Interpretation and Discussion of the Royal Australian College of General Practitioners' "Guidelines for Preventive Activities in General Practice" : Vision Problems (Postprint)

Authors: Li Tianzi, Jiang Yue, Jiang Yue

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Abstract

Vision problems persist throughout the entire life cycle and represent an increasingly prominent issue across all age groups; thus, how to implement long-term management is a critical question for general practitioners to consider. This article focuses on vision problems as outlined in the tenth edition of the "Guidelines for Preventive Activities in General Practice" by the Royal Australian College of General Practitioners (RACGP), with an emphasis on in-depth interpretation and analysis regarding screening for children aged 3–5 years, populations at risk for glaucoma, and case finding for diabetic eye disease in the elderly. The objective is to further explore and analyze the core responsibilities and significance of primary care general practitioners in vision management across different life stages, propose scientific and specific guidelines for screening and preventive actions, and offer practical strategies and recommendations for improving work within primary care communities.

Full Text

Preamble

Guidelines · Consensus · Standards

Interpretation and Discussion of the Royal Australian College of General Practitioners' "Guidelines for Preventive Activities in General Practice" : Vision Problems

Li Tianzi[1], **Jiang Yue**[2*]

1 Introduction

Vision problems are a significant public health concern globally. As primary care providers, general practitioners (GPs) play a crucial role in the early detection, management, and prevention of visual impairment. The Royal Australian College of General Practitioners (RACGP) provides comprehensive recommendations in its "Guidelines for Preventive Activities in General Practice" (commonly known as the Red Book). This article aims to interpret and discuss the vision-related sections of these guidelines to provide insights for clinical practice and health management.

2 Screening and Prevention for Children

The guidelines emphasize that early detection of vision problems in children is vital for preventing long-term developmental issues and permanent vision loss, such as amblyopia.

2.1 Newborns to Preschool Age For newborns, the primary focus is on detecting congenital abnormalities. GPs should perform red reflex testing to screen for congenital cataracts and retinoblastoma. As children progress toward preschool age, the focus shifts to detecting strabismus and refractive errors. The guidelines recommend that all children undergo a formal vision screening at least once between the ages of 3 and 5.

2.2 School-Aged Children For school-aged children, vision screening should be integrated into routine health assessments. Common issues include myopia, which has seen a rising prevalence globally. GPs should encourage outdoor activities as a preventive measure against the onset and progression of myopia, while also monitoring for signs of eye strain or academic difficulties that may stem from undiagnosed vision problems.

3 Screening and Prevention for Adults

In the adult population, the focus of preventive activities shifts toward chronic conditions and age-related degenerative diseases.

3.1 Young and Middle-Aged Adults For asymptomatic adults under the age of 40 without specific risk factors, routine vision screening is generally not recommended unless the patient reports symptoms. However, individuals with high-risk factors—such as a family history of glaucoma or systemic diseases like diabetes—require tailored surveillance.

3.2 Older Adults (Aged 65 and Over) The risk of vision impairment increases significantly with age. The RACGP guidelines recommend regular vision assessments for adults aged 65 and older. Key conditions to monitor include:

- **Cataracts:** Assessing for

2.100016 北京市，清华大学第一附属医院全科医学科

- Corresponding Author: Jiang Yue, Chief Physician; E-mail: redtealook9@sina.com

Abstract

Vision problems persist throughout the entire life cycle and represent an increasingly prominent issue for the general population. Determining how to implement long-term management of these issues is a critical question for general practitioners (GPs). This article focuses on the vision-related recommendations within the tenth edition of the *Guidelines for Preventive Activities in General Practice* published by the Royal Australian College of General Practitioners (RACGP). Specifically, this paper provides an in-depth interpretation and analysis of vision screening for children aged 3–5 years, risk-based screening for glaucoma, and case-finding for diabetic eye disease among the elderly population.

分析。旨在进一步探讨和剖析基层全科医生在各年龄阶段人群视力管理中的核心职责和重要意义，提出科学、具体的

This document provides screening and prevention guidelines and offers practical strategies and recommendations for improving primary care community work.

Keywords: Ophthalmology; Royal Australian College of General Practitioners (RACGP); Red Book; Vision problems; General practitioners; Myopia; Glaucoma; Diabetic retinopathy

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Interpretation and Discussion of the RACGP Guidelines for Preventive Activities in General Practice: Vision Problems

Introduction

The *Guidelines for Preventive Activities in General Practice* (commonly known as the "Red Book"), published by the Royal Australian College of General Practitioners (RACGP), serves as a cornerstone for evidence-based preventive care in primary health settings. The latest edition provides comprehensive updates on the screening, prevention, and management of common ophthalmic conditions. Given the increasing global burden of vision impairment, particularly in aging populations and due to the rising prevalence of myopia and diabetes, interpreting these guidelines is essential for enhancing the quality of care provided by general practitioners (GPs) and community health workers.

1. Screening and Prevention of Common Vision Problems

The Red Book emphasizes the role of the GP in the early detection of vision-threatening conditions. By integrating systematic screening into routine primary care, clinicians can significantly reduce the incidence of avoidable blindness.

1.1 Myopia and Refractive Errors The guidelines highlight the increasing prevalence of myopia, particularly among children and young adults. GPs are encouraged to monitor visual acuity during developmental milestones and provide timely referrals to optometrists or ophthalmologists. Early intervention is critical to prevent high myopia, which is associated with increased risks of retinal detachment and macular degeneration later in life.

1.2 Glaucoma As a leading cause of irreversible blindness, glaucoma requires a proactive screening approach. The RACGP guidelines suggest that screening should be risk-stratified, focusing on individuals over the age of 40, those with a family history of the disease, and specific ethnic groups at higher risk. Regular intraocular pressure (IOP) measurement and optic nerve assessment are recommended as part of comprehensive eye examinations for these populations.

1.3 Diabetic Retinal Disease Diabetic retinopathy remains a significant complication of diabetes mellitus. The guidelines reinforce the necessity of annual or biennial retinal examinations for all diabetic patients, depending on their glycemic control and previous

Vision Problems LI Tianzi1, JIANG Yue2* 1.Department of General Practice of the Second Affiliated Hospital of Zhengzhou University, Zhengzhou 450000, China 2.Department of General Practice of the First Affiliated Hospital of Tsinghua University, Beijing 100016, China *Corresponding author: JIANG Yue, Chief physician; E-mail: redtealook9@sina.com 【Abstract】 Vision problems persist throughout the entire life cycle and have become an increasingly prominent issue among populations across all life stages. How to manage them long-term is a critical question for general practitioners (GPs). This article focuses on vision-related issues outlined in Royal Australian College of General Practitioners (RACGP) Guidelines for Preventive Activities in General Practice the 10th Edition. It provides in-depth interpretation and analysis, particularly regarding children aged 3-5 years, screening for glaucoma risk populations, and the detection of diabetic eye disease in elderly populations.

The aim of this study is to further explore and analyze the core responsibilities and significance of vision management by primary care general practitioners (GPs) across different age groups, propose scientific and specific screening and preventive action guidelines, and offer practical strategies and recommendations for improving community-based clinical work.

【Key words】 Ophthalmology; Royal Australian College of General Practitioners;

Red Book; Vision problems; General practitioners; Myopia; Glaucoma; Diabetic retinopathy

Vision problems manifest in various forms and present differently across diverse populations. In recent years, the high incidence of various vision problems has posed a significant threat to public health [**?**]. For GPs, the focus of management and screening methods varies by age group, necessitating the adoption of differentiated management strategies. In children and adolescents, vision problems primarily manifest as myopia, hyperopia, astigmatism, and amblyopia. Childhood is a critical stage for visual development; therefore, early screening is essential for the prevention and correction of vision issues. For adults, particularly middle-aged and elderly individuals, vision problems are more frequently associated with age-related eye diseases, such as glaucoma, cataracts, and diabetes-related eye conditions.

Age-related eye diseases are often insidious, with inconspicuous early symptoms; however, once they progress, they can cause irreversible damage to vision. Consequently, early disease prevention and patient screening are imperative. The process and trends of population aging cannot be ignored, as eye problems among the elderly are becoming increasingly prominent, constituting a vital component of a GP' s workload.

As age increases, the physiological functions of the elderly gradually decline, and a series of changes occur in ocular structures, significantly increasing the risk of various eye diseases. For instance, if glaucoma is not diagnosed and treated in a timely manner, it can progressively damage the optic nerve, leading to vision loss or even blindness. Cataracts cause the lens to become opaque, obstructing light from entering the eye and resulting in blurred vision. Furthermore, diabetes-related eye diseases, such as diabetic retinopathy (DR), are among the most common and serious complications for diabetic patients, posing a severe threat to the visual health of the elderly. As a cornerstone of primary healthcare, GPs play a critical role in the prevention, screening, and preliminary treatment of eye diseases in the elderly population, requiring sufficient attention and focus [**?**].

High-risk groups for eye diseases include patients over 50 years of age characterized by: diabetes mellitus; myopia; long-term use of steroid hormones; migraines and peripheral vasospasms; abnormal blood pressure; and a history of ocular trauma.

1.2 Preventive recommendations for patients in the "Red Book"

For the general population, specific preventive recommendations regarding vision problems are proposed [**?**]. It is recommended to maintain proper eye care to help prevent eye strain and vision issues: reduce ocular exposure to ultraviolet (UV) radiation to lower the risk of cataracts (e.g., wearing hats and sunglasses when outdoors); wear prescription glasses or contact lenses as required for specific conditions; use protective eyewear (especially for occupations or hobbies involving the risk of foreign objects or chemicals entering the eyes); take breaks

to rest the eyes during prolonged screen use to reduce digital eye strain; quit smoking; and increase the intake of fruits and vegetables.

2 Interpretation and analysis of the "Red Book"

2.1 澳大利亚和国际背景下的流行病现状

This article provides an in-depth interpretation and expanded analysis of the recommendations regarding vision issues found in the *Guidelines for Preventive Activities in General Practice* (commonly referred to as the "Red Book") [**?**], published by the Royal Australian College of General Practitioners (RACGP). Vision problems affect a vast majority of the population across all age groups. This study aims to clarify the screening and prevention recommendations outlined in the Red Book, integrate them with the practical context of primary care in China, and propose scientific management measures for general practitioners (GPs) tailored to different populations. Furthermore, it provides specific strategies for the improvement and refinement of primary care services.

1. Relevant Content from the "Red Book"

The recommendations presented in the Red Book are not limited to professional medical interventions; they also emphasize daily preventive measures for patients.

1.1.1 关于视力筛查的建议

Vision screening is recommended for children aged 3 to 5 years to detect amblyopia or its associated risk factors [**?**]. (1) Primary risk factors include: amblyopia; uncorrected refractive errors (such as myopia, hyperopia, and astigmatism); refractive errors; and vitreous opacity. (2) Other risk factors include: a family history of visual impairment in first-degree relatives; premature birth; low birth weight; maternal substance abuse; smoking during pregnancy; and low parental education levels. However, vision screening is not recommended for children under 3 years of age [**?**].

Research has found that the rate of vision loss among Aboriginal and Torres Strait Islander people over the age of 40 is nearly three times that of other Australians [**?**, **?**].

With the aging of the population, the incidence of vision problems in China remains high. An investigation based on the Global Burden of Disease [**?**] analyzed the burden of three subtypes of blindness and vision impairment (refractive error, near vision loss, and other vision impairments) among Chinese children and adolescents (aged 0–19). The results indicated that the prevalence and disease burden of refractive error show a significant upward trend, while the burden of near vision loss and other vision impairments has decreased significantly. Across all three subtypes, the disease burden is generally higher in females than in males.

Among these, near vision loss has the highest prevalence, while refractive error accounts for the highest rate of Disability-Adjusted Life Years (DALYs). Other vision impairments ranked lowest in both prevalence and DALY rates [?]. Therefore, high priority should be given to the prevention, control, and screening of refractive errors in children and adolescents. It is recommended that comprehensive prevention and control strategies be implemented to provide all-around intervention.

Due to insufficient evidence, vision screening is not recommended for the general population [?]. However, opportunistic screening is recommended for populations at specific risk. Groups at higher risk of vision impairment and loss include: the elderly, patients with diabetes, individuals with a family history of visual impairment, and former or current smokers [?]. Various age groups are affected by vision problems; while children, adolescents, and the working-age population all suffer from various vision issues, the impact is even more severe in elderly patients. It is estimated that between 2017 and 2018, more than 13 million Australians suffered from at least one chronic (long-term) eye disease, affecting 93% of the population aged 65 and older [?].

Glaucoma screening is not recommended for the general population (i.e., those without specific risk factors) [?]. Furthermore, screening for primary open-angle glaucoma is not recommended for the general population aged 40 and older [?].

1.1.2 关于视力问题病例发现的建议

With advancing age, the prevalence of various ocular diseases among elderly patients—including cataracts, macular degeneration, glaucoma, and diabetic retinopathy—exhibits a continuous upward trend [?]. Visual impairment significantly impacts patients' quality of life and increases the risk of injury and secondary illness. In severe cases, it can lead to blindness, posing a substantial threat to public health. The emergence of numerous vision impairments and related issues across all life stages is becoming increasingly evident on a global scale [?], necessitating further attention.

Among these conditions, the incidence of open-angle glaucoma increases with age, being particularly common in individuals over 40 years old. This prevalence is notably higher among Caucasian, Asian, and African populations [?].

Research indicates that vision problems in China are correlated with factors such as aging, geography, and specific work environments or habits. Within the scope of general practice, it is recommended to identify high-risk populations for glaucoma—specifically those over 50 years of age—and refer them to optometrists or ophthalmologists for further evaluation [?]. The frequency of follow-up is determined by the patient' s visual assessment. A survey and factor analysis of eye diseases among children aged 3-6 years in high-altitude areas [?] revealed a prevalence rate of 17.63%. The most common condition was refractive error. High-risk factors for pediatric refractive error include parental history of refractive error, the use of nightlights during infancy, low birth weight, preterm

birth, and excessive daily screen time. Furthermore, visual decline is more severe among long-term computer users compared to non-users, with observed variations based on industry, gender, and age [**?**].

Evidence supports routine vision screening for children under the age of 3 in primary care settings [**?**]. However, children in this age group often cannot cooperate with certain clinical screening tests used in general medicine, such as standard visual acuity tests, which may lead to false-positive results.

Consequently, there is currently no definitive evidence or guideline basis for screening infants. For children over the age of 3, emphasis should be placed on preschool vision screening and eye care. Refractive abnormalities are relatively common among preschool children. Nevertheless, it is recommended that vision problems be screened and prevented as early as possible to reduce their adverse effects and social burden; this aligns with the core principles of practicing the "Red Book" guidelines in general practice.

2.2 建议证据的分析

Visual impairments manifest in diverse forms, and populations across all age groups are at risk. Consequently, general practitioners must increase their focus on the importance and prevention of eye diseases. According to the recommendations of the "Red Book," requirements and priorities vary across different populations, with a particular emphasis on the practical utility of screening for specific pediatric age groups and diseases in special populations. Specifically, the guidelines emphasize case-finding for vision screening in children aged 3–5 years and retinopathy in elderly diabetic patients, providing practical clinical guidance. The evidence and analysis for these recommendations are derived from multiple high-quality meta-analyses and systematic reviews, classified as Level 1 evidence in evidence-based medicine.

Vision screening is not recommended for children under 3 years of age; however, it is recommended for children aged 3–5 years to detect amblyopia or its high-risk factors. This recommendation stems from a 2017 systematic review published in *JAMA* by the RTI International-University of North Carolina Evidence-based Practice Center [**?**], which aimed to systematically evaluate vision screening for children aged 6 months to 5 years for the U.S. Preventive Services Task Force (USPSTF). Although studies directly assessing the effectiveness of screening are limited, the recommendation is supported by indirect evidence. Vision impairment is common and often associated with factors such as a family history of refractive errors, duration of near-work activities, improper diet, daily outdoor time, and eye health behaviors [**?**]. The primary objective of vision screening in children aged 3–5 years is to identify common vision problems, most notably amblyopia. Amblyopia, commonly referred to as "lazy eye," usually occurs in only one eye but can occasionally affect both. The Optometry Australia guidelines suggest specific techniques for measuring visual acuity in children aged 3–5 years. If standard tests cannot be performed, "intermittent sound testing"

may be considered as an alternative. Options include using Patty Pics or Lea Symbols at 3 m or 6 m, or a Snellen chart with multi-line displays or crowding bars to improve the sensitivity of amblyopia detection; single-line displays with crowding bars may also be considered [**?**]. Therefore, for children in this age group, greater emphasis should be placed on the sensitivity and specificity of screening [**?**].

Vision screening is not recommended for the general population [**?**], particularly screening for glaucoma in populations without significant risk factors [**?**]. Currently, vision screening instruments are widely utilized. Examinations are conducted using conventional visual acuity charts, domestic handheld vision screeners [**?**], and the Spot binocular vision screener [**?**]. Using cycloplegic refraction results as the "gold standard" to identify refractive errors allows for the early detection of childhood vision problems. For example, for students in grades 2–4, standard logarithmic visual acuity charts can be employed for screening.

2 篇高质量 Meta 分析和系统评价。一篇在 Cochrane 数

Various screening methods, such as distance visual acuity testing using logarithmic visual acuity charts and non-cycloplegic automated refraction, are widely utilized in clinical practice [**?**].

2.3.2 青光眼的筛查

Introduction to Glaucoma and Screening Protocols

Glaucoma represents a group of relatively common optic neuropathies characterized by the pathological loss of retinal ganglion cells. This condition leads to progressive vision loss, accompanied by recurrent structural changes in the retinal nerve fiber layer and the optic nerve head. As the leading cause of irreversible blindness worldwide, glaucoma is particularly insidious and severe; patients are often unaware of its onset until significant damage has occurred. Furthermore, many non-ophthalmic medical professionals possess limited knowledge of the disease, which frequently results in delays regarding timely medical consultation and specialist referrals [**?**]. While often associated with aging, glaucoma is not exclusively a geriatric issue and can affect individuals across all age groups.

Evaluation of Screening Efficacy

Current evidence regarding the impact of community-based vision screening on visual impairment in the elderly has been rigorously evaluated. According to a systematic review published in the Cochrane Database—utilizing the GRADE (Grading of Recommendations Assessment, Development, and Evaluation) approach to assess the certainty of evidence—and an analysis of the USPSTF (U.S. Preventive Services Task Force) guidelines published in JAMA, there are no significant differences in visual improvement or other clinical outcomes between

elderly populations who undergo vision screening in primary care settings and those who do not. Consequently, universal population-wide screening is not currently advocated.

Recommendations for Primary Open-Angle Glaucoma (POAG)

Specific to primary open-angle glaucoma (POAG), current guidelines do not recommend universal screening for the general population aged 40 and older [**?**]. This recommendation is derived from a systematic review published in JAMA that investigated the effectiveness of early screening and treatment for POAG patients [**?**]. The findings indicate that while intraocular pressure-lowering treatments can delay the progression of asymptomatic early visual field defects, the clinical evidence does not support the implementation of broad screening programs for the asymptomatic general public at this time.

Early symptoms of glaucoma typically include elevated intraocular pressure, ocular hyperemia (redness), decreased contrast sensitivity, blurred vision, or visual field defects. Early detection of these signs is critical for preserving vision [**?**]. Within the core classification of glaucoma, primary angle-closure glaucoma remains a primary concern. While pharmacological treatments constitute the majority of first-line therapies for both open-angle and angle-closure glaucoma, there is a growing trend toward the increased use of surgical interventions for open-angle glaucoma. Despite these clinical advancements, further population-based screening studies are required to demonstrate that the early identification and treatment of asymptomatic glaucoma patients are effective in improving vision-specific functional outcomes and health-related quality of life.

2.3 建议的内涵和分析

Emphasis should be placed on identifying vision problems within specific high-risk populations; however, generalized screening for the entire population is not recommended.

2.3.1 儿童视力筛查

In Australia, newborn vision screening is generally not performed routinely at birth, though it is typically conducted in hospitals shortly after delivery. Currently, there is no evidence that managing low intraocular pressure can effectively slow the progression of glaucoma. Open-angle glaucoma can be diagnosed using optical coherence tomography (high sensitivity), automated perimetry (high sensitivity), tonometry (low sensitivity), and optic disc visualization (low sensitivity) [**?**]. However, there are currently no established tools to determine which specific patients or individuals are at higher risk, or who might derive the greatest benefit from screening [**?**].

Although there is currently no evidence to support population-wide screening for primary open-angle glaucoma, general practitioners (GPs) play an indispens-

able role in identifying high-risk patients and advising them to undergo regular, comprehensive ophthalmic examinations [**?**]. As previously mentioned, it is recommended that GPs identify high-risk populations—specifically those over the age of 50—for early intervention. Notably, the prevalence of vision impairment has shown a continuous upward trend year by year and across different grade levels. Therefore, research into adverse health risk factors in children should be further strengthened to effectively implement prevention and control measures for poor vision.

High-risk populations should be referred to optometrists or ophthalmologists for further evaluation. Ocular health issues among the elderly are significant and require urgent intervention. This demographic often suffers from multiple eye conditions, including cataracts, glaucoma, or diabetic retinopathy, particularly in elderly patients with chronic comorbidities such as type 2 diabetes and hypertension.

Current referral processes remain inadequate and incomplete, which hinders effective glaucoma screening and timely treatment for high-risk populations [**?**].

2.3.3 糖尿病相关眼病的病例发现

Diabetic Retinopathy (DR) is a significant manifestation of fundus microvascular disease and has become the third leading cause of blindness worldwide, following cataracts and glaucoma. Most patients exhibit no obvious symptoms in the early stages, and their vision remains unaffected. However, if blood glucose control is unstable, vascular endothelial cells may suffer permanent damage, triggering a series of fundus lesions that cause visual impairment. In severe cases, this can lead to blindness, posing a grave threat with an extremely poor prognosis. Research indicates that the prevalence of DR among diabetic patients in national epidemiological surveys from 2018 to 2020 was 16.3%, with the prevalence of vision-threatening DR reaching as high as 3.2% [**?**]. Consequently, the prevention and management of diabetic eye disease in elderly patients have become matters of urgent necessity.

Diabetic eye disease encompasses a category of blinding conditions caused by diabetes. The etiology of these diseases is complex, commonly involving the continuous influence of hypertension, genetic factors, and persistent hyperglycemia. The primary pathological changes are caused by damage to the retinal capillary endothelium, including thickening of the glomerular basement membrane, microvascular occlusion, and retinal edema resulting from increased permeability due to the impairment of the blood-retinal barrier. Furthermore, secondary conditions such as neovascularization, fundus hemangiomas, glaucoma, cataracts, optic nerve atrophy, and macular degeneration are all common forms of diabetic eye disease [**?**]. For this specific age group, screening efforts for related eye diseases—such as intraocular pressure measurement and fundus examination—should be strengthened to facilitate early case detection.

General practitioners (GPs) possess distinct advantages in the case discovery

of diabetes-related eye diseases, including diabetic retinopathy and other microvascular complications. As Type 2 diabetes is a fundamental and critical component of chronic disease management, GPs can provide comprehensive and continuous humanistic care under the framework of the family doctor contract service model. For diabetic patients, regular fundus examinations are essential for the prevention of related ocular complications [**?**]. It is necessary to standardize the control of patients' blood glucose, blood pressure, and lipid levels, while advising smoking cessation and alcohol restriction. During follow-up, efforts should be made to avoid microvascular damage and achieve the goals of early detection, early diagnosis, and early intervention.

At present, primary care communities in China face multiple challenges, including insufficient equipment, imperfect screening methods, weak awareness of screening, unclear screening protocols, and inefficient referral mechanisms [**?**]. For example, many facilities possess only visual acuity charts but lack professional equipment such as ophthalmoscopes and refractometers. Furthermore, GPs often have insufficient mastery of specialized knowledge, and there is a lack of ophthalmologists practicing within the community. Issues such as low screening sensitivity for high-risk populations or a lack of practical experience in the referral process remain prevalent [**?**]. As the "gatekeepers" of health, primary care physicians should assume the responsibility for screening and preventing eye diseases across the entire population. By implementing classified management for different groups, they can reduce the economic and social burden of these diseases and improve the quality of life for residents.

3.2.1 完善基层设施和转诊

Under the guidance of the "Red Book," it is essential to further refine and implement requirements for primary-level equipment allocation. This ensures that visual acuity screening protocols are effectively operationalized rather than remaining theoretical. Strengthening the comprehensive management of multiple risk factors is critical for preventing eye diseases in elderly patients with diabetes.

To prevent the onset of diabetic eye disease and effectively manage existing patients, the priority must be placed on glycemic control. Furthermore, providing long-term, continuous monitoring and follow-up is vital. A comprehensive prevention and treatment service model should be adopted for patients with diabetic eye diseases [**?**].

2.4 建议的预期结果

(1) Vision problems across all age groups have been systematically categorized, and corresponding screening measures have been provided. (2) Specific screening protocols for targeted populations—including children and the elderly—can be implemented across various regions and social backgrounds. These protocols have achieved significant results in narrowing

the gap in disease management. (3) Taking screening as an example, fundus examinations should be conducted to assess the severity of diabetes [**?**]. Patients diagnosed with Type 2 diabetes should undergo an initial fundus screening at the time of diagnosis. For those without fundus pathology, annual screening is recommended. Patients with mild to moderate pathology should be screened every 6 to 12 months, while those with severe pathology or those currently undergoing treatment should follow medical advice or undergo screening every 3 to 6 months.

Currently, there are numerous clinical diagnostic methods for diabetic retinopathy, such as fundus photography, indirect ophthalmoscopy after pupil dilation, ocular B-scan ultrasonography, and direct ophthalmoscopy [**?**]. However, in practical community settings, the implementation of these methods is often hindered or limited by various factors, which restricts the screening capabilities of the community. Therefore, it is recommended that communities be equipped with practical and essential diagnostic equipment. Early screening for vision problems in the community has a demonstrably positive impact on preventing serious diseases and reducing the overall social burden.

3.1 视力问题凸显，基层力度不够

Furthermore, it is essential to enhance the training of healthcare professionals to achieve the goal of highly efficient screening. Given that primary healthcare facilities may face certain deficiencies in diagnostic expertise and hardware infrastructure, community centers should prioritize timely referrals within an integrated, multi-level diagnostic and treatment model.

On one hand, this involves promoting "bottom-up" referrals. This ensures that patients facing diagnostic difficulties or limited treatment options receive timely, appropriate, or advanced clinical solutions, allowing for fundamental intervention and adjustment during the early or even ultra-early stages of a disease. On the other hand, the model facilitates "top-down" patient reception, which focuses on providing long-term, continuous management for chronic conditions and ensuring sustained health maintenance for children.

Currently, vision loss has become a common and frequently occurring condition among children both in China and globally, posing a serious threat to their physical and mental health as well as their overall development. The period from birth to age six is a critical window for visual development. Since visual impairment is often caused by external factors, timely community intervention and management can significantly reduce the occurrence of adverse events [**?**]. At present, the prevalence of poor vision among primary school students remains severe, with high detection rates of visual impairment, highlighting an urgent need for robust management strategies.

3.2.2 加强基层宣教

Primary community healthcare plays a vital role in the prevention and control of pediatric eye diseases. Community-based interventions have demonstrated definitive efficacy in preschool vision care, significantly improving behavioral compliance, reducing screen time and near-work duration, and fostering healthy visual habits to protect children' s eyesight [**?**].

As myopia remains the primary threat to pediatric visual health, it is essential to emphasize the role of primary health services in behavioral interventions for myopia prevention. By implementing standardized myopia screenings and utilizing information visualization to design science communication materials for pediatric vision health, we can achieve multiple objectives. Such approaches not only effectively promote the dissemination of health knowledge and enhance public understanding of pediatric vision care but also encourage children to establish sound health perspectives. This integration of clinical intervention and visual communication is undoubtedly beneficial for the healthy development of children, the promotion of a social culture of health, and long-term public health outcomes.

3.3 指南开发建议

Achieving early detection and intervention for myopia, along with strengthening the establishment and management of refractive development archives, is essential for preventing and controlling the onset and progression of myopia in children. Furthermore, interventions during pregnancy can yield significant results [**?**]. Maternal behavioral habits during pregnancy and the frequency of electronic product use by children postnatally are closely related to pediatric refractive errors. Currently, China has implemented several relevant policies and clinical guidelines in the field of vision health management [**?**, **?**, **?**], such as diagnostic and treatment guidelines for ophthalmic diseases, vision screening standards for children, myopia prevention and control guidelines, and expert consensuses or guidelines for diabetic retinopathy. However, there are still no comprehensive general practice prevention recommendations in China. From a population-wide perspective, there is a lack of specialized vision screening and prevention guidelines, as well as definitive general practice standards and detailed implementation rules. To address this, it is recommended that pregnant women reduce their exposure to cooking fumes at home, avoid passive smoking (second-hand smoke), and avoid home renovations during pregnancy [**?**]. Pregnant women should also improve the hygiene of their living environment, avoid harmful environmental exposures, enhance nutritional supplementation, and maintain good household sanitation.

There is insufficient attention paid to vision problems in children outside the 3-5 age range—including newborns, infants, and children over the age of 6—and there are no definitive guidelines or evidence for these groups. High frequency of electronic product use by children postnatally also increases the risk of vision

problems; therefore, more attention should be paid to children' s eye health, the use of electronic products should be reduced, and children should be encouraged to spend more time in outdoor activities [**?**].

It is necessary to fully leverage the role of primary-level health education to stimulate subjective initiative among the population, thereby improving compliance with medical consultations, medication adherence, monitoring, and follow-up visits [**?**]. For example, among the elderly, publicity regarding glaucoma and cataract knowledge should be strengthened. Currently, there are no clear regulatory references for vision screening in young and middle-aged populations.

Diabetes-related eye diseases are becoming increasingly prominent. The management of patients with diabetic retinopathy should be a primary focus, necessitating strengthened blood glucose control, regular follow-up, and comprehensive general practice management for diabetic patients to ensure early screening for vision problems.

According to the "Red Book," vision screening must follow the principle of universal population coverage while avoiding indiscriminate screening that leads to a waste of medical resources. It is also important to strengthen lifestyle education for diabetic patients, encouraging them to maintain healthy diet, exercise, and blood glucose monitoring habits at home. This ensures that blood glucose is controlled within a stable and reasonable range, thereby preventing the occurrence of long-term complications [**?**].

3.2.3 开展基层创新模式

It is essential to ensure that high-risk and special populations are not overlooked during screening. However, high-quality evidence is still required in several areas, including: (1) guidelines for the prevention and management of vision problems in the general population; (2) standardized protocols for pediatric vision screening; (3) guidelines for the screening, prevention, and control of diabetes-related eye diseases; and (4) comprehensive management strategies for elderly patients with diabetic eye disease. Furthermore, training for healthcare personnel, particularly general practitioners, must be strengthened to expand the workforce capable of identifying and preventing vision issues.

Innovative medical service models should be implemented to fully leverage the leading role of primary healthcare. For instance, community-based or hospital-family intervention models can promote pediatric eye health from multiple dimensions. These models have been shown to improve parents' knowledge, behaviors, and satisfaction regarding eye care [32], while increasing children' s outdoor activity time, daily hand-washing frequency, and eye exercise duration. Such interventions help children develop healthy visual habits and maintain optimal vision levels. Additionally, the "General-Specialist" collaborative model has proven to be both scientific and feasible [33]. By integrating the efforts of general practitioners and specialists for joint follow-up interventions and preventive

guidance, this model plays a critical role in the identification and management of patients with diabetic retinopathy.

3.2.4 倡导基层数据先行

Artificial Intelligence (AI) plays a critical role in the efficient screening and risk early-warning systems for diseases among the elderly population [**?**]. By leveraging AI technology for the deep mining and analysis of primary vision health data, it is possible to accurately identify high-risk groups prone to visual impairments. This paper provides an interpretation and analysis of the recommendations for vision screening and preventive activities outlined in the Royal Australian College of General Practitioners (RACGP) "Red Book." Furthermore, based on China' s national conditions and the current status of primary care practice, we advocate that general practitioners adopt differentiated case-finding and screening measures for various populations to facilitate early disease prevention and patient management.

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Introduction and Strategic Implementation

By establishing intelligent data management systems, primary healthcare facilities can achieve real-time monitoring and dynamic updates of vision health data, providing a robust foundation for formulating scientifically sound preventive strategies. Furthermore, utilizing AI algorithms to conduct comparative analyses of vision problem data across different regions helps identify regional disparities and characteristics. This enables the implementation of targeted preventive measures tailored to local conditions. From the strategic perspective of "Healthy China," the visualization of popular science information regarding children' s vision health has proven to be highly feasible [**?**].

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Abstract

Objective: To explore the clinical application effects of comprehensive nursing interventions combined with health education in patients with retinal lesions.

Methods: A total of 120 patients with retinal lesions treated at our hospital from January 2018 to December 2019 were selected as research subjects. They were randomly divided into a control group and an observation group, with 60 cases in each group. The control group received routine nursing care, while the observation group received comprehensive nursing interventions combined with systematic health education. The clinical efficacy, nursing satisfaction, and changes in quality of life scores were compared between the two groups.

Results: The total effective rate of treatment in the observation group was significantly higher than that in the control group ($P < 0.05$). Furthermore, the observation group demonstrated significantly higher scores in nursing satisfaction and various dimensions of quality of life compared to the control group ($P < 0.05$).

Conclusion: Implementing comprehensive nursing interventions and health education for patients with retinal lesions can effectively improve clinical outcomes, enhance patient satisfaction, and significantly promote the recovery of visual function and quality of life. This approach warrants further clinical promotion and application.

1. Introduction

Retinal lesions encompass a variety of pathological changes in the retinal tissue, often leading to severe visual impairment or even blindness if not managed effectively. Common conditions include diabetic retinopathy, hypertensive retinopathy, and age-related macular degeneration. Given the chronic nature of these diseases and the psychological stress associated with vision loss, routine nursing care often falls short of meeting patient needs. Recent clinical practice suggests that integrated care models focusing on both physical recovery and psychological support are essential for optimizing patient outcomes.

2. Materials and Methods

2.1 General Data The study included 120 patients diagnosed with retinal lesions. Inclusion criteria: (1) Diagnosis confirmed by fundus examination and optical coherence tomography (OCT); (2) No cognitive impairment; (3) Voluntary participation in the study. Exclusion criteria: (1) Severe systemic infections; (2) Mental health disorders; (3) Incomplete clinical data. There were no statistically significant differences in age, gender, or disease duration between the two

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Note: Figure translations are in progress. See original paper for figures.