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ORIGINAL ARTICLE

VISUAL ACUITY AND ITS IMPLICATIONS FOR SCHOOL PERFORMANCE ACUIDADE VISUAL E SUAS IMPLICAÇÕES PARA O RENDIMENTO ESCOLAR DE CRIANÇAS ACUIDAD VISUAL Y SUS IMPLICACIONES PARA EL RENDIMIENTO ESCOLAR

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ABSTRACT

Objective: to correlate the visual acuity deficit in the performance of pupils in the 4th and 5th years of a public school. **Method:** descriptive exploratory study with a quantitative approach, performed with 40 students who had low visual acuity after testing with the Snellen chart. The data collection instrument was a questionnaire. Data were analyzed using the χ^2 and the test of Fisher-Freeman-Halton and then were presented in tables. The research was proved by the Research Ethics Committee of the University Hospital Lauro Wanderley, N° 56/10. **Results:** the survey revealed that 25 children have difficulty reading, 9 possessed diminished learning capacity and 8 had failed. **Conclusion:** the study reinforces that ophthalmology is the best preventive strategy, intended for the prevention of more serious eye problems, such as blindness, besides the clear improvement in school performance, learning, intellectual, psychological and social. **Descriptors:** School Performance; Early Detection; Visual Acuity.

RESUMO

Objetivo: correlacionar o déficit na acuidade visual ao rendimento escolar dos alunos do 4º e 5º anos de uma escola pública municipal. **Método:** estudo exploratório-descritivo com abordagem quantitativa, constituído por 40 escolares que apresentaram baixa acuidade visual após o teste com a escala de Snellen. O instrumento de coleta de dados utilizado foi um questionário. Os dados foram analisados utilizando-se o teste de χ^2 e o teste de Fisher-Freeman-Halton e em seguida foram apresentados em forma de tabelas. A pesquisa foi provada pelo Comitê de Ética em Pesquisa do Hospital Universitário Lauro Wanderley com N° 56/10. **Resultados:** a pesquisa revelou que 25 escolares apresentaram dificuldade de leitura, 9 possuíam capacidade de aprendizado diminuída e 8 já haviam reprovado. **Conclusão:** o estudo reforça que a oftalmologia preventiva é a melhor estratégia, tendo como finalidade a prevenção de problemas visuais mais graves, como a cegueira, além da nítida melhora no rendimento escolar, aprendizado, desenvolvimento intelectual, psicológico e social. **Descritores:** Rendimento Escolar; Detecção Precoce; Acuidade Visual.

RESUMEN

Objetivo: correlacionar el déficit en la acuidad visual al rendimiento escolar de los alumnos de 4º y 5º de la educación primaria de una escuela pública municipal. **Método:** estudio exploratorio con abordaje cuantitativo, constituido por 40 escolares que presentaron baja acuidad visual tras el test con la escala Snellen. El instrumento de colecta de datos utilizado fue una encuesta. Los datos fueron analizados utilizándose del test de χ^2 y el test de Fisher-Freeman-Halton y en seguida fueron presentados en forma de tablas. La investigación fue aprobada por el Comité de Ética en investigación del Hospital Universitario Lauro Wanderley, con N° 56/10. **Resultados:** la investigación reveló que 25 escolares presentaron dificultad de lectura, 9 poseyeron capacidad de aprendizaje reducida y 8 ya habían reprobado. **Conclusión:** el estudio refuerza que la oftalmología preventiva es la mejor estrategia, teniendo como finalidad la prevención de problemas visuales más graves como la ceguera, además de la nítida mejoría en el rendimiento escolar, aprendizaje, desarrollo intelectual, psicológico y social. **Descriptores:** Rendimiento Escolar; Detección Precoz; Acuidad Visual.

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INTRODUCTION

Vision plays an important role in child development, as this is essential for learning and receiving sensory information from the external environment. It is a sense indispensable, especially with the entry of children in school, as this develops intensely intellectual and social activities directly associated with psychomotor skills and visual.

The relationship between the education system and the conventional sense of vision has been the subject of studies, which have shown results as the importance of this effect on school performance and social integration. Visual acuity loss is a major cause of school dropout and repetition rates among children in Brazil. According to the Literacy Program, the difficulty of seeing accounts for 22.9% of truancy among elementary school students in public schools. However, until the child dropping out of school, it can be marginalized and discriminated against in their socio-cultural environment.

The perception of visual impairment in children can occur complaint by the students themselves or by observation and perception of parents, relatives or teachers. However, many children can not express the difficulties in seeing, especially in the first years of life, so extra care is required of those responsible for the problems in the eye.

To avoid more serious problems in the future as amblyopia and strabismus, it is necessary early detection of visual problems. In developing countries, the problem is even greater, because in them are 80% of cases of blindness in the world, and two thirds are composed of foreseeable situations or curable.

Prevention and early detection of ocular disabilities in childhood are the best resources to avoid low vision. Such actions should be done preferably in school, because it is an institution with a large concentration of children, it is up to health professionals to integrate school student, family and community. The education of these professionals in their working environment is a key strategy for personal development and health improvement.

However, early detection of changes is not always possible for many adults neglect the observation of signs and symptoms shown by the child. Children with visual impairment have different signs and symptoms, such as difficulty seeing the picture, headache, pain, redness and eye pruritus, inattentive, easily

dispersing, difficulty in sports practices and decreased ability to learning.

Thus, it is the diagnosis and immediate intervention to prevent problems such as optical low vision, to improve school performance, learning process, education and socialization of students. The study aims to correlate the visual acuity deficit in the performance of pupils in the 4th and 5th years of municipal schools of João Pessoa.

This project is part of a research project derived from a master << Attention to health of school children in João Pessoa - Paraíba >> in which we evaluated the visual acuity of children in the municipal João Pessoa. During data collection, it was noticed that some children showed up disinterested, unmotivated or even rebellious, and those that showed deficits in visual acuity. Therefore, for this study, it is the following research question. << What are the implications of visual impairment in school performance of these children>>

To take account of the research problem, this study aims to:

- Correlate the deficit in visual acuity performance of pupils in the 4th and 5th years of a public school.

METHOD

Descriptive exploratory study with a quantitative approach, carried out from March to April 2010, where 40 students were analyzed. Inclusion criteria were: children in 4th and 5th grade of elementary school, enrolled in one of the selected schools, which parents signed a consent form, and that to be performed the measurement of visual acuity in the project "health care of school children in João Pessoa, "the school had low visual acuity.

As determining the Brazilian Council Ophthalmology decreased vision is visual acuity less than 0.8 (20/25) in at least one eye, with or without signs and symptoms.

Methods of screening for visual acuity, the most widespread is the Snellen chart, created by Hermann Snellen, a French ophthalmologist of the nineteenth century. This method is based on the letter E facing the four directions in fileiras.⁸ Therefore, it is considered as normal children who have visual acuity greater than 0.7, who were equal or below this value are considered carriers of visual impairment.⁹ In the present study, the visual impairment was subdivided into ocular impairment (visual acuity between 0.1 and

0.3) and moderate ocular (visual acuity between 0.4 and 0.7).

The data collection instrument was a questionnaire, being held with the teachers of 40 children, consisting of six closed questions, directed to the academic performance of students. Data were analyzed using the 2 test and the test of Fisher-Freeman-Halton, and nonparametric tests, used for the analysis of quantitative variables then were presented in tables. Schoolwork took place through the topics: difficulty reading from far and near (present or absent), learning capacity (adequate or decreased) and the number of failures (now rebuked and the number of times).

The study was conducted in accordance with the requirements of Resolution 196/96 of the National Health Council, which sets forth the standards and regulatory guidelines for

research involving humans. The research project was approved and funded by the National Council for Scientific and Technological Development (CNPq) with protocol No. 482922/2007-9 as the Call MCT / CNPq 15/2007 and approved by the Research Ethics Committee of the University Hospital Lauro Wanderley - CEP / HULW with No. 56/10. Were guaranteed anonymity of the subjects, as well as authorization of school principals, parents, students and teachers.

RESULTS

The total number of students examined was 40, where the vast majority, representing 26 students, were aged between 8 and 10 years as shown in table (1).

Table 1. Low visual acuity related to age in students of 4th and 5th grade of elementary school, in João Pessoa - PB. * Changing between 0.1 and 0.3. Change ** between 0.4 and 0.7.

Age group	Visual Acuity		Total	
	Severe *	Moderate**		
Between 8-10 Years	10	16	26	Fisher-Freeman-Halton exact P = 0,316
%	38,46%	61,54%		
>10 Years	3	11	14	
%	21,43%	78,57%		

* * Visual acuity between 0.1 and 0.3. ** Visual acuity between 0.4 and 0.7

Of the 40 students evaluated, 21 were male and 19 were female. The distribution of students with low visual acuity between males

and females is shown in Table (2).

Table 2. Low visual acuity related to gender distribution in the school's 4th and 5th grade of elementary school, in João Pessoa - PB.

Gender	Visual Acuity		Total	
	Severe *	Moderate**		
Male	6	15	21	Fisher-Freeman-Halton exact P = 0,577
%	28,57%	71,43%		
Female	7	12	19	
%	36,84%	63,16%		

Table (3) shows the relationship of visual

impairment with difficulty reading.

Table 3. Low visual acuity related to the degree of difficulty for reading in students of 4th and 5th grade of elementary school, in João Pessoa - PB

Difficulty reading	Visual Acuity		Total	
	Severe *	Moderate**		
Yes	9	16	25	Fisher-Freeman-Halton exact P = 0,730
%	36%	64%		
Not	4	11	15	
%	26,67%	73,33%		

The Relation of the learning ability and deficits in visual acuity is shown in table (4). In this study, only nine children showed a decrease in learning ability. The vast majority,

31 students presented the learning capacity dictates how appropriate.

Table 4. Low visual acuity related learning ability in students of 4th and 5th grade of elementary school, in João Pessoa - PB.

Learning capacity	Visual Acuity		Total	
	Severe *	Moderate**		
Adequate	9	22	31	Fisher-Freeman-Halton exact P = 0,437
%	29,03%	70,97%		
Decreased	4	5	9	
%	44,44%	55,56%		

When assessing the presence of failures among students with low visual acuity was found that 8 of them had failed, and 5 students had disapproved moderate deficit in

visual acuity and only 3 students had severe deficits in visual acuity, as shown in the table (5).

Table 5. Low visual acuity related to the presence of school failure in students of 4th and 5th grade of elementary school, in João Pessoa - PB.

Disapproval	Visual Acuity		Total	
	Severe *	Moderate**		
Yes	3	5	8	Fisher-Freeman-Halton exact P = 0,999
%	37,5%	62,5%		
Not	10	22	32	
%	31,25%	68,75%		

DISCUSSION

For the following analysis used to test the χ^2 test and the Fisher-Freeman-Halton. For all crosses met $p > 0.05$, meaning that no association was found between visual impairment with variable cross.

Of the 40 students who participated in the study, 26 students had between 8 and 10 years. Most children who had low visual acuity was male, totaling 21 students, however the higher incidence of severe visual impairment was present among women.

This study differs from studies found in the literature. In Sorocaba, a city belonging to the state of São Paulo, was assessed the prevalence of visual impairment in public schools. Of the 9640 schoolchildren, 4921 (51.0%) were male, and 4,719 (49.0%) female. We found a significant difference in the prevalence of visual impairment among sexes, being higher in females (14.9%) than males (11.5%).

In a study of students in the first grade of a public school in Florianópolis, were examined 700 children from 1st to 8th grades in the period from March to July 2001. The total number of students examined was 700, belonging to 372 (53.1%) were male and 328 (46.9%) female. Regarding gender distribution, the prevalence of decreased visual acuity was 22% among students, and 22.3% among alunas.⁸ The result shown by this study contradicts the literature probably due to the small sample.

The degree of difficulty of reading-related visual impairment is shown in table (3). It was observed that 25 (62.5%) students had some kind of difficulty in reading, 9 children with severe visual impairment and 16 with moderate visual acuity.

In the assessment of 161 students of the third year of elementary school in the public Juiz de Fora, Minas Gerais, regarding the student's perception about his vision, 51.6% said they did not see well as formation of

some perceived change (double vision, blurred vision, seeing evil from afar or up close).

Abnormalities of refraction lead to deviations from normal vision, taking the example of myopia. In it, there is an imbalance between the length of the eye and the apparatus dioptric focal length of the eye. In myopia the eyeball is too long, making the image blurry or unclear because the image plane is formed before the retina. Thus the image is formed with objects situated very close, seeing the distance so blurred.

The refractive errors interfere with good school performance, as in a study of 270 children with suspected visual problem addressed by teachers for eye examination, 80.5% of them could have their deficiencies school explained by low vision and / or refraction error .

The Relation of the learning ability and deficits in visual acuity is shown in table (4). In this study 9 children showed impaired learning ability. The vast majority, 31 students had adequate learning ability.

The main feature of learning difficulties is the poor academic performance, or performance degradation of other activities like, reading, writing or calculations. Although poor academic performance is not the only criterion to identify problems in learning, it is necessary that family members and teachers are aware of any child's difficulty in school or at home.

When evaluating the number of failures among students with visual impairment, it was found that eight students had failed, three of them had severe deficits in visual acuity and 5 moderate deficit, as shown in table (5).

This result is similar to results found in literature. In a study of 240 children from municipal schools in Santa Catarina, twenty percent of the students who had low visual acuity were disapproved that year, against 15.9% of those without visual acuity deficit.

This result corroborates a study of children in northeastern Rio Grande do Sul evaluated

338 children were in Him and established the relationship between school failure and low visual acuity. The result was that children with visual impairment have an approximately three-fold higher risk of reprovarem compared to children of normal visual acuity. The study also states that repetition can lead to abandonment of school students, whose indices are significant when compared to developed countries.

In a study conducted in public Juiz de Fora, Minas Gerais, among students with visual impairment, 25% had fair or poor school performance, accounting for a significant percentage compared with students who have normal visual acuity.

The main education policies in Brazil are focused on decreasing dropout and repetition rates, along with high school acceleration programs. These strategies are aimed at the production of statistical information and worship numbers, and shapes to demonstrate that education is going well in the country.

It would be appropriate for all children to join in preschool or first grade, were subjected to ophthalmologic or at least had their visual acuity measured and monitored, it is inappropriate to make a program on eye health one year, with the school 1st grade, and in subsequent years not to continue with the same children. Eye care projects should have minimum target for assessing the same children when they were 4, 7 and 13 years old, because over time the optical correction of students fails to meet their needs, making it even some cases harmful.

CONCLUSION

In the correlation between the deficit in visual acuity performance of pupils in the 4th and 5th years of municipal schools of João Pessoa, it was found that a total of 40 students surveyed, 21 students were males and 19 for sex female, 26 students were aged between 8 and 10 years. It was found visual impairment with male predominance. This situation is further compounded by the 25 students who had difficulty reading, possessed diminished learning capacity and 8 had failed.

Good vision is critical in the process of education and socialization of children. Prevention and early detection of ocular disabilities in childhood are the best resources to avoid the low vision and these actions should be done preferably in school, because it is an institution with a large concentration of children, leaving the professionals of the health area school, integrating the student,

family and community.

The study, along with other studies, which reinforces the preventive eye care is the best option, with the aim of both preventing more serious eye problems, such as blindness, or for a significant improvement in school performance, learning and intellectual development, psychological and social development of these children and adolescents. This prevention can be done using a simple method of sorting through the visual acuity with the use of Snellen chart.

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