International Journal of Early Childhood Special Education (INT-JECSE)
DOI:10.48047/INTJECSE/V16I1.4 ISSN: 1308-5581 Vol 16, Issue 01 2024

Evaluating the arithmetic skills of first-year elementary school children with cochlear implants

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Received: 04/2023; Published: 01/2024
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Abstract:
This study aims to evaluate the computational skills of 12 children with cochlear implants, aged 7 to 10 years, who are in the first-year elementary education, using the Zareki-R-A battery, the results of which, showed the presence of difficulties in arithmetic in the majority of cases, especially Mental oral arithmetic, Numbers reading, Position of numbers in vertical scale, recovering numbers, comparing verbally two numbers, presenting a visual estimate of quantities, qualitative estimation of quantities, verbally presented computational issues, comparing two written numbers.
Keywords: Deafness, Cochlear implant, Arithmetic. Arithmetic difficulties.

1-Introduction:

Arithmetic activity is important in the curriculum, Sahraoui (2021) has highlighted its importance in refining the mind of the learner and upgrading his intelligence, providing him with logical objectivity in dealing with things. This is measured by the age stages in which the learner passes through which there have been developments in the level of mental and cognitive processes, showing the extent towhich this activity affects its collection in the rest of the educational programs. Therefore, international educational organizations endeavour to address problems that impede attainment at the elementary level and are regarded as the establishment phase because they help the learner to perceive attitudes and issues as well as computational concepts. Mental processes are affected by the deafness shown by each Halaoua (2001) that it limits the child's learning of the language and the relationship between thinking and language and has been demonstrated by Fruth (1987), that not only does the language factor bear the cause of the discarded child's delays, but there are other reasons that may have a much greater role in the course of cognitive development. Andin et al. (2023) thinks that it has already been found that deaf people using signals recruit partially different brain areas during simple arithmetic.

Al-Ghazali (2011) also linked deafness to the impact on the child's linguistic development, resulting in educational problems that are either temporary or persistent in computational difficulties that lead to a time difference identified by Roux (2014) between 2 to 3 years for deaf learners compared to audiences and their ability to solve computational problems is shown at the same level as three years younger listeners at the age of 11, and this lack of developmental and behavioural inputs demonstrated by the study of Amrani (2009) that it reduces the regulation of cognitive concepts under cognitive control systems, which is the result of several reasons restricted by the study of each of Ezzayat (2001) and Shalaby (1997) to programming information and how to use it, as well as the failure of educational methods to develop the concepts of reasoning identified by the Bouamar Study (2017) as categories, classification, sequences and numerical... etc, compared to their regular peers to deprive them of the experiences and sensory concepts resulting from the interaction. The results have found that deaf children with cochlear implants show a better level of evolution of logical thinking processes than those with classical organs from here shows us the importance of cochlear implants in developing language skills as reported by Kirazli et al. (n.d.), it can have unwanted effects on academic performance especially in deaf children, The results showed a moral increase in learners' performance throughout the study period and positively affected their statistically improved performance in the Arithmetic.

Studies including that of Quinter et al. (2004) also indicate that disruption of hearing inputs in deaf children is likely to have multiple impacts on cognitive, behavioural and social development and from which audio inputs are necessary at an early stage for the natural development of oral and written language, as demonstrated by the study of both Manor et al. (2000), who linked preparatory education children's suffering from language disorders and showed delays in acquiring elementary computational skills and computational handling compared to ordinary children. Langdon et al. (2023) added that the importance of learning early arithmetic lies in achieving subsequent academic results by prioritizing teaching time and early intervention to increase the likelihood of a strong basis in the arithmetic. A brief overview of the account's evolution as key objectives for early intervention programmes and the development of computational skills in very young children and in preparatory education age.

The study of Aouaidjia (2018) found that there are therapeutic programs in line with the nature of their cognitive, linguistic and academic needs where the degree of deafness has a clear impact on the acquisition and development of writing skills and hence computational skills, and the greater the degree of deafness the impact. The study of Ait Yahia (2017) noted that deaf children have limited linguistic abilities by showing differences in language acquisition. There are three factors that lead to linguistic dysfunction: the degree of hearing loss; The age of the appearance of deafness; The presence or absence of other associated disabilities, which helps a deaf child with a cochlear implant to advance and master arithmetic according to basic elements identified by Lacheheb (2015) in his study as being based on (3) basic elements, namely the principles of numerical arithmetic, secondly applied exercises for the scale of adequate weight, length and spaces, and thirdly geometric forms.

The study of Rahmouni (2016) found that preliminary arithmetic need the ability to recognize the order and sequencing to represent the counting process. The absence of some cognitive capabilities may affect the learner's acquisition of solution strategies, as we find the division of computational functions to (3) basic skills.

The first is understanding the numbers, understanding the quantities, symbols and digital system, the second is producing the number, which is counting, reading and writing the numbers, and the third is" arithmetic ", which is training the implementation and retrieval of digital facts. Athouibi (2022) added that the acquisition of basic processes in the arithmetic; as the foundational skills in the learning of computational skills at the gradual educational stages; in order to avoid computational difficulties that lead to lower educational attainment which is linked to the pupil's ability as well as traditional teaching methods that are free from motivation and excitement. According to Salhi (2019), developing the capacity of deaf child subject to cochlear implants and acquiring computational skills in line with the attainment level are dependent on qualification and family and school support to reduce academic difficulties.

The Study of Dambiel-Birepinte (2005) adds that the principles of integration into the normal school environment are already part of the priorities of the two publications N°82-2 and 82048, of January 29th, 1983, which recommend that "Individual integration into the ordinary classroom must be requested as a priority and must be accompanied, if necessary, by personal assistance at the school level and that each case must be the subject of an educational project; taking into account available capacities and means and encouraging " New forms of integration" if these innovations allow them to respond to specific individual situations, so it is necessary to understand the way children learn to calculate as well as the difficulties they may face. This preambles the way for a study of Gervasoni and Sullivan (2007) This aims to reveal children's computational capacity, assess arithmetic and arithmetic curricula, and the most effective forms of intervention for children struggling to learn.

Language levels in deaf children are affected as a result of hearing deficits that lead to delays in linguistic acquisitions. This is a correlation between cognitive and linguistic ability, and deafness limits linguistic development. This is confirmed by studies in this filed(Gilbertson & Kamhi,1995; Brown; 1996; Davis et al., 1986; Bichop, 1983; Delage & Tuller, 2007; Stelmachowicz et al., 2004; Briscoe et al. 1001).

We find studies that have used Zareky-R-A battery, including the study of Ben Abed and Ben Tahar (2016), in order to know the level of thinking beyond cognitive to solve calculating problems in the fourth year pupils with dysfunctional elementary, as well as Ben Abed and Ben Tahar (2017) aimed at recognizing the impact of beyond-cognitive thinking on mathematics achievement in hard-to-calculate learners on fourth-year elementary and Bouslimani and Soltani study (2021) with the aim of detecting

the difficulties of calculating for third-year elementary learners, we find also the study of Sahraoui (2021) that aimed to show a correlation between visual spatial capability and dyscalculia in elementary fifth-grade learners, aged 10 to 11 years, based on 5 sub-tests of Zareki-R-A battery.

We note that the studies applied to the battery did not apply to the deaf category; and the age group also varies at the school level and most of them have applied some sub-tests of the battery.

Our study comes as an additive by which we confirm the results of the previous studies that have identified computational difficulties, so our general question is as follows:

Are children with cochlear implants in the first year of elementary school enduring computational skills difficulties?

2. Hypothesis:

children with cochlear implants in the first year of elementary enduring computational skills difficulties.

3. Research Objectives:

Description of the process of acquiring arithmetic for children with cochlear implants.

Identify the level of the arithmetic's initial acquisitions for child with cochlear implants in the first year at first elementary school.

Identify the cognitive processes involved in the arithmetic in the deaf child with cochlear implants.

Detection of computational difficulties to a deaf child with cochlear implants at the centre or at school.

To learn about the extent to which the concept of arithmetic is acquired in a deaf child with a cochlear implant in both oral and written ways.

4. The importance of the research:

It is to demonstrate the strengths and weaknesses faced by deaf child with cochlear implants in the first year of elementary school. This will be a database that will help each specialist understand the arithmetic skills of these children, through which it can propose techniques used to overcome difficulties in this field through appropriate early intervention.

5. Defining Concepts:

5.1. Deafness: When there is an auditory dysfunction that results in an auditory loss (deafness) measured by decibel that impedes speech hearing and understanding. Inadequacy of the situation manifests itself in the performance of functions such as education, which increases as linguistic requirements rise, making it need specialized pedagogical methods to overcome disability.

5. 2. Cochlear Implantation: A machine containing electrodes implanted within the cochlear, which aims to activate hearing nerve fibres to improve the ability of its communication skills, including verbal non-follow-up long-term, is directed to children with deep deafness who do not benefit from regular earphones under the age of 5 with the goal of learning speed.

5.3. Arithmetic: Arithmetic is a mental activity that treats numerical codes to extract unknown numbers using logic in order to facilitate an individual's daily life.

6. Methodological procedures:

6.1. Research method:

In our study, we adopted the descriptive method, which is the appropriate method for our study.

6.2. Sample Search:

The sample consisted of 12 cochlear implant learners ranging in age from 7 to 10, in the first elementary year.

Table 1
sample personnel.

Cases:	Chronological age:	Mental age:	Deaf Type:
1. (R.S)	July 28th, 2015	7 years, 3 months and 5 days	Innate Deaf
2. (H.D)	August 17th, 2015	7 years, 5 months and 13 days	Innate Deaf
3. (A.D)	July 20th, 2015	7 years, 5 months and 16 days	Innate Deaf
4. (S.B)	September 14th, 2015	7 years, 13 months and 10 days	Innate Deaf
5. (B.F)	September 22nd, 2015	7 years, 13 months and 18 days	Innate Deaf
6. (M.Z)	December 30th, 2013	9 years, 0 months and 26 days	Innate Deaf
7. (A.N)	May 28th, 2014	9 years, 4 months and 25 days	Innate Deaf
8. (M.A)	August 23rd, 2014	9 years, 7 months and 20 days	Innate Deaf

9. (CH.D)	**March 05th, 2013**	**9 years, 9 months and 1 day**	**Innate Deaf**
10. (R.CH)	**December 16th, 2012**	**10 years, 0 month and 12 days**	**Innate Deaf**
11. (A.B)	**May 24th, 2012**	**10 years, 07 months and 20 days**	**Innate Deaf**
12. (A.T)	**January 01st, 2012**	**10 years, 11 months and 3 days**	**Innate Deaf**

With regard to the conditions for selecting the sample, we took all children with cochlear implants without exception; in the first year of elementary school regardless of their age. The sample was deliberately selected excluding children who did not meet the conditions for research.

6.3.Place and Time of the Research:

With regard to spatial boundaries, research has been carried out in three schools: El-Bachir El-Ibrahimi School, located in Bordj Menail; under the Directorate of Education of county of Boumerdès. The second school is an elementary school El-Djorf school located in Bab Ezzouar, under the Directorate of Education of county of Algiers. The third school is the deaf and dumb school under the Directorate of Social Activity of county of Algiers. The forth school is called the School of deaf children "Ahmed Khellafa", in Ferdjioua; under the directorate of Ministry of National Solidarity, Family and Women's Issues. In addition to two centres for the deaf-mute, one located in Boukhalfa, under the Directorate of Social Action of County of Tizi Ouzou, and the second in Bordj Menail; under the Directorate of Social Activity of County of Boumerdès.

As for the time of the research, it has been conducted from the beginning of January to the end of February, of the year 2023

6.4. Research Tools:

6.4.1. Zareky Battery:

We used in this research a Zareki battery to evaluate the arithmetic in its adapted Algerian edition by Hacene (2011), designed to process and evaluate the numbers and arithmetic in children with disordered counting principles and code knowledge; numerical and arithmetic on children in elementary school aged 6 to 11 years. It contains 12 tests, consisting of 92 items spread over 11 subtypes, and since the return test is a classic measurement in working memory that has not been included in the arithmetic of the battery's total score.

This battery includes the following tools:

The excitement book: contains printed cards that we find in some tests that flip as they are displayed on the examinees.

Test brochure: Includes examiner data and test instructions read by the examiner on the examinee and then records the examinee's responses.

The total drip sheet: records the checker points obtained through battery tests.

The internal pages: are intended to identify the tool for each test and provide instruction recording an answer and observations of the examinee's behaviour and making a drip.

The last page: is where the examiner notes the general behaviour as well as the examinee's pathological precedents.

Answer copybook: to record the examinee's answers to some tests.

Scoring scale: is a transparent sheet to correct items from item 6.7 to item 6.12.

Hour: to calculate the time taken in some tests that require arithmetic.

Table calculating the mental age of the examinee by writing the date of application of the battery as well as the date of birth of the examinee to extract the mental age.

Tests: include 12 tests, that are: Counting points; verbal reverse counting; dictating numbers; verbal mental arithmetic; reading numbers; place of numbers in a vertical scale; recovering numbers; comparing verbally two numbers; presenting a visual estimate of quantities; quantitative estimation of quantities in context; verbally presented computational issues and comparing two written numbers.

6.4.2. How to use search tools:

We took the Zareki -R-A battery and assessed the arithmetic process of (12) cochlear implant learners studying in the first year of elementary, in an average of 4 servings per case with appropriate conditions to apply the test by providing calm and a writing table on the question copybook, with the examinees sitting in front of the examiner to observe their behaviours. The meeting time was set between 30 to 60 minutes, in line with the readiness and capabilities of the case during the test.

When using the arithmetic skills measurement, we registered the results into the drip sheet taking into account the standard degree associated with each age group as applied in the battery of Zareki; that contributes to an accurate assessment of the level of computational performance of these children, limiting the lowest score 0 to the highest grade 163; but without inserting the degree of test re-numbers.

7. View and discuss search results:

Here we will show the quantitative and how-to results of our study.

7.1. Quantitative analysis:

We will present here our findings through the application on the research sample as shown in the following table:

Table 2.
the results of cases through the application of battery of Zareki sub-tests items

Repartition of samples by	Cases	Mental age	Sub-tests clauses/gross grade												Global grade
			Numbers arithmetic	Inverse oral	Dictation of	Mental oral	Numbers reading	Position of	recovering	comparing verbally	presenting a visual estimate	qualitative	verbally presented computati	comparing two	
Category 1: from 7 years to 7 years, 13 months and 18 days	1. (R.S)	7 years, 3 months and 5 days	6/0	4/0	16/2	44/0	16/2	24/0	24/0	16/0	5/0	10/0	10/0	10/0	163/4
	2. (H.D)	7 years, 5 months and 13 days	6/6	4/2	16/4	44/20	16/4	24/12	24/6	16/6	5/0	10/0	12/0	10/0	163/54
	3. (A.D)	7 years, 5 months and 16 days	6/6	4/2	16/4	44/0	16/2	24/0	24/0	16/0	5/0	10/0	12/0	10/0	163/14
	4. (S.B)	7 years, 13 months and 10 days	6/6	4/2	16/4	44/20	16/4	24/12	24/6	16/4	5/0	10/0	12/0	10/0	163/52
	5. (B.F)	7 years, 13 months and 18 days	6/5	4/0	16/0	44/0	16/0	24/2	24/9	16/0	5/0	10/0	12/0	10/0	163/07
Category 2: from 9 years to 9 years, 9 months and 1 day	6. (M.Z)	9 years, 0 months and 26 days	6/6	4/2	16/2	44/0	16/4	24/12	24/4	16/2	5/0	10/0	12/0	10/0	163/38
	7. (A.N)	9 years, 4 months and 25 days	6/6	4/2	16/2	44/0	16/4	24/6	24/4	16/0	5/0	10/0	12/0	10/0	163/20
	8. (M.A)	9 years, 7 months and 20 days	6/0	4/0	16/0	44/0	16/0	24/0	24/0	16/0	5/0	10/0	12/0	10/0	163/00
	9. (CH.D)	9 years, 9 months and 1 day	6/6	4/2	16/4	44/0	16/4	24/0	24/3	16/0	5/0	10/0	12/0	10/0	163/16
Category 3: from 10 years to 10 years, 11	10. (R.CH)	10 years, 0 month and 12 days	6/5	4/2	16/2	44/4	16/2	24/0	24/2	16/2	5/0	10/0	12/0	10/0	163/17
	11. (A.B)	10 years, 07 months and 20 days	6/6	4/0	16/2	44/4	16/2	24/0	24/5	16/0	5/0	10/0	12/0	10/0	163/14
	12. (A.T	10 years, 11 months	6/6	4/2	16/2	44/2	16/2	24/0	24/4	16/0	5/0	10/0	12/0	10/0	163/14

	)	and 3 days													

Through table 2, we found that 8 out of 12 cases got a score test of 6 degrees.
In 2 cases, they got 0 degrees; two cases have got 5 degrees, so the grades ranged from 0 to 6 degrees.
In the reverse oral counting test: 4 cases got a score of 0; 8 cases got 2 degrees, of which grades are ranged between 0 to 2. For the "number dictating" test, 5 cases got 2 degrees; 5 other cases got 4 degrees; and 2 cases got 0 degrees, from which scores ranged between 0 and 4 degrees. For the "oral mental arithmetic" test, 6 cases got a score of 0; 02 cases got 20 degrees; 1 case got 8 degrees, and two cases got 4 degrees and 1 case got 2 degrees, of which grades are ranged between 0 to 20 degrees.
In the number-reading test: 5 cases got two degrees; 5 others cases got 4 degrees; and two cases got 0 degree, of which grades are ranged between 0 and 4 degrees.
In the position of numbers in vertical scale test, 7 cases got 0 degrees, 3 cases got 12 degrees, 1 case got 6 degrees and 1 case got 2 degrees, grades are ranged between 0 and 12 degrees.
In the "numbers repeat" test: 3 cases got 0 degrees; 2 cases got 6 degrees; 3 cases got 4 degrees; 1 case got 3 degrees; 1 case got 2 degrees; 1 case got 5 degrees and 1 case got 9 degrees, of which grades are ranged between 0 and 3 degrees.
Through our inspection of the test "comparison with two oral numbers presentation: 8 cases got 0 degrees and two 2 cases got 02 degrees, 1 case got 4 degrees and 1 case got 6 degrees.
For the following test (4): “optical quantification test "; “quantification test"; “arithmetic problems presented verbally test”; and “comparing two written numbers" all 12 cases got a score of 0.
For the overall degree of battery sub-tests, the previous table shows that the first case got a total degree estimated at 4 degrees, the second case got a total degree estimated at 54 degrees, and for the third case, he got a total degree estimated at 14 degrees; the fourth case got a total degree estimated at 52 degrees; the fifth case got a total degree estimated at 7 degrees; the sixth case got a global degree estimated at 38 degrees; the seventh case got a total score estimated at 20 degrees; the eighth case got a total score of 00 degrees; the ninth case got a total score of 16 degrees; and the tenth case got a total degree of 17 degrees, up to the eleventh and twelfth cases, they got a total score of t 14 degrees.

7.2. Qualitative analysis:

We interpreted the battery results by adopting the method of analyzing the results of Hacene (2011). According to her, we suspect that there was a disorder when observing the overall degree below to:
52 for children from 7 to 7 years and 11 months, for cases (5), namely : (R.S), (H.D), (A.D), (S.B) and (B.F), who have attained mental age between (7 years) to (7 years, 13 months and 18 days).
98 for children from 9 to 9 years and 11 months in cases (4), namely: (M.Z); (A.N); (M.A); (CH.D); who got the mental age between (9 years) to (9 years, 9 months and 1 day).
99 for children from 10 to 11 years and 6 months for cases (3), namely: (R.CH); (A.B); (A.T); who got mental age between (10) years) to (10 years,11 months and 3 days).
In view of the low rough grade, we have to use the scores obtained in each sub-test, namely:

7.2.1. Counting numbers Test:

Each of case 1 (R.S) and case 8 (M.A), have got 0 note; that the total degree of sub-test is less than 3 and 4 relative to the age rate because there is a difference in age between case 1 and case 8, which is because they does not know the principles of counting which is a set ofrules on arithmetic.
Case 5 (B.F) and case 10 (R.CH), have got 5 note that the total degree of sub-test is less than 3 and 4 relative to the age rate because there is a difference in age between case 5 and case 10
And that's because they does not know the principles of counting which is a set ofrules on arithmetic.
Second case (H.D) and third case (A.D); and forth case (S.B); were able to pass the test successfully, having got a score of 6 out of 6 is the full mark, i.e. they were not less than 3, as well as the sixth case (M.Z); the seventh case (A.N), the ninth case (CH.D); the eleventh case (A.B); and the case twelfth (A.T); have passed the test successfully by obtaining a score of 6 out of 6 is the full mark that it is not less than 4. So, we can say about these cases that they have the principles of prompt counting and discernment, and also because they have no difficulties in perception of space and have the ability to pay attention.

7.2.2. Reverse oral counting Test:

First case (R.S); second case (B.F); have got 0 out of 4, equal to 0, and concerning the eighth case (M.A); the eleventh case (A.B); they got 0 out of 4 that is less than 1 as shown in the table above, i.e.

the cases could not control the appropriate verbal chain. When we applied the test, we noticed that the cases had a problem of reverse counting, which is what the results obtained show.

Concerning the second case (H.D), the third case (A.D) and forth case (S.B), they got 2 out of 4 that is not equal to 0, as well as the sixth case (M.Z), the seventh case (A.N), ninth case (CH.D), tenth case (R.Ch); and twelfth case (A.T; they got 2 out of 4, so no less than 1.

7.3.2. Numbers Dictating Test:

For the first two cases (R.S), the second case (H.D), they got 2 out of 16, the third and forth cases (A.D) and (S.B), they got 4 from 16, and fifth case (B.F), he got 0 out of 16. Given the scores of less than 4, this is due to their inability to differentiate between individual and dozen numbers.

The sixth case (M.Z) and the ninth case (CH.D), have got 4; the seventh case (A.N); has got 2; the eighth case (M.A) has got 0; and all of the above-mentioned cases with the same mental age or convergence with some of them we have noticed that they are below to 11. This is a result of the fact that they have not been able to distinguish between the individual and the dozen numbers, owing to a lack of training at the preparatory teaching level.

The tenth case (R.CH); eleventh case (A.B) and twelfth case (A.T); have get 2 which is less than 10. There are any faults in dozens.

7.4.2. Oral Mental Arithmetic:

First cases (R.S); third case (A.D) and fifth case (B.F), have Got a score of 0 than 44, and in regard to the second case (H.D) and forth case (S.B), they have got a score of 20 out of 44, and all of those scores are less than 9.

The sixth case (M.Z) has got 8 from, 44; the seventh case (A.N); eighth case (M.A), they got a score of 0 out of 44, and these scores are all below 26.

The tenth case (R.CH); eleventh case (A.B); they got a score of 4 out of 44, and the twelfth case got a score of 2 out of 44, and these scores are all below 31.

7.5.2. Number Reading Test:

The first case (R.S) and third case (A.D); they got a score of 2 out of 16, and the fifth case (B.F), h got 0; and all these scores are less than 4; so the cases that don't know Arabic symbols.

The sixth case (M.Z); the seventh case (A.N) and the ninth case (CH.D); have got a score 4 out of 16; the eighth case (M.A) has got a score of 0 out of 16, and all these scores are less than 11 and therefore we feel the difficulty of not knowing the Arab symbols.

The tenth case (R.CH); the eleventh case (A.B); and the twelfth case (A.T); have got 2 out of 16; and these scores are all less than 12, so the cases that don't know Arabic symbols.

The second case (H.D) and forth case (S.B), have got 4 out of 16; these scores are not less than 4 and so these cases don't know the Arabic symbols.

7.6.2. Position of numbers in vertical scale Test:

The first case (R.S) and the third case (A.D), have got 0 from 12; whereas the fifth case (B.F), has got 2 out of 12, and all of these scores are less than 6, they have difficulty to realize the similarity of the numbers and there have problems with space perception.

The second cases (H.D); and forth case (S.B); have got 12 out of 12, and these scores are all not less than 6; they have difficulty to realize the similarity of the numbers and there have problems with space perception.

The seventh case (A.N); has got a score of 6 out of 12; the eighth case (M.A) and the ninth case (CH.D); have got a score of 0 out of 12, and all of these scores are less than 8, they have difficulty to realize the similarity of the numbers and there have problems with space perception.

The sixth case (M.Z) got 12, and all of these scores are not less than 8. There is no difficulty and these cases realize the similarity of the numbers as you realize space.

The eleventh case (A.B) and the twelfth case (A.T) have got a score of 12 out of 12, and these scores are all not less than 6; they have difficulty to realize the similarity of the numbers and there have problems with space perception.

The tenth case (R.CH), has got a score of 0 out of 12; and this score is less than 10; so there is difficulty in realizing the similarity of the numbers and there are problems in the perception of space.

7.2.7. Repeat numbers:

The sixth case (M.Z) and the seventh case (A.N), have got a score of 4 out of 12; the eighth case (M.A), has got a score of 0 out of 12; concerning the ninth case (CH.D), he got a score of 3 out of 12; and these scores are all below 5.
The first case (R.S) and the third case (A.D), have got a score of 0 out of 12, these scores are all below 7.
The tenth case (R.CH), has got a score of 2 out from 12; the eleventh case (A.B), has got a score of 5 out from 12; and the twelfth case (A.T), has got a score of 4 out from 12; these scores are all below 8.
All of the above cases have difficulties with verbal working memory.
For the second case (H.D), the forth case (S.B) they have got a score of 6 out of 12; the fifth case (B.F), has got a score of 9 out of 12; and all of these scores are not less than 7; these cases do not have difficulties in verbal working memory.

7.8.2. Comparing verbally two numbers:

The first case (R.S), the third case (A.D) and the fifth case (B.F); have got a score of 0 out of 16; the forth case (S.B), has got a score of 4 out of 16; concerning the second case (H.D), he got a score of 6 out of 16; and all of these scores are not less than 6, they have no difficulties in working memory.
The sixth cases (M.Z and the tenth case (R.CH) have got a score of 2 out of 12; the seventh case (A.N); the eighth case (M.A); the ninth case (CH.D); the eleventh case (A.B) and the twelfthcase (A.T); have got a score of 0 out of 16; so all of these scores are less than 8; they have difficulties in working memory and from which we touch the problem of not activating the Arabic symbol before doing comparison.

7.2.9. Visual Estimation for Quantities Test:

All cases in this test got a score of 0 out of 5, hence, it is clear that cases lack the meaning of numbers and the notion of appreciation, so each of the first case (R.S); second case (H.D); third case (A.D); forth case (S.B) and the fifth case (B.F); have grades below 1.
The sixth case (M.Z); the seventh case (A.N); the eighth case (M.A) and the ninth case (CH.D); have grade bellow 2.
The tenth case (R.CH); the eleventh case (A.B) and the twelfth case (A.T); have all of them score bellow 3.

7.2.10. Qualitative quantification for quantities Test:

All the cases in this test got a score of 0 out of 10. They have not reached maturity and knowledge of judgment, as we find each of the first case (R.S); the second case (H.D); the third case (A.D); the forth case (S.B); and the fifth case (B.F); have got less than 2.
The sixth case (M.Z); the seventh case (A.N); the eighth case (M.A) and the ninth case (A.T); have got less than 3.
The tenth case (R.CH); the eleventh case (A.B) and the twelfth case (A.T); have got scores below 4.

7.2.11. Verbally presented computational issues Test:

We find that each of the first case (R.S); the second case (H.D); the third case (A.D); the forth case (S.B); the fifth case (B.F); the sixth case (M.Z); the seventh case (A.N); the eighth case (M.A) and the ninth case (CH.D); have got a score of 0 out of 12. There is no difficulty.
The tenth case (r.CH), the eleventh case (A.B); the twelfth case (A.T) ,have got a score of 0 out of 12; so all bellow 3, there is difficulty which is taken into account from 8 years, because difficulties can be associated with understanding the text of the matter, working memory and basic arithmetic.

7.2.12. Comparison of Two Written Numbers Test:

The first case (R.S); the second case (H.D); the third case (A.D); the forth case (S.B); and the fifth case (B.F); have got a score of 0 out of 10; which is less than 6 and therefore there is difficulty.
The sixth case (M.Z), the seventh case (A.N); the eighth case (M.A); the ninth case (CH.D); have got a score of 0 out of 10; so all of these scores are less than 8 and therefore there is difficulty.
The twelfth case (A.T), the tenth case (R.CH); the eleventh case (A.B); have got a score less than 9; therefore there is difficulty

8. Discussion:

This study showed computational difficulties in cochlear transplant children as confirmed by previous studies. These difficulties can be explained, as showed by the Education study (2021), that they are due to teacher's pedagogical skills, lost numeracy teaching methods, teacher's teaching style, and learners' learning methods. These difficulties are also due to the lack of knowledge on the learners

with real implants at the preparatory stage, as illustrated by various studies, among which we find that most of the difficulties of arithmetic begin at the elementary level and continue at the various stages of development and learning, which appear to learn some concepts of counting and numeracy, as confirmed by the study of (Miller & Mercer, 1997; Miller& MacKay, 1996; Johnson, 1989; Kelly et al. 1997);

The study of Bonvillian et al. (1976) added a review of the factors affecting the success or failure of an ordinary child's hearing or deaf to read, write and educational attainment encountered with educational difficulties beginning at the elementary stage, which the researcher attributed to the teacher's competence. The Study of Ziada (2006) also stated that the arithmetic is a process acquired at the elementary level, but all that is in writing has the initial acquisition of classification, retention of numbers and numbers.

In the light of the studies mentioned in this area concerning the difficulties got by the cochlear implant learner in the first year of elementary, we will analyse these results from the sub-tests of the battery and therefore interpret the results obtained through the points counting test on the methods of presenting each of the studies. Gelman and Gallistel (1986) states that common errors during counting experiments are due to the process of harmonizing the word and the appointment.

Fuson (1988) adds that children learn numeral sequencing through two overlapping phases of first acquisition in which children learn to correctly pronounce traditional sequencing and a later breakdown stage, where parity relationships, order and processes are made serial numbers and the sequence is produced in more complex ways ", these phases overlap because the first part of the sequence may be in development, The incorrect sequences they produce will be learned during the detailed phase.

As for the verbal census reverse test, we find that the cases got average scores to adopt on the fingers in the count, which earned them control of the verbal chain, as the study of Crollen et al. (2011) proved that numerical perception using fingers plays a functional role in the development of mature counting system. This is because fingers contribute to giving creative representation of numbers as well as tracking the number of spoken words during the reading of the counting sequence and maintaining the incitement of the principle of individual correspondence by helping children to coordinate marking processes attribution of the word counting to each element) division (isolation of elements that have already been restricted from those that have not been counted; While maintaining respect for the principle of stable classification (digital markers must be enumerated in the same order across the count sequences) by supporting the emergence of a fingertip routine in a sequence constant order.

As for the oral mental arithmetic test, the scores obtained by the cases show that most lack the arithmetic strategy of organized and sequenced actions and behaviours planned by the account teacher that determine the course of action and adjust its actions in the account share, as confirmed by the study of Thevenot et al. (2015) that these difficulties are due to the lack of good storage of information in memory,

Mental computation strategies are linked to memory and relate to retrieval that makes it difficult for children to move from a difficult task (arithmetic) to a simpler task (identification). This relates to the strategy used during the solution. Fuson (2020) adds that learning and teaching addition and subtraction is from simple small numbers which are the solution procedures used by children preparatory education and the first year which are the solution procedures according to the level of growth, the size of the added numbers and subtraction.

As for the number reading test, through the results obtained in the number reading test, we found a discrepancy in the marks.

The highest score of 4 out of 16; so it is obvious that there is a lack to this category in this test; Gilbertson and Kamhi (1995). This study examined the differentiated abilities of deaf children to learn and acquire new words. The results indicate that deaf children are two distinct groups. The first group is deaf children whose language grows naturally and the second group of deaf children who suffer from poor language and whose linguistic outcome is poor.

In the test of the placement of numbers in a vertical scale, the majority of cases received 0 out of 12, there is a problem in understanding this test. This is due to the fundamental problem of the lack of understanding of space, which was interpreted by the study of EL-Yasseri (2005) as a disturbance of

the space structure, which manifests itself in the unstable thinking of the child's logical with a side disorder, so he cannot offer distances to known places with difficulty in locating himself among others; he does not control some spatial terms such as above, below.

And in testing the repetition of numbers; we found that cases who got less than 12 marks have a problem of dyscalculia and this is what we find in most elementary schools according to the study of Raja and Kumar (2012); and during analysis of neuropsychiatric processes and computational errors committed by elementary school learners, it was found that the majority of this group had more than double digit reading and writing difficulties in sequencing numbers.

As for the examination of the comparison of two verbal numbers, the scores obtained by the cases show the numbers achieved through the school programme as well as the speech therapy mentoring as well as the working memory aspect interpreted by the study of Andin et al. (2013); the existence of working memory similar to lexical elements in deaf people has been proven, while short-term memory is regularly weaker in deaf people compared to ordinary people may be due to differences in a acoustic similarity through sign language and speech methods and in a visual quantification test. All cases got a score of 0 out of 5. This shows that cases lack the meaning of preparation and the concept of estimation.

In the quantitative quantification test, all cases in this test got a score of 0 out of 10. They did not reach maturity and knowledge of judgment. By testing verbally presented computational issues, cases with a mental age of less than 10 years and who got 0 out of 12, there's no difficulty, and that's what the results of 9 cases have shown, whereas for the cases that are 10 years old and over, and get 0 out of 12 here, there's a difficulty that can be associated with understanding the text of the matter and with working memory, which is confirmed by the study of Elbirmani (2015). The process of cognitive representation of information is linked to stimuli received by the senses and then modified to bring it into line with past experience, and then this information are stored in brief representations. From those strategies, the kid learns how to describe the internal cognitive mental processes in learning, remembering, thinking and solving problems. The main pillar of these strategies is the organization of information to facilitate the reception and coding of information in memory.

The test for comparison of two written numbers and by the results obtained, all cases suffer from a disorder at the level of the test for comparison of two written numbers. The difficulties in this test are associated with the lack of knowledge of Arabic codes.

Through the results obtained, the sample children suffer from computational difficulties and the emergence of 3 age groups varying according to mental age. This is due to their different ages. This is confirmed by the study of Micallef and Prior (2004) that children with computational difficulties show delays in the development of computational skills when comparing with each of their ages and their ordinary computationally identical peers.

The study of Vanbinst et al. (2014) adds that cognitive abilities contribute to individual differences in the development of children's computational strategy and that symbolic processing of numerical amounts may be a particular risk factor for children with persistent computational difficulties.

This category also needs great attention for the development of their abilities. This is what the study of Bochkov (n.d.) stated that by studying with specialized teachers, children with cochlear implants develop their ability to concentrate and distinguish voices through individual performance lessons, opens up opportunities to create a shared self-space so that a child with congenital deafness becomes actively immersed in the stream of sounds.

Hence, this study provided an addition despite the small size of the sample that needs to be expanded in other studies. Our results also require us to devise new strategies in arithmetic learning for the first year of elementary school of the deaf category that allow us to enhance the acquisition and development of computational skills in later stages, as well as the subordination of the study sample to neuroimaging, for parts of children who are suspected of being vulnerable to early arithmetic with the aim of early numerical development and using this knowledge to guide attempts at hard-of-arithmetic rehabilitation and monitor progress in neuroimaging.

This has been confirmed by a study that humanity's ability to calculate has a tangible brain pillar. The Superior temporal sulcus is systematically activated in all numerical tasks and can host a central representation of quantity that also activates areas of the prefrontal cortex in the central and bottom when people engage in mental arithmetic.

The parietal lob has recently been identified, and the number of neurons has finally been identified; and understanding of the system's diseases, which lead to lack of adult or developmental dysarithmetic for children, has begun to pave the way for brain-oriented intervention studies.

9. Conclusion:

Academic achievement is a problem for deaf learners, including computational achievement which belongs to the written language and which represents their weak ability and is a reflection of the difficulties of oral language, The arithmetic is influenced by, inter alia, the deafness factor and the presence of language, which will affect language skills as well as the experience from the surrounding environment, as well as the low level of motivation, despite the different degree of deaf learner intelligence; which is ultimately linked to teaching methods and the adapted programme for the level of education. Arithmetic is based on the pillars of building the learning process at the elementary level, which requires learning and acquisition, especially of the deaf cochlear transplant category, with a view to overcoming difficulties if appropriate strategies are used in a timely and effective manner, This is to develop their cognitive abilities and academic skills with adequate rehabilitation to fully accommodate the strengths and needs of deaf learners.

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