https://doi.org/10.35627/2219-5238/2025-33-9-35-42
Original Research Article

Cataract Awareness in Tlogowaru District: The Challenges and Attitude in Rural Community

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Abstract

Introduction: Health promotion and education play a crucial role in reducing preventable blindness and visual impairment in underdeveloped countries. This study *aims* to evaluate understanding and perspectives of adults regarding cataracts in Tlogowaru (rural area of Malang).

Materials and methods: We conducted a cross-sectional study involving adults aged ≥ 18 years in Tlogowaru rural area using a closed-ended questionnaire adapted from an original article, translated into Indonesian, and validated with a Cronbach's alpha of > 0.6. Knowledge levels were categorized as poor (< 6) or good (≥ 6) based on the total score of 9. A total of 270 respondents participated in this study.

Results: While 68.5 % of the respondents exhibited good knowledge about cataracts, 59.6 % expressed a contradictory negative attitude towards the condition. Our analysis indicates that fear of pain (59.2 %) and concerns about surgical outcomes (56.6 %) significantly contribute to this negative attitude. Significant associations were found between knowledge and factors such as age ($p = 0.003$), gender ($p = 0.021$), education ($p = 0.000$), and income ($p = 0.000$).

Conclusion: Our findings highlight the disparity between adequate knowledge and negative attitudes towards cataracts, thus underscoring the need for targeted awareness initiatives to improve perceptions and encourage proactive health behavior.

Keywords: cataract, awareness, knowledge, attitude, associated factors, questionnaire.

Cite as: Kautsarani I, Handayani N, Sulistya TB. Cataract awareness in Tlogowaru District: The challenges and attitude in rural community. *Zdorov'e Naseleniya i Sreda Obitaniya*. 2025;33(9):35–42. (In Russ.) doi: 10.35627/2219-5238/2025-33-9-35-42

Осведомленность о катаракте в районе Тлоговару: вызовы и отношение к проблеме жителей сельской местности

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Резюме

Введение. Пропаганда здорового образа жизни и просвещение играют решающую роль в снижении числа случаев предотвратимой слепоты и нарушений зрения в развивающихся странах. *Целью* данного исследования является оценка понимания и отношения к катаракте взрослых жителей района Тлоговару, сельской местности Маланга.

Материалы и методы. Проведено поперечное исследование с участием взрослых в возрасте от 18 лет, проживающих в Тлоговару, используя анкету закрытого типа, заимствованную из оригинальной статьи, переведенную на индонезийский язык и валидированную с альфа Кронбаха > 0,6. Уровень знаний оценивался как низкий (< 6) или хороший (≥ 6) на основе общего балла равного 9. В исследовании приняли участие 270 респондентов.

Результаты. В то время как 68,5 % участников продемонстрировали хорошие знания о катаракте, 59,6 % выразили противоречивое негативное отношение к этому заболеванию. Анализ показывает, что формированию негативного отношения в значительной степени способствуют боязнь боли (59,2 %) и опасения по поводу исхода операции (56,6 %). Были обнаружены статистически значимые зависимости между уровнем знаний и такими факторами, как возраст ($p = 0,003$), гендерная принадлежность ($p = 0,021$), уровни образования ($p = 0,000$) и дохода ($p = 0,000$).

Заключение. Полученные результаты выявили несоответствие между достаточным уровнем знаний и негативным отношением к катаракте, что подчеркивает необходимость целенаправленных инициатив по повышению осведомленности для улучшения восприятия и поощрения проактивного поведения в отношении здоровья.

Ключевые слова: катаракта, осведомленность, знание, отношение, сопутствующие факторы, вопросник.

Для цитирования: Каутсарани И, Хандаяни Н, Сулистья ТБ. Осведомленность о катаракте в районе Тлоговару: вызовы и отношение к проблеме жителей сельской местности // Здоровье населения и среда обитания. 2025. Т. 33. № 9. С. 35–42. doi: 10.35627/2219-5238/2025-33-9-35-42

Introduction

The World Health Organization (WHO) describes cataracts as lens opacities that progress to blindness if left untreated [1]. Cataracts, one of the leading causes of blindness worldwide, account for nearly 90 % of cases in several developing nations. They have significant social and economic repercussions [2]. Age-related increases in cataract incidence make prevention key to lowering difficulties brought on by cataracts [3].

Findings of the Rapid Assessment of Avoidable Blindness (RAAB) survey, which was carried out in 15 Indonesian provinces between 2014 and 2016 by the Indonesian Ophthalmologists Association and the Research and Development Agency of the Ministry of Health showed that in the province of East Java,

https://doi.org/10.35627/2219-5238/2025-33-9-35-42
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the frequency of blindness is 4.4 %, with untreated cataract being the primary cause in 81.1 % of cases. This prevalence rate is the highest in Indonesia, significantly higher than the nation's average of 3 %. The survey targeted a population over 50 years old [4].

Numerous studies have demonstrated that poor financial circumstances, limited transportation access, misperceptions, residual vision, and inadequate knowledge pertaining to risk factors, the nature of the disease, and available treatment options are the primary causes of delayed treatment [5, 6]. Knowledge of cataracts is the most critical thing. It is essential for starting routine eye exams, preventing cataract development, and allowing for quick interventions to reduce the disease burden [7]. Furthermore, cataract knowledge is required to implement health education and promotion strategies [8]. It is well known that health promotion and education play an essential role in reducing the burden of preventable causes of blindness and visual impairment in developing countries [9].

According to a large-scale study conducted in rural western China, there remains a considerable knowledge gap about cataracts among adults aged 50 and above, particularly regarding treatment options and surgical reimbursement. Factors such as age, education level, income, marital status, living arrangements, and prior eye examinations were significantly associated with the levels of cataract awareness [10]. The knowledge and attitude of eye patients highly influence their general health behavior towards seeking timely care. The availability of health services at the local level and patients' attitudes restrict the community's access to cataract surgery [11].

This study *aims* to assess the general knowledge of the adult population in the rural area regarding cataracts and their associated risk factors, which will help researchers, policymakers, and resource allocators develop health education and promotion programs for disease prevention and early treatment.

Materials and Methods

Study setting, design, period

This is a cross-sectional study including a purposive sample of 270 participants. We conducted the study at Tlogowaru, a rural area in Malang, Indonesia in November 2023. All respondents, aged ≥ 18, living in Tlogowaru and willing to sign a consent letter met the inclusion criteria. A total of 22 respondents who were absent at the event and unable to complete the research series were excluded from the study.

Data collection tools

We collected data using a closed-ended questionnaire. We adopted a questionnaire from a published article, translated it into Indonesian [12] and validated it using Cronbach's alpha. The validation results for every variable in the questionnaire indicate a value of > 0.60 (high reliability). The questionnaire has three sections: a) demographic (name, age, gender, education, and monthly income); b) knowledge; and c) attitudes towards cataracts. The interviewer entered the respondent's name, age, gender, height, and weight after he or she had signed the informed consent form. Gender was determined based on participants' self-reported sociocultural identification (male or female). Afterwards, respondents autonomously completed the questionnaire, which consisted of nine closed questions (yes, no, don't know, or another choice of statement) to assess the level of knowledge and eleven closed questions to assess the respondent's attitude (agree, disagree, or neutral).

Operational definitions

Awareness of cataract was measured through knowledge about cataract and attitude (how participants respond to situations leading to cataract) and was analyzed according to the operational definition described below.

Knowledge. We assessed the participants' levels of knowledge using nine knowledge-related questions covering nine domains: simple description, risk factors, symptoms, complications, and treatment choices, as well as media information. Each item was given equal weight. We used the overall score to categorize participants' general knowledge as good if it scored between six and nine points, and poor if it scored less than six [13].

Attitude. We assessed the participants' overall attitude score using 11 questions, which included supportive attitudes towards cataract prevention and barriers related to patient perspective, such as cataract management. We used the Likert scale model (T-score), which presents a positive attitude if the score is more than the mean score and negative otherwise [13].

Data processing and analysis

We expressed quantitative data using descriptive statistics and analyzed them using the Statistical Package for Social Sciences (SPSS) version 2.0. The first step in this investigation was to determine the logistic regression model's feasibility by calculating the value of the goodness-of-fit test on the Hosmer and Lemeshow tests using the chi-square. We employed multivariable binary logistic regression to identify characteristics associated with cataract knowledge. In multivariable binary logistic regression, factors with a *p*-value of 0.05 were considered statistically significant. We ultimately presented the results as tables.

Results

A total of 270 of the 292 adults aged ≥ 18 years completed the questionnaire, yielding a response rate of 92.4 %, and were subsequently categorized into three age groups: 18–29, 30–39, and > 40 years. The study excluded twenty-two individuals due to their inability to complete the questionnaire. Up to half of the study participants, specifically 180 (66.7 %), were women. Most of the respondents (55.2 %) were between 18 and 29 years of age. According to the breakdown of respondents' most recent educational level, senior high school ranks first, accounting for 40.4 %. (Table 1). A total of 44.4 % have income below 1 million, 32.2 % have payments between 1 and 3 million, and another 23.3 % have revenue greater than 3 million.

According to Table 2, 80 % of the respondents believed surgery was the most effective treatment for cataracts, followed by pharmaceuticals (11.9 %) and spiritual (8.1 %). Awareness of surgical procedures

https://doi.org/10.35627/2219-5238/2025-33-9-35-42
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Table 1. **Socio-demographic characteristics of the respondents (*n* = 270)**
Таблица 1. **Социально-демографические характеристики респондентов (*n* = 270)**

Variables / Переменные	*n*	%
Gender / Пол (заявленная гендерная принадлежность)		
Female / Женский	180	66.7
Male / Мужской	90	33.3
Age (year) / Возраст (лет)		
18–29	149	55.2
30–39	60	22.2
≥ 40	61	22.6
Education / Образование		
Elementary / Начальное	76	28.1
Junior high / Неоконченное среднее	70	25.9
Senior high / Среднее	109	40.4
Graduate and higher / Высшее и последующее	15	5.6
Monthly income (IDR) / Ежемесячный доход (индонезийских рупий)		
< 1 000 000	120	44.4
1–3 000 000	87	32.2
≥ 3 000 000	63	23.3

Table 2. **Participants' knowledge about cataract in Tlogowaru, Malang Rural Area (*n* = 270)**
Таблица 2. **Знания участников исследования, проживающих в Тлоговару, сельской местности Маланга, о катаракте (*n* = 270)**

Questions / Вопросы	*n*	%
Do you know about cataract? / Известно ли вам о катаракте?		
Yes / Да	137	50,7
No / Нет	133	49,3
What causes cataract? / Что является причиной развития катаракты?		
Ageing / Старение	111	41,1
Malnutrition / Несбалансированное питание	17	6.3
Smoking / Курение	7	2.6
Prolong physical/outdoor activities / Продолжительная физическая активность / работа на свежем воздухе	25	9.3
I don't know / Не знаю	110	40.7
Is cataract treatable / or preventable? / Возможно ли лечение и/или профилактика катаракты?		
Yes / Да	226	83.7
No / Нет	44	16.3
Can cataract lead to blindness? / Может ли катаракта привести к слепоте?		
Yes / Да	226	83.7
No / Нет	44	16.3
What is the effective treatment for cataract? / Что является эффективным лечением катаракты?		
Surgery / Хирургическое вмешательство	216	80
Couching / Коучинг	0	0
Medication / Лекарственная терапия	32	11.9
Spiritual / Духовные практики	22	8.1
How cataract is operated in hospital? / Как проводится операция по удалению катаракты в больнице?		
Eye is removed / Удаляют глаз	81	30
Lens is removed and replaced / Хрусталик удаляют и заменяют на искусственный	50	18.5
I don't know / Не знаю	139	51.5
Lens dislocated / Сдвигают хрусталик	0	0
Are all cataract surgeries the same? / Все ли операции по удалению катаракты одинаковы?		
Same / Одинаковы	85	31.4
Different / Различны	57	21.1
I don't know / Не знаю	128	47.5
Do you think cost of cataract surgery is affordable? / Считаете ли Вы стоимость операции по удалению катаракты доступной?		
Yes / Да	153	56.6
No / Нет	58	21.4
It should be free / Операция должна быть бесплатной	59	22.0
Others / Другое	0	0
Sources of information that motivate people to go for cataract information / Источники информации, мотивирующие людей узнать больше о катаракте		
Media / Средства массовой информации	113	41.8
Someone operated / Прооперированные пациенты	69	25.5
Family/community / Семья/сообщество	26	9.8
Informants / Информаторы	62	22.9

https://doi.org/10.35627/2219-5238/2025-33-9-35-42
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was limited: only 18.5 % correctly understood that cataract surgery involves lens removal and replacement, whereas 30 % mistakenly believed the entire eye is removed, and more than half (51.5 %) admitted not knowing. According to the respondents' knowledge of whether cataract surgery is affordable, the majority (56.6 %) believed it was reasonable. Furthermore, most respondents (41.8 %) chose the media as a source of information about cataract surgery, followed by word of mouth from operated patients (25.5 %) and informants (22.9 %).

Table 3 presents the finding that most respondents (59.2 %) agreed fear of pain could discourage them from visiting the hospital for cataract treatment. In assessing whether fear of surgery results can prevent people from seeking cataract intervention, most respondents (56.6 %) agreed that fear of visual results could deter people from seeking cataract intervention, 24.1 % did not agree, and only 19.3 % were neutral.

In terms of accessibility, most respondents (62.6 %) believed that a lack of accessibility discourages people from getting cataract treatment. Approximately 74.5 % of participants agreed that individuals with poor vision should seek hospital care, while 10.7 % disagreed and 14.8 % remained neutral. Although the average Likert-scale agreement across individual attitude items towards cataract and its management was relatively high (mean agreement score = 68.5 %), the composite scoring system indicated that only 40.4 % of respondents could be categorized as having an overall positive attitude (cut-off mean score = 50). This discrepancy highlights that while participants frequently endorsed favorable responses at the item level, their attitude profile remained predominantly negative.

As shown in Table 4, out of 270 respondents, 185 (68.5 %) demonstrated good knowledge while 85 (31.5 %) had poor knowledge of cataract. When distributed by gender, age, education, and income, significant differences were observed between subgroups. Female participants were more likely to have poor knowledge compared to males (76.5 % vs. 23.5 %, $p = 0.021$). Younger participants (18–29 years) showed the largest proportion of those with poor knowledge (68.2 %), whereas higher knowledge was more prevalent in older age groups ($p = 0.003$). Education level was strongly associated with knowledge: more than half of the respondents with poor knowledge had only completed elementary school (51.8 %), while those with senior high school (51.4 %) was predominantly in the good knowledge group ($p < 0.001$). Monthly income also showed a significant association ($p < 0.001$), with participants earning above IDR 3,000,000 more likely to have good knowledge (31.9 %), compared with only 4.7 % among those with poor knowledge.

Table 3. **Participants' attitude towards cataract in Tlogowaru in Malang Rural Area (*n* = 270)**
Таблица 3. **Отношение участников к катаракте в Тлоговару, сельской местности Маланга (*n* = 270)**

Variables / Переменные	Disagree / Не согласен		Neutral / Отношусь нейтрально		Agree / Согласен	
	n	%	*n*	%	*n*	%
Attending hospital for treatment / Обращение за медицинской помощью	136	50.4	0	0	134	49.6
Personal belief can prevent people from cataract treatment / Личные убеждения могут препятствовать обращению за лечением катаракты	60	22.2	51	18.9	159	58.9
Cost of cataract surgery can prevent people from seeking treatment / Стоимость операции по удалению катаракты может препятствовать обращению за лечением	49	18.1	60	22.2	161	59.7
Fear of pain can prevent people from seeking treatment / Боязнь боли может препятствовать обращению за лечением	58	21.5	52	19.3	160	59.2
Fear of surgical outcome can prevent people from seeking treatment / Страх перед хирургическим вмешательством может препятствовать обращению за лечением	65	24.1	52	19.3	153	56.6
Lack of accessibility can prevent people from seeking treatment / Удаленность медицинского учреждения может препятствовать обращению за лечением	51	18.9	50	18.5	169	62.6
Cataract will recur after surgery / После операции возможно развитие вторичной катаракты	57	21.1	61	22.6	152	56.3
Person with poor vision should go to hospital for treatment / Человеку с плохим зрением следует обращаться за медицинской помощью	29	10.7	40	14.8	201	74.5
Cataract extraction restores sight / Удаление катаракты восстанавливает зрение	30	11.1	59	21.9	181	67.0
Couching is harmful eye practice / Коучинг вреден для глаз	41	15.2	77	28.5	152	56.3
People from cities go to hospital for intervention more often than those in rural areas / Городские жители чаще обращаются в больницу за медицинской помощью, чем жители сельской местности	29	10.8	46	17.0	195	72.2
Attitude / Отношение	Positive / Положительное				109 (40.4 %)	
	Negative / Отрицательное				161 (59.6 %)	

https://doi.org/10.35627/2219-5238/2025-33-9-35-42
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Table 4. **Factors associated with knowledge about cataract (*n* = 270)**
Таблица 4. **Факторы, связанные со знаниями о катаракте (*n* = 270)**

Variable / Переменная	Knowledge / Уровень знаний		*p*
	Good / Высокий (≥ 6) *n* (%)	Poor / Низкий (< 6) *n* (%)	
Gender / Пол			
Female / Женский	115 (62.2)	65 (76.5)	0.021
Male / Мужской	70 (37.8)	20 (23.5)	
Age (year) / Возраст (лет)			
18–29	91 (49.2)	58 (68.2)	0.003
30–39	51 (27.6)	9 (10.6)	
≥40	43 (23.2)	18 (21.2)	
Education / Образование			
Elementary / Начальное	32 (17.3)	44 (51.8)	0.000
Junior High / Неполное среднее	43 (24.2)	27 (31.8)	
Senior High / Среднее	95 (51.4)	14 (16.5)	
Graduate and higher / Высшее и последующее	15 (8.1)	0 (0)	
Monthly income (IDR) / Ежемесячный доход (индонезийских рупий)			
< 1 000 000	85 (45.9)	35 (41.2)	0.000
1–3 000 000	41 (22.2)	46 (54.1)	
>3 000 000	59 (31.9)	4 (4.7)	
Total / Итого	185 (68.5)	85 (31.5)	

Table 5 shows that a higher level of education is associated with a 1.741 times greater probability of better knowledge about cataracts ($p = 0.001$). Additionally, older age is associated with a 1.473 times greater likelihood of better cataract knowledge ($p = 0.043$). Respondents with higher monthly income were also 1.61 times more likely to demonstrate good knowledge ($p = 0.024$). Furthermore, being female was associated with a 1.808 times greater likelihood of possessing better knowledge about cataracts.

Discussion

Knowledge about cataracts reduces the burden of cataract blindness because it allows people to delay the onset of the disease and initiate practical interventions [8]. In the current study, 68.5 % of the participants possessed a solid understanding of cataracts. This finding is higher than the results of three studies conducted in Northwest Ethiopia (64.7 %) [13] and Southern Ethiopia (61.7 %) [14], as well as Nigeria (18.2 %) [15]. Nonetheless, this result is lower than in the studies conducted in Nepal (74.6 %) [16], Iran (74 %) [17], and China (70.9 %) [18]. This research, unlike the institution-based study in China that focused on adults aged 30 and older, took place in the community with a target population of 40 and older. The discrepancy may be attributed to socio-demographic differences between countries, as participants' level of education and socioeconomic status influenced their knowledge. The distinction between the target population and the study environment may also contribute to the discrepancy.

Adults aged 40 and older were 1.4 times more likely to have better knowledge compared to younger adults. This finding aligns with study reports from Ontario, Canada, and surveys conducted in China [19]. This could be attributed to the age-related rise in the disease

Table 5. **Logistic regression analysis of factors associated with knowledge about cataract**
Таблица 5. **Логистический регрессионный анализ факторов, связанных со знаниями о катаракте**

				95.0 % C.I. for EXP(B) / 95% ДИ для EXP(B)	
	B	Sig.	Exp(B)	Lower / Нижняя граница	Upper / Верхняя граница
Education level / Уровень образования	0.555	0.001	1.741	1.272	2.383
Income / Доход	0.477	0.024	1.611	1.065	2.436
Age / Возраст	0.387	0.043	1.473	1.012	2.144
Gender / Пол	0.592	0.068	1.808	0.958	3.412
Constant / Константа	-1.798	0.013	0.166		

Notes: EXP (B) = Odds Ratio (OR)
Overall Percentage = 73.7 %
Nagelkerke R-squared = 0.093

Примечания: EXP (B) = отношение шансов (OR)
Общий процент = 73,7 %
Коэффициент детерминации Нагелькерке = 0,093

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incidence, which may require increased support for cataract care in our aging population. Additionally, the community tends to discuss age-related diseases more frequently than younger ones, thereby increasing their familiarity with cataracts. Despite this, misconceptions were common. Nearly one-third of the respondents believed cataract surgery involves eye removal, and a half admitted not knowing the actual procedure. This highlights the need for community-based health education, emphasizing that cataract surgery is safe, effective, and restores vision.

Individuals with a bachelor's degree were 1.7 times more likely to have stronger knowledge than those with elementary education. This finding could be attributed to the fact that as individuals' education levels rise, their health concerns tend to increase, too. They will also have a positive attitude towards health care. Additionally, those with a higher education degree would have access to health care information to become more aware of the discrepancy [20].

Participants with higher monthly income were 1.6 times more likely to have good knowledge about cataract than those with lower income (AOR = 1.61, 95 % CI: 1.07–2.44, $p = 0.024$). This finding is consistent with Ethiopian [13], Iranian [17], and Chinese [19] studies and may be attributed to the fact that people with higher socioeconomic status have access to eye care services. In addition, those with a lower income may be reluctant to visit an eye care center out of fear of high expenses. However, it was not significant in Southern Indian studies [21].

According to the survey results, the majority of the respondents stated that they were unaware of how to manage cataracts, leading them to consider having their eyes removed as a treatment for the condition. This issue requires cataract counseling, specifically focusing on the management of cataracts. Knowing the proper cataract therapy would reduce the fear of treatment. To improve their quality of life, future efforts should concentrate on providing education and making it easier for people of all backgrounds to access and collect information about eye diseases, particularly age-related ones. A multidisciplinary team in charge of cataract education and prevention should include the ophthalmology community, stakeholders, and family.

This study showed that 40.4 % of the respondents had a positive attitude towards cataracts. This finding is higher than the overall attitude of the study participants in Yirgalem town (35.3 %) [13] and Southern Ethiopia (37.9 %) [21]. This variance may be attributed to differences in socioeconomic and demographic characteristics between the study participants. Different target demographic groups and study sites may also explain the variance. While this study revealed more positive attitudes than other studies, it is important to note that negative attitudes (59.6 %) predominate. A lack of information about cataracts and their treatment may be the reason for the fear of painful procedures and surgical outcomes. The distance to the eye care service also influences intention of individuals to seek treatment and undergo therapy. The cost of transportation to the eye care service may also represent additional expenses for preparation prior to surgery, as patients may need to make multiple trips to the facility.

The strength of this study is that there are still not many studies assessing attitudes towards cataracts in Indonesia. The study faced limitations due to recall bias, as the participants required reminders. Future research should expand to larger and more diverse populations, incorporating intervention studies to measure the impact of educational programs.

Conclusions

Significant proportions of participants had good knowledge of cataracts that contradicted their negative attitude. Age, gender, higher education, and monthly income were all significantly associated with the level of cataract knowledge. These findings underscore the need for targeted awareness campaigns, especially for groups with poorer knowledge, to improve early detection and prevention, supporting more effective health education and policy development in rural communities like Malang.

Recommendations

1. Eye health promotion and education should be established utilizing a broad-based (population-based) strategy rather than a clinic-based approach.

2. To effectively promote cataract awareness and surgical options in the rural area community, education programs should prioritize culturally relevant strategies that consider limited access to media, gadgets, and television. Utilizing leaflets or other simple, easy-to-understand materials that convey information in a straightforward, yet comprehensive manner can help alleviate fears and encourage individuals to seek necessary check-ups and treatment.

3. Stakeholders at various stages must adopt a family approach, considering the educational level of the community, in order to raise awareness about cataracts.

Acknowledgment: The authors would like to express their gratitude to all the ophthalmology residents who contributed to the successful completion of this community research.

Благодарность: Авторы хотели бы выразить свою благодарность всем ординаторам-офтальмологам, которые внесли свой вклад в успешное проведение данного исследования.

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Compliance with ethical standards: Ethics approval was provided by the Ethics Committee of Dr. Saiful Anwar Malang Regional General Hospital, no. 400/215/K.3/302/2021.

Availability of data and materials: Data and materials for this study are available from the corresponding author at reasonable request and for non-commercial purposes.

Funding: This research received no external funding.

Conflict of interest: The authors have no conflicts of interest to declare.

Received: February 4, 2025 / Accepted: September 8, 2025 / Published: September 29, 2025

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https://doi.org/10.35627/2219-5238/2025-33-9-35-42
Оригинальная исследовательская статья

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Соблюдение этических стандартов: исследование одобрено этическим комитетом Региональной больницы общего профиля им. д-ра Сайфула Анвара в Маланге (№ 400/215/K.3/302/2021).

Доступность данных и материалов: данные и материалы исследования могут быть предоставлены автором, ответственным за переписку, по обоснованному запросу и в некоммерческих целях.

Финансирование: исследование проведено без спонсорской поддержки.

Конфликт интересов: авторы заявляют об отсутствии конфликта интересов.

Статья получена: 04.02.25 / Принята к публикации: 08.09.25 / Опубликована: 30.09.25