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APPLICATION OF INFORMATION AND COMMUNICATION TECHNOLOGIES TO IMPROVE THE EFFECTIVENESS OF PSYCHOLOGICAL AND PEDAGOGICAL REHABILITATION OF STUDENTS WITH COHLERARY IMPLANTATION

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Abstract

Every year, an average of 800-850 children with hearing impairments are born in Uzbekistan. If hearing defects in infants are not identified in a timely manner and measures are not taken to eliminate them, these children may face serious difficulties in the process of social integration into society in the future.

Today, cochlear implantation is used as a solution to this problem. In our country, since 2014, the operation of cochlear implantation for hearing-impaired and deaf children has been financed from the state budget.

Cochlear implantation only restores the auditory analyzer functionally, creating a physiological foundation for the development of auditory perception and speech acquisition. After surgery, there is a need for psychological and pedagogical rehabilitation of children with cochlear implants. Psychological and pedagogical rehabilitation plays an important role in integrating cochlear implanted children into social life and orienting them towards inclusive education.

Today, the methods of using information technology tools in the process of psychological and pedagogical rehabilitation are yielding good results. These methodologies are aimed at developing the auditory-speech and cognitive abilities of children with cochlear implants, forming their communicative integration skills.

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Keywords. Cochlear implant, psychological and pedagogical rehabilitation, information and communication technologies, inclusive education, audio-verbal method, auditory-speech abilities, cognitive abilities, communication skills.

ПРИМЕНЕНИЕ ИНФОРМАЦИОННО-КОММУНИКАЦИОННЫХ ТЕХНОЛОГИЙ ДЛЯ ПОВЫШЕНИЯ ЭФФЕКТИВНОСТИ ПСИХОЛОГО-ПЕДАГОГИЧЕСКОЙ РЕАБИЛИТАЦИИ УЧАЩИХСЯ С КОЛЛЕРНОЙ ИМПЛАНТАЦИЕЙ

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Аннотация

Ежегодно в Узбекистане рождается в среднем 800-850 детей с нарушениями слуха. Если дефекты слуха у младенцев не выявляются своевременно и не принимаются меры по их устранению, эти дети могут столкнуться с серьезными трудностями в процессе социальной интеграции в общество в будущем.

Сегодня в качестве решения этой проблемы используется кохлеарная имплантация. В нашей стране с 2014 года операция кохлеарной имплантации для слабослышащих и глухих детей финансируется из государственного бюджета.

Кохлеарная имплантация восстанавливает только слуховой анализатор функционально, создавая физиологическую основу для развития слухового восприятия и усвоения речи. После операции возникает необходимость психолого-педагогической реабилитации детей с кохлеарными имплантатами. Психолого-педагогическая реабилитация играет важную роль в интеграции детей с кохлеарным имплантатом в общественную жизнь и ориентации их на инклюзивное образование.

Сегодня методы использования инструментов информационных технологий в процессе психолого-педагогической реабилитации дают хорошие результаты. Эти методики направлены на развитие слухо-речевых

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и когнитивных способностей детей с кохлеарными имплантатами, формирование у них навыков коммуникативной интеграции.

Ключевые слова: Кохлеарный имплантат, психолого-педагогическая реабилитация, информационно-коммуникационные технологии, инклюзивное образование, аудиовербальный метод, слухоречевые способности, когнитивные способности, коммуникативные навыки.

KOXLEAR IMPLANTATSIYALI O‘QUVCHILARNING PSIXOLOGIK-PEDAGOGIK REABILITATSIYASI SAMARADORLIGINI OSHIRISHDA AXBOROT-KOMMUNIKATSIYA TEXNOLOGIYALARIDAN FOYDALANISH

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Annotatsiya
O‘zbekistonda har yili o‘rtacha 800-850 ta eshitishda nuqsoni bo‘lgan bolalar tug‘iladi. Agar chaqaloqlarda eshitish nuqsonlari o‘z vaqtida aniqlanmasa va ularni bartaraf etish choralari ko‘rilmasa, bu bolalar kelajakda jamiyatga ijtimoiy moslashish jarayonida jiddiy qiyinchiliklarga duch kelishlari mumkin.
Bugungi kunda bu muammoning yechimi sifatida koxlear implantatsiyadan foydalanilmoqda. Mamlakatimizda 2014-yildan boshlab zaif eshituvchi va kar bolalar uchun koxlear implantatsiya operatsiyasi davlat byudjeti hisobidan moliyalashtirilmoqda.
Koxlear implantatsiya faqat eshitish analizatorini funksional jihatdan tiklaydi, eshitish idrokini rivojlantirish va nutqni o‘zlashtirish uchun fiziologik asos yaratadi. Operatsiyadan so‘ng koxlear implantli bolalarni psixologik-pedagogik reabilitatsiya qilish zarurati tug‘iladi. Psixologik-pedagogik reabilitatsiya koxlear implantli bolalarni ijtimoiy hayotga integratsiyalash va inklyuziv ta’limga yo‘naltirishda muhim rol o‘ynaydi.

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Bugungi kunda psixologik-pedagogik reabilitatsiya jarayonida axborot texnologiyalari vositalaridan foydalanish usullari yaxshi samara bermoqda. Ushbu metodikalar koxlear implantli bolalarning eshitish-nutq va kognitiv qobiliyatlarini rivojlantirish, ularda kommunikativ integratsiya ko‘nikmalarini shakllantirishga qaratilgan.

Kalit so‘zlar. Koxlear implant, psixologik-pedagogik reabilitatsiya, axborot-kommunikatsiya texnologiyalari, inklyuziv ta’lim, audioverbal metod, eshitish-nutq qobiliyati, kognitiv qobiliyat, kommunikativ ko‘nikmalar.

The relevance of the problem. Speech is the primary means of communication between people throughout their lives and plays an important role in ensuring the normal course of life. According to the World Health Organization, 1-2 out of 1,000 children are born with hearing impairments. Unfortunately, an average of 800-850 children with hearing impairments are born annually in our country. If hearing impairments in newborns are not identified in a timely manner and measures are not taken to eliminate them, these children may face serious difficulties in the process of social adaptation in society in the future.

To date, cochlear implantation is used as a solution to this problem. The cochlear implantation system is a high-tech device consisting of a speech processor located behind the ear and a complex of implants and electrodes that are surgically placed under the skin.

In our country, attention is paid to the issues of protecting children's health, especially improving the quality of life for children in need of social protection, and ensuring their social adaptation to our society at the level of state policy. Since 2014, cochlear implantation operations to help deaf children have been funded by the state budget.

Years of experience have shown that the performed cochlear implantation surgery cannot provide complete rehabilitation, but only creates a physiological foundation for the restoration and development of hearing. Rehabilitation is necessary for full hearing restoration.

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Literature analysis on the topic. A number of foreign and domestic researchers are conducting scientific research on the problems of using information and communication technologies to increase the effectiveness of psychological and pedagogical rehabilitation after cochlear implantation.

According to researcher O.I. Kukushkina, the use of information and communication technologies in the process of psychological and pedagogical rehabilitation further expands the range of teaching aids. Information and communication technologies create learning conditions necessary for solving developmental and corrective tasks that cannot be created with traditional methods.

Researcher G.S. Abdullaeva, analyzing the corrective and educational possibilities of using information and communication technologies in the special education system, notes the insufficiency of research on using information and communication technologies in the education of persons with disabilities. In his opinion, the introduction of ICT into the special education process allows for achieving the desired correctional result in a short period of time in situations where solving correctional tasks is difficult, and for individualizing the correction process.

Researcher E.P. Trifonova notes that the use of information and communication technologies in the process of developing cognitive abilities, which play a decisive role in the development of auditory and speech abilities and the formation of communication skills in students with cochlear implants, increases the effectiveness of correctional work.

According to researchers T.K. Korolevskaya, the "Sound World" computer program created based on the results of the conducted research contributes to the development of auditory-speech and cognitive abilities, as well as the formation of communicative skills in the process of surdopedagogical work.

Researcher Yu.B. Zelenskaya notes that the "Speech viewer" computer program can be processed taking into account specific linguistic features, as well as successfully used in the speech rehabilitation of children with speech disorders who are native speakers of the same language and achieve high results.

Analysis of literature on the topic shows that the use of information and communication technologies in the process of psychological and pedagogical

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rehabilitation contributes to the development of auditory-speech and cognitive abilities, as well as the formation of communicative skills in primary school students with cochlear implantation.

Analysis and results. Currently, cochlear implantation remains ineffective in most cases due to the incorrect implementation of the post-operative psychological and pedagogical rehabilitation stage.

To date, students with cochlear implants studying in specialized boarding schools account for an average of 10-13% of the total number. According to the established regulation, students who receive a cochlear implant must transition to inclusive education after undergoing psychological and pedagogical rehabilitation for 2-5 years. However, most students with cochlear implants continue their studies in specialized boarding schools until they complete their secondary education.

As a result of studying the psychological and pedagogical rehabilitation process of students with cochlear implants in specialized boarding schools, the following cases were identified:

- lack of psychological and pedagogical support, lack of speech environment, students with cochlear implants use the fingerprint alphabet and sign language for communication;
- within the framework of psychological and pedagogical rehabilitation, individual additional classes are not conducted, with the exception of frontal and individual classes;
- within the framework of psychological and pedagogical rehabilitation, innovative technologies are not used in the educational process;
- within the framework of psychological and pedagogical rehabilitation, methodological cooperation with parents has not been established, and they lack the necessary knowledge and skills;
- a student with a cochlear implant in family communication primarily listens, performs tasks, conducts their activities based on habitual actions, and expresses their attitude toward the given issue with short words such as "yes" or "no," often through gestures. Due to their limited vocabulary, they find it difficult to express their thoughts. Therefore, they prefer gestures.

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Results of the analysis of questionnaires conducted with specialists of the specialized boarding school

№	Factors exerting negative influence	in percent %
1.	There is no psychological and pedagogical support.	28
2.	No speech environment created.	33
3.	Students with cochlear implants use dactyl and sign language for communication.	24
4.	Measurement criteria and a monitoring system for the level of development of auditory-speech and cognitive abilities have not been developed.	37
5.	Within the framework of psychological and pedagogical rehabilitation, methodological cooperation with parents has not been established.	45
6.	Methodological classes are not conducted with parents; they lack knowledge and skills.	27

The possibilities of using information and communication technologies in the process of psychological and pedagogical rehabilitation in a specialized boarding school and within the family have been studied, and the following have been identified:

- specialized boarding schools will have "Information and Communication Technologies" classrooms equipped with modern computers;
- practically every student has a smartphone, knows how to use it, and independently finds the necessary resources through the internet and Telegram;
- 62% of students with cochlear implants have a computer, laptop, or tablet at home and possess the knowledge and skills to use them;
- 90% of students with cochlear implants play games at home on a computer, laptop, tablet, or phone for 2-4 hours daily;
- hearing-impaired students do not understand the control commands on the monitor when working with ICT tools, as they are presented in English or Russian. Therefore, using visual memory, they perform tasks based on the skills they have memorized.

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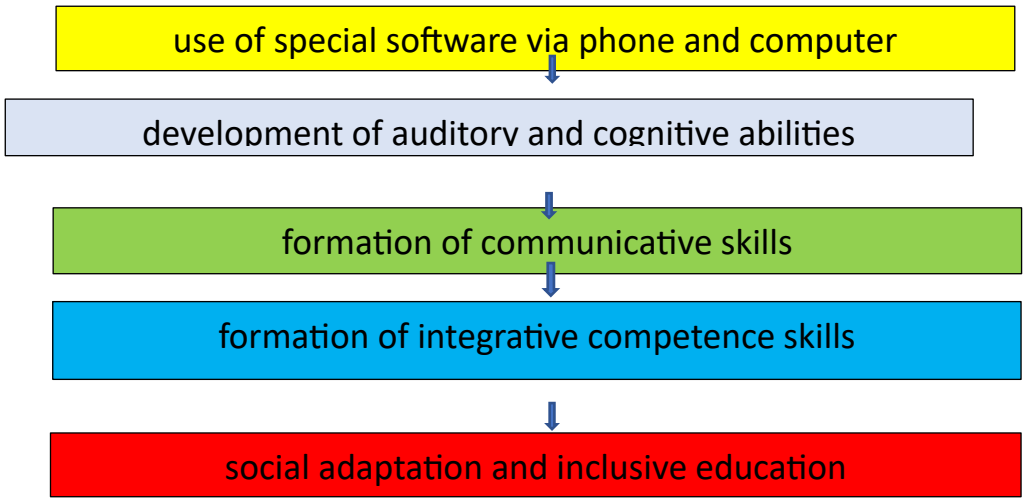
Based on the obtained data, the organizational and methodological aspects of a differentiated approach to the psychological and pedagogical rehabilitation of students with cochlear implants in specialized boarding schools and families, as well as the possibilities of using information and communication technologies, were studied.

The solution to the problem. The results of the analysis show that in the process of psychological and pedagogical rehabilitation, there are sufficient opportunities for the development of auditory-speech and cognitive abilities, the formation of communication skills using information and communication technologies based on a specially developed methodology for preparing students with cochlear implants for inclusive education. To effectively utilize these opportunities, it is necessary to analyze the process of psychological and pedagogical rehabilitation in specialized boarding school and family settings, determine the forms, methods, and means of using ICT tools, develop a model, evaluation criteria, and monitoring system, and develop pedagogical requirements for creating IT programs, audiovisual, and video courses, as well as the methodology for their application.

Methodology for the psychological and pedagogical rehabilitation of students with cochlear implants in specialized boarding schools and within the family



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Proposals and recommendations. To find a solution to the problem, research was conducted jointly with specialists from the Department of Biomedical Engineering at Tashkent State Technical University to develop software aimed at developing the auditory-speech and cognitive abilities of children with cochlear implants, forming communication skills, as well as pedagogical requirements for its content and methods of application in the process of psychological and pedagogical rehabilitation. As a result of the research work, experimental versions of the computer programs "Uy Logopedi" (controls the correct pronunciation of words), "Star Spectral Analysis Program of Speech" (carries out spectral analysis of speech), "Star Tune" (controls the auditory perception of sounds without speech), and "Speech UZ" (forms the grammatical structure of the Uzbek language) were developed, aimed at eliminating hearing and speech disorders.

When developing the program's content, he relied on the principle of gradual sound complication by replacing syllables, syllables with words, and words with sentences. Speech material was determined taking into account children's age, hearing and speech development levels, personal interests, the content of the special educational program, the child's rehabilitation capabilities, certain speech disorders, and family conditions. To make the lessons interesting and effective, cartoons and films, videos, photos, and videos reflecting their daily activities with family members were used.

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Differences in the indicators of the experimental and control groups before and after the study according to the criteria

		Criteria						
		1. Execution of tasks with a report on the actions performed.	2. Selection of communicative situations.	3. Drawing in pairs.	4. Ask the student questions and record the answers.	5. Compiling a story based on the drawing.	6. Reading the text	Mean
Experimental group	Before the experiment	1,54	1,42	1,61	1,25	1,23	1,28	1,39
	After the experiment	1,77	1,63	1,88	1,43	1,42	1,48	1,60
Control group	Before the experiment	1,56	1,41	1,63	1,24	1,24	1,30	1,39
	After the experiment	1,63	1,43	1,71	1,28	1,30	1,36	1,44

The study revealed that the parents of most students with cochlear implants do not undergo pedagogical and psychological rehabilitation during the holidays. For this reason, a certain portion of the auditory-speech skills acquired by students during their studies is forgotten during the holidays. To prevent this situation, a web platform called "Listen, Watch, Pronounce Correctly Together" was developed, intended for downloading onto computers and smartphones, as well as for homework assignments. With its help, students can study online and independently during the holidays. These classes help to preserve and strengthen the auditory-speech skills acquired during the learning process.

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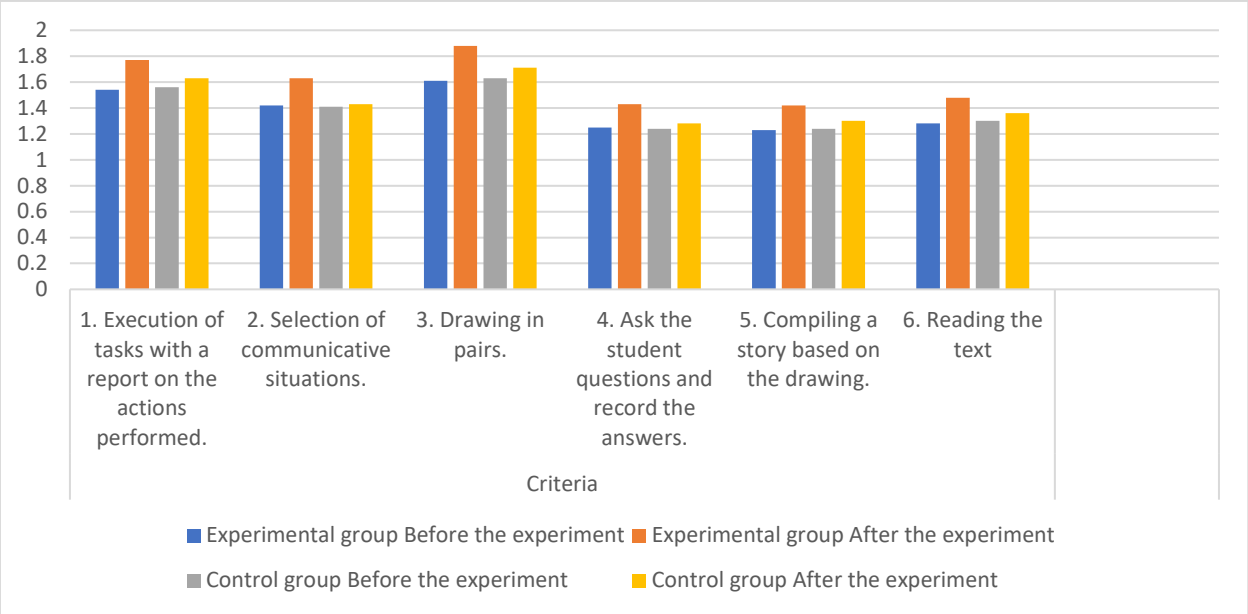
Dynamics of the results of the experimental and control groups before and after the study



Conclusion

Preliminary results obtained during the experiment showed that in working with the software used in the psychological and pedagogical rehabilitation process, there was a strong interest in children with cochlear implants, which contributed to their active participation in classes and increased the effectiveness of individual classes.

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