW, Clement ND. Meaningful values of the EQ-5D-3L in patients undergoing primary knee arthroplasty. Bone & Joint Research. 2022; 11: 619–628.

[17] Wu Q, Chen Y, Zhou Y, Zhang X, Huang Y, Liu R. Reliability, validity, and sensitivity of short-form 36 health survey (SF-36) in patients with sick sinus syndrome. Medicine. 2023; 102: e33979.

[18] Wan Y, Zhao L, Huang C, Xu Y, Sun M, Yang Y, *et al*. Validation and comparison of the National Eye Institute Visual Functioning Questionnaire-25 (NEI VFQ-25) and the Visual Function Index-14 (VF-14) in patients with cataracts: a multicentre study. Acta Ophthalmologica. 2021; 99: e480–e488.

[19] Yang Y, Ding R, Hu D, Zhang F, Sheng L. Reliability and validity of a Chinese version of the HADS for screening depression and anxiety in psycho-cardiological outpatients. Comprehensive Psychiatry. 2014; 55: 215–220.

[20] Duong AT, Van Tassel SH. Depression and Glaucoma: A Review and Considerations for Researchers and Providers. International Ophthalmology Clinics. 2022; 62: 39–44.

[21] Shin DY, Jung KI, Park HYL, Park CK. The effect of anxiety and depression on progression of glaucoma. Scientific Reports. 2021; 11: 1769.

[22] Chen PW, Liu PPS, Lin SM, Wang JH, Huang HK, Loh CH. Cataract and the increased risk of depression in general population: a 16-year nationwide population-based longitudinal study. Scientific Reports. 2020; 10: 13421.

[23] Majidzadeh S, Mirghafourvand M, Farvareshi M, Yavarikia P. The effect of cognitive behavioral therapy on depression and anxiety of women with polycystic ovary syndrome: a randomized controlled trial. BMC Psychiatry. 2023; 23: 332.

[24] Assi L, Chamseddine F, Ibrahim P, Sabbagh H, Rosman L, Congdon N, *et al*. A Global Assessment of Eye Health and Quality of Life: A Systematic Review of Systematic Reviews. JAMA Ophthalmology. 2021; 139: 526–541.

[25] Latif K, Nishida T, Moghimi S, Weinreb RN. Quality of life in glaucoma. Graefe's Archive for Clinical and Experimental Ophthalmology = Albrecht Von Graefes Archiv Fur Klinische Und Experimentelle Ophthalmologie. 2023; 261: 3023–3030.

[26] Alimoradi Z, Jafari E, Broström A, Ohayon MM, Lin CY, Griffiths MD, *et al*. Effects of cognitive behavioral therapy for insomnia (CBT-I) on quality of life: A systematic review and meta-analysis. Sleep Medicine Reviews. 2022; 64: 101646.

[27] Muench A, Vargas I, Grandner MA, Ellis JG, Posner D, Bastien CH, *et al*. We know CBT-I works, now what? Faculty Reviews. 2022; 11: 4.

[28] Bertie LA, Hudson JL. CBT for Childhood Anxiety: Reviewing the State of Personalised Intervention Research. Frontiers in Psychology. 2021; 12: 722546.

[29] Kendall PC, Ney JS, Maxwell CA, Lehrbach KR, Jakubovic RJ, McKnight DS, *et al*. Adapting CBT for youth anxiety: Flexibility, within fidelity, in different settings. Frontiers in Psychiatry. 2023; 14: 1067047.

[30] Patel A, Daros AR, Irwin SH, Lau P, Hope IM, Perkovic SJM, *et al*. Associations between rumination, depression, and distress tolerance during CBT treatment for depression in a tertiary care setting. Journal of Affective Disorders. 2023; 339: 74–81.

[31] Hvenegaard M, Moeller SB, Poulsen S, Gondan M, Grafton B, Austin SF, *et al*. Group rumination-focused cognitive-behavioural therapy (CBT) *v.* group CBT for depression: phase II trial. Psychological Medicine. 2020; 50: 11–19.

[32] Oud M, de Winter L, Vermeulen-Smit E, Bodden D, Nauta M, Stone L, *et al*. Effectiveness of CBT for children and adolescents with depression: A systematic review and meta-regression analysis. European Psychiatry: the Journal of the Association of European Psychiatrists. 2019; 57: 33–45.

[33] Pellegrini M, Bernabei F, Schiavi C, Giannaccare G. Impact of cataract surgery on depression and cognitive function: Systematic review and meta-analysis. Clinical & Experimental Ophthalmology. 2020; 48: 593–601.

[34] Berchuck S, Jammal A, Mukherjee S, Somers T, Medeiros FA. Impact of anxiety and depression on progression to glaucoma among glaucoma suspects. The British Journal of Ophthalmology. 2021; 105: 1244–1249.

[35] Gorka SM, Young CB, Klumpp H, Kennedy AE, Francis J, Ajilore O, *et al*. Emotion-based brain mechanisms and predictors for SSRI and CBT treatment of anxiety and depression: a randomized trial. Neuropsychopharmacology: Official Publication of the American College of Neuropsychopharmacology. 2019; 44: 1639–1648.

[36] Nakao M, Shirotsuki K, Sugaya N. Cognitive-behavioral therapy for management of mental health and stress-related disorders: Recent advances in techniques and technologies. BioPsychoSocial Medicine. 2021; 15: 16.

[37] Gupta A, Kumari S. Effect of CBT on Metacognitive Beliefs in Depressive Disorders. Turk Psikiyatri Dergisi = Turkish Journal of Psychiatry. 2023; 34: 8–88.