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Correlation Between Level of Parental Knowledge About Visual Acuity and The Incidance of Retractive Errors in Children with Disabilities in Mawar Putih Special School

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Abstract

Refractive error of the eye is a condition where the image is firm. It is not formed on the retina but on the front or back of the yellow spot and is not located at a single sharp point. Knowledge is one of the factors that plays a role in developing a person's health. The aim of this study was to analyze the relationship between the level of parental knowledge about visual acuity and the incidence of eye disorders in children with disabilities. The aim of this study was to analyze the relationship between the level of parental knowledge about visual acuity and the incidence of eye disorders in children with disabilities. This research is a descriptive correlation with a cross-sectional approach where research subjects were obtained using total sampling techniques (n=75). The relationship between parent level of knowledge about visual acuity and the incidence of eye disorders was analyzed using the Spearman Rank test. There were 34 parents (45.3%) who had sufficient knowledge about sharp vision and 31 students (41.3%) who had myopia. The relationship between the two shows a p value = 0.033. Conclusion: There was a relationship between level of parental knowledge about visual acuity and the incidence of refractive errors in children with disabilities in Mawar Putih special school.

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INTRODUCTION

One of the key senses for a human being is the eye through which an individual gathers more than 80 percent of the required visual data. Yet, there are many problems associated with the eyes that range from minor ailments to severe conditions that could cause blindness (Kementerian Kesehatan Republik Indonesia, 2018). Eyes have a very important role, especially for vision. In addition, the eyes are also the windows to the world, because with our eyes we can see the beauty of the world. Uncorrected refractive errors are one of the most common causes of visual impairment. If a child experiences an uncorrectable refractive error, there will be concentration disorders that can interfere with the child's learning activities. Eyes that look normal do not rule out the possibility of impaired vision (Saiyang, B., Rares, L. M., & Supit, 2021).

Vision is a very important aspect in life. There are five types of eye diseases that are most common in Indonesia, namely refractive errors, conjunctivitis, pterygium, cataracts and glaucoma (Ratanna R.S.M., Rares L., 2014). Based on data from the World Health Organization (WHO) 2014, there are 285 million people in the world who experience visual impairment, where the highest prevalence of 43% is caused by refractive disorders, 33% is caused by cataracts, and 2% by glaucoma. Refractive disorders in children are a problem that must be addressed immediately (Basri, S., Pamungkas, S. R., & Arifian, 2020).

It is projected that out of the total world population which is about 7.53 trillion, there will be 290 million people (3.40%) suffering from visual impairment, made up of 38 million people suffering from blindness and 217 million people suffering from moderate to severe visual impairment, plus another 188 million people suffering from mild visual impairment. One country with many people suffering from visual impairments is Indonesia, where 10% out of the 66 million school aged children (aged 5-19 years) suffer from refractive errors. In Indonesia, refractive error is the most common eye disease. Cases of refractive error have been increasing year by year (Bourne RR, Stevens GA, White RA, Smith JL, Flaxman SR, 2017).

Refractive errors commonly observed in children include myopia and amblyopia. Myopia can be defined as an eye disorder whereby light entering the eye could not focus on the retina since it converges before the retina or yellow spots. According to the WHO, the number of people with myopia stood at 27% (1,893 million) in the year 2010 and about 90% of those affected lived in developing countries. There has been a sharp rise in cases of myopia in some countries in Asia (including China) due to increased use of computer devices rather than reading books. The prevalence rate of myopia in Indonesia is 25% among adults and 10-12% among children (Hapsari, 2016). According to the WHO report in Fauzi, it was stated that ninety percent of cases of visual impairment occur in developing countries. Uncorrected refractive errors such as myopia, hypermetropia, and astigmatism constitute the most common cause of visual disability, while cataracts represent the leading cause of blindness in developing nations. It should be noted that eighty percent of these cases could actually have been avoided or treated (World Health Organization, 2015).

Refractive eye error is a condition where a clear image is not formed on the retina but at the front or back of the yellow spot and is not located at a sharp point. Uncorrected refractive errors are the main cause of decreased visual acuity in the world and can cause blindness. The three most common refractive errors are myopia, hypermetropia and astigmatism (Ilyas S, 2018). About 80 to 85 percent of learning involves the sense of sight, and poor vision might hinder child growth in terms of skills involving vision. If left untreated, visual impairment will certainly have an impact on academics and behavior. Furthermore, it can even lead to work accidents in the future, as well as become an economic burden on the country (Samian, 2013). Based on the results of McCrann's research on parental knowledge of myopia refractive disorders in their children, of 329 parents, only 46% thought that myopia posed a health risk to their children, while the same number (46%) thought that myopia was a discomfort in the optical function of the eye that could be corrected with glasses, contact lenses, or laser refractive surgery (McCrann, S., Flitcroft, I., Lalor, K., Butler, J., Bush, A., & Loughman, 2018).

Knowledge is one of the factors that plays a role in developing a person's health. The more knowledge a person has about refractive eye disorders, the better the level of health they will have, especially for parents who have children with disabilities who need help to maintain their health condition. The symptoms felt are that the vision feels blurry, the child often blinks when looking at the writing on the blackboard, and the child's performance decreases. If a child already feels signs of blurred vision, as a wise parent it would be a good idea for the parent to immediately take the child to the nearest refraction clinic to get the right help (Witjaksono, 2022). Therefore, this research was conducted to determine whether there is a relationship between the level of parental knowledge about visual acuity and the incidence of refractive errors in children with disabilities.

METHOD

This research is a descriptive correlational study with a cross-sectional approach that assesses the level of parents' knowledge about visual acuity on the incidence of refractive errors in children with disabilities. 75 students were sampled using total sampling technique. Researchers used a visual acuity test as an instrument to collect data. Before entering the stage of testing the students' best visual acuity, they are screened first. After obtaining data on students who have vision problems, it will be recorded on the prescription form that has been provided. Then, the researcher approached the respondents and provided an explanation of the aims and objectives of the research to the participants. After that, the researcher began the stages of examining 6/6 visual acuity alternately. Students who have 6/6 vision are directed to return outside the examination room. Meanwhile, students who have vision below 6/6 will undergo further examination until they get the best visual acuity correction results. Data analysis using the SPSS version 26.0 program includes descriptive analysis and relationship testing. Each parent's knowledge data about visual acuity and the incidence of eye disorders is explained using a frequency distribution. The data was correlated

and analyzed using the Spearman Rank test. All results were considered statistically significant if the p value was <0.05 with a 95% confidence interval.

RESULTS AND DISCUSSION

Demographic Characteristics

SLB C Mawar Putih has 75 students, with 12 teachers. Located on Jl. Western Self-Sufficiency XI No. 64 B, Kebon Bawang sub-district, Tanjung Priok sub-district, North Jakarta and has 9 classes. Number of hearing/speech impairments: 17 children, number of intellectual impairments: 58 children. The demographic characteristics of the 75 research subjects include the level of parental knowledge about visual acuity (Table 1). Table 1 shows that 34 parents (45.3%) have sufficient knowledge about visual acuity. Meanwhile, 15 parents (20%) had less knowledge about sharp vision. Table 2 shows the research subjects based on the results of examinations carried out to determine eye abnormalities that occur in children with disabilities. The majority of the diagnosis was myopia as many as 31 students (41.3%). There were 25 students (33.3%) who experienced hypermetropia. Only 19 students (25.3%) had normal eyes and no eye abnormalities. Table 3 shows the characteristics of the subjects in the study, showing that there is a significant relationship between the two variables studied with a p-value of 0,033.

Table 1. Description of level of parental knowledge in each group

Levels of Parental Knowledge	Frequency	Percentage (%)
Good	26	34.7
Enough	34	45.3
Less	15	20.0
Total	**75**	**100.0**

Table 2. Description of incidence of retractive errors in each group

Incidence of Retractive Errors	Frequency	Percentage (%)
Hypermetropia	25	33.3
Myopia	31	41.3
Normal	19	25.3
Total	**75**	**100.0**

Table 3. Correlation of the Level of Parental Knowledge About Visual Acuity and the Incidence of Refractive Errorsin Children with Disabilities

Levels of Parental Knowledge	The Incidence of Retractive Errors						Total		p-value
	Normal		Myopia		Hypermetropia				
	n	%	n	%	n	%	n	%	
Less	5	20.0	13	52.0	7	28.0	25	100.0	0.033
Enough	11	35.5	15	48.4	5	16.1	31	100.0	
Good	10	52.6	6	31.6	3	15.8	19	100.0	
Total	**26**	**34.7**	**34**	**45.3**	**15**	**20.0**	**75**	**100.0**	

Analysis of the Relationship Between the Level of Parental Knowledge About Visual Acuity and the Incidence of Refractive Errors in Children with Disabilities

The following table shows an analysis of the relationship between the level of parental knowledge about visual acuity and the incidence of eye disorders, where 75 research subjects were taken as samples using total sampling techniques. Parents who had less knowledge and had disabled children with myopia were 13 respondents (52%). Parents who had sufficient knowledge and had children with disabilities with myopia were 15 respondents (48.4%) with p value = 0.033 which was statistically significant. Spearman rank test analysis: The level of parental knowledge about visual acuity and the incidence of eye disorders showed that there was a significant relationship ($p < 0.05$).

Based on the research results, it is known that the majority of parents have sufficient knowledge about sharp vision, namely 34 respondents (45.3%). Sharp vision is a primary indicator of the health of the eyes and visual system. Sharp vision is defined as a person's ability to see an object (Skuta GL, Cantor LB, 2015). Visual acuity examinations in normal adults are usually familiar and comfortable to carry out, but visual acuity examinations in children, especially those with disabilities, will require techniques, methods and ways to obtain cooperation depending on the condition of the respondent. Subjective refraction examinations in

children will not be effective, so the examination carried out is an objective refraction examination. Apart from that, the gold standard refraction examination performed on children is cycloplegic, so it can prevent accommodation (Wright KW, Hengst TC, 2013).

It cannot be denied that today's human dependence on smartphones is starting to become worrying. Nowadays, adults and even young children are often addicted to checking the smartphone in their hands. Various basic human activities such as communication already use smartphones and rarely use direct or interpersonal communication (M. G. Sobry, 2017). Parents are the first to make primary decisions and make decisions regarding health services for their children. So knowledge about eye problems is really needed by parents. This understanding plays a role in early detection of refractive errors and also plays a role in seeking appropriate help. It is hoped that refraction detection can be carried out quickly and optimal vision can be obtained with appropriate parental behavior. With the right knowledge and attitude, parents are able to carry out early detection and seek appropriate help (Kalangi, W., Rares, L., & Sumual, 2016).

In today's developing era, people can get information from various sources, as well as information about refractive errors. Nowadays, information can be easily found from any media. Such as information from print media which can be obtained from newspapers and magazines, electronic media which can be obtained from television, radio, the internet and even through health worker activities such as training held. A person's level of knowledge can also be influenced by information obtained from various sources. The more information someone obtains, the more likely they are to have extensive knowledge (Notoatmodjo, 2018).

Late diagnosis of childhood refractive errors could be caused by several factors like unawareness, ignorance of symptoms in children by parents and teachers, unavailability or affordability of refractive services and negative attitude to spectacle-wearing in children. As was demonstrated in research carried out by Olusanya, non-existence of systematic refractive errors screening program among school children could cause delays in detection leading to late treatment, inadequate school eye health and refractive error services, ignorance of parents and teachers as well as public misconceptions on the wearing of spectacles. In children, these factors cause even greater harm (Olusanya, B., Ugalahi, M., Ogunleye, O., & Baiyeroju, 2019).

Based on the result of the study, most of the participants have the problem of myopia, which was experienced by 31 students or 41.3% of the respondents. Myopia is an optical defect of the eyes where there is too much light refraction capability and eye refraction problems causing the rays to be bent in front of the retina. The earlier a person's eyes are exposed to bright light directly, the greater the chance of experiencing myopia (Nassa Mokoginta, Saskia, 2019).

Vision examination in children is the most important part of a comprehensive eye examination. Visual acuity examinations in children are difficult to carry out, especially if it is carried out on children with disabilities, because they often feel afraid and have difficulty concentrating. Therefore, the use of a retinoscope to carry out objective refraction examinations must be fast and accurate. And conditions are really needed where children are interested in the examinations we carry out. We have to create conditions like this in various ways, for example by greeting and inviting someone to shake hands, by praising or paying attention to something they wear such as their clothes, shoes and hair or by giving them attractive colored toys. Visual acuity examination must be adjusted to the patient's age, cooperation, neurological condition and reading ability (Julita, 2018).

It is important to carry out this examination consistently because it aims to provide recording of basic visual acuity, support the examination and diagnosis of eye disease or refractive disorders, assess changes in visual function, and measure the results of treatment. One of the methods that can be used is the Snellen chart. Normal visual acuity measured using the Snellen chart is assessed as 20/20 in feet or 6/6 in meters. Other measurement methods have also been developed which aim to check visual acuity, visual function, and to document the results (Brodie SE, Gupta PC, 2020).

Basic vision examination includes checking distance and near vision acuity. A sharp distance vision examination is carried out with sufficient light, distance and a standardized chart, and begins by examining the right eye. The examiner closes the patient's left eye while examining the right eye. The patient can also be asked to close the left eye himself with his hand. The examiner then determines a chart or examination method that is adapted to the patient's condition and the patient's ability to read letters or pictures. Patients who have visual acuity values below normal will undergo a pinhole examination. This examination is carried out to determine the cause of the patient's decreased visual acuity due to refractive disorders or due to causes other than refraction (organic abnormalities). Near vision acuity examination is used to assess the patient's ability to see clearly at normal reading distances. This examination is usually carried out at a distance of 40 cm using a handheld card (Brodie SE, Gupta PC, 2020).

Research conducted by Theophanous stated that the prevalence of myopia in children in Southern California showed that of 60,789 patients, 41.9% of patients had myopia. The prevalence of myopia increases with age from 14.7% at ages 5 to 7 years to 59.0% at ages 17 to 19 years (Theophanous C, Modjtahedi BS, Batech M, Marlin DS, Luong TQ, 2018). Another research conducted by Ariaty at Pare-Pare City Elementary School showed that 35 students suffered from myopia out of 165 respondents (Ariaty, Y., Hengky, 2019).

There is a significant relationship between parental knowledge about visual acuity and the incidence of eye disorders in children with disabilities. Parents with a low level of knowledge about visual acuity, it is known that they have children with 13 respondents (52%) had myopia, while 10 respondents (52.6%) had parents with a good level of knowledge about visual acuity. A good level of parental knowledge regarding refractive errors can help detect and prevent refractive errors in children early. With a good level of parental knowledge about refractive errors, it is hoped that there will be changes in behavior to continue to support children's eye health, especially in preventing the occurrence of refractive errors, so that the incidence of refractive errors in children will decrease (Ebeigbe, J. A. dan Emedike, 2016).

CONCLUSION

Visual acuity examination is an examination that can be carried out on patients in any condition, including special patient conditions. Special patients can have language, hearing, literacy and intellectual limitations. The limitations that special patients have included nonverbal or deaf patients, and patients with mental retardation, and other disabilities. Visual acuity must be checked as accurately as possible so that it can further help improve the quality of vision for special patients. There is a significant relationship between the level of parental knowledge about visual acuity and the incidence of eye disorders in children with disabilities. It is necessary to carry out regular health promotion activities to provide knowledge about eye health and routine eye examinations as well as paying attention to other factors that can influence eye health such as genetics, device use patterns and lifestyle.

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