

SATISFACTION OF COCHLEAR IMPLANT USERS WITH POST-LINGUAL HEARING LOSS

Satisfação dos usuários do implante coclear com perda auditiva pós-lingual

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ABSTRACT

Purpose: evaluate the satisfaction of cochlear implant users with post lingual hearing loss. **Methods:** cross-sectional study with 51 patients, recruited from a reference center for auditory health in Natal, Brazil, who received cochlear implants. Adapted questionnaires were used to evaluate users' satisfaction. **Results:** a high satisfaction score within the studied population was obtained with the International Outcome Inventory – Cochlear Implant (100, 0%) and the Satisfaction with Amplification in Daily Life (98,0%). Dissatisfaction could be related to personal image (13,7%), costs and services (27,5%), and to the presence competitive noise (9,8%). **Conclusion:** cochlear implant is an intervention with a high satisfaction index amongst investigated users.

KEYWORDS: Cochlear Implantation; Health Services Evaluation; Consumer Satisfaction

■ INTRODUCTION

The subject with a hearing inability can undergo serious damage in your social, psychological and professional life, besides negative feelings of insecurity, fear, depressions, isolation and tension¹.

In the majority of the individuals with deficient functioning, although partial, of the cochlear hair cells, the Individual Sound Amplification Device (AASI) are satisfactory for the rehabilitation.

However, people with severe and profound hearing loss are less benefited or do not take advantage of it. For this group, the advent of the Cochlear Implant (CI) has been an alternative treatment^{2,3}. Studies show evidence that the CI not only provides audiology gains in terms of conscience of sound, but it also reduces the limitations in the activities by developing self-confidence, the improvement in communication in general, thus benefiting the quality of life⁴.

In Brazil, to assist the hearing disabled, the Ministry of Health regulated the credentialed centers, in order to guarantee the effectiveness in the individuals' treatment. The ordinance GM/MS n° 1278 on October 1999, is the most current documentation concerning the CI⁵. While it is of extreme importance to the population's access to the treatment, it does not encompass all the procedures that aim good attention practices and hearing health care⁶. Therefore, it is necessary for the practices to be evaluated to justify the decisions of the service.

According to Donabedian (1988)⁷, in general, the evaluation of health services involves the evaluation of the structure, the evaluation of the process and the evaluation of the results that deals with the changes noticed in the patients health, as well as the user's satisfaction after the intervention.

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Despite that the CI is a treatment established for hearing loss of severe-profound level since the 60's, there are few studies about the users' satisfaction of this device⁸. In Brazil No Brazil, the situation is aggravated: to the present moment, there are not studies that address this important aspect of the intervention. Further on, no gadget was elaborated or adapted in the attempt to accomplish this evaluation. The ordinance GM/ MS n° 1278 of October, 1999⁵ determines the notification of the results psychoacoustic obtained by the CI programing. Although, none of the results about the satisfaction, are required during the follow up of the individuals.

The user's satisfaction of the audiology service involves his expectations, the monetary and psychological costs, the problems encountered throughout the process of rehabilitation and the difficulties of communication that still remains after the intervention, all under the exclusive perspective of the user, may be determinant in the non-utilization of the auxiliary devices for the hearing disabled^{9,10}.

The satisfaction is something determined exclusively by the user, becoming into an evaluation merely subjective⁹. It suggests that the quantification of the adaptation results in the patient's perspective can be defined using the more comprehensive measurements than the use of the performance with the cochlear implant. The level of satisfaction of CI users not always corresponds to the level of gains in the scores of perception of the speech. Consequently, it is not possible to predict the degree of satisfaction based only on objective tests¹¹.

Through this analysis it will be possible to access the fundamental questions that involves the user's expectations, psychological dimensions, difficulties that remain after the using the device, problems in the rehabilitation process, among others. Such changes in the patients' lives, or in the health condition, should be the first results to be considered in new medical interventions.

Accordingly, the objective of this work is to evaluate the satisfaction of the users of the cochlear implant with post-lingual hearing loss, in the center of reference in hearing care in the city of Natal – RN.

■ METHODS

This research was submitted to the research ethics committee evaluation from the Federal University of Rio Grande do Norte according to the dictum n° 196 from October 10th, 1996, from the National Council on Ethics in Research, and it obtained an assent to its attainment through the process 040/2012.

It is a sectional study fulfilled with 51 patients of the Cochlear Implant Program at Otocentro/

RN, located in the county of Natal. The criteria for inclusion in the present study were: to be sensor neural hearing disabled post-lingual of severe/profound and a CI user for a minimum period of time of 12 months. The patients were sought to participate in the research at the moment of the periodical evaluation with the other professionals form the center. After the documented permission through the Term Consent, they also answered two satisfaction evaluation questionnaires self-applied. The questionnaire Satisfaction with Amplification in Daily Life (SADL) and the International Outcome Inventory – Cochlear Implant (IOI – CI) were originally developed for users of Personal Sound Amplification Device^{12,13} and adapted for users of the cochlear implant.^{8,14}

The application of the questionnaires was fulfilled in a room with the researcher's presence. It was explained to the individual about the purpose of the questionnaire and that in the existence of difficulties in the comprehension of any question, the rest of the questionnaire should continuing to be answered and after the it was finished, a brief explanation would take place about the question in doubt.

The instrument SADL contains 15 questions aiming to quantify the global satisfaction with the CI and to generate a profile of satisfaction. The dimensions evaluated by it are positive effects, cost and service, negative factors and a self-image. The SADL provides a global score and a score to each one of the four subscales. The questions 1, 3, 5, 6, 8, 9, 10, 11, 12, 14 and 15 reflect the "very much" as total satisfaction and it was scored as 7, while, "not at all" as total dissatisfaction and it was scored with as 1. The questions 2, 4, 7 and 13, are inverted where the "very much" indicates total dissatisfaction, being scored as 1 and the "not at all" indicates total satisfaction, being scored as 7.

The IOI – CI contains seven items with a scale of answers varying from 1 – 5 with low scores indicating the worst results. It is divided by two factors¹⁵: the factor 1 refers to the conjunct analysis of the domains "Daily usage of the IC", "Benefit", "Satisfaction" and "Life Quality", indicating how is the relation between the user and his cochlear implant. The factor 2 refers to the analysis of the domains "Limitations and the Residual Activities", "Restriction of Residual Participation" and "Impact in Others", indicating the relation between the user and his social environment.

The descriptive analysis of the results was accomplished, in order to characterize the answers from the subjects. According to the factorial scores of both questionnaires, the individuals were grouped between satisfied and dissatisfied. For better

comprehension of the readers, the grouping was done in the following way:

- SADL (scale of 7 points): individuals with a score equal or inferior to 3,5 were considered dissatisfied and individuals with a score higher than 3,5 were considered satisfied. The reasoning is inverted for the questions 2, 4, 7 and 13.
- IOI – CI (scale of 5 points): individuals with scores equal or inferior to 2,5 were considered dissatisfied and individuals with the score higher than 2,5 were considered satisfied.

■ RESULTS

51 user of the cochlear implant from Otocentro/RN participated of this study, being 56,9% male and 43,1% female. In average, the participants underwent the surgery of the CI at 46 years old and the period of time they are hearing disabled is of 17 years (Table 1). The other information about the social demographic data of the individuals is described on Table 1.

In relation to the satisfaction, the participants of the study were satisfied with their devices, obtaining a high score in the global analysis and in the subscales in both questionnaires (Table 2).

The results of the analysis of the distribution between the groups evidenced an inferior index, although expressive in some subscales, of individuals dissatisfied compared to the satisfied. These findings are described on Table 3.

■ DISCUSSION

The satisfaction is one the results that a hearing health care service should offer. It is a return from the user to his expectations, to the financial costs, psychological aspects, problems found throughout the usage and difficulties in communication that still remain after the intervention. To evaluate this result is of extreme importance to the centers of hearing health care that performs the cochlear implant surgery in Brazil.

In both instruments used in this study, the satisfaction of the CI user displayed itself really high. The individuals related that the CI assisted them to comprehend the people to whom they converse the most as well as it reduces the number of times that they request their interlocutors to repeat the spoken message. That assures the benefit brought about the communication and the social reintegration, improving, therefore, the self-confidence of the subjects.

This finding is also related by other authors^{8, 11,14}. In this study conducted by Faber and Grontved (2000), it is possible to verify the

improvement brought by the CI by comparing the before and after of some situations. The respondents improved significantly concerning the speech discrimination, usage of telephone, self-confidence and familiar daily life¹⁶.

As they were questioned if the cochlear implant compensated the hearing disability, the majority answered positively. With that, it is proved that the acoustic benefit lived by the CI users, make them transpose their major communicatively difficulties. All of the respondents affirmed that the acquisition of the CI was the best option as a treatment to their disability and they trusted the competence of the professionals evolved in the process.

The knowledge of the negative factor with the usage if the CI is, perhaps, one of the most important returns in the satisfaction survey. The users complaints, be it hearing or psychological, can determine the abandoned of the treatment, the waste of all investment and the frustration lived by the patient and his family.

A noisy environment, for instance, is unfavorable for the communication of any individual. In the users with the CI this condition provokes a significant reduction of the performance, even in situations considered more favorable, in which the level of speech is placed above the level of noise¹⁷. Compared to the normal hearing individuals, CI users present large difficulty to perform tasks that require segregation of the sound¹⁸. Manrique et al. (2006) suggests that the limitation beyond being associated with the technology of the implants and with the functional state of the hearing pathway, also guards the relation with the innate limitations of the hearing system before the adverse situation and especially by the speech of binaural stimulation that has a patient implanted in one ear only¹⁹.

Despite the possibility to achieve higher levels of speech comprehension, researches reveal that the users of the CI continue to present considerable difficulty in speech comprehension with noise in the background^{11,20,21}. By evaluating the users satisfaction of the CI in different situations, Castro et al. (2005)²² proved that the satisfaction in noisy environments presents a smaller punctuation than the other aspects. Following the same reasoning, other researchers verified that the difficulties or inconveniences related by the CI users are few and are more associated to perception of sound in noisy situation²³. In the same way, the participants of our research demonstrated a certain level of dissatisfaction before the competitive sounds.

One of the related points to self-image, evaluated through the perception of the disability by others after the use of the CI, the individuals indicated a tendency to dissatisfaction. Our hypothesis is that

Satisfaction with Amplification en Daily Life (SADL)

NAME: _____

DATE ____ / ____ / ____

INSTRUCTION

It is listed below questions about your cochlear implant. Please, circle the letter that corresponds better to your answer to each answer. The list of words offers the meaning of each letter.

A = Nothing / B = A little/ C = In some way/ D = Moderately/ E = Substantially / F = A lot/ G = Very Much

Remember that your answers have to show your opinions about the cochlear implant you are using now.

1	Your hearing device helps you to understand what people talk frequently, when compared to any other hearing device?	A	B	C	D	E	F	G
2	Do you get frustrated when your device captures sounds that do not allow you to hear the sounds you would like to?	A	B	C	D	E	F	G
3	Are you convinced that to have acquired your hearing device was your best option?	A	B	C	D	E	F	G
4	Do you think that people notice your disability better when you are using your hearing device?	A	B	C	D	E	F	G
5	Do your devices reduce the number of times you have to ask people to repeat what they say?	A	B	C	D	E	F	G
6	Do you think that your hearing device compensates your disability?	A	B	C	D	E	F	G
7	Are you upset for not getting the desired volume on your hearing device?	A	B	C	D	E	F	G
8	How much are you satisfied with the appearance of your hearing device?	A	B	C	D	E	F	G
9	Does using the hearing device improve your self-confidence?	A	B	C	D	E	F	G
10	How much natural is the sound received in your hearing device?	A	B	C	D	E	F	G
11	How much does your hearing device help when talking on telephones that do not possess volume amplifiers?	A	B	C	D	E	F	G
12	How competent was the person who provided you the hearing device?	A	B	C	D	E	F	G
13	Do you think that using the hearing device makes you less capable?	A	B	C	D	E	F	G
14	Is the cost of your hearing device reasonable?	A	B	C	D	E	F	G
15	Are you satisfied with hearing device's quality (concerning the amount of times you needed it repaired)?	A	B	C	D	E	F	G

Do you use a hearing device in the ear opposite to the cochlear implant?

() Yes

() No

Figure 1 – Satisfaction questionnaire adapted for users of the cochlear implant – SatisfactionwithAmplificationen Daily Life (SADL)

IOI – CI – International Outcome Inventory for Cochlear Implants

NAME: _____

DATE: ____/____/____

1– Think about how much you used your present cochlear implant over the past two weeks. On an average day, how many hours did you use the cochlear implant?

none	less than 1 hour a day	1 to 4 hours a day	4 to 8 hours a day	more than 8 hours a day
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2 – Think about the situation where you most wanted to hear better, before you got your cochlear implant. Over the past two weeks, how much has the cochlear implant helped in those situations?

helped not at all	helped slightly	helped moderately	helped quite a lot	helped very much
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3 – Think again about the situation where you most wanted to hear better. When you use your cochlear implant, how much difficulty do you STILL have in that situation?

very much difficulty	quite a lot of difficulty	moderate difficulty	slight difficulty	no difficulty
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4 – Considering everything, do you think your cochlear implant is worth the trouble?

not at all worth it	slightly worth it	moderately worth it	quite a lot worth it	very much worth it
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5 – Over the past two weeks, with your cochlear implant, how much have your hearing difficulties affected the things you can do?

affected very much	affected quite a lot	affected moderately	affected slightly	affected not at all
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6 – Over the past two weeks, with your cochlear implant, how much do you think other people were bothered by your hearing difficulties?

bothered very much	bothered quite a lot	bothered moderately	bothered slightly	bothered not at all
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7 – Considering everything, how much has your cochlear implant changed your enjoyment of life?

worse	no change	slightly better	quite a lot better	Very much better
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Figure 2 – Inventory adapted for users of the cochlear implant –International Outcome Inventory for Cochlear Implants – IOI – CI.

Table 1 – Characteristics of the individuals included in the satisfaction study

Characteristics	Sectional Study		
	n (%)	Average	DP
Age at the implant (in years)	51 (100)	46,20	17,68
Hearing loss duration (in years)	51 (100)	17,49	12,68
Time of therapy (in months)	40 (100)	21,68	19,68
Sex			
Male	29 (56,9)		
Female	22 (43,1)		
Education**			
Up to 8 years of school	22 (43,1)		
Above 8 years of school	25 (49,0)		
Characteristics of the hearing loss			
Progressive	41 (80,4)		
Sudden	10 (19,6)		
Etiology			
Unknown	23 (45,1)		
Genetic	4 (7,8)		
Meningitis	4 (7,8)		
Other	20 (39,2)		
Type of the Implant			
Cochlear	33 (64,7)		
Med-EI	17 (33,3)		
AdvancedBionics	1 (2,0)		
Implanted Ear			
Right	17 (33,3)		
Left	34 (66,7)		

*Weekly frequency of speech therapy. The therapy lasts about 30 to 40 minutes each.

**Categorization from the average of years of schooling of the population.

Table 2 – Description of the global score and the subscales of SADL and IOI – CI of the participants of the study (n= 51)

Dimensions SADL	Average	DP	Minimum	Maximum	Median
Global	5,25	0,60	3,40	6,33	5,33
Positive Effects	5,91	0,75	2,67	7,00	6,00
Negative Factors	5,10	1,05	1,75	6,50	5,10
Self-Image	4,62	0,99	2,33	6,67	4,66
Services and Costs	4,54	1,70	1,00	7,00	5,00
Dimensions IOI – CI	Average	DP	Minimum	Maximum	Median
Global	4,31	0,53	2,86	5,00	4,42
Factor I	4,64	0,43	3,00	5,00	4,75
Factor II	3,86	0,83	1,33	5,00	4,00

Table 3 – Description of the dimensions evaluated in the Questionnaires Satisfaction with Amplification in Daily Life and International Outcome Inventory – Cochlear Implant according to the agroupment of the individuals between satisfied and dissatisfied.

Grouping	Satisfied (%)	Dissatisfied (%)
SADL		
Global	98,0	2,0
Positive Effects	98,0	2,0
Negative Factors	90,2	9,8
Self-Image	86,3	13,7
Services and Costs	72,5	27,5
IOI – CI		
Global	100,0	0,0
Factor I	100,0	0,0
Factor II	96,1	3,9

the perception by the others is more related to the appearance of the device than to the communication of the users of the CI. The CI consists in an intervention that brings acoustic benefits, assisting therefore its users in the communicative context, developing self-confidence and independence that were lost at the moment of the hearing disability acquisition.

Yamada (2002)²⁴ while studying the affectivity and the experience after the Cia, verified in the planted people that to start to hear with the implant has a special meaning, because it makes possible to the person to enter a sound world, to diminish anguish, to amplify heir communication with others and to change their world perspective. According to the author, the study pointed to changes such as an improvement in self-confidence, self-acceptance, a self-feeling of value and disposition, and the predominant presence of optimistic feelings that were oriented to self-satisfaction. However, to some of them, the external device unity of the CI, as well as the difficulties in communication, exposed and confirmed the hearing deficiency, something that inclined them to feel “less than the others” and to manifest feelings of inferiority and rejection. In our study, the individuals researched responded that the use of the CI did not make them feel less able, reflecting also the aspects of self-image evaluated in the SADL.

A common preoccupation among users of the hearing assistance device is the aesthetics. While investigating the level of satisfaction in the patient of the cochlear implant, Murakami, Neme, Yamada e Bevilacqua (2001)²⁵ demonstrated that although some of the patients manifested some kind of nuisance regarding the aesthetics, the implant helped them to hear, to improve their life quality and to be more satisfied, reasons in which can

be comprehended the large satisfaction with the aesthetics with our users in our investigation.

Concerning the costs and services, the cochlear implant requires a series of special cares for maintenance of its good functioning and its utile life. The external devices of CI have a factory warranty of three years for factory defects. In this period of time the pieces are evaluated and changed by a representative of each brand in Brazil. Despite the concession of all procedure by SUS, after the period of time, the maintenance is of responsibility of the family and/or CI user. To take on financially the demand in the Brazilian reality, many times, makes impossible to the users to handle the costs.

The *ADAP* (Association of Hearing Disabled, Parents, Friends and Users of the Cochlear Implant), is an entity with philanthropic endings which its goal it to assist people with hearing disability and users of the cochlear implant. One of its goals is to facilitate the maintenance of the external devices of the cochlear implant, instruments and such, designated to the treatment of people with hearing disabilities and users of the cochlear implant, according to the available financial resources²⁶.

According to the institution, the main pieces required to be replaced are what are called the controllers and the battery compartments. A break or rust of this piece makes impossible the use of the device. Secondly is the transmitting antenna and at last, but not so rare, is the fixing of the processors of the speech. Another essential component for the proper functioning of the CI is the rechargeable battery. It has an utile life of about a tear, this period is covered by the manufacturer. After the warranty, the value of these batteries, depending on the brand, varies between R\$ 300,00 and R\$ 1.200,00²⁶.

Romero et al. (2006)²³, observed that the individuals indicated as a limitation of the economical

aspect, maintenance of the batteries used in the CI. In our study there was a expressive number of dissatisfaction related to the services and costs of the CI in general.

In the analysis of the IOI-CI, similarly to the SADL, the subjects of the research were satisfied regarding the device and its relationship with the social environment in which they live. Similar results are found in literature presenting very satisfied individuals with their cochlear implants^{17,27}.

The social relationships, self-esteem and the autonomy are negatively affected aspects in the lives of people who cannot hear. For these people, the CI can provide the improvement of their family daily life, social integration and work progression²³. The results of our study worked together with the ones discovered in scientific literature, once the individuals researched referred, in its majority, that to use the CI is worth it and brings joy to their life.

The continuous daily usage of the CI is determinant to a continuous improvement of the performance and the adaptation to a new way of hearing. The patient is able to enjoy all of the benefits brought by the device such as, acoustics, psychological and social. Some of the studies indicated a dail use of the CI by the participants between 10 to 14 hours^{23,28,29}. In the present research the majority of the subjects used their devices for a time period superior to 8 hours per day. The continuous use can be associated to the satisfaction, once the time the patient uses his CI can reflect the benefit that he is obtaining²³.

Regarding the interaction of the individual in hi environment, Halberg, Ringdahl, Holmes e Carves

(2005)¹⁴, noticed that the patients feel moderately affected due to their hearing difficulty. In the present study the individuals expressed a high level of satisfaction in their social relationships. This discovery corroborates with researches that portray significant improvements in social life of the individuals with the CI, in their work environment, in the increase of job opportunities and in the amplifications in the quality of leisure activities^{17,30}.

Due to the large index of satisfaction expressed in the analysis of two instruments utilized in this study, it was not possible to perform the analysis of the group separated in relation to the other variables, what makes it strictly descriptive. However, with this data, it is possible to identify the main causes for dissatisfaction of the CI users.

■ CONCLUSION

The users of the cochlear implant have a high level of satisfaction and an index inferior, though expressive, of the dissatisfied individuals. The more evident factors of dissatisfaction are related to the services and costs with the CI. The most evidenced factors of dissatisfaction relate to each other with the service and costs with the CI, self-image and negative factors with the use of the device, for example, to hear in noisy environments.

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RESUMO

Objetivo: avaliar a satisfação dos usuários de Implante Coclear com perda auditiva pós-lingual. **Métodos:** estudo seccional com 51 implantados, pacientes de um centro de referência em saúde auditiva na cidade do Natal-RN. Foram utilizados dois questionários de satisfação adaptados para usuários de implante coclear. **Resultados:** houve um alto índice de satisfação entre os pesquisados, detectado pelo *InternationalOutcomeInventory –CochlearImplant*(100,0%) e pelo *SatisfactionwithAmplification in Daily Life* (98,0%).A insatisfação foi observada em relação à imagem pessoal (13,7%),serviços e custos (27,5%), e na presençado ruído competitivo(9,8%). **Conclusão:** o implante coclear é uma intervenção com alto índice de satisfação entre os usuários pesquisados.

DESCRITORES: Implante Coclear; Avaliação de Serviços de Saúde; Satisfação do Usuário

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