

THE PREVALENCE OF REFRACTIVE ERRORS ON FIFTH GRADE STUDENTS IN PUBLIC ELEMENTARY SCHOOL NUMBER ONE SESETAN

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Abstract: Vision is an important thing for humans, especially in the field of education. The health of this organ of vision is often ignored by humans so that it can cause refractive abnormalities. Delays in making this correction, especially in school-age children can interfere with the learning process of the child himself. The purpose of this study was to determine the characteristics and prevalence of patients with refractive errors who are in SDN 1 Seseetan who are in fifth grade status. This research is a descriptive cross-sectional study to determine the prevalence and characteristics of refractive errors in fifth grade students of SDN 1 Seseetan. Respondents in this study were 49 students. This study was conducted by measuring eye vision to determine whether the student refraction errors or not and screening risk factors was done by filling out the questionnaire provided. Characteristics of respondents by sex were female (53.1%) and male (46.9%) where in this study respondents included in the category of refraction errors were 32.7% and respondents in the normal category were 67.3%. The prevalence of respondents who read more than two hours a day was 36.7%. The prevalence of respondents who use monitors more than four hours a day is 18.4%. The prevalence of respondents who have siblings who use glasses is 34.7%. The prevalence of respondents who have parents using glasses is 30.6%.

Keywords: refractive error, myopia, astigmatism, glasses.

I. INTRODUCTION

In educational activities, obtaining information is the main thing to do. This must be done by the teacher and students. This is especially for students, information obtained must be delivered smoothly and understandably. Things that affect quite a lot, one of which is vision. This is the main access to learning. These abnormalities in vision can interfere with the activity of obtaining information that is important in the term of education. This refractive errors in Indonesia is estimated to be uncorrected this is the cause of a decrease in the quality of vision. This can be seen from the estimate in 2006 which stated that 153 million people in the world experienced uncorrected refractive errors and complained of reduced visual acuity. Based on the data, 13 million are said to be among children aged 5-15 years. In the results of the 2009 Ministry of Health survey found the prevalence of refractive errors of 61.71% and was ranked first in the highest disease in Indonesia. The problem of eye refraction disorder is still not getting much attention proven by the elementary school children's health program which is still focused on oral and dental health. The delay in making this correction can cause the learning abilities of this child to be disrupted. This should be of more concern to the government. (1)(2)

II. MATERIAL AND METHODS

A. Subject

This study is a descriptive cross section by taking primary data directly in Public Elementary School 1 Seseetan, on one day in October 2018. The research subjects were all fifth graders on SDN 1 Seseetan who fulfilled the inclusion criteria

namely willing to be the subject of research and filling out the questionnaire in full, still active in teaching and learning activities. And does not meet the exclusion criteria, which is refusing to be a research sample and having eye abnormalities that can affect refraction status such as congenital abnormalities, infections and trauma.

The sampling technique is total sampling. The number of samples obtained is 49 students. Data in the form of primary data collected through snellen chart examination and questionnaire. The questionnaire contained questions related to risk factors for refractive errors including reading activities, monitor activity, sibling history, parent history. Then the eye sharpness data will be equipped with a snellen chart examination by the doctor. Data is then analyzed with the help of IBM SPSS Statistics 20 software

III. RESULT AND DISCUSSION

A. Result

Characteristics of refractive errors in fifth grade students on elementary school number 1 Sesetan in 2018 are explained based on gender, refraction abnormalities, types of refractive errors, reading activities, monitor activities, siblings who use glasses, and parents who use glasses other than reading glasses.

Table 1: Characteristics refractive errors

CHARACTERISTICS		n	Percentage (%)
Gender	Male	23	46,9
	Female	26	53,1
Refractive Error Status	Ametropia	16	32,7
	Emmetropia	33	67,3
	Myopia	14	28,6
Refractive Error Type	Hyperopia	0	0
	Astigmatism	2	4,1
	>2 hours	18	36,7
Reading Activity (in a day)	≤2 hours	31	63,3
	>4 hours	9	18,4
Monitor usage activities (in a day)	≤4 hours	40	81,6
	Exist	17	34,7
Siblings that use eyeglasses	Doesn't exist	32	65,3
	Exist	15	30,6
Parents had using eyeglasses other than reading	Exist	15	30,6
	Doesn't exist	34	69,4

Table 1 shows that the total of respondents from this study were 49 people with details of 23 men (46.9%) and 26 women (53.1%). Respondents who have abnormal status ametropia refraction as many as 16 respondents and emetropia as many as 33 respondents. In research the type of refractive errors is categorized into three groups and is sorted from the highest incidence, namely myopia, astigmatism, and hypermetropia. Most of the respondents (63.3%) stated that they read in a day for less than two hours. Most of the respondents (81.6%) had monitor usage activities of less than four hours. The monitors intended in this case are television screens, computers, and smartphones. Respondents who claimed not to have siblings using glasses (65.3%) were higher than those who had (34.7%). Respondents who stated that they did not have parents using glasses other than reading glasses were 34 respondents (69.4%).

Table 2: The status of refractive errors based on gender

Gender	Ametropia (%)	Emetropia (%)	Total (%)
Male	6 (26)	17 (74)	23 (100)
Female	10 (38,5)	16 (61,5)	26 (100)
Total	16 (32,7)	33 (67,3)	49 (100)

Table 2 shows that of the 49 respondents, 26 of them were female respondents. The prevalence of women who have ametropia (38.5%) occurs higher than men (26%). Men have a high percentage of emetropia (74%).

Table 3. The types of refractive errors based on gender

Gender	Miopia (%)	Astigmatism (%)	Total (%)
Male	4 (66,7)	2 (33,3)	6 (100)
Female	10 (100)	0 (0)	10 (100)
Total	14 (87,5)	2 (12,5)	16 (100)

Table 3 shows that of the 16 respondents who had refractive errors, 10 of them were women. Women have a high percentage of myopia (100%) refractive errors. Men have a high percentage in the type of refractive errors astigmatism (33.3%).

Table 4. The status of refractive errors based on the intensity of reading activities

Intensity of daily reading activities	Ametropia (%)	Emetropia (%)	Total (%)
≤ 2 hours	9 (29)	22 (70,9)	31 (100)
> 2 hours	7 (38,9)	11 (61,1)	18 (100)
Total	16 (32,7)	33 (67,3)	49 (100)

Table 4 shows that of the 49 respondents, 31 of them were respondents who read less than two hours a day. The percentage of respondents who read more than two hours a day who had ametropia had a high number (38.9%). Respondents who read less than two hours had a high percentage of emetropia (70.9%).

Table 5. The types of refractive errors based on the intensity of reading activities

Intensity of daily reading activities	Miopia (%)	Astigmatism (%)	Total (%)
≤ 2 hours	7 (77,8)	2 (22,2)	9 (100)
> 2 hours	7 (100)	0 (0)	7 (100)
Total	14 (87,5)	2 (12,5)	16 (100)

Table 5 shows that of the 16 respondents who had refractive errors, 9 of them read less than two hours a day. The percentage of respondents who read more than two hours a day experienced high types of myopia (100%) refraction errors. The percentage of respondents who had reading activity less than two hours a day was high in the type of astigmatism refraction errors (22.2%).

Table 6. The status of refractive errors based on the intensity of monitor usage activities

Intensity of monitor usage activities	Ametropia (%)	Emetropia (%)	Total (%)
≤ 4 hours	13 (32,5%)	27 (67,5)	40 (100)
> 4 hours	3 (33,3%)	6 (66,7)	9 (100)
Total	16 (32,7%)	33 (67,3)	49 (100)

Table 6 shows that of the 49 respondents, 40 of them were respondents who had monitor usage activities less than four hours a day. The percentage of respondents who have monitor usage activity more than four hours a day experiencing ametropia has a high number (33.3%). Respondents who have monitor usage activity

Table 7. The types of refractive errors based on the intensity of monitor usage activities

Intensity of monitor usage activities	Miopia (%)	Astigmatism (%)	Total (%)
≤ 4 hours	12 (92,3)	1 (7,7)	13 (100)
> 4 hours	2 (66,7)	1 (33,3)	3 (100)
Total	14 (87,5)	2 (12,5)	16 (100)

Table 7 shows that of the 16 respondents who had refractive errors, 3 of them had monitor activities of more than four hours a day. The percentage of respondents who had monitor activity more than four hours a day experienced a high type of astigmatism refraction disorder (33.3%). The percentage of respondents who had monitor activity was less than four hours a day high in the type of myopia refraction disorder (92.3%). These defined monitors are sourced from televisions, gadget devices, and computer screens.

Table 8. The status of refractive errors based on based on whether or not siblings who had using glasses

Siblings who had using glasses	Ametropia	Emetropia	Total
Exist	6 (35,3)	11 (64,7)	17 (34,7)
Doesn't Exist	10 (31,2)	22 (68,8)	32 (65,3)
Total	16 (32,7)	33 (67,3)	49 (100)

Table 8 shows that of the 49 respondents, 32 of them were respondents who had siblings using glasses. The percentage of respondents who have siblings using glasses experiencing ametropia has a high number (35.3%). Respondents who did not have siblings using glasses had a high percentage of emetropia (68.8%).

Table 9. The types of refractive errors based on based on whether or not siblings who had using glasses

Siblings how had using glasses	Miopia (%)	Astigmatism (%)	Total (%)
Exist	5 (83,3)	1 (16,7)	6 (100)
Doesn't Exist	9 (90)	1 (10)	10 (100)
Total	14 (87,5)	2 (12,5)	16 (100)

Table 9 shows that of the 16 respondents who had refractive errors, 6 of them were respondents who had siblings using glasses. The percentage of respondents who have siblings using glasses experienced a high type of astigmatism refraction disorder (16.7%). The percentage of respondents who did not have siblings who used high glasses in the type of myopia refraction errors (90%).

Table 10. The status of refractive errors based on based on whether or not parents who has use glasses

Parentst who had using glasses, but not glasses for reading	Ametropia (%)	Emetropia (%)	Total (%)
Exist	3 (20)	12 (80)	15 (100)
Doesn't Exist	13 (38,2)	21 (61,8)	34 (100)
Total	16 (32,7)	33 (67,3)	49 (100)

Table 10 shows that of the 49 respondents, 15 of them were respondents who had parents using glasses. The percentage of respondents who have parents using glasses experiencing emetropia has a high number (80%). Respondents who did not have parents who used glasses had a high percentage of ametropia (38.2%). The glasses referred to here are glasses to help the person to read.

Table 11. The types of refractive errors based on based on whether or not parents who had using glasses

Parentst who had using glasses, but not glasses for reading	Miopia (%)	Astigmatism (%)	Total (%)
Exist	2 (66,7)	1 (33,3)	3 (100)
Doesn't Exist	12 (92,3)	1 (7,7)	13 (100)
Total	14 (87,5)	2 (12,5)	16 (100)

Table 11 shows that of the 16 respondents who had refractive errors, 3 of them were respondents who had parents using glasses. The percentage of respondents who have parents using glasses experienced a high type of myopia refraction disorder (66.7%). The percentage of respondents who do not have parents who use glasses is high in the type of myopia refraction disorder (92.3%). Eyeglasses what is meant here is glasses to help the person to read.

B. Discussion

Prevalence of refractive errors in elementary school number 1 Ssetan students. As soon as the fifth grade has a prevalence of 32.7%. This prevalence is higher than research in Elementary Schools in Romania (25%), Temanggung Regency (14.7%). This difference is caused by culture and its geographical location is much different. (3)(4)(5)

Refractive errors were found to be higher in female subjects (38.5%). This is also consistent with other studies in Elementary Schools in Romania (26.1%), Temanggung Regency (17.5%). Research in Malaysia also stated similarly that female respondents had a proportion of myopia events. This is probably due to the activity of women's rooms higher than men. Outdoor activities provide more light intensity and have the effect of reducing the power of accommodation and the release of dopamine by the retina of the eye. This causes a reduced risk of refractive errors. (3)(6)(8)

Reading activities that are more than two hours a day have a high percentage of ametropia (38.9%). In this study, it is also compatible with research in elementary schools in Malang (84%), Malaysia (85.7%). Different results were obtained in the study in Medan Sunggal Subdistrict, which read less than ninety minutes a day had a higher rate of refractive errors (54.2%). This refractive errors can be caused by close eye activity carried out continuously. This is cumulative and can trigger refractive errors. (3)(4)(8)(9)

Monitor activity that is more than four hours a day has a high percentage (33.3%). These defined monitors are sourced from televisions, gadget devices, and computer screens. This research is in line with similar research which states that the high percentage results are in Malang Elementary Schools (87.5%) and Temanggung Regency (51.2%). This is probably due to the blue light produced by the monitor being miopigenic. Individuals who are exposed to these blue rays continuously can cause refractive errors. (4)(7)(10)

Respondents who have siblings using glasses have a high percentage of refractive errors (35.3%). This is in accordance with other studies, namely in Santo Patrick Vocational School Malaysia (47.6%). This can be caused by several mechanisms. Genetic factors can reduce the nature of refraction errors to their offspring. Another mechanism is the habit handed down by the family to its members. (4)(8)

The study also stated that respondents who did not have parents using glasses other than reading glasses had a high percentage of refractive errors (92.3%). These results are not in accordance with the research in Malang (80.8%), Temanggung Regency (38.8%), and Egypt (80%) which stated the opposite results. The theory states that refractive errors can be influenced by genetic factors and also habits of parents. This difference can be caused by differences in research methods. In another study, questionnaires were filled in by the parents of respondents, while in this study the respondents themselves directly filled in. (4)(7)(11)(12)

IV. CONCLUSION

Students of State Elementary School 1 Sesian as many as 49 respondents who were the subjects of the study, found the prevalence of refractive errors was 32.7%. Respondents consisted of 23 men and 26 women. The prevalence of refractive errors in women (38.5%) is higher compared to men (26%). The age of the respondents is 10-11 years. The highest prevalence of the type of refractive errors in respondents is myopia (87.5%). Of all the risk factors, the highest prevalence of refractive errors was found in respondents who read more than two hours a day (38.9%). The second highest is in respondents who have siblings using glasses (35.3%), then the respondents who use the monitor screen more than four hours a day (33.3%) and respondents who have parents using glasses other than reading glasses (20%).

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