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Promoting Legal Behavior In Health: Digital Education For Eye Health

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Abstract

Visual impairment, particularly refractive errors, has become an increasingly pressing global health issue, especially among children. This study aims to explore the role of digital education in building a positive eye health culture in schools and preventing refractive errors, focusing on implementing Sustainable Development Goal (SDG) 16. A quantitative survey was conducted on students to measure their knowledge, attitudes, and experiences related to eye health and the use of digital technology in education. The results showed that most students had sufficient awareness of the importance of eye health, but knowledge about refractive errors still needed to be improved. Digital education has been shown to positively affect students' understanding and encourage them to adopt healthy habits in maintaining eye health. In addition, this study found that the implementation of SDG 16 principles in educational programs in schools is essential to creating a learning environment that supports eye health. The study concluded that by using digital technology and implementing SDG 16, educational institutions can play a significant role in addressing the increasing challenges of eye health.

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Promoting Legal Behavior In Health: Digital Education For Eye Health

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Abstract. Visual impairment, particularly refractive errors, has become an increasingly pressing global health issue, especially among children. This study aims to explore the role of digital education in building a positive eye health culture in schools and preventing refractive errors, focusing on implementing Sustainable Development Goal (SDG) 16. A quantitative survey was conducted on students to measure their knowledge, attitudes, and experiences related to eye health and the use of digital technology in education. The results showed that most students had sufficient awareness of the importance of eye health, but knowledge about refractive errors still needed to be improved. Digital education has been shown to positively affect students' understanding and encourage them to adopt healthy habits in maintaining eye health. In addition, this study found that the implementation of SDG 16 principles in educational programs in schools is essential to creating a learning environment that supports eye health. The study concluded that by using digital technology and implementing SDG 16, educational institutions can play a significant role in addressing the increasing challenges of eye health.

Keywords: Eye Health, Legal Behavior, Digital Education, Myopia Booming.

1 Introduction

1.1 A Subsection Sample

The report of the World Health Organization in 2019 mentioned that vision problems or eye health situations should be a significant concern globally. The report explained the increasing prevalence of myopia and refractive disorders that occur in younger people, especially in school-age children. This condition significantly impacts the quality of life and achievement of children in school (1). Even more extreme, Holden et al. (2016) have stated that cases of myopia will explode so that it is estimated that by 2050, half of the world's population will suffer from myopia. The global community must face the myopia boom in 2050 (2), (3). Myopia boom can occur more quickly if refractive disorders are not appropriately anticipated. Bourne et al. (2021) explained in their research that the increasing prevalence of blindness and myopia cases in the last three

decades was primarily due to uncorrected refractive disorders. Efforts to carry out early detection and appropriate intervention have yet to be maximized. As a result, this visual impairment has increased rapidly globally, especially in the Asian region (4).

Doringin et al. stated that the use of gadgets that do not pay attention to health rules can accelerate and worsen refractive disorders. In particular, the COVID-19 pandemic has led children to use gadgets very intensively because there is no other choice but to use technology in learning during the pandemic. Many children need education to properly use gadgets (3), (5).

During the COVID-19 pandemic, schools and children seemed to be forced to switch to technology in learning. Online learning methods have become very massive (Ali, 2020). In reality, online learning with the use of very massive gadgets has become a learning solution. However, the challenge is that the use of gadgets in a healthy way and following health rules has yet to occur properly (6), (7), (5).

Teachers and parents are essential factors in instilling education about the correct use of gadgets. During school age, children pay close attention to teacher instructions. Therefore, teachers and parents need to have knowledge and awareness of the correct use of gadgets and follow the correct rules related to eye health. However, this still needs to be improved by parents and teachers (5), (3), (8).

Many studies related to refractive health only examine technical factors but still pay little attention to the behavior of students who obey the law, obey the rules, and obey the rules to maintain eye health. Doringin and Oktriono (2019) mentioned the challenges of increasing students' health awareness. França et al. (2022) mentioned the importance of health law awareness in the school environment (9).

Sustainable Development Goal (SDG) 16 mentions the development of inclusive and equitable communities to encourage legal behavior in eye health (Hnatyuk et al., 2024). The statement criticizes that digital education for eye health cannot only highlight the technical acceptance of technology and gadget use. More than that, awareness of the rules, principles, and laws regarding Efforts to maintain Eye Health must also be considered (10), (11).

The formulation of the problem that is the question that will be answered in this study is related to:

1. How can digital education increase students' awareness, knowledge, and obedience to Eye Health?
2. How can digital education form obedient and obedient behavior regarding the rules, regulations, and laws to maintain Eye Health?
3. How can the principles of SDG 16 encourage responsible behavior in obeying the law and principles related to Efforts to maintain Eye Health?

1.2 Digital Education in Learning Process and Health

The widespread use of technology in education, primarily since the COVID-19 pandemic, has raised awareness of the importance of digital education in all aspects, including maintaining eye health. Massive online learning has opened our eyes to the health aspects that must be done when people use gadgets. Technology allows people to learn anywhere, anytime and is not hindered by time and distance. However, mature strategies and rules are needed so technology does not impact health, especially eye health (12), (3).

Yelubay et al. (2020) stated that digital education is instrumental in building and developing a digital culture among teachers and students. Developing a robust digital culture for teachers and students can overcome the difficulties and challenges of implementing technology in schools. However, it is essential to realize that knowledge, infrastructure, and commitment to holding digital education still need to be improved (13), (5).

Other literature shows digital education's various challenges and benefits, especially in developing a digital culture for students and teachers. Yelubay et al. (2020) stated that developing a strong digital culture among teachers and students can overcome challenges in implementing technology in schools. However, they also mentioned some difficulties or barriers to digital education, like inadequate digital infrastructure and limited technical knowledge, which can prevent the success of digital adoption in health education (13). Nur Hidayat et al. (2020) stated that digital training has greatly changed teachers' skills in using technology. The same training should be carried out to improve teachers' skills in mastering the impact of technology in education. Good training related to the rules, regulations, and laws to maintain eye health and reduce the risk of refractive disorders due to unhealthy student behavior can be implemented successfully. (14).

1.3 The Impact of the Digital Education to the Children Eye Health

Massive online learning has an impact on increasing cases of myopia, especially in children. Cases of myopia are found in increasingly younger people. Early childhood children experience visual impairment because they tend not to follow safe screen time guidelines, the duration of gadget use, or the level of gadget lighting (7), (5).. In addition, children tend to have less time for outdoor activities, which results in visual impairment (15).

Bourne et al. (2021) published their research in *The Lancet Global Health*. They revealed that eye health education in schools has a very significant effect on reducing the prevalence of visual impairment and refractive disorders, mainly if the approach can be carried out according to their age. Bourne et al. (2021) emphasized the importance of developing a digital education curriculum that allows for eye health protection and reduces cases of refractive disorders (4).

1.4 The Principal and Rule of Eye Health Protection

Several countries have set strict rules regarding eye health examinations, care, and protection. Some of these rules and regulations are as follows:

Eye examinations are done once a year in the world of education. WHO has set eye health standards so that school children undergo annual eye examinations to detect early visual impairment and refractive disorders. These health standards are carried out in school health policies. Several countries have implemented eye health standards in the world of education. The Ministry of Health of the Republic of Indonesia has also recommended routine eye examinations in schools to detect early visual impairments that significantly affect children's learning achievement. In 2021, the Ministry of Health stated the obligation for regular eye examinations (16), (17), (18).

Limit screen time for children. The WHO and the American Academy of Pediatrics have determined that children aged 5-18 should be limited to a maximum of 2 hours per day outside of education. China and Canada also set a screen time limit for children under 18 years of age of 1.5 hours per day. This regulation aims to reduce eye strain and the risk of increasing and accelerating myopia in children (19), (18).

Increase outdoor activities. Holden et al. (2016) have stated the possibility of a myopia boom that will be experienced by half of the world's population by 2050. One way to prevent it is to do lots of outdoor activities. Outdoor activities are very helpful in suppressing the growth of myopia cases (2), (5)

Take regular breaks with the 20-20-20 formula. This rule states that students who use digital devices should divert their gaze for 20 seconds to an object 20 feet (about 5 meters) away every time they use a gadget for about 20 minutes. The activity will prevent eye strain.

Adequate lighting and avoid using gadgets in dark rooms. There are lighting standards for eye health in schools and workplaces. Several international standards, including ISO and worker protection standards, have regulated safe lighting levels in schools and workplaces. This regulation aims to reduce eye strain due to reduced or excessive lighting (3).

Workplace protection. The Occupational Safety and Health Administration (OSHA) has also stipulated that every workplace that contains risks to the eyes (including the risk of light, chemicals, or other hazardous particles) must provide eye protection for workers and train them to have eye protection.

There are labeling and restrictions on digital products for children. Several countries have already labeled digital devices with the potential and risk of visual impairment in children. For example, several European countries have implemented strict regulations regarding the excessive use of blue screens by creating unique labels for these products.

Continuous eye health services. The United States and India have established the obligation of continuous eye health services for their citizens to prevent blindness. India has implemented a national eye health service program for vulnerable groups to prevent blindness.

Ban on the sale of contact lenses without a prescription. Several countries have implemented a ban on the use of contact lenses without a prescription because they can cause eye infections. This rule ensures that only those who meet eye health standards can use contact lenses. This rule is also followed by restrictions on advertising related to the sale of contact lenses.

Water quality standards for eye health. WHO has rules related to water quality standards for those who use contact lenses or have eye disorders. The standard is done to monitor and reduce the risk of infections that can cause visual impairment.

Regulations on the accessibility of eye health services. WHO recommends that countries have rules governing public access to eye examination and treatment services. Access to eye care, including glasses, is often very expensive.

Guidelines for providing eye health education in schools. Several schools have rules related to eye health education. The guideline is done mainly to anticipate the myopia boom, which is predicted to increase myopia significantly globally.

Anti-radiation glasses are used for prolonged screen use. Children who use screens for a long time are asked to wear anti-radiation glasses or blue light protection lenses to protect them from exposure to blue light from digital screens.

Consumption of good nutrition can improve eye health. Good nutrition from foods containing vitamins A, C, and E and minerals such as zinc plays a vital role in maintaining eye health (5).

1.5 The Implementation of the Principal of Sustainable Communities through Digital Education to Eye Health

Hnatyuk et al. (2024) stated that education plays a very significant role in increasing students' awareness of a good environment and eye health and strengthening young people's compliance with the rules, regulations, and laws that apply in society. The principle of sustainable communities explained in Sustainable Development Goal (SDG) 16, emphasizes the importance of efforts to increase access to education and health so that communities can be inclusive, just, and law-abiding (10), (20).

The principle of sustainable communities that focuses on legal awareness and healthy living behavior can be improved through digital education and the development of attitudes of obedience to regulations. Digital-based health education is very effective in increasing students' understanding of health risks and efforts to foster obedience and healthy living habits (9).

1.6 Conceptual Framework: Digital Education for Legally Compliant Behavior in Eye Health

From the literature review above, it is concluded regarding the rules and regulations that need to be followed to build a healthy life, namely:

1. Regular eye examinations (once a year).
2. Limit screen time in using gadgets.
3. Increase outdoor activities

4. Take regular breaks with the 20-20-20 formula when using gadgets.
5. Adequate lighting and avoid using gadgets in dark rooms.
6. Protection in the workplace.
7. Labeling and restrictions on digital products for children.
8. Continuous eye health services.
9. Prohibition of the sale of contact lenses without a prescription.
10. Water quality standards for eye health.
11. Providing greater access to eye health services.
12. Guidelines for providing eye health education in schools.
13. Use of anti-radiation glasses for prolonged screen use.
14. Consumption of good nutrition to improve eye health.
15. 15. Regular eye examinations (once a year).

2 Methods

2.1 Research Design

This study uses mixed-methods or mixed quantitative and qualitative research methods. The quantitative method is carried out through a survey of students to measure knowledge, attitudes, and healthy living behaviors related to eye health, which are closely related to compliance with the rules and laws for healthy living. Qualitative methods are used through interviews with students, teachers, and optometrists to obtain data on respondents' experiences and perspectives on implementing digital education, rules and laws, and community compliance for healthy living.

2.2 Population and Sample

The study population was six schools in Jakarta and Banten, with samples of grade XII students in each school with around 75-100 students per school. The population and sample for the interview were the same. Namely, the schools surveyed had around 2-3 students in each school plus around 2 teachers in each school. Also, 5 optometrists who carried out activities with students and teachers at the school were interviewed.

2.3 Data collection and analysis

Data collection using a survey related to knowledge about eye health, student attitudes towards healthy gadget use, compliance with eye health regulations, and student perceptions of the importance of law-abiding behavior. The questionnaire used a 5-point Likert scale (strongly disagree to strongly agree).

The interview also collected the same questions as the main points of the survey questions. This study was also enriched with field observations at the schools where the survey was conducted.

Data analysis was carried out using descriptive statistics to obtain an overview of students' knowledge, attitudes, and behavior related to efforts to maintain eye health and compliance with rules/regulations. The Pearson correlation test was conducted to test the relationship between students' knowledge of eye health and compliance with rules and legal norms.

Interview data were analyzed using the thematic analysis method, which identified the main themes related to the benefits, challenges, and experiences in implementing digital education related to eye health. Field observations were conducted to ensure survey answers and interview results.

After that, the survey data, interviews, and observations will be triangulated.

3 Results and Discussion

3.1 Results

Based on the methods mentioned, namely quantitative and qualitative, the research results can be formulated as follows:

1. Digital education encourages in-depth understanding and student compliance to follow the rules or regulations regarding eye health maintenance. A total of 85% of respondents admitted to having a good understanding and compliance to maintain eye health. They mentioned the school's efforts to link eye health education with school literacy so that it becomes part of school learning.
2. The correlation test showed a very positive relationship between student knowledge and their compliance with the rules and standards for maintaining eye health. This means that the higher the student's knowledge, the greater their compliance with eye health maintenance practices.
3. As many as 70% of students showed a change in attitude related to the duration of viewing gadget screens and resting their eyes. The information they received through digital education changed them to commit to maintaining the duration of viewing screens and taking breaks or resting their eyes after a certain time.
4. Teachers at school found that students became obedient and took the initiative to follow the rules to maintain eye health because they had a good understanding.
5. As many as 90% of teachers admitted that their students' insights and attitudes changed drastically in relation to obeying the rules, taking the initiative to have their eyes checked, and limiting the use of gadgets, after participating in digital education.

6. The challenges faced are limited infrastructure and resistance shown by certain parties. As many as 30% of students have not been able to comply, which is an indication to seek further education and also support from parents and the community.
7. Students gave very positive reactions related to interactive digital education, such as videos and specific applications.
8. As many as 95% of students hope that this digital education program can continue in the coming years.

3.2 Discussion

Readiness of infrastructure, both technological devices, software, and the internet. Digital education increases students' understanding of the importance of maintaining eye health. However, the effectiveness of this education is hampered by the accessibility of technological infrastructure, both at school and at home, which is still very limited. Support from several parties, especially the government, is needed to ensure the availability of accessibility to technological infrastructure, both technological devices, software, and the internet. When there are regulations related to concern for eye health, it is very important for the government to have a commitment and real steps to ensure that the policy can be implemented.

Consistency of attitudes towards the use of gadgets at school and at home.

This study shows that implementing digital discipline at home is still a challenge compared to at school. Family control over gadget use seems very limited. This is caused by both the attitude of parents who are still not firm and because the understanding and practice of using gadgets from parents is also limited. Schools and homes must collaborate to handle children's gadget use so that a common attitude is built regarding gadgets, rules of use, and a commitment to maintaining eye health.

Implementation of the rules or regulations for using gadgets needs to be consistent and sustainable. Educational programs for using gadgets in a healthy way need to be consistent and sustainable rules. For that, it is very much needed that this program becomes a commitment from all parties, namely the government, schools, and the community. Related to this program, of course, it requires sufficient allocation of funds, rules and consistency to follow the rules, commitment to hold campaigns, and even support for an easy-to-implement curriculum.

Educational institutions and the government need to work together with institutions, especially those related to eye health, both government and private organizations to take joint steps to integrate caring attitudes towards eye health into real steps together.

More than that, multi-sector collaboration is needed to further increase concern for eye health. Sustainability is possible if there is good innovation, access, and commitment.

Concern for efforts to maintain eye health can strengthen regional communities, countries and the global community. SDGs that encourage peace, justice, and strengthening of institutions (SDG 16) and Health and well-being (SDG 3) are implemented and pursued in real terms through commitment and real steps to maintain eye health.

4 Conclusion

This study shows several existing rules related to efforts to maintain optimal eye health. These rules include routine eye checks, duration of viewing gadget screens, the importance of outdoor activities, resting the eyes after 20 minutes of activity on gadgets, adequate lighting, protection, and good nutrition.

This study also emphasizes the importance of digital education, a positive relationship between compliance with rules and regulations in efforts to maintain eye health, positive mindset changes in students and teachers to increasingly maintain eye health that are visible if they have sufficient understanding and challenges that must be considered so that this program is sustainable, namely the commitment of all parties, infrastructure, both software, equipment, and the internet, as well as education that is rich in programs (sufficient in content) and innovation (interesting).

The limitations of this study are related to the short research time to see changes in student attitudes, as well as small and non-varied populations and samples as a picture of the very varied social, economic, and cultural backgrounds of the community.

Further research requires a broader reach considering multicultural, multi-background, and integrated aspects.

This study recommends collaborative efforts and infrastructure preparation to increase understanding and awareness to maintain eye health.

5 References

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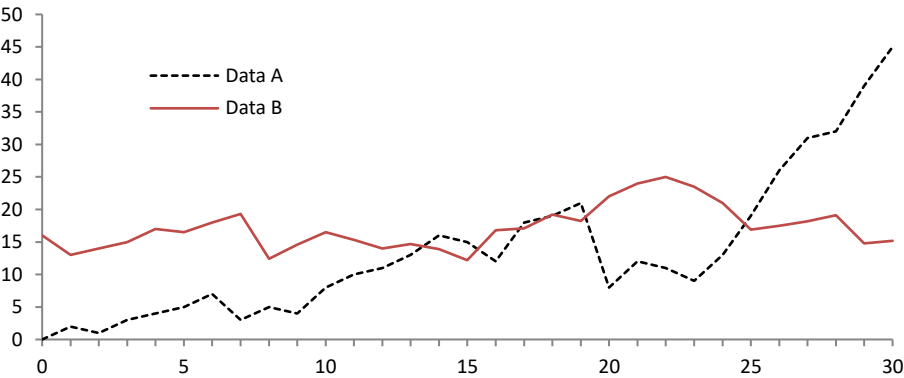


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References

1. Author, F.: Article title. Journal **2**(5), 99–110 (2016)
2. Author, F., Author, S.: Title of a proceedings paper. In: Editor, F., Editor, S. (eds.) CONFERENCE 2016, LNCS, vol. 9999, pp. 1–13. Springer, Heidelberg (2016)
3. Author, F., Author, S., Author, T.: Book title. 2nd edn. Publisher, Location (1999)
4. Author, F.: Contribution title. In: 9th International Proceedings on Proceedings, pp. 1–2. Publisher, Location (2010)
5. LNCS Homepage, <http://www.springer.com/lncs>, last accessed 2023/10/25

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