

Impaired Vision Function Due to Use of Gadget

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ABSTRACT

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Background: The disruption of the visual function resulting from the use of gadgets, by explaining the disturbance of the visual function that occurs and the proper and correct use of gadgets, which can maintain vision function, especially for children and adolescents

Method: SLiterature sources were searched using data bases: Google Scholar, Pubmed, Proquest, Science Direct, and Sinta using keywords: computer, gadget, portable display, smartphone and eye, myopia, vision, visual. With boolean operators (AND, OR, NOT). The articles obtained were published between January 2015 and October 2020 for selection according to the objectives of the literature review and obtained as many as fifteen studies included in this literature review.

Result: Prolonged use of gadgets and the like was significantly associated with decreased visual acuity and the onset of myopia (8 studies), as well the occurrence of one or more Computer Vision Syndrome in the eye organs (7 studies).

Conclusion: The use of gadgets is not the only main cause of health problems, but contributes significantly to various health problems, especially impaired vision, namely decreased visual acuity, myopia, and computer vision syndrome. Proper management of gadget usage can prove beneficial in understanding education and other fields better whereas excessive use can lead to various health problems.

Keywords: Gadgets, impact, visual impairment

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INTRODUCTION

Gadgets have become a part of our lives today. The groups that experienced an increase in gadget use were children and adolescents. Excessive use of gadgets for a long time will cause health problems including visual function, namely the decrease in visual acuity and the onset of myopia and Computer Vision Syndrome. Increasing the frequency and duration of gadget use will increase the decrease in visual acuity (Mathers, et al. 2010). The prevalence of myopia is increasing, from year to year, as many as 1.6 billion sufferers of myopia in the world are predicted to increase to 2.5 billion in 2020. The prevalence of myopia in children in Asia is around 29%, while in children in Western countries it is 5% lower (Yu et al., 2011). According to WHO, as many as 43% of refractive errors can cause blindness (WHO, 2019) if not corrected, for that, through the World Sight Day warning, WHO launched the theme Count Down 2020 (striving for the world's population to avoid blindness and obtain optimal vision). The duration of daily computer use that is more than 4 hours per day and the duration of computer use that has been more than 8 years experiences one or more symptoms of Computer Vision Syndrome (Poudel, 2018). Purpose of the Literature Review are Explain the disturbance of visual function due to the use of gadgets, especially on the eye health of children and

adolescents, and Explain the proper and correct use of gadgets that can maintain visual function, especially to children and adolescents

MATERIALS AND METHODS

Literature Search Strategy : Protocol and Registration using PRISMA to find a selection of studies that have been found and adjusted to the objectives of the literature review. Data Search in June - October 2020. using databases, namely : Sinta, Science Direct, Pubmed, Proquest, Google Scholar. Keywords : gadgets, smartphone, portable display, and eye, myopia, vision, visual, and boolean operators (AND, OR, or NOT) adjusted to the Medical Subject Heading (MeSH)

Inclusion Criteria using the PICO Method, as follows: Population are international and national journals dealing with research topics, using gadget and the like, sample are children to adults, male and female, samples ranging from 50 respondents to 9.884 respondents, desains : cross sectional, cross sectional with case control, intervensi prospektif, comparatif prospektif, longitudinal prospektif, and observasional prospektif. Variable : Frequency of use of the Gadget, Duration of use of the Gadget, Position of viewing the Gadget, and Visibility to the Gadget. instrument : questionnaires, measusement of visual acuity and refraction, Scrmers's test, tear break up time, tear meniscus height, and score computer vision syndrome. Analisis : chi-square, logistic regression, linier regression, man-whitney, paired t tests, and student's t test.

RESULTS

Fifteen articles met the inclusion criteria based on the topic of the review literature, namely the disruption of vision function due to the use of gadgets. The study design used in each study that had an impact on visual impairment was 9 cross-sectional studies, 2 cross-sectional studies with case control and 1 study each prospective intervention, prospective comparative, prospective longitudinal, and prospective observational. The study according to this literature review was conducted in Indonesia with five studies (Putri, DW, & Mulyono, M. 2018, Wahyuningrum, T., & Prameswari, VE 2018, Rahmat, NN, et al., 2017, Bawelle, CFN et al., 2016, Rahimi, MB et al., 2015), four studies in India (Ichhpujani, P., et. All., 2019, Patel, D., et. All., 2019, Saxena, R., et. All., 2017, Saxena, R., et. All., 2015), three studies in Korea(Choi, JH, et. All., 2019, Dong Ju Kim et al., 2017, Moon, JH, et. All., 2016), and the other one study in China (Guan, H., et. All., 2019), one study in Ireland (Mc Crann, S. et. all., 2020), one study in Romania (Bogdănici, CM, et al., 2017). Respondents in this study are people who use gadgets and the like. Gender characteristics of the respondents consisted of women and men. Meanwhile, the respondents' ages ranged from children to adults

DISCUSSION

On average, the use of gadgets for more than 4 hours a day will have a higher risk of visual disturbances, while those using 1-2 hours of use and less than 1 hour will have a lower risk. The position when doing activities using the gadget in a sitting position is considered better than the lying position. This is because when doing activities in a sitting position, you can maintain the ideal distance between the eye and the object being seen. In addition, doing activities in a sitting position can provide good lighting because the illuminating lights come from above, which is the condition that is considered the best. Meanwhile, if you use a gadget lying down will cause the eyes to be unable to relax. This is because the muscles in the eye will pull the eyeball downwards following the location of the object being seen, thus causing the eye to become more accommodating. Eyes that are accommodated for a long time will experience a decrease in visual acuity faster. The use of chairs when using gadgets is recommended because the sitting position will reduce the risk of eye health problems.

Most of them just realized about the dangers of using gadgets too long after experiencing disturbances in their bodies, such as decreased visual acuity, incidence of myopia or increased degree of myopia, CVS, such as eye strain, dry eyes, irritation, blurred vision, sensitivity to light, and double vision. The time spent viewing gadgets in children and adolescents with a possible incidence or increase in the degree of myopia varies (Lanca C. 2020).

The possibility of CVS causing permanent eye damage is small or even non-existent, but this eye disorder can affect workers' comfort in using computers. If left without proper handling, the impact will not only cause long-term vision problems but also interfere with productivity and work safety. To minimize the occurrence of CVS are those with CVS suspects, should check the eye to an eye specialist. And computer users should try to blink more frequently, close their eyes for 20 seconds, at

least every half hour or blink every time they press the “enter” key. Improvement of sitting position when using the monitor screen. To reduce fatigue, taking a five-minute break for every 30 minutes, apply the "20-20-20 rule". After looking at the monitor screen for 20 minutes, focus your eyes on an object 20 feet (6 meters) away for 20 seconds (AOA, n.d.).

CONCLUSION

Although the use of gadgets is not the only major cause of health problems, it contributes significantly to various health problems, especially impaired vision, namely decreased visual acuity, myopia, and computer vision syndrome. Like a double edged sword which has both beneficial and detrimental effects, proper use can prove to be beneficial in understanding the field of education better whereas overuse can lead to various health problems.

CONFLICTS OF INTEREST

The comprehensive summary in this review literature is that writing is done independently and does not have a conflict of interest in writing with anyone.

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