

## IMPACT OF THE OPHTHALMOLOGICAL SCREENING TEST IN CHILDREN AND ADOLESCENTS IN SOCIAL VULNERABILITY

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**Abstract:** Vision plays a fundamental role in the child's physical and psychosocial development, which is why ophthalmological screening with early diagnosis of visual alterations is extremely important. The aim of this study is to assess the visual acuity of children in the ``Esportista Cidadão/Casa Menino`` in Park project, detect visual deficits and refer them to an ophthalmologist for an accurate assessment. The screening method used was the Snellen test, based on children and adolescents reading letters and recording the results according to the Snellen scale. Of the 61 children examined, 61 (37.9%) had some degree of visual impairment and 100 children (62.1%) had 100% visual acuity. Of the children who presented visual impairment, 35 (57.4%) were female and 26 (42.6%) were male. 8 (5%) children had very severe visual impairment; 12 children (7.4%) had severe visual impairment; 28 children (17.4%) moderate visual impairment and 13 children (8.1%) mild visual impairment. Ophthalmological screening is easy to perform and reliable, therefore, it must be part of programs in schools, institutions and government actions. Early diagnosis must allow adequate correction through efficient ophthalmologic care and provision of good quality eyeglasses.

**Keywords:** Ophthalmologic screening. Infancy. Social vulnerability. Visual acuity.

## JUSTIFICATION

The Health Promotion project in Assistance Entities in Ponta Grossa-Paraná works to ensure the social well-being and education of children and adolescents in situations of social vulnerability. The project works at the Duque de Caxias Educational Institute, a care and educational institution known as ``Guarda Mirim de Ponta Grossa``. The activities take place after school hours and are prepared by trained educators, who are divided into

several themes, among them: pedagogical, cultural, musical, sports, environmental and emotional education, digital inclusion, among others. Thus, aiming to also cover the theme of promotion, education and support in health, a partnership was established with the extension project of the UEPG Medicine course. One of the main themes that are correlated with health and school learning is visual acuity, since school-age children who have visual alterations may have greater difficulty during learning, which may lead to inattention, drowsiness, headache, changes in emotional and psychological state, disinterest, and this can bring psychological, physical and social repercussions for this child. It must be noted the importance of the diagnosis of reduced visual acuity that can be made through screening. Studies done report that cases of blindness could have been avoided, in the range of 50-75%, with appropriate public health measures. Although the impact of decreased visual acuity can be extremely serious, most vision defects can be corrected if diagnosed and treated in time.

## GOALS

The general objective of the ophthalmological evaluation carried out in the project was to screen the children and adolescents assisted at ``Guarda Mirim de Ponta Grossa``, identify those with vision problems and refer them to a specialized evaluation that will be carried out free of charge.

As specific objectives, there is the intention to enable the free acquisition of good quality glasses for children who are diagnosed with ocular pathologies by the ophthalmologist. In addition, there is also the objective of expanding the knowledge of the academic in the screening and evaluation of patients.

## METHODOLOGY

Ophthalmological screening was carried out at ``Guarda Mirim de Ponta Grossa``, during the period in which the children were for their usual activities, that is, after school hours. The visual acuity measurement was applied individually to 61 children and adolescents, from January 2022 to May 2022. Those responsible for applying the test were the medical students participating in the extension project. The visual acuity test is measured by showing the patient objects of different sizes at a standard distance from the eye—five meters. The method used was the Snellen table, a table with letters of different sizes organized in rows and columns. The test is simple, but requires skill and training from those who will apply it. The assessment does not require any prior preparation, like pupil dilation done in other vision tests.

Test preparation: the test was performed in an environment with good lighting and silence. A chair was placed for the child to sit, at a distance of six meters from the Snellen sign scale. First, it was explained to each child how it would be done, clarifying all doubts. The child was then asked to sit on the chair. The poster with the Snellen scale was posted on the wall so that the visual acuity line 0.8 to 1.0 was at eye level. A black pen was used to indicate the symbols and an occluder card was used to cover the eyes.

Test performance: one eye was tested, then the other, starting with the right eye (OD). The child was asked to cover the left eye (LE) with the card, without pressing and keeping it open. For the child who wore glasses, they were tested first with them on and then without. The examiner pointed to each symbol with the pen, asking them to speak out loud which letter was being shown. The test started from the top of the card, indicating the first letter. The sequence was being followed, with a total of 11 lines. The child had to hit more

than half of the letters contained in the line to move on to the next line. If he missed more than half of the line before reaching line 6, the test was restarted to reassess. The procedure was repeated with EO. The children were informed about the importance of speaking clearly and truthfully “I don’t see”, when they were not seeing the letter indicated. During the measurement of visual acuity, it was verified whether the child had complaints and signs such as tearing, burning, continuous blinking of the eyes, strabismus, discomfort, headache, dizziness or half-closed eyes.

Registration of results: the equivalent of the last line read without difficulty was always recorded. The results of the right eye (OD) and the left eye (LE) were recorded separately. The signs and symptoms presented by the child during the examination were also recorded.

Test analysis: the correct reading, by both eyes, of all symbols up to line 6, resulting in 0.8, was an indicator of normal vision; if the child could not correctly read all the letters, up to line 7, resulting in a correction less than or equal to 0.7, it was considered an indication of a visual problem. Children who were evaluated with visual problems were referred to an ophthalmologist.

## RESULTS

Medical students participating in the extension project were able to practice a primary care measure that is extremely important for patients’ quality of life: the detection of visual problems. The entire neuropsychosocial development of the human being is related to vision and it is through it that the individual contacts the outside world. Once the patient has impaired visual acuity, he has significant difficulties in child and youth development and learning. (SOUZA, 2020)

During the child’s school phase, it is possible to perceive the damage in visual acuity due to the effort that is made to see the activities on

the board or in the notebook. The pedagogical coordinator, however, may find it difficult to differentiate whether it is a reduction in vision or a more timid or disinterested personality. This way, the Snellen chart can be used, which is a low-cost and easy-to-apply tool. (SOUZA, 2020)

In the present study, the Snellen chart was used, which is the universally accepted method to measure visual acuity. (ZAPPAROLI, 2009) A total of 61 students were examined, children and adolescents participating in the Instituto Educacional Duque de Caxias, aged between 6 and 16 years, 27 female and 34 male. The visual acuity of the minors was then measured and they were asked about ophthalmological complaints (itching, tearing, burning, continuous eye blinking, strabismus, discomfort, blurred vision, headache, dizziness and squinting).

Visual acuity was then classified as "adequate" or "deficit", the first being when the patient reads without difficulty up to the 20/30 line and the second when the patient already meets criteria for regular or priority referral to the Ophthalmologist.

The parameters used to define the referral to the specialist are summarized in the table below. (Table 1)

Priority routing criteria	Regular referral criteria
Visual acuity less than 0.1 (20/200)	Visual acuity less than or equal to 0.7
Acute picture of ophthalmological symptoms	Strabismus
Recent eye trauma	Diabetic patient
	Chronic ophthalmologic symptomatology

**Table 1:** criteria for referral to the ophthalmologist. Author's source.

It was observed that 30% of the children had a visual impairment, and of these, 14 (78%) were female. Of children with disabilities, 56% are aged 9 to 12 years, 28% are aged 13 to 19 and 17% are aged 5 to 8 years. The evaluated results are listed in the table below. (Table 2)

Visual acuity	Number of children n (%)	Gender		Age		
		Female	Male	5 to 8	9 to 12	13 to 19
Adequate	43 (70%)	13 (48%)	30 (88%)	10	21	12
With deficit	18 (30%)	14 (52%)	4 (12%)	3	10	5
Total	61 (100%)	27 (100%)	34 (100%)	13	31	17

**Table 2:** Distribution of analyzed children according to studied variables and visual acuity. Author's source.

## PICTURE



**Figure 1:** medical student applying ophthalmological screening test to student of "Guarda Mirim".

## FINAL CONSIDERATIONS

To understand the limitation of the visual acuity test with the Snellen Chart for the age group examined, it is emphasized that the objective of such activity is a screening of the need for referral to a specialist and not a diagnosis of a vision problem. Knowing that

vision is fundamental for a child's learning process, it is concluded, through the data obtained, that the visual acuity test at school age is essential, with the school environment being the most suitable place for such a test to be performed, involving health, education and family teams.

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