

## KNOWLEDGE ON EYE HEALTH IN KARANG DUKUH VILLAGE, BARITO KUALA, SOUTH BORNEO, INDONESIA

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### ABSTRAK

Gangguan penglihatan dapat menyebabkan penurunan kualitas hidup seseorang. Gangguan penglihatan adalah masalah kesehatan masyarakat dunia yang dapat dicegah. Penyakit katarak dan refraktif error menjadi dua permasalahan utama. Penyuluhan kesehatan mata merupakan upaya promotif dan preventif untuk meminimalkan prevalensi kerusakan mata. Penelitian bertujuan untuk mengukur pengetahuan responden mengenai kesehatan mata sebelum dan setelah penyuluhan kesehatan mata dengan cara pengisian kuesioner. Penyuluhan dilaksanakan pada warga Desa Dukuh Barito Kuala dalam rangkaian kegiatan pengabdian sosial oleh Tim Bantuan Medis Calamus Scriptorius Fakultas Kedokteran Universitas Lambung Mangkurat. Hasil penelitian didapatkan dari jumlah responden yang ikut serta yaitu sebanyak 37 orang yang menghadiri event penyuluhan. Berdasarkan uji test Wilcoxon terdapat perbedaan pengetahuan yang signifikan sebelum dan setelah penyuluhan ( $p < 0,05$ ). Pada kegiatan ini, pre-test dan post-test dilakukan menggunakan pengisian kuisisioner yang bertujuan untuk mengetahui tingkat pengetahuan masyarakat mengenai kesehatan mata. setelah dilakukan uji pengetahuan dari penyuluhan tersebut didapatkan peningkatan masyarakat yang lebih dibandingkan saat dilakukan sebelum penyuluhan. Penyuluhan kesehatan menggunakan metode ceramah dengan media poster yang bermafaat untuk mempermudah dan mempercepat pemahaman penerima pesan terhadap pesan yang disajikan. Masyarakat memberikan respon positif karena pelatihan yang diberikan merupakan sesuatu yang dibutuhkan oleh masyarakat. Harapannya tentu penyuluhan ini tidak selesai begitu saja tetapi masyarakat dapat menerapkan dalam kehidupan sehari-hari secara mandiri.

**Kata kunci** : mata, pengetahuan mata, perawatan mata, penyuluhan

### ABSTRACT

*Impaired vision can lead to a decrease in a person's quality of life. Visual impairment is a major avoidable public health problem worldwide. Cataracts and refractive error are the two main causes of vision impairment. Visual impairment and blindness are health problems with a large prevalence throughout the world. Counseling on eye health is a promotive and preventive effort to minimize eye damage. The research was to measure participants' understanding of eye health before and after counseling with questionnaire filling. The counseling was in conjunction with social service events for the residents of Dukuh Barito Kuala Village by Tim Bantuan Medis Calamus Scriptorius Faculty of Medicine, Lambung Mangkurat University. Meanwhile, the sample used in this research was people with the inclusion criteria who were attending the education event from start to finish, with a total of 37 participants. Wilcoxon test results in a significant difference between the pretest and posttest ( $p < 0,05$ ). In this activity, an initial and final evaluation was carried out using a questionnaire that assessed participants' knowledge about preventing eye health problems. The pre-test and post-test scores will be compared after the activity. Activities are considered successful if the level of knowledge becomes better with the post-test score being higher than the pre-test score.*

**Keywords** : education of eye, eye care, knowledge

### INTRODUCTION

Impaired vision can lead to a decrease in a person's quality of life, and the reduced ability to work or carry out daily activities. The causes of eye disorders include environmental factors and lifestyle. Preventive action through counseling about eye health is a promotive

and preventive effort to minimize eye damage. Visual impairment is a major avoidable public health problem worldwide. Cataracts and refractive error are the two main causes of vision impairment. Visual impairment and blindness are health problems with a large prevalence throughout the world. Research conducted in 98 countries found that 216 million people in the world experience visual impairment and 36 million people are categorized as blind. Diseases that cause visual impairment are refractive errors (116 million), cataracts (56 million), age-related macular degeneration (8.4 million), glaucoma (4 million), and diabetic retinopathy (0.2 million). Diseases that cause blindness are cataracts (12 million), refractive errors (7.4 million), and glaucoma (2.9 million). These disorders are predicted to increase in 2050 if systematic efforts are not made to detect and treat early to prevent the severity of the disease. Indonesia is one of the countries with a fairly large prevalence of visual impairment and blindness compared to several countries in ASEAN. The prevalence of blindness in Indonesia is 3% and contributes 13% to the blindness rate in ASEAN countries.

Health education uses the lecture method with poster media which is useful for making it easier and faster for recipients to understand the messages presented (Ministry of Health of the Republic of Indonesia, 2020). The eye health educational material presented is based on phenomena that are often found in community activities, for example, eye disorders that can be felt when staring at a device for too long and ways to prevent these eye disorders. This topic was chosen based on the consideration that this pandemic has changed social activities to be online-based so that the frequency and duration of gadget use can certainly increase and can affect a person's visual acuity. The community gave a positive response because the training provided was something that the community needed. Apart from that, the benefit obtained from this activity is increasing public understanding of the importance of eye health so that it does not become a problem in the future. The hope is of course that this counseling will not just end, but that people can apply it in their daily lives independently.

## **METHODS**

This research is a quasi-experimental study with a one-group pre-test and post-test design. The pre-test was carried out before providing eye health education, while the post-test was carried out after providing education on the same day. Education in this research used PowerPoint and leaflet media, while to determine the level of public knowledge it was measured using a questionnaire. Researchers conducted pre-tests and post-tests on respondents to see any changes that occurred before and after the treatment.

**Time and Place of Research** This research took place in July 2023. This research was carried out in Karang Dukuh Village, Barito Kuala Regency, South Kalimantan at the TBM Calamus scriptorius social event. The research instrument used for data collection was a questionnaire (list of questions) regarding eye health that tested for validity and reliability. Never been used in other research. Dependent variable: knowledge of the people of Karang Dukuh Village, Barito Kuala Regency. Independent variable: counseling of education. The population in this study were people of all ages and groups who attended the TBM Calamus scriptorius social outreach event. Meanwhile, the sample used in this research was people with the inclusion criteria who were attending the education event from start to finish, with a total of 37 participants.

## **RESULTS**

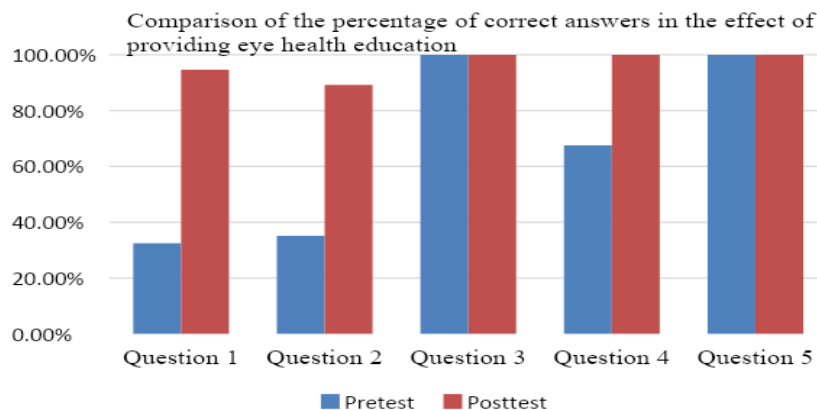
Indonesia is an agricultural country where agriculture is essential in the national economic system. Karang Dukuh is a village located in Belawang District, Barito Kuala Regency, South Kalimantan Province, where most people are farmers and planters,

prioritizing income from rice crops and citrus plantations. The activity was carried out in July 2023. The screening was conducted on 37 villagers who attended the activity and were willing to fill out a questionnaire containing five true or false (see further in the attachment) the pretest and the posttest on eye health education. Visual impairment is a major avoidable public health problem worldwide. Cataracts and refractive error are the two main causes of vision impairment. Visual acuity is the ability of the sense of sight to distinguish various visual forms. Optimal vision can be achieved if the visual nervous system is intact so that it can focus on objects correctly. The control of childhood blindness is one of the priorities of the World Health Organization (WHO). Eye health disorders are also an important problem in children because 80% of information is obtained during the first 12 years of a child's life through vision. Myopia is a condition where distant objects cannot be displayed clearly on the retina by the eye's optical system because the incoming light is refracted in the eye front of the retina or yellow spots. Myopia is also one of the main causes of decreased visual acuity in school-aged children, whereas good vision is very necessary in the teaching and learning process. As we get older, myopia will get worse.

**Table 1. The Characteristics Of The 37 Respondents Who Attended The Activity Were As Follows**

Variables		Frequency	Percentage (%)
(1)	(2)	(3)	(4)
Sex	Male	7	18,9%
	Female	30	81,1%
Age	>60 year	6	16,21%
	30-60 year	28	75,67%
	<30 year	3	8,12%
Occupation	Farmers or Planters	16	43,24%
	Nor Farmers nor Planters	12	32,43%
	Housewife or does not work	9	24,33%

The characteristics showed that there were more female than male respondents (81.1%), more productive age villagers attended counseling >70% and were dominated by outdoor workers and farmers.



**Figure 1. An Overview Of The Increase In The Comparison Of Pretest And Posttest Values can Be Presented In The Following Curve**

## DISCUSSION

The curve presented (Figure 1), shows that the third and fifth questions have the same percentage score between the pretest and posttest. It shows that the villagers already know the importance of consuming food sources rich in vitamin A to maintain good eye health (see further questionnaire in the attachment). In addition, respondents also know and realize that it is essential to do early detection and periodic eye examinations so that normal vision can be achieved and does not interfere with quality of life. While for questions 1, 2, and 4 the residents still knew less than half of the respondents. Villagers do not know that smoking and diabetes mellitus can affect eye health and even result in cataracts or visual nerve disorders. Villagers also still use eye drops carelessly without knowing whether the indications are correct, even though there are complications, including the risk of increased eye pressure or glaucoma. Residents still lack knowledge about using personal protective equipment when working, especially those doing outdoor work such as hats and glasses, even though it is essential to prevent eye damage due to trauma or sunlight.

In this activity, an initial and final evaluation was carried out using a questionnaire that assessed participants' knowledge about preventing eye health problems. The pre-test and post-test scores will be compared after the activity. Activities are considered successful if the level of knowledge becomes better with the post-test score being higher than the pre-test score. The initial test (pre-test) is used when the material is being delivered to find out before giving counseling the extent of knowledge that the community has so far. The test material given must relate to the material to be taught. The final test (post-test) is carried out at the end of the education process on the material to find out the extent of the public's understanding of the material and the important points of the material studied in maintaining eye health.

**Table 2. The Details Of The Corrected Answers Of Respondents can Be Presented In The Following Table**

Question of number	Answer	Pretest	Posttest
1	Correct	12 (32,43%)	35 (94,6%)
	Wrong	25 (67,57)	2 (5,4%)
2	Correct	13 (35,14%)	33 (89,19%)
	Wrong	24 (64,86%)	4 (10,81%)
3	Correct	37 (100%)	37 (100%)
	Wrong	0 (0%)	0 (0%)
4	Correct	25 (67,56%)	37 (100%)
	Wrong	13 (32,44%)	0 (0%)
5	Correct	37 (100%)	37 (100%)
	Wrong	0 (0%)	0 (0%)

The first question is whether smoking habits can affect eye health or whether diabetes can lead to blindness. Those are still many respondents who do not know the harmful effects of smoking and also the complications of diabetes mellitus in the form of blindness. This result was obtained from 32.43% of respondents, which increased to 94.6% after being given eye health education.

Smoking has an impact on visual function. According to research by Fernandes TM et al, there is a relationship between heavy smokers who have been addicted for a long time and the loss of the process of the red-green color vision system. The side effects of smoking can cause color vision disorders, visual fields, and blindness. There are several hypotheses regarding the mechanism of visual impairment, including a decrease in antioxidant levels and an increase in free radicals. Other mechanisms are the accumulation of toxic substances in the retinal pigment epithelium, decreased blood flow to the retina, hypoxia, and macular

degeneration. This mechanism affects the cone receptor cells, which have a high density in the fovea causing a disturbance in color vision.

Diabetic Retinopathy is the leading cause of blindness in patients aged 20-64 years worldwide. The World Health Organization (WHO) states that RD is the cause of blindness in 4.8% of all 39 million blind people worldwide, while in Indonesia, RD is the second most common complication after nephropathy. The longer a person suffers from DM, the more likely they are to suffer from complications. The most common complication in DM sufferers is RD, a disease that does not have alarming symptoms at first, but the development of RD can lead to blindness.

Eye health promotion is vital for supporting the health and well-being of eye patients and the community, and there is a lot we can all do to help. In low- and/or middle-income countries, nine out of ten people who are blind or visually impaired have a condition that could have been prevented or treated. This suggests that preventive measures and eye health promotion could play an important role in reducing blindness and vision impairment. Whether people remain healthy or become sick is influenced by many factors, including the conditions in which people live, their level of income, and their education.

People are also more likely to become ill if they do not know how to keep themselves and their families healthy, or how and where to seek care if they become sick. The same applies to many eye conditions. For example, people are more likely to develop type 2 diabetes and vision loss from diabetic retinopathy if they do not know what causes diabetes if they cannot afford or cook healthy food, if it is difficult for them to exercise, or if they do not understand the importance of taking their medication regularly and having their eyes examined regularly. The role of health education in eye care is to encourage the uptake of eye health-promoting behaviors and increase the use of eye care services.

The second question is whether routinely using eye drops rubbing your eyes is permissible to relieve symptoms of complaints. The table above shows an increase in knowledge from 35.14% to 89.19% that many villagers argue there are insufficient health facilities around. Still, they try to treat themselves, one of which is by washing their eyes with running water and resting their eyes for a moment.

During this time, eye treatment often carried out in the community is to use eye drops, especially if it is urgent to get treatment. However, many people use over-the-counter eye drops at pharmacies without first consulting an eye doctor. One of the most widely used active ingredients in eye drops is corticosteroids. However, the use of eye drops containing corticosteroids is not for the long term and can trigger glaucoma (American Academy of Ophthalmology, 2011). Rubbing the eyes is also not allowed because it can worsen the eye complaint due to repeating friction in the eyelids or even infection.

Blepharitis is an inflammatory condition that occurs in the eyelid margin. However, the incidence and prevalence of blepharitis in Indonesia have not yet been documented well. Several factors can be the cause of blepharitis; some examples of these factors are infection, allergy, irritation, and cosmetics on the eye (mascara). It has been known that infection and sebum gland dysfunction are the common cause of this disease; however, this case presents blepharitis caused by salt water that has not been reported yet. Hygiene, lifestyle, and where the patient lives play a role in this unique case. General treatment in blepharitis, such as eyelid hygiene and antibiotics, such as steroid pharmacotherapy, shows good improvement, combined with lifestyle education. The development of glaucoma induced by the elevation of intraocular pressure (IOP) as a result of the injury by blunt objects occurs through the damage of each part of the eye including the cornea, sclera, anterior chamber, trabecular meshwork, lens, vitreous, choroid, and the orbit. conducted. The IOP lowered, from 19.6 mmHg to 16 mmHg and 14 mmHg in the first, seventh, and twenty-third day post-surgical evaluations. Direct trauma from blunt objects can induce an increase in IOP which then leads to traumatic

glaucoma. Injury affecting the lens can generate lens subluxation or dislocation. Elevated IOP following lens subluxation may result from the pupillary block. Blunt ocular trauma can cause severe damage to vision as it can lead to secondary glaucoma. Thorough examinations and treatments need to be taken appropriately.

The third question is whether consuming vitamin A is very good for eye health. The table results show that all 37 respondents already know that vitamin A is good for maintaining eye health, but do not care about the vitamin content in the food that they consumed. Vitamin A is a fat-soluble micro-nutrient and functions as a maintainer of eye health because it plays a role in regenerating pigment in the retina of the eye in dark adaptation. Vitamin A can be obtained from foods that contain carotenoids or retinyl esters, including carrots, spinach, kale, papaya, cheese, liver, milk, and others. Vitamin A acts as a precursor to rhodopsin, all-trans-retinal, which is synthesized into all-trans-retinol by isomerase enzymes. All-trans retinol is converted to 11-cis retinol and then 11-cis retinal which combines with scotopsin which will later form new rhodopsin which has a long-term effect on retinal adaptation to light intensity.

The fourth question is the importance of using anti-radiation sunglasses to protect Pterygium and Corneal Ulcer. The results show an increase in knowledge before (67.56%) and after (100%). Primarily, many villagers work as outdoor farmers and gardeners, so this education can impact the attitude they will have later to maximize eye health.

Pterygium is an overgrowth of fibrovascular tissue on the conjunctiva and cornea. The cause of pterygium is not fully known, but old age, frequent outdoor activities, and exposure to UV light, dry air, and dust are associated as risk factors. Pterygium is formed mainly due to exposure to UV rays. Exposure to UV light can cause damage to the corneal stem cells, resulting in conjunctivalization of the cornea and the cornea being invaded by aggressive fibroblasts. UV radiation can also cause mutations in the tumor suppressor gene p53, resulting in the abnormal pterygial epithelium. UV radiation causes various ocular problems from benign conditions like pterygium to malignancy, which can eventually cause visual impairment and blindness. It is essential to protect the eyes from the sun to avoid diseases caused by UV radiation by seeking shelter using hats and sunglasses or photochromic lenses, umbrellas, and clothing. Sunglasses are not just an accessory but also an important tool for protecting the eyes from UV radiation.

The cornea acts as a protective membrane through which light rays reach the retina. Its translucent nature is due to its uniform structure, avascularity, and detergents. The endothelium is more important than the epithelium in the mechanism of dehydration, and chemical or physical injury is more severe than injury to the epithelium. Damage to endothelial cells causes corneal edema and loss of transparency. Corneal ulcers can occur due to trauma to the foreign body and with tears or disease that causes bacteria or fungi to enter the cornea, causing infection or inflammation. Farmers are more likely to get ulcers if they lack personal protective equipment when working in the fields and are accidentally exposed to splashes of rice and injure their eyes, which can lead to keratitis if not treated promptly and appropriately.

The incidence of contact lens-related complications is rising due to increasing contact lens usage. The most frequent contact lens-related complications include dry eye, pinguecula, corneal neovascularization, microbial keratitis, and giant papillary conjunctivitis. An overlying corneal epithelial defect and corneal infiltrates are the hallmarks of microbial keratitis, which bacteria, fungi, amoebas, or viruses can cause. The incidence rates for contact lenses associated with microbial keratitis range from 2 to 20.9 per 10,000 people globally and seem to increase as more people use them. Microbial keratitis is a corneal infection caused by microorganisms characterized by an overlying epithelial defect and corneal infiltrates with severe and progressive vision loss. The usage of contact lenses is one of the significant risk factors for increasing this incidence. As the number of people who wear contact lenses

grows, so does the number of corneal ulcers. Corneal ulcers caused by contact lenses have been linked to bacterial, fungal, and protozoan infections, most ulcers are caused by bacteria. A study conducted for five years in Japan revealed that 88.6% of microorganisms found in patients' cultures are bacteria, followed by fungi (8.6%) and acanthamoeba (2.9%). *Pseudomonas aeruginosa* is the most prevalent bacteria involved in corneal infection.

The fifth question is that periodic eye examinations and screening for early detection of diseases are essential to prevent eye health problems. The eye is one of the five basic senses that require regular inspection and care that should be done in 1-2 years, especially if using glasses to maximize an appropriate accommodation. Then, for DM sufferers, it is also better to do funduscopy screening to find out if there is any suspicion of retinopathy. Routine examination of the eyes should be started at an early age. Eye screening even needs to be created in newborns to detect abnormalities. The American Academy of Pediatrics recommends that neonatal screening be carried out before three months. The results of the table show they approved that routine examination can be carried out to support eye health.

The eye is a complex sensory organ that has the function of seeing. Through healthy eyes, every human being stores many memories throughout his life. However, vision problems often occur, ranging from mild to severe disorders. The increasing prevalence of eye disorders poses a serious threat to development because it threatens national economic growth. Cases of blindness or limited vision need to be checked regularly so that eye problems can be diagnosed early. In recent decades, the rising frequency of myopia has become a major public health issue.

Myopia is a common healthy lifestyle issue that causes vision loss and is linked to other eye illnesses. People with low vision due to refraction, according to the survey results, have low eyesight. Prevention is impossible to rely on. The number of people with visual disabilities and amblyopia can be reduced by detecting instances early, evaluating their regular wear, and emphasizing the importance of prevention and control.

Based on the results of the comparison with five same questions an initial test (pretest) before treatment and a final examination (posttest) related to maintaining eye health ( $p < 0,05$ ) with the Wilcoxon test.

## CONCLUSION

Based on the results of the comparison above, show that there is a significant result difference between the pretest and posttest on eye health education. This research may have a bias in dishonest respondents choosing the same answers as other respondents they had seen. It still lacked participating respondents and limited research time without exploring other risk factors related to the knowledge of each respondent so that research could be carried out further in the future.

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