

# A Personal Approach in Educating the Use of Eye Protection to Prevent Pterygium among Fishermen in the Coastal Village of Waihaong, Ambon City

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**Abstract**— Pterygium is an eye disease commonly found in coastal fishermen due to excessive ultraviolet (UV) radiation exposure. Waihaong Village, Ambon City, is one of the coastal areas with many fishermen who are vulnerable to this risk. This community service activity aimed to raise awareness among the fishermen in Waihaong Village regarding the importance of using eye protection to prevent the occurrence of pterygium. The educational activity was held on June 8, 2024, in Waihaong Village, Ambon City. The method was participatory, conducting direct educational sessions for the fishermen through door-to-door counselling and group meetings. The results of the community service performed in Waihaong Village, Ambon City, show that a personal approach to education is highly effective in increasing the fishermen's knowledge and awareness of the importance of eye protection against UV radiation exposure that could lead to pterygium. This direct and personal approach encouraged the fishermen to become more proactive in applying eye protection, such as wearing sunglasses, during their daily activities at sea.

**Keywords:** Pterygium, fishermen, personal approach, eye protection

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## I. INTRODUCTION

Indonesia has a vast maritime territory, providing a livelihood for many workers closely tied to marine activities, including fishermen (Malisngorar & Tunny, 2021). Fishermen are people whose economic life heavily depends on the marine environment through fishing activities or aquaculture. Most of them reside in coastal areas, close to their places of work (Assagaf et al., 2023). According to Nazhifah and Kadriyan (2022), fishermen are often exposed to sunlight containing ultraviolet (UV) radiation, which is one of the factors that can increase the incidence of pterygium.

Pterygium is a wing-shaped growth of tissue that contains blood vessels and tissue originating from the conjunctiva. This growth may spread to the corneal limbus and even extend onto the cornea (Cárdenas-Cantú et al., 2016; Shahraki et al., 2021). Damage to the limbal stem cells, which serve as the boundary between the cornea and conjunctiva, is an early stage of developing pterygium (Das et al., 2015; Notara et al., 2018). UV exposure can lead to mutations in the p53 gene, triggering the proliferation of limbal epithelial cells and the formation of fibrovascular tissue that extends toward the cornea (Somba et al., 2018).

Based on data from Riskesdas in 2013, the prevalence of pterygium in Indonesia was recorded at 8.3%, with the highest prevalence found in Bali (25.2%), followed by Maluku (18.0%) and West Nusa Tenggara (17.0%). Meanwhile, the lowest prevalence of pterygium was recorded in DKI Jakarta (3.7%) and Banten (3.9%). The geographical location of Maluku, situated between 30 and 8,300 degrees south latitude, makes it a region prone to pterygium occurrence. Additionally, Maluku's characteristics as an archipelagic province, with 90% of its territory consisting of seas, resulting in a large portion of the population working as fishermen and farmers, who are at significant risk of direct UV exposure (Malisngorar & Tunny, 2021).

Key risk factors for the occurrence of pterygium include ageing, with individuals over 40 having a higher prevalence of the condition (Pamungkas et al., 2024). Gender also plays a role, with men being more susceptible to pterygium than women. Occupations that require outdoor work are another risk factor, as direct exposure to intense UV radiation can damage the eyes and increase the likelihood of pterygium development (Rahma & Batubara, 2021). Among fishermen, pterygium is more commonly found in those who do not take

preventive measures, as they are exposed to UV radiation continuously (Tandon *et al.*, 2022).

In Waihaong Village, Ambon City, fishermen are particularly vulnerable to pterygium due to the high intensity of UV exposure while working at sea. However, despite the known risk, many fishermen remain unaware of the importance of eye protection in preventing pterygium.

Personal Protective Equipment (PPE) is an effective preventive measure to reduce the risk of pterygium (Aisyah, 2020; Aulia & Susilawati, 2024). Using sunglasses and wide-brimmed hats that protect the eyes from direct sunlight and irritation from strong winds is crucial in reducing the incidence of pterygium. Studies have shown that the incidence of pterygium is 0.7 times higher in individuals who do not wear sunglasses and hats compared to those who consistently wear them (Amsyar *et al.*, 2023). Some fishermen feel uncomfortable and limited in their daily activities when required to use eye protection, such as hats or sunglasses. Many only use sunglasses or hats when their eyes feel irritated or sore due to intense sun exposure, mainly while working at sea or along the shoreline. However, once the irritation subsides, the habit of using eye protection is often discontinued, mainly due to the discomfort they experience. This behaviour leads to a lack of awareness about the importance of sustained eye protection, even though excessive UV exposure can increase the risk of eye diseases like pterygium, which is common among fishermen frequently exposed to direct sunlight.

Educational efforts are necessary to prevent pterygium in fishermen (Kaliky & Ukratalo, 2025; Embisa & Ukratalo, 2025). Education is a learning process that can be conducted both formally and informally, aimed at educating, providing knowledge, and developing the potential within each individual, thereby achieving a better learning process (Manery *et al.*, 2024; Afnil *et al.*, 2025). According to the Indonesian Dictionary (KBBI), education refers to changing a person's or group's attitude and behaviour to mature through teaching, training, processes, and methods of instruction. On the other hand, health education is the application or implementation of education in health. Operationally, health education refers to all activities to provide and enhance knowledge, attitudes, and good practices among individuals, groups, or communities to maintain and improve their health.

This education must be tailored to the habits and conditions of the fishermen, providing them with a deeper understanding of the harmful effects of excessive sun exposure without protection. Using comfortable and appropriate eye protection, such as UV-protective sunglasses, can help prevent eye damage and improve the quality of life for fishermen who spend extended periods outdoors.

This community service activity aims to raise awareness among the fishermen in Waihaong Village about the importance of using eye protection to prevent pterygium.

## II. METHOD

The educational activity on using eye protection to prevent pterygium was conducted on June 8, 2024, in Waihaong Village, Ambon City. The activity was conducted personally by visiting fishermen at locations they frequent after finishing their fishing activities, such as at the harbour or gathering areas. This personal approach was chosen to provide each fisherman with the opportunity to receive direct and more in-depth information regarding the importance of protecting their eyes from excessive UV exposure, which can lead to pterygium.

## III. RESULT AND DISCUSSION

This community service activity began with socialization sessions aimed at the fishermen's group in Waihaong Village. The socialization was conducted directly at locations frequently visited by the fishermen, such as gathering areas after they had finished their fishing activities (Figure 1). The selection of these locations was intended to facilitate easy access to information for the fishermen without interrupting their primary activities. Many fishermen have limited time and face difficulties attending meetings outside their working hours, so deciding to hold socialization at familiar and strategic locations is an effective solution. Additionally, these locations served as social gathering points, allowing the fishermen to interact with one another, making delivering information more natural and easier to absorb in a relaxed setting.





Figure 1. Personal Education for Fishermen

The socialization at these locations allowed for direct discussions between the community service team and the fishermen, allowing them to ask questions and receive more detailed explanations regarding the benefits of using eye protection. This direct interaction was essential, as it allowed fishermen to express their concerns or doubts about eye protection, which might have been perceived as impractical or uncomfortable. During these discussions, the community service team could offer in-depth explanations about the dangers of UV exposure on eye health and how eye protection, such as UV-protective sunglasses, could significantly reduce the risk of developing pterygium.

Pterygium is a fibrovascular tissue growth that affects the bulbar conjunctiva and extends onto the corneal surface (Sakti, 2021). This condition is degenerative and invasive, typically occurring bilaterally on the nasal side of the eye. Pterygium generally takes a triangular shape, with the head or apex facing the centre of the cornea, while the base faces the semilunar fold at the eye's canthus. Pterygium is more commonly experienced by individuals exposed to direct sunlight for extended periods, particularly those who spend much time outdoors with high UV exposure.

The session also explained that fishermen working more than 5 hours per day have a higher risk of developing pterygium than those working less than 5 hours per day. Pterygium can be classified into four degrees (Figure 2):

1. Degree I: When fibrovascular tissue covers the sclera but does not pass the limbus.
2. Degree II: When fibrovascular tissue covers the sclera, crosses the limbus, and covers less than 2mm of the cornea.
3. Degree III: When fibrovascular tissue reaches the edge of the pupil.
4. Degree IV: When fibrovascular tissue passes over the pupil.

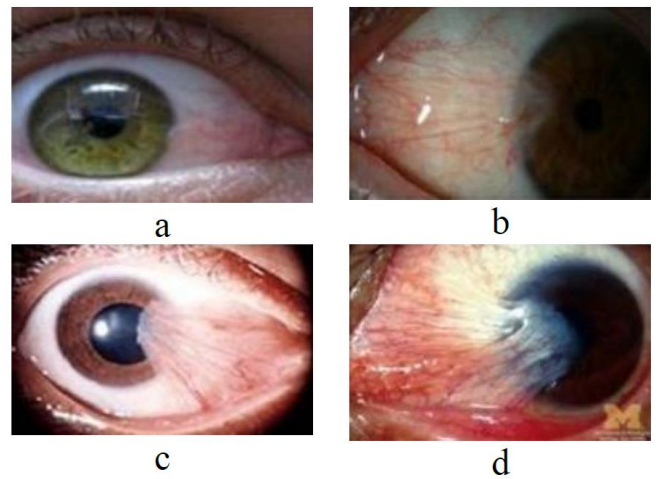


Figure 2. Classification of Pterygium  
a) Grade I, b) Grade II, c) Grade III, d) Grade IV

In the early stages, symptoms may include red eyes, cosmetic disturbances such as a membrane on the eye, and discomfort or a foreign body sensation without a significant decrease in visual acuity. A reduction in visual acuity typically occurs in pterygium stages III and IV, as the fibrovascular tissue covers the pupil (Paloma & Geriputri, 2023). If left untreated, pterygium can cause cosmetic concerns, abnormal tear function leading to dry eyes, and potentially impair vision in stages III and IV (Rany, 2017; Linaburg et al., 2018). Pterygium is also one of the causes of blindness among populations in coastal areas, such as fishermen and homemakers. The risk of blindness increases with longer years of work experience (Tesfai et al., 2021). The most common treatment for pterygium is surgery, which is performed when the pterygium interferes with vision. The main complication after surgery is recurrence, which is the regrowth of fibrovascular tissue at the limbus and cornea. However, surgery may improve the tear film, reducing dry eye symptoms in pterygium patients (Singh, 2017; Linaburg et al., 2018).

To reinforce knowledge and provide more detailed information, each fisherman participating in the activity was also given a leaflet containing essential information about pterygium and its prevention. The leaflet was written in simple language with easily understandable images, making it accessible to fishermen without a medical background (Figure 3).



Figure 3. Pterygium Leaflet

Additionally, the team explained that using Personal Protective Equipment (PPE), such as sunglasses, can help prevent the occurrence of pterygium. According to Itamurti et al. (2021), sunglasses can provide eye protection; however, ultraviolet (UV) radiation can still reach the eyes even when sunglasses are worn. UV radiation can reach the eyes from various directions, such as through direct sunlight, from below via radiation reflected from the ground's surface, and in all directions through diffuse radiation. Therefore, if the sunglasses used are ineffective, they could increase the UV radiation dose received by the eyes due to pupil dilation (Backes et al., 2019).

Sunglasses are not merely accessories but are vital tools to protect the eyes from UV radiation. Choosing the right sunglasses also affects how well they provide protection. High-quality sunglasses should be equipped with labels or stickers stating that they provide 100% UV protection against all types of UV rays. Some manufacturers also include a label stating "UV absorption up to 400nm," which means the same. The colour of the sunglasses should not be the primary indicator of UV protection. Darker lenses do not necessarily offer better protection. For example, sunglasses with yellow or grey lenses do not filter more sunlight. Meanwhile, lenses with brown or rose colours can provide better contrast but do not directly improve UV protection.

Complete Personal Protective Equipment (PPE) is strongly related to a reduced risk of pterygium in fishermen. According to Rany (2017), wearing complete PPE, including long-sleeve clothing, hats, gloves, masks, boots, and sunglasses, can help reduce direct exposure to the factors that cause pterygium, particularly harmful ultraviolet (UV) radiation. Excessive UV exposure, especially for fishermen who often work outdoors, is a primary factor leading to pterygium.

#### IV. CONCLUSION

A personal approach to educating fishermen in Waihaong Village, Ambon City, about eye protection from excessive ultraviolet exposure is crucial in raising their awareness and knowledge. This personal approach can foster a closer, trusting relationship between the educators and the fishermen, making the information more readily accepted and applied in their daily lives. It also encourages a more proactive behavioural change in maintaining eye health amidst the challenging working environment.

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