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Perception of quality of life in children and teenagers hearing aids users

Percepção da qualidade de vida em crianças e adolescentes usuárias de próteses auditivas

Percepción de la calidad de vida en niños y adolescentes usuarios de prótesis auditivas

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Abstract

Introduction: With the advancement of technology, electronic devices related to hearing rehabilitation somehow fulfill the needs of users and improve quality of life and communication skills. Health-related quality of life (HRQOL), it is a subjective theme of difficult measurement, requires the use of questionnaires for such measurement. **Objective:** To analyze and compare the perception of quality of life of children and adolescents who use hearing aids in their point of view and of their relatives/guardians, correlating them with the audiological and school characteristics. **Method**: Cross-sectional, quantitative and descriptive study, with structured interview and questionnaire. Sample was composed of 25 subjects (children and adolescents), aged between 08 and 18 years of age, diagnosed with bilateral sensorineural hearing loss. The procedures used: Anamnesis; verification of hearing aids; (PedsQL) version 4.0 - Portuguese - Brazil, to analyze the perception of HRQOL of children/adolescents and their relatives/caregivers. **Conclusion:** Subjects with sensorineural hearing loss diagnosis presented a similar perception of HRQOL compared to their parents/guardians' answers. The analyzed variables in the hearing aid use

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Authors' Contributions:
RQM, LPC, EP: Study design, methodology, data collection, article outline; ALM: critical review and orientation; TMK: Study design, critical review and orientation; EPVB- Critical review and orientation.

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profile did not demonstrate being associated to HRQOL of the deaf subjects. The group of adolescents suggested a lower self-perception of HRQOL than the pediatric age group.

Keywords: Quality of Life; Surveys and questionnaires; Hearing loss.

Resumo

Introdução: Com o avanço da tecnologia, os dispositivos eletrônicos relacionados com a reabilitação auditiva suprem de algum modo as necessidades dos usuários e melhoram a qualidade de vida e as habilidades comunicativas. Qualidade de Vida Relacionada à Saúde (QVRS), por ser um tema subjetivo de difícil mensuração, requer a utilização de questionários para tal aferição. **Objetivo:** Analisar e comparar a percepção de qualidade de vida de crianças e adolescentes usuárias de próteses auditivas na sua visão e de seus familiares/responsáveis, correlacionando-as com as características audiológicas e escolares. **Método:** Estudo transversal, quantitativo e descritivo, com entrevista estruturada e questionário. Amostra constituída por 25 sujeitos (crianças e adolescentes), idade entre 08 a 18 anos incompletos, diagnosticados com deficiência auditiva bilateral neurossensorial. Os procedimentos utilizados: anamnese; verificação das próteses auditivas; atualização dos dados audiológicos e o questionário *Pediatric Quality of Life Inventory*TM (PedsQL) versão 4.0 – Português – Brasil, para análise da percepção da QVRS de crianças /adolescentes e seus familiares/responsáveis. **Conclusão:** Sujeitos com diagnóstico de deficiência auditiva neurossensorial apresentaram semelhante percepção de QVRS comparada às respostas de seus familiares/ responsáveis. As variáveis analisadas no perfil de uso da prótese auditiva não mostraram relação na QVRS dos sujeitos surdos. O grupo dos adolescentes evidenciou uma autopercepção de QVRS inferior à percebida pela faixa etária pediátrica.

Palavras-chave: Qualidade de vida; Inquéritos e questionários; Deficiência auditiva.

Resumen

Introducción: Con el avance de la tecnología, los dispositivos electrónicos relacionados con la rehabilitación auditiva suplen de alguna manera las necesidades de los usuarios y mejoran la calidad de vida y las habilidades comunicativas. Calidad de Vida Relacionada a la Salud (QVRS), por ser un tema subjetivo y de difícil mensuración, requiere la utilización de cuestionarios para tal verificación. **Objetivo:** Analizar y comparar la percepción de calidad de vida en niños y jóvenes usuarios de prótesis auditivas, correlacionándola con los rasgos audiológicos y escolares. **Método:** Estudio transversal, cuantitativo y descriptivo, con entrevista estructurada y cuestionario. Amuestra constituida por 25 sujetos (niños y adolescentes), edad entre 08 y 18 años incompletos, diagnosticados con pérdida auditiva bilateral neurosensorial. Los procedimientos utilizados: Anamnesis; verificación de las prótesis auditivas; actualización de los datos audiológicos y el cuestionario Pediatric Quality of Life InventoryTM (PedsQL) versión 4.0 – Portugués – Brasil, para el análisis de la percepción da QV de niños/adolescentes y sus familiares/responsables. **Conclusión:** Sujetos con diagnóstico de pérdida auditiva neurosensorial presentaron semejante percepción de QV comparada a las respuestas de sus familiares o responsables. Las variables analizadas en el perfil de uso de la prótesis auditiva no mostraron relación en la QVRS de los sujetos sordos. El grupo de los adolescentes evidenció una autopercepción de QVRS inferior a la percibida por la franja etaria pediátrica.

Palabras claves: Calidad de Vida; Encuestas y cuestionarios; Pérdida auditiva.

Introduction

Hearing is a sense that plays a relevant role in the development of oral communication, learning and social interaction skills. Therefore, hearing impairment (HI) can lead to a disharmony in hearing skills, or their inability, affecting oral language performance, directly impacting the subject's quality of life and compromising his/her development while being biopsychosocial [1].

Historically, subjects diagnosed with bilateral severe and / or profound sensorineural hearing loss had very limited possibilities for oral communication as well as listening, which had negative effects on their social activities. With the advancement of technology, the increasingly sophisticated electronic devices and the association with hearing rehabilitation make it possible to meet the needs of the hearing impaired in order to improve their communication skills and consequently the quality of life of this population[2].

Each disability involves different social and physical situations with varying levels of limitations in terms of daily activities and restriction in social participation. Families and / or health care providers may also be affected depending on each case[3].

Since Health-Related Quality of Life (HRQoL) is a subjective subject and difficult to measure, the World Health Organization (WHO) has defined it as the subjects' perception of the cultural context and value systems in which they are inserted, in return to their goals, expectations, standards and concerns[4]. With this definition, we began to think about questionnaires that would better identify the perception of quality of life, as a way of transforming what would be subjective into objective, and analyzing how it affects the life of a subject.

Aspects related to social and emotional issues are difficult to assess, as these aspects may vary depending on the day and time they are applied. However, HRQoL is extremely important and to ignore it would be to neglect the stages of subject development[5].

The application of questionnaires enables better therapeutic directions and more concrete intra and interpersonal comparisons, thus allowing differentiating different views[6]. In addition, the use of objective instruments that include self-perception and self-assessment of all factors involved is considered a quick and effective option for investigating the subject's well-being[7].

Among the questionnaires, the Pediatric Quality of Life Inventory (PedsQL), version 4.0, stands out and is appropriate for assessing the quality of life in healthy and / or chronically ill children[8]. It was translated and validated to Brazilian Portuguese in 2008 [9], and it was applied in different populations [10- 11-12-13].

We have found in the literature consulted only three studies with application of HRQoL questionnaire, PedsQL version 4.0, in subjects with HI[14-15-16].The authors [14] performed the application of the instrument in children with mild or moderate sensorineural HI, and children without such sensory deficit to analyze health-related quality of life. Other researchers investigated health-related quality of life only in children with unilateral HI[15]. Also, the effect of HI on subjective reports of fatigue for school-age children was investigated using a standardized measure[16].

This gap identified in the literature regarding the lack of studies on HRQoL measurement in the HI population reinforces the relevance of better understanding the perception of quality of life of children and teenagers with HI, and how their parents and / or caregivers perceive this considering the use profile of hearing aids and other variables.

Therefore, the aim of this study was to analyze and compare the perception of quality of life of children and teenagers who use hearing aids in their point of view and on that of their family members / guardians, correlating them with audiological and school characteristics.

Methods

It is a cross-sectional, quantitative and descriptive study, using structured interview and questionnaire. The norms of Resolution 466/2012 of the National Health Council - NHC were observed. All subjects signed the Informed Consent (IC) and Consent. The study is linked to a research project institutionally registered under number 046494, "Hearing Performance and Perception of Quality of Life in Children and Adolescent Users of Hearing Aids", with CAAE 74028617.0.0000.5346 and Approval Opinion number 2.316.749. The research was conducted in a school clinic and conducted from March to December 2017.

The sample consisted of 25 subjects (children and teenagers), 13 male and 12 female, aged 8 to 18 years incomplete, considering the provisions of the *Estatuto da Criança e do Adolescente (ECA)*[17], diagnosed with mild to profound bilateral sensorineural hearing impairment, users of hearing aids, fitted in a hearing health service, via *Sistema* Único *de Saúde (SUS*) and their families. Subjects who no longer used hearing aids, had middle ear alterations at the time of sample composition procedures, had congenital malformations, and observable neurological and / or syndromic abnormalities were excluded from the study.

The procedures performed for the composition of the sample group were: anamnesis, with questions related to school and hearing characteristics, verification of hearing aids and updating of audiological data for subjects with pure tone audiometry performed more than six months from the date of collection. To update the audiological data there were performed: visual inspection of the external acoustic meatus; pure tone audiometry following the classification of Lloyd and Kaplan (1978) [18] to determine airborne hearing thresholds at frequencies from 0.25 to 8 kHz and bone thresholds at frequencies from 0.5 to 4 kHz in an acoustically treated cabin according to ANSI S3.1-1991 environmental noise level standard; logoaudiometry, to determine Speech Recognition Threshold (SRT) and Speech Recognition Percentage Index (SRPI) and immittance for analysis of middle ear conditions.

After performing these procedures, the sample group consisted of 25 hearing aid users (mean age 12.9 years) and their families. Regarding HI, all were bilateral sensorineural, with mild to deep variability, with three subjects presenting mild (12.00%), five moderate (20.00%), nine moderately severe (36.00%), six severe (24.00%) and two deep (8.00%)

As a research procedure, the subjects were asked to answer the PedsQL version 4.0 questionnaire. - Portuguese - Brazil, with the help of the researcher's reading when necessary. The subjects were instructed to consider the experiences of the last month for the answers, as indicated by the test's applicability instructions. In this study, two modules of the PedsQL questionnaire were used, one applied to family members / caregivers and the other to subjects with HI, taking into account the chronological age of each subject to choose the interview. The versions that compose the questionnaire for each age group of 8-12 years and 13-18 years are equivalent, differing only in terminology as a function of the expected degree of development at each age. The questionnaires were applied to family members / caregivers during the period when the child / teenager was performing the audiological procedures in an available therapy room, after which they were applied to the HI subjects in the evaluation room.

The PedsQL 4.0 questionnaire consists of self-assessment forms addressed to children / teenagers, and to their parents´/caregivers, questionnaires regarding their perception of their child's quality of life. In both forms, the subjects used the scale of responses from zero to four levels. Zero corresponding to never being a problem; one, correspondent to almost never being a problem; two, sometimes corresponds to being a problem; three, often being a problem; four, almost always being a problem.

The questionnaire was analyzed through the total result and two sub-results related to physical health, that has eight items, and psychosocial with 15 items. The analysis of the questionnaire considered the antagonistic and linear score in the item score, transformed into a scale that corresponds from zero (0) to one hundred (100), that is, zero is replaced by 100, one for 75, two for 50, three for 25, four for zero.

Total scores, psychosocial scores and physical capacity were computed by the sum of items divided by the number of items answered. Thus, the higher the score, the better the health-related quality of life.

The results obtained from all subjects were analyzed and matched with the information collected at the time of the anamnesis and in the audiological procedures performed in the study.

The variables analyzed were: PedsQL 4.0 questionnaire scores obtained by children / teenagers and their respective family members / caregivers, degree of HI, progressive or not HI, hearing aids effectiveness (effective use eight hours or more[19]), FM System and the type of school attended by the subjects (regular or special).

All collected data were transcribed in a table using Excel (2010), for better visualization and for subsequent statistical analysis.

Data were submitted to descriptive and analytical statistical analysis using the Wilcoxon, Mann-Whitney and Spearman Correlation Test at a 0.05

significance level with 95% statistical confidence intervals.

Results

Regarding the PedsQL 4.0 questionnaire, a global analysis of the scores obtained by subgroups of children / teenagers and their respective family members / caregivers was performed.

Thus, the values of the subjects' responses were compared between the scores obtained by family members / guardians, which can be observed in Table 1.

Table 1. Quality of Life Questionnaire Scores by Category – *Pediatric,Quality,of Life Inventory TM 4.0* (Peds-QL TM) and comparison between the scores obtained from the subjects and family members / guardians (n = 25)

QUALITY OF LIFE	SUBJETC	RESPONSIBLE	Value of p
	Md (Xmín; Xmáx)	Md (Xmín; Xmáx)	
Emotional Aspect	75,0 (34,4; 100,0)	87,5 (28,1; 100,0)	0,6186
Social Aspect	65,0 (20,0; 100,0)	70,0 (25,0; 100,0)	0,2604
School Aspect	75,0 (15,0; 100,0)	75,0 (25,0; 100,0)	0,8638
Psychosocial aspect	65,0 (35,0; 90,0)	60,0 (20,0; 100,0)	0,0666
Total Scores	73,3(25,0; 88,3)	66,7 (30,0; 88,3)	0,6570
Total dos Escores	72,9 (28,3; 89,1)	74,0 (35,9; 91,3)	0,6265

Caption: Md = median; XMin. = Minimum value; XMax. = Maximum value; Mann-Whitney U Test.

This first analysis was performed globally, in which the responses of all subjects and all family members / guardians were compared for possible significance.

In Table 2, the HRQoL measurements obtained in the Peds-QL categories were crossed with the degree of hearing impairment.

Table 2. Comparison of ranks by scores in the categories of *Pediatric Quality of Life Inventory TM 4.0* (Peds-QL TM) with the degree of hearing impairment (n = 25)

	Degree of hearing impairment	
Variables	r	Value of p
Physical capacity	-0,234048	0,260141
Emotional Aspect	0,147418	0,481924
Social Aspect	-0,142929	0,495512
School Aspect	0,005612	0,978762
Psychosocial aspect	-0,04815	0,819213
Total Scores	-0,080623	0,701645

Spearman Correlation Test

Table 3 shows the comparison of scores by the scores obtained from the Peds-QL TM categories, between the variables: HI as to whether it is progressive or not; effectiveness of hearing aid use; FM System and the type of school attended by the subjects, whether regular or special.

Table 4 analyzed the perceptions of family members and the two subgroups of children / adolescents.

Table 3. Comparison of ranks scores obtained in the *Pediatric Quality of Life Inventory TM 4.0* (Peds-QL TM) categories between the variables hearing impairment, effectiveness of hearing aids, use or not of the Modulated Frequency System and type of school

		Quality of Life Md (Xmáx; Xmín)					
		PC	**EA**	**SA**	**Sa**	**PSY**	**TOTAL**
HI	Progressive	64,0(40,6;75,0)	50,0(40,0;75,0)	65,0(45,0;80,0)	45,0(40,0;80,0)	53,3(41,1;71,7)	57,0(41,3;73,0)
	Not progressive	75,0(34,3;100,0)	70,0(20,0;100,0)	80,0(15,0;100,0)	70,0(35,0;90,0)	76,7(25,0;8,9)	76,0(28,2;89,1)
	p-value	0,1691	0,0738	0,1926	0,1175	0,0342*	0,0492*
Use of AASI	Effective	75,0(34,3;100,0)	65,0(20,0;100,0)	80,0(15,0;100,0)	70,0(35,0;90,0)	76,7(25,0;88,3)	76,0(28,2;89,1)
	Not effective	64,0(40,6;93,7)	52,5(40,0;75,0)	62,5(40,0;85,0)	62,5(40,0;85,0)	60,0(41,7;78,3)	62,4(41,3;83,7)
	p-value	0,3073	0,2244	0,0685	0,4056	0,1804	0,161
MF	yes	75,0(40,6;100,0)	65,0(20,0;100,0)	80,0(35,0;100,0)	70,0(40,0;90,0)	76,7(41,7;83,3)	76,0(41,3;89,1)
	No	70,3(34,3;93,7)	57,5(25,0;85,0)	65,0(15,0;90,0)	60,0(35,0;90,0)	58,3(25,0;88,3)	64,6(28,3;85,0)
	p-value	0,3443	0,4351	0,0512	0,0889	0,113	0,1567
Type of School	Regular	75,0(34,3;100,0)	60,0(20,0;85,0)	80,0(15,0;100,0)	70,0(35,0;90,0)	73,3(25,0;83,3)	73,0(28,2;89,1)
	Special	65,6(40,6;100,0)	80,0(40,0;100,0)	60,0(40,0;90,0)	57,5(40,0;90,0)	67,5(42,0;88,2)	71,0(41,3;85,0)
	p-value	0,738	0,2482	0,3331	0,5761	0,9407	0,9407

Caption: * Statistically significant value. (p≤0,05).HI = Hearing Impairment; MF= Modulated Frequency; Md=median; XMin. = Minimum value; XMax. = Maximum value PC=Physical Capacity; EA= Emotional Aspect; SA= Social Aspect; Sa=School Aspect; PSY= Psychosocial aspect. Mann-Whitney U test.
** Mann-Whitney U test

Table 4. Comparison of scores by Pediatric Quality of Life Inventory TM 4.0 (Peds-QL TM) scores between family member / guardian versus child / teenager perception (n = 25)

Variable	Md (Xmáx; Xmín)		Value of p	Md (Xmáx; Xmín)		Value of p
	Parents group 8-12	Parents group 13-18		children 8-12	Teenagers 13-18	
PC	59,4 (100, 28,1)	89,1(96,9; 46,9)	0,722958	75 (100; 40,7)	70,3 (100; 34,4)	0,140405
EA	70 (100; 25)	72,5 (95; 50)	0,956412	60 (100; 20)	65 (85;25)	0,259165
SA	50 (100; 25)	87,5 (100; 35)	0,512396	75 (100; 35)	77,5(100;15)	0,003204
Sa	40(85; 20)	77,5 (100; 35)	0,460339	65 (90; 40)	72,5(90;35)	0,006962
PSY	55 (86,7; 30)	79,2 (88,3; 61,7)	0,913173	76,1 (88,3; 41,7)	72,5(83,3; 25)	0,002509
TOTAL	53,3(90,2; 35,9)	83,2 (91,3; 57,6)	0,934898	76,1 (90,2; 35,9)	69,6 (89,1; 28,3)	0,016505

Caption: Md=median; XMin. = Minimum value; XMax. = Maximum value; PC=Physical Capacity; EA= Emotional Aspect; SA= Social Aspect; Sa=School Aspect; PSY= Psychosocial aspect. Mann-Whitney U test.

Discussion

Regarding the analysis of the total score of the PedsQL 4.0 questionnaire, 23 subjects had an adequate HRQoL with a score above 50% and two subjects were classified with low HRQoL. In the present research, all participants perform follow-up in the hearing rehabilitation sector, which includes speech therapy and periodic reviews of hearing aids. Thus, the subjects have the help of the speech therapist when necessary, thus contributing to a better perception of hearing impairment, their limitations and possible solutions, which contributes to a better quality of life.

As shown in Table 1, no statistically significant difference was observed between the perceptions of the hearing impaired subject in relation to their relatives / guardians about HRQoL. Noteworthy is the item of perception of school aspects, in which family members / guardians evaluated their children's HRQOL with a lower perception when compared to the analysis that children / adolescents evaluated themselves, ie, the subjects (children / adolescents) presented a positive analysis of HRQoL in the school aspect, indicating an adequate adaptation in the academic environment, but without statistically significant differences. Such findings show similarities with another study that used the same questionnaire (PedsQL)[15] and on which the researchers applied in the second stage of the study, the generic quality of life instrument (PedsQL) to a population of preserved hearing (composed of 24 children), a population with unilateral hearing impairment (32 children) and a population with bilateral HI (29 children), aiming to measure the health-related quality of life. The instrument was applied to parents and to the children themselves. In its first stage, it revealed that children with unilateral hearing impairment face difficulties yet learn to adapt to their condition. Thus, both in the questionnaire applied to parents and in the version applied to children and adolescents, the result of the sample of the three groups showed that there was no quantitatively significant difference in any of the three physical, psychosocial and total scales of the used instrument[15].

When comparing the present study with the study above, it is observed that the sample is reasonably larger, yet both studies obtained the same quantitative result. It can be inferred that subjects with hearing impairment along with their family members / guardians are adapting in their daily lives and presenting a similar perception of HRQoL in the aspects evaluated in the instrument.

In another study, the validated and standardized questionnaire translated into Sign Language (HRQoL) was applied to the pediatric age group and another to its family member through the KIDSCREEN-27 questionnaire in order to analyze the HRQoL of 114 deaf children and adolescents with different levels of hearing impairment, aged eight to 18 years old, living in rural and urban areas, and belonging to both the public and private sectors. As a result, the authors did not find differences between mean indices of children / adolescents and their parents in all dimensions of the KIDSCREEN-27 questionnaire, except autonomy and social support[20].

Another study obtained similarity in the information provided by parents and children, as occurred in the present study. It is believed that parents / caregivers, when measuring their children's QOL, answered the scale as a projection of what the child / adolescent would have given, although they were told how they should answer the questionnaire. Assuming this possibility, such interpretation of the family member when responding to the instrument should be considered as an effect on the analysis of the real perception of what family members / guardians infer to be the QOL of their respective children / subjects[21].

As observed in Table 2, there was no difference between the perception of quality of life of the sample subjects and the different degrees of HI. This data agrees with a study[14], in which the authors made a similar investigation, but with a sample of 6581 children, elementary students, part of the sample of subjects diagnosed with mild to moderate sensorineural hearing impairment and another part of the sample constituted by normal hearing children, in which there were no statistically significant differences between HRQOL, language, reading and behavior variables, however, the short-term phonological memory ability in the group of subjects with sensorineural hearing impairment was lower when compared to the group of normal hearing subjects. This analysis assumes a good adaptation of the users with the hearing aids, so as to positively interfere in the evaluated categories of the instrument, regardless of the degree of hearing impairment.

Another study aimed to measure QOL in adolescents with HI and their normal-hearing siblings using four questionnaires, including PedsQL ™ 4.0. As a result, they also found no statistically significant difference in the HRQoL measurement results between the groups studied, i.e., the degree of hearing impairment did not change the perception of HRQoL[22].

It is noteworthy that the authors of the present study believed that children and adolescents with more severe disabilities would have a worse perception of quality of life, but this hypothesis was not confirmed. It is inferred that this happened because all the subjects in the sample were patients of a Hearing Enabling and Rehabilitation service for a long time and in this service they had speech therapy and psychological intervention, as well as participation in parents' groups. These factors may have directly influenced the perception of quality of life of subjects in the sample group.

Regarding the information on the effective use of hearing aids, obtained through the report of the family member / guardian, and the HRQoL variable (Table 3), there was no statistically significant difference. In other studies, when comparing the time reported by parents versus what was found by objective analysis, parents / caregivers tend to overestimate the time of amplification use by about 2/5 hours, especially for younger children[23-24]. It is possible that this methodological difference may help to understand the lack of relationship between use and the perception of QOL in our study, since it was only compared to subjective information on the use of hearing aids.

Another study conducted with 272 subjects aged between five months to seven years and three months, with mild to severe hearing impairment, sought to estimate the time of daily use of hearing aids, subjectively and objectively.

The use of hearing aids was less effective in younger subjects with mild hearing impairment compared to older children with severe disabilities[23-25].

In a recent study with a sample of 20 subjects, which analyzed the relationship between socioeconomic classification and the perception of quality of life, however, using another instrument, and developed only with relatives of children and adolescents with hearing impairment, better quality of life of the family member / guardian was observed in the social domain and worse quality of life in the environmental domain. Thus, the study showed that there was a relationship between socioeconomic classification and the perception of quality of life of family members, a fact that was not correlated in our study, being a gap that can be analyzed by other researchers in the area[26].

Also in Table 3, regarding the scores of the analysis of the variables effective use of hearing aids and the MF system, as well as the type of school being regular or special, there was no evidence of a relationship with QOL reported by the subjects. This indicator disagrees with another study, in which the use of hearing aids showed innumerable benefits for the subjects, especially at the school level. But it corroborates when compared to the types of schools (regular and special) that also did not show significant results that would influence the HRQoL[21]. It is believed that some statistical results of this study were influenced by the sample size and that in the sample composition four subjects studied in a special school, also using sign language, maintaining good social and cultural relations and not impairing the quality of life.

In 2007, a study conducted with children with late hearing impairment showed that these subjects tend to report higher levels of dissatisfaction with their social lives than subjects with congenital hearing impairment, as this population tends to acquire sign language within the deaf community late[27]. In the present sample, it is these subjects who use sign language in social environments, who do not end up making effective use of hearing aids, as they only use it in a family environment when parents and / or guardians so desire.

It is noteworthy that the analyzes that most closely approximated the values of statistical significance were the scores regarding the use of hearing aids versus the social aspect. Subjects who use it for more than eight hours have a better perception of QoL in the social aspect, not being significant, but observed in the differences of the medians of the results.

Regarding the classification of progressive or non-progressive hearing impairment, also observed in Table 3, subjects with non-progressive HI had a significantly better perception of HRQoL in psychosocial aspect and total score when compared to individuals with progressive HI, which corroborates with another study[27]. The crossing of this variable with the emotional aspect also approached the significance value (p value 0.07).

The use of the MF system (Table 3) did not present statistical significance in the HRQoL questions in the social aspect (p value 0.0512) and school (p value 0.088). The other variables considered presented a similar behavior from the statistical point of view without representing a direct influence with the perception of quality of life, analyzed by the use of the PedsQL protocol. Another study[16] measured the effect of hearing impairment on subjective reports of fatigue in school-age children using the Multidimensional Fatigue Scale Pediatric Quality of Life Inventory (PedsQL) instrument[28], in a sample of 10 children diagnosed with hearing impairment and 10 normal hearing children. The subjects with HI used hearing aids or full-time CI in the school environment and seven subjects used the MF system. The study concluded that school-aged HI children reported significantly more fatigue compared with normal hearing children, relevant findings in academic and psychosocial performance associated with fatigue.

When analyzing Table 4, it is observed that the group of adolescents had a low perception of HRQoL in the social, school, psychosocial and total aspects when compared to the expected scores for the respective age group. A study was found in the literature that measured the quality of life of German children with HI and normal-hearing children who were enrolled in a regular school, using the Children and Youth Quality of Life Inventory (CYQoLI)[29, 30]. The results showed that children with hearing impairment had a significantly higher quality of life perception than hearing students and were more satisfied with the school. The authors found in their study that the pediatric population (8 to 11 years) obtained higher scores in various domains of the above-mentioned instrument than adolescents (12 to 18 years). These lower scores in the adolescent group may be a consequence of greater self-awareness of their limitations. The present study corroborates the findings of the aforementioned studies, although different procedures were used regarding the linguistic mode of presentation of the instrument in the collection in this research, because the sample group of adolescents also showed lower HRQOL scores in the PedsQL instrument.

Conclusion

As explained above, it was possible to conclude that children and adolescents with mild to profound sensorineural hearing impairment presented similarity in HRQoL perception when compared with the scores obtained by their family members and / or guardian, regarding the general analysis.

There was no direct relationship in the HRQoL of the subjects regarding the degree of hearing impairment, use of hearing aids, use of the MFsystem and type of school. The variable non-progressive hearing impairment positively correlated in the HRQoL of the sample subjects, just as the adolescents demonstrated to have a significantly lower self-perception of HRQoL than their respective age group.

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