

การศึกษาความต้องการและการให้บริการฟื้นฟูสมรรถภาพสำหรับผู้มีภาวะสายตาเลือนรางในคลินิกสายตาเลือนรางในโรงพยาบาล

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บทคัดย่อ

งานวิจัยนี้มีวัตถุประสงค์เพื่อศึกษาการจัดบริการฟื้นฟูสมรรถภาพทางการเห็นในคลินิกสายตาเลือนรางของโรงพยาบาลในประเทศไทยและสำรวจความต้องการของผู้ป่วยต่อการจัดบริการดังกล่าว งานวิจัยนี้ดำเนินการ ณ คลินิกสายตาเลือนราง โรงพยาบาลจุฬาลงกรณ์ สภากาชาดไทย ซึ่งเป็นสถานพยาบาลชั้นนำในประเทศไทยและเป็นจุดเริ่มต้นหลักในการฟื้นฟูสมรรถภาพภายหลังการสูญเสียการมองเห็น ข้อมูลถูกเก็บรวบรวมจากกลุ่มตัวอย่างผู้ป่วยสายตาเลือนรางจำนวน 100 คนที่เข้ารับบริการที่คลินิกดังกล่าวระหว่างเดือนมกราคมถึงมีนาคม พ.ศ. 2565 โดยใช้วิธีการสัมภาษณ์ทางโทรศัพท์ด้วยแบบสอบถามที่ประกอบด้วยคำถามปลายปิดเป็นหลักและเสริมด้วยคำถามปลายเปิด ข้อมูลเชิงปริมาณถูกวิเคราะห์ด้วยสถิติเชิงพรรณนา ส่วนข้อมูลเชิงคุณภาพใช้วิธีการวิเคราะห์เนื้อหา ผลการศึกษาพบว่ากลุ่มตัวอย่างส่วนใหญ่เป็นเพศหญิง (ร้อยละ 56) โดยร้อยละ 74 ของผู้ป่วยมีอายุตั้งแต่ 40 ปีขึ้นไป และพบว่าโรคจอประสาทตาเสื่อมเป็นสาเหตุหลักของภาวะสายตาเลือนราง แม้ว่าร้อยละ 67 ของกลุ่มตัวอย่างจะเคยได้รับการฟื้นฟูมาก่อน ซึ่งส่วนใหญ่เป็นการได้รับอุปกรณ์ช่วยการมองเห็นมากกว่าการฝึกทักษะการสร้างความรู้ความคุ้นเคยกับสภาพแวดล้อมและการเคลื่อนไหว แต่ยังคงพบอุปสรรคสำคัญในการเข้าถึงบริการ ได้แก่ ทัศนคติทางสังคม ค่าใช้จ่ายในการเดินทาง และปัญหาด้านสภาพแวดล้อมของการให้บริการ ในด้านความต้องการของผู้ป่วยพบว่าร้อยละ 52 โดยเฉพาะในกลุ่มผู้สูงอายุ มีความต้องการอุปกรณ์ช่วยการมองเห็นมากที่สุด รองลงมาคือความต้องการฝึกทักษะด้านเทคโนโลยี (ร้อยละ 15) ทั้งนี้ เนื่องจากความหลากหลายของประชากรกลุ่มนี้ ผู้ป่วยสายตาเลือนรางจึงมีความต้องการอย่างมากให้คลินิกจัดบริการในรูปแบบเบ็ดเสร็จที่ครอบคลุม ซึ่งรวมถึงการให้บริการเชิงรุกเพื่อเข้าถึงผู้ป่วย งานวิจัยนี้มีข้อเสนอแนะให้จัดทำโปรแกรมให้ความรู้และคำปรึกษาการเพื่อช่วยให้ผู้ป่วยทราบถึงประโยชน์ของการฟื้นฟูสมรรถภาพทางการเห็น รวมถึงลดทัศนคติเชิงลบและความเข้าใจผิดเกี่ยวกับการใช้อุปกรณ์ช่วยการเคลื่อนไหวในผู้ป่วยสายตาเลือนราง ควบคู่ไปกับการปฏิรูปนโยบายเพื่อเพิ่มประสิทธิภาพในกระบวนการเบิกจ่ายและการจัดซื้ออุปกรณ์ช่วยการมองเห็นที่มีราคาสูง

คำสำคัญ: สายตาเลือนราง การฟื้นฟูสมรรถภาพทางการเห็น อุปกรณ์ช่วยการมองเห็น การฝึกทักษะการสร้างความรู้ความคุ้นเคยกับสภาพแวดล้อมและการเคลื่อนไหว

A Study of Needs and Rehabilitation Services Provision for Persons with Low-Vision in a Hospital-Based Low-Vision Clinic

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Abstract

This study investigates the provision of vision rehabilitation services at a hospital based low vision clinic in Thailand and examines the service needs of patients. The research was conducted at the low vision clinic of King Chulalongkorn Memorial Hospital (KCMH), a major national facility and key entry point for rehabilitation following vision loss. Data were collected from 100 low vision patients who visited the clinic between January and March 2022. Telephone interviews were administered using a questionnaire consisting primarily of closed ended items, supplemented with open ended questions. Quantitative data were analyzed descriptively, and qualitative responses were examined through content analysis. Findings showed a slight female majority (56%), with most patients aged 40 years or older (74%). Retinitis pigmentosa emerged as the leading cause of low vision. Although 67% of participants had previously received rehabilitation services—mainly access to low vision devices rather than orientation and mobility (O&M) training—several barriers persisted, including social stigma, transportation costs, and challenges related to the service environment. In terms of needs, 52% of patients, especially older adults, prioritized access to low vision devices, followed by technology training (15%). Given the heterogeneity of this population, respondents expressed a strong preference for a comprehensive, one stop service model that integrates outreach capabilities. The study recommends implementing educational and counseling programs to improve patient awareness of rehabilitation benefits, reduce stigma related to mobility aids, and address misconceptions. Policy reforms are also needed to streamline reimbursement and procurement processes for high cost assistive devices.

Keywords: Low Vision, Vision Rehabilitation Services, Low-Vision Devices, Orientation and Mobility (O&M) Training

Background of the Study

The World Health Organization (2019) reports that over 2.2 billion people worldwide have a vision impairment. More than 216.6 million individuals suffer from low vision (Flaxman et al., 2017), including nearly 20.8 million in Southeast Asia (Keeffe et al., 2019). Low vision is defined as visual impairment that cannot be corrected by standard spectacles, contact lenses, medication or surgery, and it negatively impacts many aspects of quality of life (Mojon-Azzi et al., 2008) including limitations in daily activities, leisure pursuits, emotional regulation, and depressive symptoms (Kempen et al., 2012), with broader consequences on educational and vocational functioning, leading to increased unemployment and learning difficulties, particularly in children and workers (Mojon-Azzi et al., 2010). Given the rising prevalence of visual impairments and the need for individuals to regain independence following significant vision loss, vision rehabilitation is essential for improving the quality of life for those with low vision (Hinds et al., 2003; Lamoureux et al., 2007).

Vision rehabilitation is a primary intervention provided by rehabilitation professionals or multidisciplinary teams (Owsley et al., 2009) with the aim to maximize function and improve quality of life by addressing not only visual deficits but also the social, psychological, emotional, and economic consequences for individuals with low vision (Chotikavanich et al., 2018). However, low-vision support services have not yet been fully or effectively implemented in many nations, particularly in developing countries (Jose et al., 2016) such as India, Bangladesh, and Myanmar (Chiang et al., 2011).

Hospital-based low vision clinics serve as critical access points for vision rehabilitation services, particularly in tertiary or academic medical centers. These clinics often receive referrals of patients with complex ocular conditions, advanced visual impairment, and diverse functional challenges. As such, patients attending hospital-based low-vision clinics represent a population with varying characteristics, causes of visual impairment, levels of functional limitation, and rehabilitation needs. Understanding this diversity is essential for clinicians to design appropriate assessments, prioritize rehabilitation goals, and deliver patient-centered care (Ehrlich et al., 2017). Despite the recognized importance of vision rehabilitation, there is limited published evidence describing service provision characteristics and the needs of patients attending hospital-based low vision clinics, especially in developing countries like Thailand. In Thailand, there are only approximately 20 hospital-based low-vision clinics, and the majority of which do not meet the WHO's secondary-level service provision standards (Chotikavanich et al., 2018). Thus, this study aims to investigate the provision of vision rehabilitation services in the King Chulalongkorn Memorial Hospital's (KCMH) low-vision clinic, one of the leading low-vision clinics in Thailand acting as the first step in rehabilitation after vision loss. The study also seeks to examine the needs of KCMH low-vision patients for further service improvement.

Purpose of the Study

This study aims to investigate the provision of vision rehabilitation services in a hospital-based low-vision clinic in Thailand (including barriers to accessing the services), and examine the patients' needs for vision rehabilitation services.

The two research questions are as follows:

1. How are the vision rehabilitation services provided to low-vision patients in the KCMH low-vision clinic?
2. What are the patients' needs for vision rehabilitation services in the KCMH low-vision clinic?

Literature Review

Low vision is conceptualized as a visual impairment where the Best Corrected Visual Acuity (BCVA) in the better eye is less than 6/18 but equal to or better than 3/60 ($< 6/18$ to $3/60$), or where the visual field is less than 30 degrees (Ministry of Social Development and Human Security [MSDHS], 2009). In addition, low vision is linked to vision rehabilitation as the primary treatment approach for individuals with low vision.

Rehabilitation services are delivered by a multidisciplinary team to enhance or substitute residual vision, thereby increasing independence and improving the patient's quality of life (van Nispen et al., 2020). Low-vision services are rehabilitation provided to patients within hospital-based clinics. According to the WHO's framework, these services should include essential components such as: visual and functional assessments, prescription of and training in low-vision devices, Orientation and Mobility (O&M) training, Activities of Daily Living (ADL) training, environmental adaptations, assistive technology training, psychosocial support, and continuous case management; as well as ensures appropriate referrals to other healthcare or rehabilitation services as needed (WHO, 2017).

Current Low vision rehabilitation services

According to the WHO Programme for the Prevention of Blindness and Deafness, low vision services should be organized across three levels (Lim et al., 2014). At the primary level, community-based and outreach services focus on screening, functional vision assessment, and referral, along with basic recommendations on non-optical aids and environmental modification. The secondary level involves hospital-based eye care professionals, including ophthalmologists and optometrists, providing diagnosis, refraction, low vision assessment, and prescription of essential optical and non-optical devices with training (Minto & Awan, 2004). The tertiary level delivers comprehensive, multidisciplinary rehabilitation encompassing advanced device prescription, O&M training, vocational training, and coordination with education and rehabilitation services. In Thailand, hospital-based low vision rehabilitation services are available in selected tertiary hospitals. Siriraj Hospital, for example, operates a low vision rehabilitation clinic offering visual function assessments, refraction, counselling,

prescription of optical and electronic devices, O&M training, and ADL training, delivered by a multidisciplinary team comprising ophthalmologists, rehabilitation teachers, O&M instructors, and social workers (Chotikavanich et al., 2018; Chotikavanich et al., 2024).

Challenges to rehabilitation services for people with low vision

It is well known that vision rehabilitation significantly improves the quality of life of persons with visual impairment (van Nispen et al., 2020). However, despite its proven benefits, uptake of these services remains markedly low (Sarika et al., 2019). A key contributing factor is that many eligible patients have never been referred to or remain unaware of vision rehabilitation services (Overbury & Wittich, 2011). This underutilization stems primarily from insufficient referrals and poor communication between eye care providers and their patients (Pollard et al., 2003; Stolwijk et al., 2023). A frequently reported challenge is the mismatch between patients' needs and the services available, driven by a limited number of low vision clinics and trained professionals (Matti et al., 2011). At the patient level, barriers such as denial of the need for low vision aids, fear of social stigma, transportation difficulties, and the financial burden of low vision devices have been consistently identified in the literature (Khimani et al., 2021).

Methodology

This study employed a primarily quantitative, survey-based method. The sample comprised the first 100 consecutive low-vision patients who visited the KCMH low-vision clinic between January and March 2022 (3 months) and met the following five inclusion criteria: (1) holding a Thai National Disability Identification Card with a low-vision specification; (2) being aged 18 years or older; (3) having received services at the KCMH low-vision clinic at least once; (4) being able to communicate verbally and respond to a telephone interview; and (5) being willing to participate in the study. The sample size of 100 participants was determined based on Krejcie and Morgan's formula, calculated from an estimated population attending the clinic over a 3-month period, which yielded a minimum required sample of 95. The sample was increased to 100 to account for potential dropouts. Once the protocol had been approved by the Committee for Research Ethics of both Mahidol University and KCMH, data collection commenced. Potential participants were contacted by telephone and provided with detailed information about the study. Those who expressed willingness to participate provided verbal informed consent, and a telephone interview was scheduled. Data were subsequently collected through telephone interviews using a survey questionnaire. The instrument comprised primarily closed-ended quantitative questions, supplemented by open-ended questions designed to elicit qualitative insights that would explain the quantitative findings in greater depth. The interviews lasted approximately 20-30 minutes. The questionnaire collected sociodemographic and clinical data (e.g., age, gender, presenting visual acuity, causes of visual impairment, and rehabilitation history) and assessed patients'

needs for vision rehabilitation services to determine whether the current services met those needs. The qualitative component (derived from open-ended questions) asked participants to share their views regarding service expectations, barriers to access, and recommendations for further improvement. These qualitative data were used to supplement the quantitative results. Quantitative data were analyzed descriptively using the SPSS software, with results summarized as frequencies and percentages. Qualitative data were analyzed inductively using content analysis.

Results

Quantitative findings

According to Table 1, an analysis of the demographic and clinical characteristics of 100 low-vision patients who visited the clinic in 2022 showed that females slightly outnumbered males, accounting for 56% of participants, whereas males accounted for 44%. The majority of patients were middle-aged (40-59 years) and elderly (≥ 60 years), representing 39% and 35% of the group, respectively, while adolescents constituted only 1%. In terms of Best Corrected Visual Acuity (BCVA), the majority of participants had moderate visual impairment ($<20/70$ - $20/200$), accounting for 61%. Severe visual impairment ($<20/200$ - $20/400$) and mild visual impairment ($\geq 20/70$) followed at 24% and 15%, respectively. The most common causes of low vision were retinitis pigmentosa (19%) and glaucoma (16%), followed by other retinal diseases (10%). Regarding rehabilitation history, 67% of the patients had previously received low-vision rehabilitation, while 33% had not. Among the 67 patients who had previously received rehabilitation, 71.6% had used only low-vision devices, and 16.4% had utilized both the low-vision devices and O&M training.

Table 1: Demographic and clinical characteristics of participants

Characteristics	Low-vision patients (%)
Gender (n = 100)	
Male	44%
Female	56%
Age (n = 100)	
18-19 (Adolescence)	1%
20-39 (Adulthood)	25%
40-59 (Middle age)	39%
≥ 60 (Elderly)	35%
BCVA in low-vision patients* (n = 100)	
Equal to or better than 20/70 (<i>Mild visual impairment</i>)	15%
Less than 20/70 -20/200 (<i>Moderate visual impairment</i>)	61%
Less than 20/200-20/400 (<i>Severe visual impairment</i>)	24%
Causes of low-vision (n = 100)	
Retinitis pigmentosa	19%
Glaucoma	16%
Other retinal diseases	10%
Age-related macular degeneration	7%
Diabetic retinopathy	7%
Retinal detachment	7%
Retinopathy of prematurity	6%
Optic atrophy	6%
Cone-Rod /Macular Dystrophy	5%
High myopia	4%
Congenital Cataract	2%
Cytomegalovirus retinitis	2%
Others	9%
Rehabilitation History	
Previously received rehabilitation services (n = 100)	
Never received	33%
Received	67%
Types of services previously received (n = 67)	
Low-vision devices only	71.6%
O&M training only	12.0%
Both Low-vision devices & O&M training	16.4%

*Classification of visual impairments according to the International Classification of Disease-10

Table 2 reports the patients' needs for existing rehabilitation services. Slightly over half of the patients needed low-vision devices (52%), followed by technology training (15%) and referrals for vocational training (8%). However, 14% of patients were not interested in any

services, which could perhaps mean that none of the existing rehabilitation services provided at the KCMH clinic met their needs.

Table 2: *The needs of patients for existing rehabilitation services in the KCMH clinic*

Type for services	Low-vision patients (%), n = 100
Low-vision devices	52%
Technology training	15%
Referrals for vocational training	8%
ADL Training	4%
O&M training	3%
Referrals for Braille training	3%
Counselling	1%
Not interested	14%

Table 3 presents the distribution of patients' needs classified by age. In the 18-19 age group which had only one patient, there was a need for low-vision devices only. In the 20-39 age group which consisted of 25 patients, their most common need was technology training (32%), followed by low-vision devices (24%), while 16% had no interest in any services. Among the 39 patients aged 40-59, low-vision devices were the primary need (59%), followed by vocational training referrals and technology training (7.7% equally), with 12.8% expressing no interest. In the group aged 60 and above which had 35 patients, the highest demand was for low-vision devices (62.9%), followed by technology training (11.4%) while 14.3% of this group were not interested in rehabilitation.

Table 3: *The needs of patients for vision rehabilitation services classified by age*

Age	Low-vision devices	ADL Training	O&M training	Technology training	Counselling	Referrals for vocational	Referrals for Braille training	Not interested	Total (n = 100)
18-19	100%	0%	0%	0%	0%	0%	0%	0%	1
20-39	24%	4%	4%	32%	4%	12%	4%	16%	25
40-59	59%	5.1%	2.6%	7.7%	0%	7.7%	5.1%	12.8%	39
≥ 60	62.9%	2.9%	2.9%	11.4%	0%	5.7%	0%	14.3%	35

Qualitative insights supplementing the quantitative findings

The qualitative findings, derived from open-ended survey questions, revealed the patients' perspectives regarding expectations of low-vision rehabilitation services, barriers to accessing the services, and recommendations for further service improvement at KCMH. Each of these themes was divided into specific categories as follows:

Expectations of low-vision rehabilitation services

Optimizing vision to enhance quality of life

Patients expressed a need for basic rehabilitation services tailored to their specific requirements, such as low-vision devices and technology training to assist with reading, working, and activities of daily living. There was also a demand for high-technology assistive devices and applications. For instance, a 39-year-old female stated: *I want to take a course in using computer programs for reading or typing to have the basic capability to find work or help with my child's homework.* Additionally, psychological support from service providers was expected alongside standard rehabilitation. One patient remarked: *Besides visual aid support, I expect to receive encouragement from the doctor.* However, some patients misunderstood the scope of low-vision clinics, expecting medical or surgical interventions aimed at fully restoring vision, including emerging technologies. A 46-year-old male described this expectation, stating: *I have researched how patients can see again without using assistive devices, such as through implants or artificial retinas.*

Maintaining vision

Some patients acknowledged that their visual condition could not be improved through medication or surgery and opted not to use assistive devices. Instead, they expected ophthalmologists to help preserve their remaining vision and prevent further deterioration while awaiting future medical advances. As a 25-year-old female stated: *I want a doctor to help preserve my vision from getting worse... in case there is a new treatment in the future, so my eyes can be treated immediately.*

Obtaining social welfare benefits

In Thailand, access to welfare programs for persons with disabilities requires official certification. Consequently, two participants expected to obtain medical documentation from ophthalmologists to register for disability status and access related benefits. One participant noted: *Registering for a disability ID card can help provide a monthly income.*

Barriers to accessing the services

Social attitudes

A lack of public awareness and understanding regarding low vision constituted a significant barrier to accessing rehabilitation services. Since many visually impaired individuals do not have obvious physical indicators of their condition, the public often fails to recognize

their disability. A 52-year-old male participant described his experience: *“When I was unsure of the bus route and tried to ask for help, people often walked away because they thought I was a beggar.”* Consequently, seeking assistance was difficult, with some patients reporting that the public lacked empathy and consideration.

Distance and financial barriers

Most of the barriers to receiving services were related to distance and financial issues. Geographical distance often exacerbates financial burdens. Some participants resided in rural areas far from the hospital and had to rely on costly public transportation, such as interprovincial buses or flights. As one participant remarked: *“I come from Nakhon Ratchasima, a journey that incurs high expenses.”* In addition to transportation costs, some patients incurred accommodation expenses when an overnight stay near the hospital was required. Costs escalated further for patients needing a companion, whether a relative or a hired caregiver. A 73-year-old female explained: *“The cost of hiring a companion had to be paid based on the duration of time.”*

Transport

Participants expressed anxiety regarding the independent use of public transportation. Identifying transport routes was particularly difficult due to their visual impairments. As one participant stated: *“I cannot see where I am, so I rely on memory or listening to an announcement.”*

Service environment

The limited operating hours of the low-vision clinic were cited as a barrier by several participants. Coordinating work leave to match appointment times was challenging, not only for the patients but also for their companions. Additionally, the hospital environment and its reliance on technology created confusion. A 50-year-old female with a best-corrected visual acuity of 20/200 explained: *“I could not clearly see the LED monitor displaying my queue number, so I had to take a photo of it and magnify it myself.”*

Recommendations for service improvement at KCMH

Rehabilitation

Participants recommended that the clinic expand its range of low-vision rehabilitation services, specifically by providing access to high-cost devices, offering device loan services, and establishing a systematic referral system. A 43-year-old female stated: *“I suggest that the clinic designate a room for high-cost equipment, such as CCTVs, which I cannot access elsewhere. This would be similar to the Disability Support Services Center (DSS). As a teacher, I need to use this equipment to prepare for student exams.”* Furthermore, participants with prior experience using low-vision aids recommended devices better suited to their needs. As one participant noted: *“I used a telescope, but I preferred a hands-free device.”*

Service system

Regarding the service system, participants raised several recommendations. A few suggested transforming the clinic into a one-stop service, which would include processing disability ID card registrations and creating communication channels to disseminate new information and technology. One participant remarked: *“I want the clinic to create an online channel for low-vision news or a messaging system compatible with smartphone screen readers.”* Additionally, mobile low-vision care units for rural areas and patient transportation services were suggested. An 87-year-old female explained: *“I desire a service that provides transportation from home to the clinic.”*

Manpower

A few participants requested staff assistance for navigating the clinic, particularly for solo patients, as changes to the service system had caused confusion. Furthermore, two participants suggested scheduling more ophthalmologists during operating hours to reduce patient waiting times.

Time

Several participants recommended better management of service schedules, specifically requesting extended operating hours or an after-hours clinic. One patient with a BCVA of 20/400 also expressed a desire for extended training: *“I wanted to take a long-term course for white cane training.”*

Accessibility

Some participants expressed concerns regarding the clinic’s accessibility. They noted that the hospital lacked expected inclusive design features. Recommendations included installing large, clearly visible signs or banners at strategic locations, including inside elevators, to direct patients to the low-vision clinic. As one participant stated: *“I want the hospital to provide a large symbol sign in a position where it is clearly visible.”*

Discussion

Rehabilitation services provision to low-vision patients in the KCMH low-vision clinic

In terms of the characteristics of low-vision patients at KCMH, the findings showed that females (56%) slightly outnumbered males (44%), which is consistent with Abu-Yaghi et al. (2022) who reported a relatively balanced gender distribution among low-vision patients. However, this contrasts with earlier studies from developing countries that reported a male predominance, often attributed to the cultural and socioeconomic barriers females face in accessing eye care services (Ibrahim & Razif, 2022; Khan, 2000; Sapkota & Kim, 2017). The gender balance seen in this tertiary-care cohort may reflect improvements in women's access to healthcare in urban Thailand. However, gender disparities may persist in rural and lower-income areas. The majority of patients were middle-aged to older adults (39% aged 40-

59 years; 35% aged ≥ 60 years), reflecting the higher prevalence of visual impairment in later adulthood driven by the progressive nature of many ocular diseases (Chen et al., 2024). Nationally, the fourth National Survey of Blindness, Low Vision, and Visual Impairment in Thailand (2006–2007) estimated approximately a million individuals classified as having low vision (Jenchitr et al., 2007), a figure expected to grow with Thailand's rapidly ageing population. This demographic reality underscores the urgency of building rehabilitation capacity that is commensurate with need. Regarding etiology, retinitis pigmentosa was the most common cause of low vision, which is in line with findings from other hospital-based low-vision clinics in tertiary care settings (Abu-Yaghi et al., 2022; Chotikavanich et al., 2018). In contrast, population-based studies have commonly identified uncorrected refractive errors or cataracts as leading causes, a discrepancy that likely reflects differences in access to primary eye care and treatment availability compared to specialized tertiary centers (Edussuriya et al., 2009; Wong et al., 2006).

Regarding the utilization of low-vision services, 67 participants had previously received vision rehabilitation. The predominant service provided at the KCMH clinic was the prescription of low-vision devices, which aligns with findings from studies in Korea (Kim et al., 2010), India (Khan, 2000), Nepal (Sapkota & Kim, 2017), and Malaysia (Ibrahim & Razif, 2022). Similarly, in Thailand Chotikavanich et al. (2018) reported that service provision at Siriraj Hospital focused largely on visual aid devices, with illuminated handheld magnifiers and spectacles being the most frequently distributed. This focus on devices likely correlates with the functional priorities of patients, as prior literature indicates that reading and near-task performance are the most commonly reported rehabilitation goals (Macnaughton et al., 2019).

Conversely, while the majority received visual aids, the results showed that only a small percentage of participants at KCMH received O&M services. This disparity may be attributed to time constraints and staffing shortages (Gold et al., 2006). Service provision at KCMH is limited to two ophthalmologists and one O&M specialist operating only two half-days per week. This finding is consistent with a US study noting that O&M instruction is more frequently provided in dedicated rehabilitation hospitals, outpatient centers, or independent agencies rather than in general hospitals, where the number of O&M specialists is often limited (Owsley et al., 2009). This stands in contrast to Siriraj Hospital, where vision rehabilitation is provided by a multidisciplinary team, and an 80-hour O&M program as a core service component (Chotikavanich et al., 2018; Chotikavanich et al., 2024). The low uptake of O&M training could also be due to patient readiness and psychological factors. In Thailand, O&M training primarily focuses on the use of the long white cane. Many low-vision participants may perceive this tool as being intended exclusively for the blind (Hersh, 2015; Southwell, 2012). This aligns with a study in South India by Christy and Nirmalan (2006), which identified the fear of stigmatization as a primary barrier; participants felt the white cane drew unnecessary

attention to their disability. Furthermore, as noted by Hersh (2015), overprotection from family members can also serve as a significant barrier to independent cane use.

Major barriers to accessing the services found in this study include social attitudes, financial barriers related to distance and transport, and the service environment. The social attitudes contribute to stigma, negative stereotypes, and a tendency to equate all visual impairment with total blindness (Adam & Pickering, 2007; Pollard et al., 2003). This, combined with patients' hope for a cure through surgery or medication, could delay or prevent individuals from pursuing rehabilitation (Sarika et al., 2019; Siemsen et al., 2005). The finding that travel costs exacerbate the financial barriers to rehabilitation also aligns with Gold et al. (2006), who identified distance and transportation burdens as structural determinants of inequitable access among rural populations. Access to vision rehabilitation is therefore not solely a function of whether services exist, but whether they are reachable. Across low- and middle-income countries (LMICs), trained low-vision practitioners, specialized equipment, and dedicated rehabilitation pathways remain scarce relative to population need (Fricke et al., 2018), and even where services are nominally available, indirect costs such as travel and lost income remain among the most persistent barriers to utilization (Bright et al., 2018). Thailand reflects this pattern. Despite Universal Health Coverage (UHC), low-vision clinics remain concentrated in Bangkok and a small number of provincial centers, leaving rural patients to absorb costs that the benefit package does not fully offset. That Thailand — classified as an upper-middle-income country with an internationally cited UHC model — continues to exhibit these structural limitations suggests that the barriers identified in this study are not idiosyncratic, but reflect systemic under-investment in low-vision care, with implications for health policy, workforce planning, and service design. Availability of services alone is thus an insufficient measure of equity. With regard to the service environment, participants identified limited operating hours as a key institutional obstacle. Unlike long waiting times (Gold et al., 2006), operating hours are rarely discussed in literature; yet they directly conflict with caregiver availability, a well-documented barrier to service uptake (Kyeremeh & Mashige, 2021; Marmamula et al., 2011). Furthermore, participants flagged physical service accommodation (not inclusively designed) as a significant hurdle, highlighting an aspect largely overlooked in prior studies.

Patients' needs for vision rehabilitation services in the KCMH low-vision clinic

Regarding existing rehabilitation services at KCMH, half of the patients reported the need for low-vision devices, followed by technology training. This is consistent with Chotikavanich et al. (2018)'s study, which reported reading, writing, and performing a near task as the most common goal for attending low-vision rehabilitation. The finding of high demand for low-vision devices across all age groups, with the greatest need found among patients aged 60 years or above, also aligns with Singh et al. (2023)'s finding regarding the effectiveness of visual rehabilitation with low-vision aids in patients with age-related macular degeneration.

Conversely, the highest demand for technology training was found among young adults aged 20-39 years. This is in line with the results of Martiniello et al. (2022), who found that smartphone and tablet devices were widely used among visually impaired individuals and were often utilized as a replacement for or in combination with traditional assistive devices. Recent studies also suggest the need for comprehensive digital skills training for young low-vision adults during the transition between educational services and career planning to improve their employment opportunities (McDonnall et al., 2024; van Leeuwen et al., 2015).

Despite this evident demand, access to appropriate devices remains structurally constrained. Thailand's public healthcare system operates across three major schemes — the Civil Servant Medical Benefit Scheme (CSMBS), the Social Security Scheme (SSS), and the Universal Coverage Scheme (UCS). Individuals with certified visual disabilities may access assistive devices primarily through their respective insurance scheme, most commonly the UCS, administered by the National Health Security Office (NHSO). Across all three schemes, coverage for assistive devices is restricted by per-device budget limits, a restricted device list, and occasional delays in budget allocation. As a result, many high-cost devices remain practically inaccessible to patients. By contrast, CSMBS beneficiaries may access a broader range of high-cost devices through direct reimbursement, provided the device appears on the approved list and is supported by clinical documentation (Patcharanarumol et al., 2018). This difference creates a structural inequality in which access to appropriate rehabilitation equipment depends not only on clinical need but also on the patient's insurance scheme.

In terms of future service improvement, it is evident from this study that patients wish for the KCMH clinic to transform itself not only to better manage its service schedules but also to be a one-stop service that provides a wide range of services and outreach services. These include providing access to high-cost devices, establishing a systematic referral system, offering mobile low-vision care units for rural areas and transportation services, having device loan services, as well as processing disability ID card registrations and creating channels to disseminate new information on low-vision rehabilitation technology. All of these recommendations reflect the fact that hospital-based low-vision clinics serve a heterogeneous population with complex, long-term visual impairment.

Implications and Limitations

With regard to practical implications, a primary recommendation of this study is that hospital administrators should adopt universal design principles to reduce environmental barriers faced by low-vision patients, such as inadequate lighting, low-contrast signage, and unmarked pathways. Moreover, the findings suggest a need to implement educational and counseling programs to inform patients about the benefits of low-vision rehabilitation, dispel misconceptions regarding mobility aids (e.g., white cane), and help overcome the stigma associated with using these services. In terms of policy implications, policymakers should

prioritize the development of a more efficient and timely reimbursement system, which includes streamlining the procurement and funding processes for high-cost devices. Furthermore, policymakers should promote integrated communication and coordination among hospital-based low-vision clinics, primary care units, and social organizations, such as rehabilitation centers, schools for the blind, and NGOs. Such policies would improve early detection and referral processes while enhancing access to comprehensive services, including assistive technology, Braille training, and community-based rehabilitation.

Since this study was conducted solely at KCMH, the findings may not be fully generalizable to the broader low-vision patient population. Differences in service availability, healthcare policies, and patient demographics at other institutions could lead to variations in rehabilitation needs and experiences. Future research should use a multi-center approach to enhance the representativeness of the results.

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