Journal of Community Health Provision
Vol. 6, Issue 3, 2026
Page 910-919
DOI: https://doi.org/10.55885/jchp.v6i3.1101

Overview of Cataract Risk Factors in Productive Age Patients: Literature Review

A.Yulia Puspitasari.S[1], Marlyanti Nur Rahmah Akib[2], Zulfikri Khalil Novriansyah[2], Ariyanie Nurtania[2], Nur Aulia Amir[2]
[1]Students of the Medical Profession Study Program, University of Muslim Indonesia, Makassar, Indonesia
[2]Departement of Ophtalmologi, Faculty of Medicine, University of Muslim Indonesia, Makassar, Indonesia
Email: andiyuliapuspitasari@gmail.com

Abstract. *Cataract is a leading cause of visual impairment and blindness that occurs not only in the elderly but also among the productive-age population. Various risk factors are thought to contribute to the development of cataracts in this age group; therefore, a comprehensive understanding of these factors is needed. This study aimed to analyze the risk factors for cataracts in productive-age patients based on recent literature. This study employed a narrative review method by examining various scientific articles obtained from the PubMed, ScienceDirect, and Google Scholar databases. The literature search was conducted using keywords relevant to the research topic. The main risk factors for cataracts in productive-age patients include ultraviolet radiation exposure, diabetes mellitus, hypertension, smoking habits, outdoor occupations, nutritional status, and socioeconomic conditions. In addition, family history, sex, and refractive errors also contribute to an increased risk of cataract development. The occurrence of cataracts in productive-age patients is multifactorial; therefore, promotive and preventive efforts through the control of modifiable risk factors are needed to reduce the incidence of early-onset cataracts.*

Keywords: *Cataract, Risk Factors, Productive Age, Presenile Cataract*

Received: July 21, 2026 Received in Revised: August 21, 2026 Accepted: September 4, 2026

INTRODUCTION

The visual system consists of various components of the eye that function in the process of vision by reacting to light, obtaining information about the environment, and helping to recognize the outside world through a process of visual perception called vision. The lens plays a crucial role in focusing light onto the retina. The lens is a round, transparent, elastic, and vascularized part of the eye. It is located behind the iris and pupil and receives its nutrients from eye fluids called aqueous humor and vitreous humor (Putri et al., 2024; Jaffet et al., 2025).

The high rate of blindness in Indonesia is not only a health problem but also a social one. Although cataracts are a disease of the elderly, 16-20% of blindness due to cataracts affects Indonesians aged 40-54, who, according to the Central Bureau of Statistics (BPS), are considered to be in the productive age group (Damayanti & Christina, 2023). Given the high prevalence and severity of this condition, cataracts have become a significant public health problem, with a significant social burden globally. These challenges emphasize the need to develop innovative therapeutic strategies to address the limited availability of surgical services worldwide (Li et al., 2024).

Risk factors are characteristics, signs, or clusters of symptoms of a disease suffered by an individual that are statistically associated with an increased incidence of new cases (Zhang et al., 2020; Genco & Borgnakke, 2013; Berenguer et al., 2023). Essentially, the benefit of risk factors is

to understand the process of disease development, in this case the non-communicable disease cataract. In epidemiology, this is known as the epidemiological triad: host (risk factors due to the host such as age and gender), agent (risk factors based on causes such as exposure to ultraviolet radiation), and environment (risk factors caused by environmental factors such as climate and socioeconomic status) (Pamungkas et al.,2024).

According to Alghamdi (2026) and Shandiz et al. (2011), Common symptoms of cataracts include visual impairment, decreased contrast sensitivity, distorted color perception, and increased sensitivity to glare. The process of cataract formation remains a matter of debate due to its multifactorial nature. The main risk factors include aging, systemic hypertension, diabetes mellitus, and exposure to ultraviolet (UV) light. All of these factors contribute to the formation of reactive oxygen species (ROS) in the lens, which play a crucial role in the development of cataracts (Li et al., 2024).

Based on this description, this study was conducted as a systematic literature review to provide a comprehensive overview of cataract risk factors in productive-age patients. The results of this study are expected to provide a scientific basis for improving promotive and preventive efforts, as well as supporting the development of cataract screening and management strategies in the productive age group, thereby reducing the impact of visual impairment on quality of life and community productivity.

METHODS

This research method uses a narrative review approach, which aims to examine, summarize, and interpret various research findings related to cataract risk factors in productive-age patients. This approach was chosen because it provides flexibility in integrating findings from diverse literature and allows researchers to compile a comprehensive and descriptive picture of the factors contributing to cataract development in the productive-age group. The literature search was conducted systematically, but not strictly adhering to a specific protocol such as PRISMA. Instead, it focused on selecting relevant, up-to-date, and high-quality sources. The literature search strategy employed a structured approach in several international databases to obtain relevant and high-quality sources, including PubMed, ScienceDirect, and Google Scholar. Keywords used in the literature search included: "cataract," "risk factors," "productive age," "young adults," and "early-onset cataract." Furthermore, keyword combinations with Boolean operators (AND and OR) were used to broaden and refine the search results. The selected articles were Indonesian and English-language studies discussing cataract risk factors in productive-age patients, published in scientific journals, and available in full-text form. Articles that do not match the research topic, have incomplete data, or are duplicate publications are not included in the analysis process.

Table 1. Inclusion and Exclusion Criteria

Inclusion	Exclusion
International journals, national journals, scientific articles, textbooks, and proceeding books discussing cataract risk factors in productive-age patients. Articles published between 2021 and 2026. Research articles in Indonesian and English. Articles discussing cataract risk factors in productive-age groups, young adults, or early-onset cataracts. Articles available in full text and fully accessible for analysis.	Journals published outside the specified year range (before 2021). Articles not available in full text. Articles that do not specifically address cataract risk factors in productive-age patients. Articles in the form of editorials, letters to the editor, conference abstracts without full texts, and duplicate publications. Articles with incomplete data or that do not meet the research objectives.

RESULT AND DISCUSSION

Table 1. Characteristics and Synthesis of Studies Included in the Literature Review on Risk Factors for Cataracts in Patients of Productive Age

No.	Year	Title	Methods	Author	Key Results	Conclusion
1	2025	Impact of Cataract on the Livelihood Income Status of Patients Availing Free Cataract Surgery in India	Cross-sectional	Vishwakarma et al.	The majority of patients are aged 51–60 years with low levels of education and experience decreased productivity due to cataracts.	Late productive age and socioeconomic status contribute to the burden of cataracts.
2	2022	Gambaran Faktor Risiko Terjadinya Katarak di Rumah Sakit Umum Anutapura Palu dan Klinik Spesialis Mata Mitra	Descriptive observational, cross-sectional	Putri et al.	DM, hypertension, and smoking were found in younger cataract patients.	Metabolic diseases and smoking can accelerate the occurrence of cataracts in productive age.
3	2021	Prevalence of Cataract, Its Risk Factors and the Barriers to Cataract Surgery Among Older Women in a Rural Population of Cuddalore	Descriptive cross-sectional	Doss et al.	Risk factors significantly associated with cataracts included age, hypertension, diabetes, tobacco use, and sun exposure.	Hypertension, diabetes, smoking, and UV exposure are important risk factors that can also be found during the productive years.
4	2022	Prevalence and Risk Factors for Adult Cataract in the Jingan District of Shanghai	Population-based, cross-sectional study	Hong et al.	Refractive errors were an independent risk factor in addition to age.	Refractive errors can increase the risk of cataracts in adulthood.
5	2024	Prevalence and Analysis of Risk Factors for Cataracts in Jember Regency, Indonesia	Observational, cross-sectional	Rohmah et al.	Outdoor occupations, smoking, and diabetes were associated with cataracts.	Occupational factors, smoking, and diabetes increase the risk of cataracts in productive age.
6	2024	Work Profile and Risk Factors of Presenile Cataract in the South Indian Population: A Case-Control Study	Case-control	Sundaresan et al.	Manual labor, low socioeconomic status, and underweight increase the risk of presenile cataracts (<50 years).	Occupational factors, nutritional status, and socioeconomic factors play a role in cataracts during productive age.
7	2024	Faktor-Faktor Yang Berhubungan dengan Kejadian Katarak Pada Lansia Di Poli Mata.	Cross-sectional	Royani et al.	Diabetes mellitus and family history were associated with cataract incidence, whereas sex and smoking were not associated.	Diabetes mellitus and family history are risk factors that also need to be considered during productive age.
8	2021	Characteristics of Risk Factors	Quantitative descriptive	Detty et al.	The most frequently identified	Hypertension, diabetes mellitus, and eye trauma are

		Among Cataract Patients			factors were age, female sex, hypertension, diabetes mellitus, and a history of no eye trauma.	risk factors that may contribute to cataracts during productive age.
9	2024	Risk Factors for Cataracts in the Working Area of Astambul Primary Health Center, Banjar Regency, South Kalimantan, Indonesia	Cross-sectional	Martyana et al.	Age, occupation, diabetes mellitus, and hypertension were significantly associated with cataract incidence, whereas sex was not associated.	Occupation, diabetes mellitus, and hypertension are relevant risk factors among patients of productive age.
10	2022	Prevalence and Risk Factors of Age-Related Cataract Among Sixty-Plus Population in a Coastal Village in South India	Cross-sectional	Anitha A. et al.	The main risk factors included age, hypertension, female sex, and low educational level.	Hypertension, female sex, and sociodemographic factors contribute to cataract risk and should therefore be considered from the productive age.
11	2025	Relationship Between Age and Gender with the Incidence of Cataracts at Outpatient Eye Clinic, Batara Siang Regional General Hospital, Pangkep Regency, 2023	Cross-sectional	Herman et al.	Age and sex did not show a significant relationship with cataract incidence.	Age and sex were not significant risk factors in the study population.
12	2024	Risk Factor Analysis of Cataracts in Primary Health Center	Retrospective analytical (case-control)	Choirunisa et al.	UV exposure, cigarette smoke, hypertension, abnormal BMI, and female sex were associated with cataract incidence.	UV exposure, smoking, hypertension, nutritional status, and sex are important risk factors for cataracts during productive age.
13	2025	Screening and Risk Factor Assessment of Cataract and Glaucoma in Hypertensive and Diabetic Populations along the Surabaya Coast	Analytical observational	Pasaribu et al.	Hypertension, diabetes, and UV exposure were associated with increased cataract incidence.	Metabolic factors and environmental exposure increase the risk of cataracts, including among productive-age groups with comorbidities.
14	2024	Analysis of Age and Gender Factors on the Incidence Rate of Cataracts in the Ophthalmology Clinic	Retrospective analytical	Wijayanti et al.	Sex was significantly associated with cataract incidence, whereas age was not significantly associated.	Sex is a contributing risk factor for cataract incidence, whereas age was not a significant factor in this study.

Overview of Cataracts in Patients of Productive Age

Cataracts are the leading cause of visual impairment and blindness worldwide, characterized by clouding of the eye lens. Although they generally occur in older adults, various studies have shown that cataracts can also be found in the productive-age group or as presenile cataracts. Productive age refers to the population aged 15–64 years, namely the age group capable of producing goods or services efficiently (Amelia et al., 2024). Presenile cataracts are defined as clouding of the intraocular lens occurring before the age of 50 years. Cataracts tend to occur at a younger age in developing countries (Sunkesula et al., 2025). The synthesis of 14 articles showed that the incidence of cataracts in the productive-age population is influenced by the interaction of various factors, including environmental factors, lifestyle, metabolic diseases, and socioeconomic factors. The study by Vishwakarma et al. (2025) showed that most cataract patients were in the late productive-age group, namely 51–60 years, and experienced decreased productivity and work ability due to visual impairment. This finding indicates that cataracts in the productive-age population not only affect individual health but also have significant social and economic consequences (Rahayu et al, 2023; Awan et al., 2012).

Risk Factors for Cataracts in Patients of Productive Age

Based on the synthesis of various articles, risk factors for cataracts in patients of productive age can be grouped into environmental factors, metabolic diseases, lifestyle, occupational factors, and non-modifiable factors.

Environmental Factors

Exposure to ultraviolet (UV) radiation is the most frequently reported risk factor. Studies by Choirunisa et al. (2024), and Pasaribu et al. (2025) showed that individuals exposed to sunlight for prolonged periods, particularly more than five hours per day, had a higher risk of developing cataracts. Ultraviolet radiation increases the formation of free radicals and oxidative stress, which accelerate lens protein damage and consequently cause lens opacity.

Metabolic Diseases

Diabetes mellitus and hypertension are important risk factors for cataract development in the productive-age population. Studies by Putri et al. (2022), Doss et al. (2021), Rohmah et al. (2024), and Martyana et al. (2024) showed significant associations between these two diseases and cataract incidence. Chronic hyperglycemia increases sorbitol accumulation in the lens, while hypertension causes microvascular disturbances and increases oxidative stress, thereby accelerating lens degeneration.

Lifestyle Factors

Smoking and tobacco use also play an important role in cataract formation. Studies by Putri et al. (2022), Doss et al. (2021), and Rohmah et al. (2024) showed that exposure to cigarette smoke increases the formation of free radicals that can damage the structural proteins of the lens. In addition, abnormal nutritional status, particularly being underweight, has been reported to increase the risk of presenile cataracts (Tarwadi & Agte, 2011; Milewicz et al., 2021).

Occupational and Socioeconomic Factors

Outdoor occupations and manual labor are associated with an increased risk of cataracts due to high exposure to ultraviolet radiation and working conditions that are less supportive of eye health (Modenese et al., 2018; Bangura, 2026; Modenese et al., 2023; Wright & Norval, 2021; Alawneh et al., 2025). The study by Sundaresan et al. (2024) showed that manual workers and individuals with low socioeconomic status were more vulnerable to developing cataracts before the age of 50 years. Lower educational levels may also affect knowledge regarding preventive measures and access to healthcare services.

ISSN 2776-1150 (Print), ISSN 2776-1169 (online)

Non-Modifiable Factors

In addition to modifiable factors, several studies have shown that family history, female sex, and refractive errors also contribute to the incidence of cataracts. Royani et al. (2024) reported an association between family history and cataract incidence, while Hong et al. (2022) showed that refractive errors were an independent risk factor for cataract formation in adults.

Impact of Cataracts on Patients of Productive Age

Cataracts in the productive-age population have a substantial impact on quality of life and individual productivity (Chockalingam et al., 2024; Asroruddin et al., 2017). Reduced visual acuity causes limitations in performing daily activities, decreases work ability, and increases dependence on others. The study by Vishwakarma et al. (2025) showed that cataracts can reduce income and worsen the socioeconomic conditions of patients, particularly among populations with limited access to healthcare. In addition, visual impairment caused by cataracts can increase the risk of occupational accidents, reduce work performance, and decrease overall quality of life (Cicinelli et al., 2023; Limoli et al., 2024). Therefore, early detection and control of risk factors are very important for maintaining the productivity of the working-age population.

Cataract Prevention Strategies in Patients of Productive Age

Control of Metabolic Diseases

Controlling blood glucose levels in patients with diabetes mellitus and controlling blood pressure in patients with hypertension are important measures for preventing accelerated cataract formation. Regular health examinations are necessary to detect and control chronic diseases at an early stage.

Protection Against Ultraviolet Exposure

The use of protective equipment such as UV-protective glasses and hats when engaging in outdoor activities can reduce the impact of ultraviolet radiation on the eye lens (Talaie & Moussavi, 2025; Rocha et al., 2026; Wang et al., 2010). This measure is particularly important for workers who have high exposure to sunlight.

Lifestyle Modification

Smoking cessation, adoption of a healthy lifestyle, and maintenance of adequate nutritional status can reduce oxidative stress and help maintain lens health. Health education regarding healthy lifestyles should be provided from young adulthood.

Health Education and Promotion

Increasing public knowledge about cataract risk factors and early signs can encourage early detection and faster treatment. Health education through primary healthcare facilities is an important strategy for reducing the incidence of early-onset cataracts.

Clinical Relevance and Public Health Implications

Overall, the synthesis of the fifteen studies showed that cataract risk factors in patients of productive age are dominated by modifiable factors, namely ultraviolet exposure, diabetes mellitus, hypertension, smoking, occupation, nutritional status, and socioeconomic factors (Ang & Afshari, 2021; Wydrych et al., 2026; Hapsari et al., 2025; Norval et al., 2011). In addition, non-modifiable factors such as family history, sex, and refractive errors also contribute to an increased risk of cataracts. These findings emphasize that promotive and preventive efforts through the control of metabolic diseases, the use of protective equipment against sunlight exposure, smoking cessation, and increased health education need to be implemented from the productive age to reduce the incidence of early-onset cataracts and maintain the quality of life and productivity of the population.

CONCLUSION

This literature review indicates that the primary risk factors for cataracts in individuals of working age include ultraviolet radiation exposure, diabetes mellitus, hypertension, smoking, occupation, nutritional status, and socioeconomic conditions. Additionally, non-modifiable factors such as family history, gender, and refractive errors—also contribute to the development of cataracts during this stage of life. Most of these major risk factors are modifiable, allowing for early prevention and control measures. Effective prevention strategies include managing metabolic diseases, using protective measures against ultraviolet exposure, smoking cessation, improving nutritional status, and enhancing health education and promotion. Through a comprehensive promotive and preventive approach, the incidence of early-onset cataracts in the working-age population can be reduced, thereby preserving quality of life, work capacity, and productivity.

REFERENCES

Alawneh, A., Fraiwan, M., & Almomani, F. (2025). Eye health in farmers: The impact of environmental and occupational factors. *PLoS One*, *20*(12), e0337944. https://doi.org/10.1371/journal.pone.0337944

Alghamdi, M. A. (2026). Impact of Cataract on Color Vision and Contrast Sensitivity: A Clinical Review. *Cureus*, *18*(3).

Amelia, S. P., Alzahrah, A. P., & Safira, D. (2024). Pengaruh persyaratan usia terhadap peluang kerja bagi tenaga kerja di Indonesia. *Terang: Jurnal Kajian Ilmu Sosial, Politik Dan Hukum*, *1*(3), 66-75.

Ang, M. J., & Afshari, N. A. (2021). Cataract and systemic disease: A review. *Clinical & experimental ophthalmology*, *49*(2), 118-127. https://doi.org/10.1111/ceo.13892

Anitha, V., Madkaikar, A., Ravindran, M., & Siddique, M. U. (2022). Preferred practice of cataract surgery in brown cataract: A questionnaire-based survey among Indian ophthalmic surgeons. *Indian Journal of Ophthalmology*, *70*(11), 3893.

Asroruddin, M., Artini, W., Gondhowiarjo, T. D., Rahayu, T., & Lestari, Y. D. (2017). Impacts of impaired vision and eye diseases on vision-related quality of life in Indonesia. *Makara Journal of Health Research*, *21*(3), 6.

Awan, H., Malik, S. M., & Khan, N. U. (2012). The economic burden of blindness in Pakistan: a socio-economic and policy imperative for poverty reduction strategies. *Indian journal of ophthalmology*, *60*(5), 358.

Bangura, S. (2026). Effects of solar ultraviolet (UV) radiation on outdoor workers health: A systematic literature review. *International Journal of Business Ecosystem & Strategy (2687-2293)*, *8*(2), 447-455. https://doi.org/10.36096/ijbes.v8i2.1221

Berenguer, C. V., Pereira, F., Câmara, J. S., & Pereira, J. A. (2023). Underlying features of prostate cancer—statistics, risk factors, and emerging methods for its diagnosis. *Current Oncology*, *30*(2), 2300-2321. https://doi.org/10.3390/curroncol30020178

Chockalingam, A., Singh, A., & Kathirvel, S. (2024). Healthy aging and quality of life of the elderly. In *Principles and application of evidence-based public health practice* (pp. 187-211). Academic Press. https://doi.org/10.1016/B978-0-323-95356-6.00007-0

Choirunisa, L., Firdausi, A. A., Hasan, H. T. C., & Amarusmana, M. (2024). Risk Factor Analysis of Cataracts in Primary Health Center. *Oftalmologi Jurnal Kesehatan Mata Indonesia*, *6*(2), 72-79. https://doi.org/10.11594/ojkmi.v6i2.71

Cicinelli, M. V., Buchan, J. C., Nicholson, M., Varadaraj, V., & Khanna, R. C. (2023). Cataracts. *The Lancet*, *401*(10374), 377-389.

Damayanti, A. E., & Christina, Y. (2023). Hubungan Umur Dan Jenis Kelamin Dengan Angka

Kejadian Katarak Senilis Di Rs Camatha Sahidya. *Zona Kedokteran: Program Studi Pendidikan Dokter Universitas Batam*, *13*(2), 408-415. https://doi.org/10.37776/zked.v13i2.1182

Detty, A. U., Artini, I., & Yulian, V. R. (2021). Characteristics of risk factors for cataract patients. *Jurnal Ilmiah Kesehatan Sandi Husada*, *10*(1), 12-17. https://doi.org/10.35816/jiskh.v10i1.494

Doss, M. S., Kalyani, P., & Felix, A. J. (2021). Prevalence of cataract, its risk factors and the barriers to cataract surgery among older women in a rural population of Cuddalore. *Int J Community Med Public Health*, *8*, 5338-44.

Genco, R. J., & Borgnakke, W. S. (2013). Risk factors for periodontal disease. *Periodontology 2000*, *62*(1), 59-94. https://doi.org/10.1111/j.1600-0757.2012.00457.x

Hapsari, C., Andarini, S., Prayitnaningsih, S., & Handayani, D. (2025). Modelling age-related cataract risk: Impacts of nutrition, smoking, and UV exposure among metabolic syndrome patients in Indonesia. *Journal of Medicinal and Pharmaceutical Chemistry Research*, *7*(9), 1852-1876.

Herman, J. E., Kanda, P., Akbari, A., Kundapur, D., Podury, S., & Jegatheswaran, J. (2025). Case Report: Recurrent intraocular pressure elevation during hemodialysis in a patient with pseudoexfoliation glaucoma. *Frontiers in Ophthalmology*, *5*, 1658649.

Hong, Y., Sun, Y., Ye, X., Lu, Y., Xu, J., Xu, J., & Ji, Y. (2022). Prevalence and risk factors for adult cataract in the Jingan district of Shanghai. *Journal of Ophthalmology*, *2022*(1), 7547043. https://doi.org/10.1155/2022/7547043

Jaffet, J., Pingali, T., Raut, A. K., Mohapatra, S., & Singh, V. (2025). Eye: anatomy, physiology, and disease. In *Complex Ophthalmic Dosage Forms: Advances in Biomedical Applications and Future Perspectives* (pp. 45-69). Singapore: Springer Nature Singapore. https://doi.org/10.1007/978-981-96-6306-4_2

Li, J., Buonfiglio, F., Zeng, Y., Pfeiffer, N., & Gericke, A. (2024). Oxidative stress in cataract formation: is there a treatment approach on the horizon?. *Antioxidants*, *13*(10), 1249. https://doi.org/10.3390/antiox13101249

Limoli, P. G., Limoli, C., & Nebbioso, M. (2024). Potential guidelines for cataract surgery and rehabilitation in visually impaired patients: Literature analysis. *Aging Medicine*, *7*(6), 802-812. https://doi.org/10.1002/agm2.12386

Martyana, D. E. (2024). Faktor Risiko Katarak di Wilayah Kerja Puskesmas Astambul, Kabupaten Banjar, Kalimantan Selatan, Indonesia. *Cermin Dunia Kedokteran*, *51*(4), 185-188. https://doi.org/10.55175/cdk.v51i4.857

Milewicz, D. M., Braverman, A. C., De Backer, J., Morris, S. A., Boileau, C., Maumenee, I. H., ... & Pyeritz, R. E. (2021). Marfan syndrome. *Nature reviews Disease primers*, *7*(1), 64. https://doi.org/10.1038/s41572-021-00298-7

Modenese, A., Chou, B. R., Ádám, B., Loney, T., Paulo, M. S., Tenkate, T., & Gobba, F. (2023). Occupational exposure to solar radiation and the eye: a call to implement health surveillance of outdoor workers. *La Medicina del Lavoro*, *114*(4), e2023032. https://doi.org/10.23749/mdl.v114i4.14657

Modenese, A., Korpinen, L., & Gobba, F. (2018). Solar radiation exposure and outdoor work: an underestimated occupational risk. *International journal of environmental research and public health*, *15*(10), 2063. https://doi.org/10.3390/ijerph15102063

Norval, M., Lucas, R. M., Cullen, A. P., De Gruijl, F. R., Longstreth, J., Takizawa, Y., & Van Der Leun, J. C. (2011). The human health effects of ozone depletion and interactions with climate change. *Photochemical & Photobiological Sciences*, *10*(2), 199-225.

https://doi.org/10.1039/c0pp90044c

Pamungkas, M., Mahwati, Y., Suparni, S., Hartiningsih, S. S., & Tusrini, W. (2024). Faktor Risiko Kejadian Katarak. *Jurnal Sehat Masada*, *18*(1), 59-79. https://doi.org/10.38037/jsm.v18i1.460

Pasaribu, I. A., Buana, A. W., & Utami, P. D. (2025). Screening and Risk Factor Assessment of Cataract and Glaucoma in Hypertensive and Diabetic Populations along the Surabaya Coast. *International Journal of Biomedical Science and Travel Medicine*, *2*(2), 60-64.

Putri, M. S. D., Kurniawan, M. I., Datu, H. H. R., Kusumawardhani, S. I., & Anoez, A. (2024). Gambaran Visus Pasien Katarak Post Operatif di RS. Bhayangkara Tahun September 2019–Januari 2022. *Fakumi Medical Journal: Jurnal Mahasiswa Kedokteran*, *4*(1), 29-37. https://doi.org/10.33096/fmj.v4i1.319

Putri, N. R. A., Ramli, R. R., & Savista, T. M. V. (2022). Gambaran Faktor Risiko Terjadinya Katarak di Rumah Sakit Umum Anutapura Palu dan Klinik Spesialis Mata Mitra. *Medika Alkhairaat: Jurnal Penelitian Kedokteran Dan Kesehatan*, *4*(1), 19-24. https://doi.org/10.31970/ma.v4i1.92

Rahayu, T., Lestari, Y. D., Ayudianingrum, A., & Rif'Ati, L. (2023). Spectacle Coverage Rate After Cataract Surgery in an Urban Area in Indonesia. *Clinical Optometry*, 167-173. https://doi.org/10.2147/OPTO.S417876

Rocha, R., Santos, J., Baptista, J. S., Joana, G., & Carlos, C. (2026). Occupational Exposure to Solar Ultraviolet Radiation: A Systematic Review of Protective Measures. *Safety*, *12*(1), 10.

Rohmah, S. (2024). Prevalence and analysis of risk factors for cataracts in Jember Regency, Indonesia. *Sriwijaya Journal of Ophthalmology*, *7*(1), 311-317.

Royani, A., Kusumajaya, H., & Arjuna, A. (2024). Faktor-Faktor Yang Berhubungan dengan Kejadian Katarak Pada Lansia Di Poli Mata. *Jurnal Penelitian Perawat Profesional*, *6*, 1-10.

Shandiz, J. H., Derakhshan, A., Daneshyar, A., Azimi, A., Moghaddam, H. O., Yekta, A. A., ... & Esmaily, H. (2011). Effect of cataract type and severity on visual acuity and contrast sensitivity. *Journal of ophthalmic & vision research*, *6*(1), 26.

Sundaresan, S., Sharmila, B., Elangovan, S., Chelliah, R., & Senthamarai, G. (2024). Work Profile and Risk Factors of Presenile Cataract in the South Indian Population: A Case-Control Study. *tnoa Journal of Ophthalmic Science and Research*, *62*(3), 337-341.

Sunkesula, S., Koochan, H. K., Killani, S. P., & Thanuja, T. (2025). Clinical Study of Presenile Cataract and its Causes and Risk Factors. *Telangana Journal of Ophthalmology*, *1*(1), 15-18.

Talaie, A., & Moussavi, S. M. (2025). The impact of ultraviolet radiation on human health. *Journal of Environmental Treatment Techniques*, *12*(1), 39-66.

Tarwadi, K. V., & Agte, V. V. (2011). Interrelationships between nutritional status, socioeconomic factors, and lifestyle in Indian cataract patients. *Nutrition*, *27*(1), 40-45. https://doi.org/10.1016/j.nut.2009.11.015

Vishwakarma, P., Mondal, A., Ranpise, D., Sundararaj, L., Shaikh, S., Chavan, S., & Kurian, E. (2025). Impact of cataract on the livelihood income status of patients availing free cataract surgery in India. *International Journal of Community Medicine and Public Health*, *12*(6), 2627.

Wang, S. Q., Balagula, Y., & Osterwalder, U. (2010). Photoprotection: a review of the current and future technologies. *Dermatologic therapy*, *23*(1), 31-47.

Wijayanti, L. A., Mainassy, M. C., Aryadi, A., Pannyiwi, R., Said, A., & Harlina, H. (2023). Analysis of Age and Gender Factors on the Incidence Rate of Cataracts in the Ophthalmology

Clinic. *International Journal of Health Sciences*, *1*(3), 258-265.

Wright, C. Y., & Norval, M. (2021). Health risks associated with excessive exposure to solar ultraviolet radiation among outdoor workers in South Africa: an overview. *Frontiers in public health*, *9*, 678680. https://doi.org/10.3389/fpubh.2021.678680

Wydrych, A., Domański, A., Dziekońska, M., Wójcik, M., Kowalczyk, K., Bogiel, Z., ... & Tomczyk, A. (2026). The role of lifestyle and diet in the course of cataract: a literature review. *Quality in Sport*, *50*, 68083-68083. https://doi.org/10.12775/QS.2026.50.68083

Zhang, L., Zhu, F., Xie, L., Wang, C., Wang, J., Chen, R., ... & Zhou, M. (2020). Clinical characteristics of COVID-19-infected cancer patients: a retrospective case study in three hospitals within Wuhan, China. *Annals of oncology*, *31*(7), 894-901. https://doi.org/10.1016/j.annonc.2020.03.296

