

# Research Progress on the Influence of Self-management Behavior on Glaucoma

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**Abstract:** *Glaucoma is the second leading cause of blindness in the world. With the deepening of the understanding of self-management behavior, the research on self-management behavior of glaucoma patients has become a hot issue. This study reviewed the influencing factors, intervention measures and related research tools of self-management behavior of glaucoma patients, in order to provide reference for self-management and related research of glaucoma patients. With the progress of society, glaucoma has become a serious eye disease. Its typical symptoms include obvious atrophy of the optic nerve, decreased vision, and even blindness [1]. At present, it has become the second largest blinding eye disease in the world. The prevalence rate in China has reached 20 % [2] and is developing in a younger direction. Some young patients with glaucoma will suddenly have serious consequences, and their vision will be greatly weakened within a few days or hours, while some teenagers have no symptoms at all, which will eventually lead to the loss of teenagers. It is estimated that there are currently 60.5 million young people in the global age group, and by 2050, this number is expected to exceed 110 million people [3]. There are currently 60.5 million young people in the world, and this number is expected to exceed 100 million by 2035. Due to the visual field defect caused by glaucoma, the patient's balance ability will be reduced, and accidental falls will occur [4]. Visual field defect blindness will cause a huge economic burden on society [5]. The irreversible blindness caused by glaucoma should be paid attention to. The 13 th Five-Year National Eye Health Plan [6] emphasizes that eye health is urgent for national health. It can not only alleviate the suffering of patients, improve their physical health, but also reduce the huge pressure they bear, so as to provide strong support for the development of the country and build a healthy and sustainable international environment.*

## 1. Influencing Factors

### 1.1 General Demographic Data

1.1.1 Age Differences Self-management capabilities vary across age groups, with age being a significant factor influencing glaucoma patients' self-management behaviors [7]. Patients of different age brackets exhibit disparities in cognitive abilities, physical functions, life experiences, and understanding and acceptance of the disease, which directly impact the effectiveness of their self-management practices. According to Ye Xueping's research ( $P < 0.05$ ) [8], the self-discipline awareness of middle-aged and elderly patients significantly declines with advancing age, a finding that aligns well with previous survey results [9]. Additionally, due to the complex etiology of glaucoma and the challenging treatment process of this chronic condition, patients often exhibit deficiencies in health cognition, thinking, and memory [10], thereby affecting their physical health status and daily social interaction skills. In the self-management and medical management activities for glaucoma patients, healthcare professionals should prioritize the middle-aged and elderly patient population. For elderly patients, particular attention should be paid to the regularity of follow-up and medication adherence. By providing targeted support and guidance, healthcare providers can assist them in enhancing their ability to manage the disease independently.

1.1.2 Cultural Background Culturally, individual self-management capacity is significantly influenced by cultural factors. Values, educational philosophies, family concepts, and social norms across different cultures collectively impact self-management processes. Research indicates that individuals with junior high school education demonstrate superior self-management performance. This finding aligns with previous studies [11,12] regarding patients with lower secondary/high school or university-level education. Individuals with higher education levels typically

possess stronger capabilities in information acquisition, comprehension, and application, enabling them to more effectively receive and process disease-related knowledge. Consequently, they can better understand disease etiology, symptoms, treatment modalities, and preventive measures, thereby formulating more scientific self-management strategies. Qiu Chen et al. [13] emphasized that comprehensive disease knowledge helps patients develop a more positive perception of the importance of treatment and nursing interventions, while fostering service awareness and confidence, ultimately enhancing disease prevention and management capabilities. Individuals with deeper and more accurate disease understanding are more likely to proactively adopt positive self-management measures, such as regular health monitoring and timely lifestyle adjustments to adapt to disease changes. This mastery of disease knowledge strengthens self-efficacy, empowering individuals to confidently address disease challenges. Conversely, those with lower education levels or insufficient disease knowledge may struggle to manage their health effectively due to lack of necessary knowledge and skills, and may even experience disease deterioration due to misinterpretation or neglect of disease signals. Therefore, understanding the patient's educational level is essential for enhancing self-management capabilities.

1.1.3 Other Income Levels and Residence Location are Significant Factors Influencing Patients' Self-Management Capabilities. Patients with higher incomes tend to score higher in self-management capability assessments. This may be attributed to the stronger economic foundation of high-income groups, enabling them to more readily access high-quality medical resources, health information, and necessary assistive tools, thereby better adhering to medical orders, undergoing regular examinations, and maintaining healthy lifestyles. Additionally, high-income patients may place greater emphasis on their health, dedicating more time and energy to self-management, including acquiring

disease-related knowledge and participating in health management courses. The study by Ocansey et al. [14] further indicates that disparities in ophthalmic healthcare accessibility between rural and urban areas may be the primary contributing factor. Residence location influences patients' perceived risk, likely due to urban areas possessing more comprehensive medical facilities, abundant health education resources, and more convenient transportation, all of which provide a superior self-management support environment for patients. Urban patients can more easily access professional medical personnel, obtain timely medical advice and treatment plans, and participate in various health promotion activities. In contrast, rural areas may experience relatively insufficient allocation of medical resources, limited channels for patients to access health information, and transportation difficulties that may hinder regular visits to medical institutions for follow-up examinations and consultations, thereby partially limiting the enhancement of their self-management capabilities. A study conducted by Choudhari et al. [15] in rural and underdeveloped regions of India demonstrated that integrating specialized vertical glaucoma care pathways into existing ophthalmic service delivery systems could enhance case detection rates and treatment adherence. This suggests the need to explore optimal models for patient self-management and complementary healthcare alliances in rural areas.

## 1.2 Disease Status

According to the research findings of scholars such as Qiu Chen and Yuan Yajuan (all  $P < 0.05$ ) [14][16], patients with glaucoma in rural areas exhibit significantly inadequate self-care abilities during the early stages of the disease. These patients often present with bilateral visual impairment, which can serve as an important indicator for assessing the severity of their condition. Patients with bilateral visual impairment experience significantly greater psychological stress compared to those with unilateral visual impairment. This substantial psychological burden may induce negative emotions such as anxiety and depression, thereby adversely affecting the patient's recovery and treatment progress. Given the complexity and potential hazards of glaucoma, close monitoring of its progression is essential. Systematic evaluations should be conducted to further clarify the potential risks associated with the disease. Based on this, practical treatment plans aimed at enhancing patients' self-management capabilities should be formulated and implemented. This approach not only helps patients better cope with the disease but also effectively improves treatment adherence and efficacy, thereby providing a robust foundation for the successful implementation of therapeutic interventions.

## 1.3 Psychosocial Factors

**1.3.1 Self-Efficacy as a Psychological Driver of Self-Management Behavior** A pivotal psychological factor is self-efficacy. Bandura's original definition of self-efficacy describes an individual's assessment of their capabilities, beliefs, and emotional experiences [17], which help them solve problems, build confidence, and achieve goals.

Research by Xu Xiaoye et al. [18] demonstrated that self-efficacy independently correlates with self-management, confirming its critical role in patients' self-care behaviors. Bakan et al. [19] reported that self-efficacy's most significant predictor is chronic patients' self-confidence. Therefore, educating patients to adopt effective stress-management techniques can enhance self-efficacy and bolster their confidence in self-management.

**1.3.2 Social Support** Social support is also a critical factor influencing the self-management of glaucoma patients. Zeng Suhua [20] proposed that multiple measures, including but not limited to professional technical training, necessary maintenance, and care, should be implemented to assist glaucoma patients in restoring their health. Providing adequate daily care, professional technical training, and essential maintenance and supervision can help patients establish a positive belief in recovery and significantly improve their quality of life. Cameron et al. [21] highlighted that patients with chronic diseases often exhibit passive dependence and vulnerable emotions, leading to a strong expectation for assistance and care from family and friends. With external support, these individuals can enhance their stress resilience and gain confidence in overcoming the challenges posed by the disease. In-depth investigations revealed that elderly glaucoma patients in rural areas are significantly influenced by social factors (all  $P < 0.05$ ). Therefore, it is essential to provide them with more care and support, maintain continuous communication and encouragement, to effectively assist them in autonomous treatment and improve their self-management capabilities.

**1.3.3 Emotions: Anxiety, depression, and hope.** Glaucoma is a chronic condition that may lead to elevated intraocular pressure (IOP) in patients, often accompanied by frequent IOP monitoring and inability to self-monitor. These conditions not only increase the patient's healthcare burden but also create numerous inconveniences and uncertainties in disease management. Consequently, glaucoma patients are prone to negative emotions such as anxiety and depression. If these emotions are not effectively managed, they may further compromise treatment adherence and self-management capabilities, thereby adversely affecting disease control. Studies have shown that establishing positive treatment confidence is crucial for glaucoma patients to control disease progression [22]. A positive mindset enhances patients' self-efficacy, encouraging active participation in disease management, better adherence to medical advice, regular medication, timely follow-up examinations, and adoption of healthy lifestyles. Additionally, a positive emotional state helps patients better cope with psychological stress caused by the disease, reducing self-management behavioral deviations due to anxiety and depression. The significant impact of emotional state on glaucoma patients' self-management behaviors underscores the critical importance of psychological interventions for glaucoma patients. By providing psychological support, conducting mental health education, and implementing cognitive behavioral therapy (CBT) and other psychological interventions, patients can gain a correct understanding of their disease, alleviate anxiety and depressive emotions, and thereby improve their self-management capabilities.

## 2. Intervention Methods for Self-Management Behaviors in Glaucoma Patients

### 2.1 Educational Intervention

Enhancing patients' health awareness and knowledge is a crucial approach. Zhang Min et al. [23] implemented educational interventions to equip patients with correct medication methods and intraocular pressure (IOP) monitoring techniques through oral education, lectures, online promotion, and distribution of educational materials. Wu Lianying et al. [24] adopted multiple measures, including feedback education, to effectively convey health information to postoperative glaucoma patients and reduce misconceptions. Jin Lu et al. [25] addressed patients' conflicting psychological states through motivational interviews to strengthen their behavioral change motivation and improve self-management capabilities. To effectively enhance glaucoma patients' self-management skills and treatment adherence, it is essential to help patients deeply understand the fundamentals of glaucoma, treatment regimens, and the importance of self-management. This can be achieved through innovative formats and diversified channels to provide systematic, comprehensive, and personalized health education. In the future, tailored educational materials can be designed for patients of different educational backgrounds and age groups. For patients with lower education levels or elderly patients, simple and understandable language with visual aids can be used; for younger patients, more detailed technical content and interactive learning tools can be provided. Additionally, community health service centers and hospital outpatient departments can regularly organize support group activities for glaucoma patients, fostering psychological resilience and enhancing self-management motivation through peer experience sharing and mutual support.

### 2.2 Psychological Intervention

The psychological factors influencing the onset and progression of glaucoma are rooted in mental health issues. Zhang Min et al. [22] conducted an in-depth exploration of the etiology of anxiety and depression in patients, highlighting that negative emotions adversely affect surgical outcomes. This approach helps patients enhance psychological resilience and stimulate their initiative in self-management. During counseling sessions, patients can share their feelings and concerns with healthcare providers, receiving emotional support and understanding. Such emotional release and psychological comfort effectively alleviate anxiety, enabling patients to adopt a more positive attitude toward their condition. Li Min et al. [26] demonstrated that continuous peer education-based nursing significantly mitigates negative emotions and improves self-management capabilities in patients with primary glaucoma. By organizing support groups for glaucoma patients, they facilitate resonance and encouragement through peer interactions. This group support not only provides practical disease management experience but also strengthens patients' social support networks, reducing feelings of loneliness and helplessness, thereby further alleviating psychological stress. Yang Xuemei et al. [27] employed a continuous nursing model to help patients better express emotions, monitor stress responses, and receive

psychological support, ensuring their emotional well-being and alleviating psychological issues such as anxiety and depression. Therefore, providing essential psychological education enables patients to correctly understand their disease and treatment processes, enhancing their confidence and expectations for therapy. Psychological interventions play a crucial auxiliary role in the comprehensive management of glaucoma and are worthy of widespread application and promotion in clinical practice.

### 2.3 Social Support Intervention

Social support provides patients with material, informational, and other forms of assistance, holding significant value. Zhang Bei et al. [28] utilized a combination of WeChat, text messages, and telephone follow-ups to conduct monthly visits, assisting patients in locating nearby medical resources by inquiring about their residential conditions. Concurrently, patients were encouraged to participate in local social activities. Tang Yanli et al. [29] developed a nursing intervention program based on the theory of planned behavior to enhance family support. During follow-up sessions, emphasis was placed on the importance of family supervision and encouragement in patient self-management, aiming to improve self-management behaviors while avoiding regression through family monitoring or assistance. Educational activities were conducted for patients' family members to help them understand glaucoma-related knowledge and nursing techniques, enabling them to better assist patients with daily management and emotional support. This comprehensive health education model not only elevates patients' knowledge levels and self-management capabilities but also fosters a family and social environment conducive to patient recovery. Therefore, it is essential to strengthen family and social support for patients, encouraging relatives and friends to participate in their self-management to aid in disease recovery.

### 2.4 Glaucoma Self-Management Questionnaire

The Glaucoma Self-Management Questionnaire (GSMQ) is a tool designed to assess an individual's level of self-discipline in daily life. By collecting data on 17 items, it comprehensively evaluates personal unhealthy habits, physical condition, and treatment adherence. This tool holds significant value in the management of chronic diseases such as glaucoma, helping individuals better cope with stress and thereby improving treatment outcomes. The GSMQ comprises two primary dimensions: the Functional Health Dimension, which assesses patients' efforts to maintain effective bodily functioning through 6 items; and the Disease Medical Management Dimension, which evaluates the medical management level of glaucoma patients through 8 items. Each item is scored using a 4-point Likert scale, where 1 indicates "completely unable" and 4 indicates "completely able." By recording patients' responses to the 17 items and calculating the total score, a higher total score indicates better self-management behavior. The content validity index (CVI) of the GSMQ is 0.938, indicating high content validity; its Cronbach's  $\alpha$  coefficient ranges from 0.712 to 0.891, demonstrating good internal consistency; and the test-retest reliability coefficient ranges from 0.612 to 0.833, further validating the stability and reliability of the tool [30].

## 2.5 Self-Efficacy Scale for Chronic Disease Management

This test is primarily used to assess the personal health status of patients with chronic diseases, including performance in symptom management, self-efficacy, emotional regulation, and communication with physicians. Developed by the Lorrigan team at Stanford University, the test comprises six items and is evaluated across two dimensions. The disease co-management dimension includes two key questions: "Have you engaged in different tasks and activities to manage your health status to reduce the need for medical visits?" and "In addition to medication, have you taken other measures to mitigate the impact of the disease on daily life?" These questions aim to evaluate the patient's initiative and effectiveness in self-management. Each question is scored using a visual analogue scale (VAS) with a range of 1 to 10. A score of 1 indicates very low ability or performance in this aspect, while a score of 10 indicates very high ability or performance. The total score ranges from 6 to 60, with higher scores indicating lower self-efficacy levels and vice versa [31]. The Chinese version of this test has a Cronbach's  $\alpha$  coefficient of 0.89 [32], demonstrating good reliability and validity, and is effective in assessing the self-management abilities and health status of patients with chronic diseases.

## 2.6 Glaucoma Awareness and Knowledge Questionnaire

The Glaucoma Awareness and Knowledge Questionnaire is an assessment tool specifically designed for glaucoma patients in 2019 by scholars including Li Jiali [33], aiming to comprehensively evaluate patients' knowledge of glaucoma-related information. The questionnaire consists of 15 items covering three dimensions: etiological factors, clinical manifestations, and medical-seeking behaviors. The questions are designed as multiple-choice items with three options: "Yes," "No," and "Do not know." Scoring follows a binary system: 2 points for correct answers and 0 points for incorrect answers or "Do not know." The total score ranges from 0 to 30, with higher scores indicating greater knowledge of glaucoma. The Cronbach's  $\alpha$  coefficient of this questionnaire is 0.884, indicating high reliability and validity. It effectively assesses patients' knowledge of glaucoma and provides a critical basis for targeted health education and intervention.

## 3. Current Perspectives

Many glaucoma patients in China still exhibit limited self-management capabilities, influenced by multiple factors such as age, education level, socioeconomic status, disease type, and personal autonomy. Additionally, the lack of adequate social support—particularly from family or community—often hinders the realization of optimal treatment outcomes. Variations in demographic groups, geographic locations, and research methodologies further constrain the self-management capacity of glaucoma patients. Therefore, greater attention should be paid to addressing disparities arising from cultural backgrounds and individual differences. Future research should focus on rigorous long-term tracking studies to evaluate the impact of self-management on long-term health outcomes in glaucoma patients. Utilizing emerging technologies like mobile applications and remote monitoring can provide patients with

real-time feedback and personalized self-management support. Concurrently, more inclusive and adaptive self-management intervention strategies should be developed, taking into account patients' cultural, socioeconomic, and psychological contexts. In summary, while existing research has yielded valuable insights into glaucoma self-management, significant efforts are still required to overcome current limitations and advance this field.

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