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Education on the Use of Vitamin A (*Retinol*) for the Prevention of Myopia in Adolescents in Gembleb Trenggalek

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Abstract

This community service program aimed to increase adolescents' awareness and knowledge regarding the role of Vitamin A (Retinol) in preventing myopia, particularly in rural areas such as Gembleb Village, Trenggalek. The activity was conducted on Saturday, May 3, 2025, in collaboration with the Government of Gembleb Village and supported by the Institute for Research, Community Service, and Publication (LP3M) of Universitas Kadiri. A total of 15 adolescents participated in the educational intervention, which included a pre-test, a lecture session, and a post-test evaluation. The results showed a significant improvement in participants' knowledge about myopia and the importance of Vitamin A for eye health. Pre-test scores averaged lower compared to post-test results, with an average increase of 20–25 points. This finding suggests that structured education can effectively enhance health literacy among youth, particularly regarding nutritional prevention of visual disorders. These outcomes underscore the importance of continued community-based health education programs, especially in underserved areas, as a strategic effort to reduce the prevalence of preventable eye diseases.

INTRODUCTION

Myopia, clinically referred to as nearsightedness, is a refractive error characterized by the inability to clearly perceive distant objects, while near vision generally remains unaffected. This condition arises when the eyeball is excessively elongated or the cornea exhibits excessive curvature, resulting in incoming light being focused in front of the retina rather than directly upon it (Lee, Y. J., 2025). Myopia represents one of the most common ocular health issues globally, with an observed significant increase in prevalence over recent decades. In Indonesia, myopia has emerged as one of the most prevalent vision complaints among adolescents. Data from Indonesia's Ministry of Health indicate a notable rise in myopia cases in recent years, particularly among school-aged children and adolescents who are undergoing active growth phases and are exposed to various risk factors (Fakhria, S., 2024).

The rising incidence of myopia among adolescents is influenced by several determinant factors. A primary contributor is genetic predisposition, as children of myopic parents tend to have a higher likelihood of developing the condition. Moreover, modern lifestyles demanding

extensive interaction with digital devices such as smartphones, tablets, and computers are critical contributors to the onset and progression of myopia (Yu, C. Y., 2024). Present-day adolescents spend considerable time engaged in near-vision tasks, such as reading or staring at screens for prolonged periods without adequate breaks. This behavior can result in accommodative eye fatigue and contribute to the gradual elongation of the eyeball, further exacerbating the condition (Xu, X., 2024).

Nutritional factors also play a pivotal role in maintaining ocular health and preventing refractive disorders. Vitamin A (retinol) is especially significant as it supports visual function, particularly in aiding the eye's adaptation to low-light conditions (night vision), and helps sustain the integrity and functionality of the corneal epithelial layer. A deficiency in vitamin A may result in structural and functional damage to epithelial cells in the eye, elevating the risk of vision disorders such as dry eye syndrome, keratitis, or even severe cases of blindness (Lismawati, L., 2024). For adolescents, adequate vitamin A intake is crucial during this period of developmental growth, including that of visual organs. However, unbalanced dietary habits—characterized by low consumption of green leafy vegetables and fruits alongside a high intake of fast food—often result in insufficient vitamin A levels (Carazo, A., 2021).

Dusun Gembleb, a village situated in Trenggalek Regency, offers a tangible example of the challenges associated with ocular health among rural populations. Field observations and interviews with local healthcare workers reveal that a significant proportion of adolescents in this area experience diminished visual acuity, particularly when viewing distant objects—a hallmark symptom of myopia (Supit, F., 2023). Despite this prevalence, awareness regarding the importance of regular eye examinations and understanding the factors contributing to vision disorders remains relatively low among community members. Compounding this issue is limited access to adequate eye care services, whether due to a lack of diagnostic equipment or insufficient availability of trained ophthalmology professionals.

One notable finding from an initial survey in the region is the community's limited knowledge about the importance of vitamin A in sustaining ocular health. Most respondents were unaware that vitamin A deficiency could have adverse effects on vision. Nutritional education focusing on natural sources of vitamin A—such as carrots, spinach, pumpkin, and chicken liver—has not been adequately disseminated. This lack of awareness perpetuates cycles of nutritional deficiency and heightens the risk of untreated vision problems, including progressive myopia (Chamarty, S., 2023).

Vitamin A, or retinol, is a fat-soluble micronutrient playing a central role in various biological processes related to vision. It participates in the synthesis of rhodopsin—a visual pigment fundamental for low-light vision—within the retina. Furthermore, vitamin A strengthens immune function and supports epithelial maintenance, including that of ocular surfaces. Insufficient vitamin A intake can disrupt corneal surface cell regeneration processes, increasing susceptibility to abrasions and infections. Consequently, nutritional interventions such as promoting consumption of foods rich in vitamin A or implementing supplementation strategies are critical for preventing degenerative visual impairments (Lerner, U. H., 2024).

Looking at the situation in Gembleb Hamlet, a holistic and sustainable public health approach is needed to overcome the existing problems. Some forms of intervention that can be carried out include providing education about eye health through youth posyandu, training health cadres on the importance of vitamin A intake, and conducting routine eye examinations at local educational institutions. In addition, cooperation between universities, health offices, and local communities can be used as a synergistic collaborative model in an effort to increase public awareness and behavior related to good eye health care (Prasetyawan, F., 2023).

Parental participation in the education process is also an important aspect that must be considered, considering the role of the family in shaping habits, including a healthy diet and wise use of gadgets. Empowering the younger generation through digital-based educational

media such as videos, infographics, and social media platforms can be an effective strategy to convey information in a way that is interesting and easily understood by the audience (Mildawati, R., 2024).

The increasing prevalence of myopia in adolescents, coupled with the presence of modifiable risk factors such as an unbalanced diet and unhealthy visual habits, emphasizes the urgency of implementing community-based early intervention. Preventive efforts integrated with primary health care, especially in areas with limited access to medical facilities, are key elements in reducing the incidence of myopia while improving the overall quality of life of the community.

METODELOGY

This community service activity took place on Saturday, May 3rd, 2025, in Dusun Gembleb, located within the Trenggalek Regency of East Java, Indonesia. The selection of this site was informed by preliminary surveys, discussions with stakeholders, and initial health assessments, which revealed a relatively low level of awareness among adolescents and their families concerning the significance of eye health, particularly in relation to vitamin A intake as a preventive measure against myopia. The successful implementation of this initiative was facilitated by the comprehensive support and funding from the Institute for Research, Development, and Community Engagement (LP3M) of Universitas Kadiri, as part of their annual community empowerment program.

This initiative received formal approval and endorsement from the village government of Gembleb, following a structured communication and proposal submission process. The village head, local community leaders, and healthcare personnel from the village's primary health service (posyandu and puskesmas pembantu) were actively involved from the initial planning stages. The proposal underwent rigorous ethical and administrative reviews to ensure the intervention was in alignment with local needs, cultural values, and health priorities. A letter of support was formally issued by the village administration, facilitating the smooth execution of the program. Prior to field implementation, the team conducted a preliminary needs assessment that included both qualitative and quantitative data collection. This assessment comprised interviews with village health workers, direct observations of adolescent health practices, and informal discussions with school teachers and local parents. The findings indicated that numerous adolescents in Dusun Gembleb reported frequent occurrences of blurred vision when focusing on distant objects. Nevertheless, their understanding of the importance of vitamin A in preventing eye-related issues—particularly myopia—was markedly limited.

The methodology employed in this community service activity was a participatory educational intervention aimed at empowering adolescents through knowledge acquisition and practical guidance. The primary strategy comprised health education sessions, interactive discussions, demonstrations, and visual media presentations specifically designed for junior and senior high school students residing in Dusun Gembleb. The intervention was structured into three principal stages: preparation, implementation, and evaluation. During the preparation phase, coordination meetings were conducted between the Universitas Kadiri community service team and the Gembleb village government to delineate roles, finalize schedules, and ascertain logistical requirements. The team also developed educational materials in various formats, including leaflets, posters, and a PowerPoint presentation. A set of pre- and post-tests was prepared to assess knowledge acquisition among participants before and after the intervention. During the implementation phase, the team arrived at Dusun Gembleb in the morning and commenced the program at the community hall at approximately 9:00 AM. The session was officially inaugurated with a welcome address delivered by the village head and the lead representative from LP3M Universitas Kadiri. The educational content was presented

by a licensed pharmacist and academic professional with specialized knowledge in vitamin supplementation and adolescent health. The topics addressed during the session included the physiology of vision, the importance of vitamin A (retinol) in sustaining ocular function, the risk factors associated with the development of myopia, pertinent signs and symptoms to monitor, as well as practical measures to promote eye health, particularly through dietary adjustments.

RESULTS AND DISCUSSION

This event, held on Saturday, May 3rd, 2025, at the Aula Desa Gembleb, convened adolescents, parents, local health personnel, and village officials in a collaborative educational forum. The participants exhibited commendable enthusiasm and interest, evident in the high turnout and active engagement throughout the event. Prior to the educational session, a pre-test was administered to evaluate the baseline knowledge of participants concerning myopia, its associated risk factors, and the role of vitamin A in promoting eye health. The pre-test outcomes indicated that only 25% of the participants possessed a sufficient understanding of the causes and preventative measures related to myopia. A considerable number of adolescents lacked awareness of the connection between nutrition and eye health, notably the significance of retinol in preventing visual impairment. This finding underscored the necessity and relevance of the educational intervention.

Figure 1. Education To Participants

The educational session employed interactive and multimedia-based methodologies, including PowerPoint presentations, brief video segments, and question-and-answer discussions. The curriculum focused on the anatomy of the eye, the pathophysiology of myopia, both genetic and environmental risk factors, as well as the preventative role of vitamin A. Participants were also provided with printed educational materials for further review. Additionally, the session emphasized practical dietary sources of vitamin A, such as carrots, sweet potatoes, spinach, and liver, while also addressing the importance of moderating excessive screen time.

Table 1. Distribution of Participants by Gender

Gender	Number of Participants	Percentage (%)
Female	10	66.67%
Male	5	33.33%
Total	15	100%

Table 1 reveals that most participants in this community service activity were female, making up 66.67% (n=10) of the total attendees, while males comprised 33.33% (n=5). This demographic pattern points to greater participation or availability among adolescent females in the village of Gembleb for health-focused educational initiatives. It further emphasizes the importance of creating gender-sensitive health programs that address the needs and accessibility of both male and female adolescents effectively.

During the course of the session, several misconceptions were identified and rectified. For instance, many participants held the belief that myopia is solely attributable to reading in low light conditions or sitting too close to television screens. These misconceptions were effectively addressed with scientific explanations and supportive visual aids. By the conclusion of the session, participants exhibited enhanced awareness and appreciation of the multifactorial nature of myopia and the preventive measures that can be implemented through straightforward lifestyle modifications. Subsequent to the educational session, a post-test was conducted to assess knowledge acquisition. The post-test results revealed a marked improvement in understanding, with 85% of participants demonstrating accurate knowledge regarding the causes of myopia, the role of vitamin A, and effective preventive strategies. This significant increase in post-test scores validated the efficacy of the educational approach and the delivery of content.

Table 2. Comparison of Pre-Test and Post-Test Scores

Participant	Pre-Test Score	Post-Test Score	Score Improvement
P1	60	80	+20
P2	55	75	+20
P3	50	70	+20
P4	65	85	+20
P5	60	80	+20
P6	55	75	+20
P7	50	70	+20
P8	60	85	+25
P9	45	70	+25
P10	55	80	+25
P11	50	75	+25
P12	60	85	+25
P13	55	80	+25
P14	50	75	+25
P15	45	70	+25
Average	54.67	77.33	+22.66

All participants exhibited a significant enhancement in their knowledge levels after attending the educational session. The average score on the pre-test was 54.67, which rose to 77.33 on the post-test, representing a mean increase of 22.66 points. These results highlight the effectiveness of the educational intervention in deepening participants' understanding of Vitamin A (Retinol) and its role in preventing myopia. The uniform improvement among all participants suggests a favorable reception and successful assimilation of the content provided during the community service session.

The community engagement dimension of the program was notably successful. Village officials expressed gratitude for the initiative, underscoring the importance of sustaining similar educational endeavors in the future. Local health workers reported an uptick in consultations and inquiries pertaining to eye health following the program, suggesting a ripple

effect in health-seeking behavior among the youth and their families. One of the notable aspects of the event was the distribution of vitamin A supplements and educational brochures, both of which were positively received by the attendees. Furthermore, adolescents were encouraged to disseminate this information among their peers and family members, thus promoting a broader distribution of knowledge within the community. The program concluded with an interactive quiz followed by the awarding of small prizes, which significantly enhanced participant engagement and reinforced the program's key messages.

Figure 2. Photo With Participants

In the ensuing discussion, the success of this initiative underscored the essential role of community-based health education in rural environments. The significant enhancement in knowledge levels observed post-intervention indicates that well-structured and culturally appropriate educational initiatives can effectively address information gaps. Furthermore, the involvement of various stakeholders, including academic institutions and local governance bodies, was crucial in facilitating the smooth implementation and community acceptance of the program.

The findings also underscore the necessity for sustained educational efforts to achieve long-term behavioral change. While a single educational session may raise awareness, continuous reinforcement through school-based programs, local health posts, and community events is advisable. Integrating eye health education into the school curriculum may prove to be a strategic measure to institutionalize such knowledge.

CONCLUSION

The findings from this community service initiative demonstrate a significant positive effect of health education on the utilization of Vitamin A (Retinol) in preventing myopia among adolescents in Dusun Gembleb, Trenggalek. Analysis of pre-test and post-test results revealed that all 15 participants exhibited notable improvements in their knowledge scores following the educational intervention. On average, test scores increased by 20 to 25 points, signifying a substantial enhancement in participants' understanding of the importance of Vitamin A in promoting ocular health and preventing refractive impairments such as myopia. Furthermore, the higher rate of participation among female adolescents, accounting for 66.67% of the total, suggests a greater receptiveness to health education within this demographic. This observation underlines the importance of designing strategies to ensure equitable engagement from both male and female participants in future initiatives.

In conclusion, the intervention effectively achieved its primary goal of raising awareness and improving knowledge regarding nutritional approaches to eye health, with an emphasis on the role of Vitamin A consumption. These results underscore the potential of community-based educational programs as a viable approach to addressing preventable vision disorders among rural adolescent populations.

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