JOURNAL LA MEDIHEALTICO

VOL. 07, ISSUE 02 (583-592), 2026
DOI: 10.37899/journallamedihealtico.v7i2.3253

Characteristics of Pterygium Patients at Waled Regional Hospital

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Article Info

Article history:
Received 16 April 2026
Received in revised form 12 May 2026
Accepted 12 June 2026

Keywords:
Pterygium
Ultraviolet Light
RSUD Waled
Patient Characteristics
Recurrent Red Eyes

Abstract

Pterygium is a triangular fibrovascular growth of the ocular surface that is commonly found in tropical regions, including Indonesia. This condition is frequently associated with prolonged ultraviolet exposure and may cause recurrent red eyes, irritation, foreign body sensation, and visual disturbance. This study aimed to describe the characteristics of pterygium patients at Waled Regional General Hospital, Cirebon Regency, in 2025, based on age, gender, occupation, duration of ultraviolet exposure, pterygium grade, and clinical manifestations. This study used a descriptive observational design with primary data collected through questionnaires. A total of 42 patients diagnosed with pterygium were selected using total sampling according to the inclusion criteria. The data were analyzed using univariate analysis and presented as frequency and percentage distributions. The results showed that most patients were aged 56–65 years (42.9%) and were female (61.9%). Housewives represented the largest occupational group (52.4%), and most respondents had ultraviolet exposure of more than five hours per day (76.2%). Grade II pterygium was the most common severity level (42.9%), while recurrent red eye was the most frequently reported clinical manifestation (42.9%). These findings indicate that pterygium patients at Waled Regional General Hospital were predominantly older adults, women, and individuals with prolonged ultraviolet exposure. Therefore, preventive education regarding eye protection, including the use of sunglasses, hats, or other protective equipment during outdoor activities, is essential to reduce the risk and progression of pterygium.

Introduction

The eye is an organ that functions as the organ of vision. Abnormalities can occur in the eye that may affect a person's vision and appearance. One of the most common eye abnormalities is pterygium. The term "pterygium" derives from "pteryx," meaning wing, and "pterygion," meaning fin. A pterygium is a fibrovascular growth of the subconjunctival tissue, triangular in shape, that extends toward the cornea at the medial and/or lateral palpebral fissure (Sarkar, 2023; Ghiasian et al., 2022; Rui-Pin Fan et al., 2026). A pterygium is a proliferative disorder of the ocular surface caused by connective tissue remodeling and angiogenesis, leading to fibrovascular proliferation (Nazhifah Naura, 2022; Ding et al., 2024; Eroğul & Şen, 2024). Pterygium can occur in one eye or both eyes; depending on its growth toward the visual axis, advanced pterygium can cause visual symptoms due to induced astigmatism or direct interference with the visual axis, so advanced pterygium has the potential to cause vision loss and may even lead to blindness (Wedananta et al., 2023; Rad, 2025; Chu et al., 2026; Hirabayashi & Barnett, 2023).

ISSN 2721-1215 (Print), ISSN 2721-1231 (Online)

The incidence of pterygium varies across different regions of the world. According to Cameron, the highest incidence is found in the "pterygium belt," located between 37 degrees north and south of the equator; the incidence of pterygium is reported to vary widely from 0.3% to 29% worldwide (Sarkar, 2023). In Indonesia, the incidence of pterygium ranges from 7.5% to 16.9%, with a prevalence that tends to be higher in rural areas and regions with high levels of ultraviolet (UV) exposure (Nafiisah & Setyawan, 2025; Tandon et al., 2022). According to a study by Made Satria Wedananta based on outpatient visit data in West Java, pterygium accounted for the highest number of cases in 2021 at the Mangusada Polyclinic in Bandung, with 232 cases, and ranked fifth in terms of the highest number of cases in 2022, with 299 cases (Wedananta et al., 2023).

Pterygium is more commonly found in tropical and subtropical countries. Indonesia is a tropical country with high UV exposure and has a 44 times higher risk of developing pterygium compared to non-tropical regions (Setyanto et al., 2023). The highest prevalence of pterygium is found among farmers, fishermen, and laborers at 15.8%, with 5.6% of cases being bilateral pterygium and 2.7% unilateral pterygium. Farmers working less than 5 hours per day have a lower risk of developing pterygium compared to those working more than 5 hours per day, indicating that prolonged outdoor exposure to UV radiation increases the risk of pterygium. The high incidence of pterygium in certain occupations is associated with high daily exposure to sunlight, wind, and dust (Rais & Nasrul, 2022; Ilmawati, 2024; Alawneh et al., 2025). Prevalence is related to Indonesia's geographical location on the equator and its status as an agrarian country where the majority of the population works as farmers (Purnawan et al., 2026; Kristanto et al., 2025; Ariefiansyah & Herman, 2023; Fahrudin et al., 2022).

Cirebon Regency, located on the northern coast of West Java Province, features a low-lying topography and a tropical climate, with average daily temperatures ranging from 25 to 30 degrees Celsius and high levels of sunlight throughout most of the year. These conditions put people who work or engage in outdoor activities at high risk of exposure to ultraviolet (UV) radiation. As a coastal region, Cirebon also has high humidity and winds carrying dust particles, creating an ideal environment for the development of chronic eye irritation. The combination of UV exposure, wind, and dust constitutes a significant environmental factor in the development of pterygium. Although Cirebon has conditions that contribute to a high risk of pterygium, data on the prevalence and distribution of clinical characteristics among pterygium patients in Cirebon are not yet available.

On the other hand, previous studies have shown that the characteristics of pterygium patients are generally dominated by adults and the elderly and are more common among women, with occupational variations such as those in the private sector and homemakers (Purnomo D et al., 2020; Wedananta et al., 2023; Rimkute & Sugiharti, 2023; Uğur, 2024; Barth et al., 2024). Meanwhile, the study by (Alsarhani et al., 2021) focused more on clinical aspects, specifically the rate of postoperative recurrence, rather than on patient demographic characteristics. Nevertheless, studies integrating environmental risk factors such as duration of ultraviolet (UV) exposure, along with comprehensive analyses covering severity levels and clinical manifestations, remain limited, particularly within the healthcare context at Waled District General Hospital in Cirebon. Therefore, this study aims to address this gap by examining the characteristics of pterygium patients based on age, gender, occupation, duration of UV exposure, severity, and clinical manifestations in 2025 through a case study at Waled District General Hospital in Cirebon Regency.

Consequently, the researchers emphasize the importance of this study as a data source regarding the characteristics of pterygium patients at Waled District General Hospital in Cirebon Regency. It is hoped that in the future, the researchers can provide information regarding the currently low public awareness of pterygium. Health education and promotion play a crucial role in raising public awareness, such as by providing information on risk factors

and the importance of eye protection like wearing sunglasses and a hat when outdoors since proper protective measures can prevent long-term UV exposure, thereby reducing the incidence of pterygium (Terbuka, 2020) and serving as a preventive measure against the condition (Malisngorar & Tunny, 2021).

Methods

This study is a descriptive observational study aimed at describing the characteristics of pterygium patients at Waled Regional General Hospital in Cirebon Regency in 2025. The study was conducted from February to May 2025, with primary data collected through questionnaires completed by patients visiting the Ophthalmology Clinic at Waled Regional General Hospital. The target population for this study was all pterygium patients, while the accessible population consisted of pterygium patients who visited the Ophthalmology Clinic at Waled Regional General Hospital during the study period. The study sample was determined using total sampling with inclusion criteria consisting of patients diagnosed with pterygium by an ophthalmologist and willing to participate as respondents by signing an informed consent form, while the exclusion criterion was patients with a history of recurrent relapse. The research variables were the characteristics of pterygium patients, including age, gender, occupation, exposure to (UV) exposure, pterygium grade, and clinical manifestations, which are further detailed in the operational definitions table (Table 1).

Table 1. Variables and Operational Definitions

No	Variable	Definition	Measurement Scale	Measurement Result
1	Pterygium	Fibrovascular tissue growth in a triangular shape	Ordinal	Grade 1 (limited to the limbus) Grade 2 (extends beyond the limbus) Grade 3 (growth >2 mm but does not cover the visual axis) Grade 4 (growth extends over the pupil and impairs vision)
2	Age	Age range of respondents based on questionnaire responses	Ordinal	17–25 years 26–35 years 36–45 years 46–55 years 56–65 years >65 years
3	Gender	Patient identity recorded based on questionnaire responses	Nominal	Male Female
4	Occupation	Patient occupation recorded based on questionnaire responses	Nominal	Farmer Fisherman Office worker Laborer Housewife Other workers
5	UV exposure	Duration of ultraviolet (UV) exposure to the eyes	Nominal	Outdoor activity >5 hours per day

				Outdoor activity <5 hours per day
6	Clinical manifestations	Symptoms experienced at first presentation	Nominal	Blurred vision Dry eyes Itching or burning sensation Foreign body sensation Recurrent red eye

Furthermore, data were collected via a questionnaire as the primary instrument, which was completed directly by respondents during their visit to the Ophthalmology Clinic at Waled Regional General Hospital in Cirebon Regency. The collected data were then processed and aanalyzed using univariate analysis to provide an overview of the frequency distribution of each study variable, namely age, gender, occupation, UV exposure, pterygium grade, and clinical manifestations. The entire research process received ethical approval from the Health Research Ethics Committee of Waled Regional General Hospital, Cirebon Regency, under number 000.9.2/114/KEPK/I/2025. The study was conducted while upholding the principles of data confidentiality, informed consent, and the protection of respondents' rights throughout the research process.

Result and Discussion

This section presents the demographic and clinical characteristics of pterygium patients treated at Waled Regional Hospital, Cirebon Regency, in 2025. The findings are organized into six major categories, namely age, gender, occupation, duration of ultraviolet (UV) exposure, pterygium grade, and clinical manifestations. Frequency and percentage distributions are presented to provide a comprehensive overview of the study population. The total sample consisted of 42 patients diagnosed with pterygium.

Age Distribution of Pterygium Patients

Table 2 presents the age distribution of respondents. The majority of patients were in the 56–65 years age group, accounting for 18 patients (42.9%), followed by those aged >65 years with 11 patients (26.2%). No patients were found in the 17–25 years age group.

Table 2. Age Distribution of Pterygium Patients (n = 42)

Age Group (Years)	Frequency (n)	Percentage (%)
17–25	0	0.0
26–35	1	2.4
36–45	4	9.5
46–55	8	19.0
56–65	18	42.9
>65	11	26.2
Total	42	100.0

Source: Primary Data Analysis, 2025

These findings indicate that pterygium predominantly affects older adults. The higher prevalence in elderly patients may reflect cumulative exposure to environmental risk factors, especially long-term ultraviolet radiation.

Gender Distribution of Pterygium Patients

The distribution of respondents according to gender is presented in Table 3. Female patients represented the majority of cases, with 26 individuals (61.9%), while male patients accounted for 16 individuals (38.1%).

Table 3. Gender Distribution of Pterygium Patients (n = 42)

Gender	Frequency (n)	Percentage (%)
Male	16	38.1
Female	26	61.9
Total	42	100.0

Source: Primary Data Analysis, 2025

These findings demonstrate that female patients were more frequently diagnosed with pterygium during the study period.

Occupational Distribution of Pterygium Patients

Table 4 summarizes the occupational characteristics of respondents. Housewives constituted the largest occupational group, accounting for 22 patients (52.4%). Farmers and laborers each represented 9 patients (21.4%).

Table 4. Occupational Distribution of Pterygium Patients (n = 42)

Occupation	Frequency (n)	Percentage (%)
Farmer	9	21.4
Fisherman	0	0.0
Office Worker	1	2.4
Laborer	9	21.4
Housewife	22	52.4
Other Occupations	1	2.4
Total	42	100.0

Source: Primary Data Analysis, 2025

The predominance of housewives suggests that pterygium is not exclusively associated with formal outdoor occupations. Daily household activities involving prolonged sun exposure may also contribute to disease development.

Distribution Based on Duration of UV Exposure

The duration of ultraviolet exposure among respondents is shown in Table 5. Most patients reported UV exposure exceeding five hours per day, representing 32 patients (76.2%).

Table 5. Distribution of Pterygium Patients Based on UV Exposure Duration (n = 42)

UV Exposure Duration	Frequency (n)	Percentage (%)
< 5 hours/day	10	23.8
> 5 hours/day	32	76.2
Total	42	100.0

Source: Primary Data Analysis, 2025

The findings reveal that prolonged UV exposure was common among respondents, indicating ultraviolet radiation as an important environmental factor in pterygium occurrence.

Distribution of Pterygium Grade

The severity distribution of pterygium is presented in Table 6. Grade II pterygium was the most frequently identified category, affecting 18 patients (42.9%), followed by Grade III with 13 patients (31.0%).

Table 6. Distribution of Pterygium Grade (n = 42)

Pterygium Grade	Frequency (n)	Percentage (%)
Grade I	9	21.4

Grade II	18	42.9
Grade III	13	31.0
Grade IV	2	4.8
Total	42	100.0

Source: Primary Data Analysis, 2025

Grade II emerged as the predominant severity level, indicating that most patients sought medical attention after the lesion had extended beyond the limbus but before severe visual axis involvement.

Distribution of Clinical Manifestations

Table 7 presents the clinical manifestations reported by respondents. Recurrent red eye was the most frequently reported symptom, affecting 18 patients (42.9%).

Table 7. Distribution of Clinical Manifestations of Pterygium Patients (n = 42)

Clinical Manifestation	Frequency (n)	Percentage (%)
Blurred Vision	10	23.8
Dry Eyes	5	11.9
Itching/Burning Sensation	4	9.5
Foreign Body Sensation	5	11.9
Recurrent Red Eye	18	42.9
Total	42	100.0

Source: Primary Data Analysis, 2025

Recurrent red eye was identified as the predominant clinical manifestation. This finding indicates that chronic ocular surface irritation and inflammation remain the most common presenting complaints among pterygium patients. The results demonstrate that pterygium patients at Waled Regional Hospital were predominantly older adults, female, and housewives, with a history of prolonged ultraviolet exposure. Grade II was the most common severity level, while recurrent red eye represented the most frequently reported clinical manifestation.

Demographic and Clinical Characteristics of Pterygium Patients

This study provides a comprehensive overview of the demographic and clinical characteristics of pterygium patients treated at Waled Regional Hospital, Cirebon Regency, in 2025. The findings indicate that pterygium was predominantly found in older adults, especially those aged 56–65 years, with a higher proportion among female patients. In addition, most respondents were housewives, had prolonged ultraviolet (UV) exposure exceeding five hours daily, were diagnosed with Grade II pterygium, and commonly presented with recurrent red eyes as the main clinical complaint.

The predominance of pterygium among patients aged 56–65 years suggests that age remains an important contributing factor in disease development. This finding is consistent with previous studies showing that pterygium prevalence increases with age due to cumulative exposure to ultraviolet radiation and chronic environmental irritation over time. Long-term UV exposure may induce limbal stem cell damage, oxidative stress, and fibrovascular proliferation on the ocular surface, eventually leading to pterygium formation (Sarkar, 2023; Wang et al., 2020). The absence of cases in younger age groups further supports the assumption that pterygium develops progressively over many years. Similar findings were reported by Wedananta et al. (2023), who observed that pterygium cases were predominantly found among middle-aged and elderly populations.

This study also found that female patients constituted the majority of cases. This finding differs from several studies reporting higher prevalence among males due to greater occupational

outdoor exposure (Qadi et al., 2021). However, the present findings may reflect local sociocultural conditions in Waled, where women, particularly housewives, frequently perform outdoor domestic activities such as drying clothes, cleaning yards, or engaging in informal work under direct sunlight. These repeated daily exposures may significantly contribute to cumulative ocular UV exposure. Previous studies in Indonesia similarly reported a substantial proportion of female pterygium patients, suggesting that gender-related exposure patterns may vary across regions (Supanji et al., 2021; Syaaf et al., 2023).

Occupational distribution revealed that housewives represented the largest patient group, followed by farmers and laborers. This result challenges the traditional assumption that pterygium primarily affects individuals in formal outdoor occupations such as fishermen or agricultural workers. While outdoor occupations remain important risk factors, this study highlights that non-formal occupations may also involve substantial UV exposure. Housewives in tropical regions often perform routine activities outdoors without adequate eye protection, increasing cumulative sun exposure. According to Setyanto et al. (2023), prolonged outdoor activity significantly increases the risk of pterygium, particularly among individuals with limited protective measures. Furthermore, exposure to wind and dust may aggravate chronic ocular surface irritation, thereby accelerating disease development (Rais & Nasrul, 2022; Hashmi et al., 2023; Duarte et al., 2026).

One of the most important findings in this study was the high proportion of patients with UV exposure exceeding five hours per day. This observation strongly reinforces the established role of ultraviolet radiation as a major environmental risk factor for pterygium. UV radiation contributes to elastotic degeneration of collagen fibers, stimulates inflammatory cytokines, and promotes angiogenesis, which collectively support fibrovascular growth toward the cornea (Tandon et al., 2022). Similar findings have been reported in studies involving tropical and coastal populations, where prolonged UV exposure was consistently associated with increased pterygium incidence (Hatsusaka et al., 2021; Chui & Coroneo, 2024). Given Indonesia's tropical climate and high annual UV intensity, public awareness regarding eye protection remains essential.

Regarding disease severity, Grade II pterygium was the most frequently observed category. This suggests that many patients seek medical attention when the lesion has extended beyond the limbus but before severe visual impairment develops. Grade II may represent a transitional stage in which symptoms become sufficiently disturbing to encourage clinical consultation. The relatively small number of Grade IV cases indicates that severe progression involving the visual axis was less common. Early diagnosis at moderate stages is clinically beneficial because intervention before advanced corneal involvement may reduce the risk of visual impairment (Nazhifah Naura, 2022; Nafiisah & Setyawan, 2025).

Recurrent red eye emerged as the most common clinical manifestation among respondents. This finding emphasizes the inflammatory nature of pterygium and its impact on ocular surface homeostasis. Chronic irritation caused by UV exposure, dryness, wind, and dust can trigger conjunctival vascular congestion, resulting in repeated redness. Inflammation and ocular surface imbalance are known to play central roles in symptom development among pterygium patients (Fang et al., 2024). The predominance of recurrent red eye over blurred vision suggests that irritation-related symptoms may appear earlier than visual impairment. This observation is clinically relevant because patients frequently seek medical care due to discomfort rather than reduced visual acuity. This study confirms that pterygium is a multifactorial ocular surface disorder strongly influenced by age, environmental exposure, and occupational behavior. The combination of older age, prolonged UV exposure, and chronic ocular irritation appears to play a central role in disease occurrence among patients at Waled Regional Hospital. These findings provide important local epidemiological evidence and may serve as a foundation for targeted preventive programs, particularly health education promoting eye protection during outdoor

activities. Future studies with larger sample sizes and analytical designs are recommended to further explore causal relationships between environmental risk factors and pterygium progression.

Conclusion

Based on the research findings, it can be concluded that the characteristics of pterygium patients at Waled General Hospital, Cirebon Regency, in 2025 were most commonly found in the 56–65 age group, among females, and predominantly among housewives. The majority of patients had a history of ultraviolet (UV) exposure exceeding 5 hours per day. Additionally, the most common pterygium grade was grade 2, with the most frequently observed clinical manifestation being recurrent red eyes. These findings indicate that age, gender, occupation, and UV exposure play a role in the characteristics of pterygium patients at the study site.

In efforts to prevent and control pterygium, the public is encouraged to increase awareness of protecting their eyes from UV exposure by wearing protective sunglasses, hats, or helmets during outdoor activities, and to seek immediate eye examinations if experiencing symptoms such as recurrent red eyes or vision disturbances. Healthcare providers are encouraged to strengthen promotive and preventive efforts through routine education regarding risk factors and early detection of pterygium, particularly among high-risk groups. Additionally, future studies are recommended to include a larger sample size and a longer study period to obtain a more comprehensive and representative picture of pterygium patient characteristics.

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