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ЕЖЕМЕСЯЧНЫЙ НАУЧНЫЙ ЖУРНАЛ

Медицинские новости Грузии

საქართველოს სამედიცინო სიახლენი

GEORGIAN MEDICAL NEWS

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GMN: Georgian Medical News is peer-reviewed, published monthly journal committed to promoting the science and art of medicine and the betterment of public health, published by the GMN Editorial Board since 1994. GMN carries original scientific articles on medicine, biology and pharmacy, which are of experimental, theoretical and practical character; publishes original research, reviews, commentaries, editorials, essays, medical news, and correspondence in English and Russian.

GMN is indexed in MEDLINE, SCOPUS, PubMed and VINITI Russian Academy of Sciences. The full text content is available through EBSCO databases.

GMN: Медицинские новости Грузии - ежемесячный рецензируемый научный журнал, издаётся Редакционной коллегией с 1994 года на русском и английском языках в целях поддержки медицинской науки и улучшения здравоохранения. В журнале публикуются оригинальные научные статьи в области медицины, биологии и фармации, статьи обзорного характера, научные сообщения, новости медицины и здравоохранения. Журнал индексируется в MEDLINE, отражён в базе данных SCOPUS, PubMed и ВИНИТИ РАН. Полнотекстовые статьи журнала доступны через БД EBSCO.

GMN: Georgian Medical News – საქართველოს სამედიცინო სიახლენი – არის ყოველთვიური სამეცნიერო სამედიცინო რეცენზირებადი ჟურნალი, გამოიცემა 1994 წლიდან, წარმოადგენს სარედაქციო კოლეგიისა და აშშ-ის მეცნიერების, განათლების, ინდუსტრიის, ხელოვნებისა და ბუნებისმეტყველების საერთაშორისო აკადემიის ერთობლივ გამოცემას. GMN-ში რუსულ და ინგლისურ ენებზე ქვეყნდება ექსპერიმენტული, თეორიული და პრაქტიკული ხასიათის ორიგინალური სამეცნიერო სტატიები მედიცინის, ბიოლოგიისა და ფარმაციის სფეროში, მიმოხილვითი ხასიათის სტატიები.

ჟურნალი ინდექსირებულია MEDLINE-ის საერთაშორისო სისტემაში, ასახულია SCOPUS-ის, PubMed-ის და ВИНИТИ РАН-ის მონაცემთა ბაზებში. სტატიების სრული ტექსტი ხელმისაწვდომია EBSCO-ს მონაცემთა ბაზებიდან.

WEBSITE

www.geomednews.com

К СВЕДЕНИЮ АВТОРОВ!

При направлении статьи в редакцию необходимо соблюдать следующие правила:

1. Статья должна быть представлена в двух экземплярах, на русском или английском языках, напечатанная через **полтора интервала на одной стороне стандартного листа с шириной левого поля в три сантиметра**. Используемый компьютерный шрифт для текста на русском и английском языках - **Times New Roman** (**Кириллица**), для текста на грузинском языке следует использовать **AcadNusx.** Размер шрифта - **12**. К рукописи, напечатанной на компьютере, должен быть приложен CD со статьей.

2. Размер статьи должен быть не менее десяти и не более двадцати страниц машинописи, включая указатель литературы и резюме на английском, русском и грузинском языках.

3. В статье должны быть освещены актуальность данного материала, методы и результаты исследования и их обсуждение.

При представлении в печать научных экспериментальных работ авторы должны указывать вид и количество экспериментальных животных, применявшиеся методы обезболивания и усыпления (в ходе острых опытов).

4. К статье должны быть приложены краткое (на полстраницы) резюме на английском, русском и грузинском языках (включающее следующие разделы: цель исследования, материал и методы, результаты и заключение) и список ключевых слов (key words).

5. Таблицы необходимо представлять в печатной форме. Фотокопии не принимаются. **Все цифровые, итоговые и процентные данные в таблицах должны соответствовать таковым в тексте статьи**. Таблицы и графики должны быть озаглавлены.

6. Фотографии должны быть контрастными, фотокопии с рентгенограмм - в позитивном изображении. Рисунки, чертежи и диаграммы следует озаглавить, пронумеровать и вставить в соответствующее место текста **в tiff формате**.

В подписях к микрофотографиям следует указывать степень увеличения через окуляр или объектив и метод окраски или импрегнации срезов.

7. Фамилии отечественных авторов приводятся в оригинальной транскрипции.

8. При оформлении и направлении статей в журнал МНГ просим авторов соблюдать правила, изложенные в «Единых требованиях к рукописям, представляемым в биомедицинские журналы», принятых Международным комитетом редакторов медицинских журналов - http://www.spinesurgery.ru/files/publish.pdf и http://www.nlm.nih.gov/bsd/uniform_requirements.html
В конце каждой оригинальной статьи приводится библиографический список. В список литературы включаются все материалы, на которые имеются ссылки в тексте. Список составляется в алфавитном порядке и нумеруется. Литературный источник приводится на языке оригинала. В списке литературы сначала приводятся работы, написанные знаками грузинского алфавита, затем кириллицей и латиницей. Ссылки на цитируемые работы в тексте статьи даются в квадратных скобках в виде номера, соответствующего номеру данной работы в списке литературы. Большинство цитированных источников должны быть за последние 5-7 лет.

9. Для получения права на публикацию статья должна иметь от руководителя работы или учреждения визу и сопроводительное отношение, написанные или напечатанные на бланке и заверенные подписью и печатью.

10. В конце статьи должны быть подписи всех авторов, полностью приведены их фамилии, имена и отчества, указаны служебный и домашний номера телефонов и адреса или иные координаты. Количество авторов (соавторов) не должно превышать пяти человек.

11. Редакция оставляет за собой право сокращать и исправлять статьи. Корректура авторам не высылается, вся работа и сверка проводится по авторскому оригиналу.

12. Недопустимо направление в редакцию работ, представленных к печати в иных издательствах или опубликованных в других изданиях.

При нарушении указанных правил статьи не рассматриваются.

REQUIREMENTS

Please note, materials submitted to the Editorial Office Staff are supposed to meet the following requirements:

1. Articles must be provided with a double copy, in English or Russian languages and typed or compu-ter-printed on a single side of standard typing paper, with the left margin of **3** centimeters width, and **1.5** spacing between the lines, typeface - **Times New Roman** (**Cyrillic**), print size - **12** (referring to Georgian and Russian materials). With computer-printed texts please enclose a CD carrying the same file titled with Latin symbols.

2. Size of the article, including index and resume in English, Russian and Georgian languages must be at least 10 pages and not exceed the limit of 20 pages of typed or computer-printed text.

3. Submitted material must include a coverage of a topical subject, research methods, results, and review.

Authors of the scientific-research works must indicate the number of experimental biological species drawn in, list the employed methods of anesthetization and soporific means used during acute tests.

4. Articles must have a short (half page) abstract in English, Russian and Georgian (including the following sections: aim of study, material and methods, results and conclusions) and a list of key words.

5. Tables must be presented in an original typed or computer-printed form, instead of a photocopied version. **Numbers, totals, percentile data on the tables must coincide with those in the texts of the articles.** Tables and graphs must be headed.

6. Photographs are required to be contrasted and must be submitted with doubles. Please number each photograph with a pencil on its back, indicate author's name, title of the article (short version), and mark out its top and bottom parts. Drawings must be accurate, drafts and diagrams drawn in Indian ink (or black ink). Photocopies of the X-ray photographs must be presented in a positive image in **tiff format**.

Accurately numbered subtitles for each illustration must be listed on a separate sheet of paper. In the subtitles for the microphotographs please indicate the ocular and objective lens magnification power, method of coloring or impregnation of the microscopic sections (preparations).

7. Please indicate last names, first and middle initials of the native authors, present names and initials of the foreign authors in the transcription of the original language, enclose in parenthesis corresponding number under which the author is listed in the reference materials.

8. Please follow guidance offered to authors by The International Committee of Medical Journal Editors guidance in its Uniform Requirements for Manuscripts Submitted to Biomedical Journals publication available online at: http://www.nlm.nih.gov/bsd/uniform_requirements.html
http://www.icmje.org/urm_full.pdf
In GMN style for each work cited in the text, a bibliographic reference is given, and this is located at the end of the article under the title "References". All references cited in the text must be listed. The list of references should be arranged alphabetically and then numbered. References are numbered in the text [numbers in square brackets] and in the reference list and numbers are repeated throughout the text as needed. The bibliographic description is given in the language of publication (citations in Georgian script are followed by Cyrillic and Latin).

9. To obtain the rights of publication articles must be accompanied by a visa from the project instructor or the establishment, where the work has been performed, and a reference letter, both written or typed on a special signed form, certified by a stamp or a seal.

10. Articles must be signed by all of the authors at the end, and they must be provided with a list of full names, office and home phone numbers and addresses or other non-office locations where the authors could be reached. The number of the authors (co-authors) must not exceed the limit of 5 people.

11. Editorial Staff reserves the rights to cut down in size and correct the articles. Proof-sheets are not sent out to the authors. The entire editorial and collation work is performed according to the author's original text.

12. Sending in the works that have already been assigned to the press by other Editorial Staffs or have been printed by other publishers is not permissible.

Articles that Fail to Meet the Aforementioned Requirements are not Assigned to be Reviewed.

ავტორთა საყურადღებოდ!

რედაქციაში სტატიის წარმოდგენისას საჭიროა დავიცვათ შემდეგი წესები:

1. სტატია უნდა წარმოადგინოთ 2 ცალად, რუსულ ან ინგლისურ ენებზე,დაბეჭდილი სტანდარტული ფურცლის 1 გვერდზე, 3 სმ სიგანის მარცხენა ველისა და სტრიქონებს შორის 1,5 ინტერვალის დაცვით. გამოყენებული კომპიუტერული შრიფტი რუსულ და ინგლისურენოვან ტექსტებში - **Times New Roman (Кириллица)**, ხოლო ქართულენოვან ტექსტში საჭიროა გამოვიყენოთ **AcadNusx.** შრიფტის ზომა – 12. სტატიას თან უნდა ახლდეს CD სტატიით.

2. სტატიის მოცულობა არ უნდა შეადგენდეს 10 გვერდზე ნაკლებს და 20 გვერდზე მეტს ლიტერატურის სიის და რეზიუმეების (ინგლისურ, რუსულ და ქართულ ენებზე) ჩათვლით.

3. სტატიაში საჭიროა გაშუქდეს: საკითხის აქტუალობა; კვლევის მიზანი; საკვლევი მასალა და გამოყენებული მეთოდები; მიღებული შედეგები და მათი განსჯა. ექსპერიმენტული ხასიათის სტატიების წარმოდგენისას ავტორებმა უნდა მიუთითონ საექსპერიმენტო ცხოველების სახეობა და რაოდენობა; გაუტკივარებისა და დაძინების მეთოდები (მწვავე ცდების პირობებში).

4. სტატიას თან უნდა ახლდეს რეზიუმე ინგლისურ, რუსულ და ქართულ ენებზე არანაკლებ ნახევარი გვერდის მოცულობისა (სათაურის, ავტორების, დაწესებულების მითითებით და უნდა შეიცავდეს შემდეგ განყოფილებებს: მიზანი, მასალა და მეთოდები, შედეგები და დასკვნები; ტექსტუალური ნაწილი არ უნდა იყოს 15 სტრიქონზე ნაკლები) და საკვანძო სიტყვების ჩამონათვალი (key words).

5. ცხრილები საჭიროა წარმოადგინოთ ნაბეჭდი სახით. ყველა ციფრული, შემაჯამებელი და პროცენტული მონაცემები უნდა შეესაბამებოდეს ტექსტში მოყვანილს.

6. ფოტოსურათები უნდა იყოს კონტრასტული; სურათები, ნახაზები, დიაგრამები - დასათაურებული, დანომრილი და სათანადო ადგილას ჩასმული. რენტგენოგრამების ფოტოასლები წარმოადგინეთ პოზიტიური გამოსახულებით **tiff** ფორმატში. მიკროფოტოსურათების წარწერებში საჭიროა მიუთითოთ ოკულარის ან ობიექტივის საშუალებით გადიდების ხარისხი, ანათალების შეღებვის ან იმპრეგნაციის მეთოდი და აღნიშნოთ სურათის ზედა და ქვედა ნაწილები.

7. სამამულო ავტორების გვარები სტატიაში აღინიშნება ინიციალების თანდართვით, უცხოურისა – უცხოური ტრანსკრიპციით.

8. სტატიას თან უნდა ახლდეს ავტორის მიერ გამოყენებული სამამულო და უცხოური შრომების ბიბლიოგრაფიული სია (ბოლო 5-8 წლის სიღრმით). ანბანური წყობით წარმოდგენილ ბიბლიოგრაფიულ სიაში მიუთითეთ ჯერ სამამულო, შემდეგ უცხოელი ავტორები (გვარი, ინიციალები, სტატიის სათაური, ჟურნალის დასახელება, გამოცემის ადგილი, წელი, ჟურნალის №, პირველი და ბოლო გვერდები). მონოგრაფიის შემთხვევაში მიუთითეთ გამოცემის წელი, ადგილი და გვერდების საერთო რაოდენობა. ტექსტში კვადრატულ ფჩხილებში უნდა მიუთითოთ ავტორის შესაბამისი N ლიტერატურის სიის მიხედვით. მიზანშეწონილია, რომ ციტირებული წყაროების უმეტესი ნაწილი იყოს 5-6 წლის სიღრმის.

9. სტატიას თან უნდა ახლდეს: ა) დაწესებულების ან სამეცნიერო ხელმძღვანელის წარდგინება, დამოწმებული ხელმოწერითა და ბეჭდით; ბ) დარგის სპეციალისტის დამოწმებული რეცენზია, რომელშიც მითითებული იქნება საკითხის აქტუალობა, მასალის საკმაობა, მეთოდის სანდოობა, შედეგების სამეცნიერო-პრაქტიკული მნიშვნელობა.

10. სტატიის ბოლოს საჭიროა ყველა ავტორის ხელმოწერა, რომელთა რაოდენობა არ უნდა აღემატებოდეს 5-ს.

11. რედაქცია იტოვებს უფლებას შეასწოროს სტატია. ტექსტზე მუშაობა და შეჯერება ხდება საავტორო ორიგინალის მიხედვით.

12. დაუშვებელია რედაქციაში ისეთი სტატიის წარდგენა, რომელიც დასაბეჭდად წარდგენილი იყო სხვა რედაქციაში ან გამოქვეყნებული იყო სხვა გამოცემებში.

აღნიშნული წესების დარღვევის შემთხვევაში სტატიები არ განიხილება.

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BARRIERS AND SOLUTIONS IN THE USE OF ALTERNATIVE AND AUGMENTATIVE COMMUNICATION: A PILOT DESCRIPTIVE STUDY PRESENTING INSIGHTS FROM ARMENIAN PROFESSIONALS

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Abstract.

Background: Individuals with severe disabilities often require Alternative and Augmentative Communication (AAC) systems to support their communication needs. However, the implementation of AAC is frequently hindered by a lack of awareness among professionals and insufficient prioritization within healthcare systems.

Material and Methods: The online survey method was used to collect data from the participating professionals for the report. We used the Tennessee Talks Virtual AAC Institute questionnaire.

Results: This paper identifies three main factors contributing to the limited use of AAC: high rural populations and economic challenges leading to inadequate rehabilitation services, lack of prioritization of communication rehabilitation by healthcare management, and limited awareness of AAC's potential benefits. Additionally, professionals' prior experiences and motivations significantly influence the adoption of AAC systems.

Conclusions: To enhance the effective use of AAC, it is essential to provide instruction aligned with the specific needs and cultural contexts of local communities, ideally facilitated by experienced professionals. By exploring the current AAC practices and barriers faced by professionals in Armenia, this study aimed to develop strategies and programs that promote the broader adoption and effectiveness of AAC systems in practice.

Key words. Alternative and augmentative communication, limited awareness, cultural context, economic challenges, severe disabilities.

Introduction.

Alternative and augmentative communication (AAC) encompasses a range of strategies and tools designed to support individuals with complex communication disorders in expressing their thoughts, needs, and feelings. Research demonstrates that AAC systems can greatly enhance communication for individuals with severe disabilities, promoting social interaction and improving quality of life. Studies indicate that the use of AAC can lead to better communication outcomes, including increased expressive language skills and improved social engagement [1]. For many individuals, AAC serves not only as a means of communication but also as a bridge to developing verbal skills [2-4]. AAC systems are broadly categorized into low-tech and high-tech systems. Low-tech options, such as communication boards and Picture Exchange Communication System (PECS) [5], are often more accessible and easier to implement in various settings. Conversely, high-tech AAC devices, which include speech-generating devices and mobile applications, offer advanced features but may require more training and resources for effective use [4,5].

Despite the known benefits of AAC, its adoption is often hindered by several barriers. Key challenges include lack of training, Awareness and perception and resource availability. Many professionals report insufficient training in AAC methods, leading to a lack of confidence in implementing these systems effectively [6]. This is especially prevalent in regions with limited access to specialized training programs. There is often a lack of awareness about the potential of AAC among both professionals and families. Misconceptions, such as the belief that AAC might inhibit speech development, can discourage its use [7]. The scarcity of communication rehabilitation services, particularly in rural or underserved areas, presents a significant barrier. Economic constraints further limit access to necessary AAC resources and technologies [8].

The effectiveness of AAC systems is influenced by cultural and contextual factors. Successful implementation requires that AAC methods be tailored to meet the specific needs and preferences of local communities. Understanding the cultural context in which communication occurs is vital for ensuring that AAC tools are relevant and effective [9,10].

Research suggests several best practices for effective AAC implementation. Individualized assessment conducted thorough assessments to identify the unique communication needs of each individual is essential for selecting appropriate AAC methods. Collaborative approach with involvement of family members and caregivers in the AAC process can enhance support and ensure consistency in communication strategies across different environments [11].

Ongoing training and support that can provide continuous professional development opportunities for practitioners is crucial to keep them updated on new technologies and methodologies.

Research has identified three main reasons for the limited use of AAC. First, factors such as a high rural population, limited healthcare access, inadequate educational and technological resources, and challenging economic conditions contribute to a deficiency in all types of rehabilitation services [12]. Second, communication rehabilitation services are often not readily available because they are not prioritized by healthcare management structures [4]. Third, while multilingual populations can present challenges in some contexts, this is not a significant obstacle in Armenia. Additionally, a critical factor to consider is the limited awareness regarding the potential of AAC as an intervention method [6]. Many professionals, family members, and others involved in the communication rehabilitation process lack understanding of AAC's potential benefits for individuals with complex communication disorders [9].

Two primary barriers also hinder the extensive adoption of AAC methods. The extent to which professionals incorporate these methods into their practice is influenced by their prior experiences, educational backgrounds, and motivation to learn new techniques that address emerging challenges. It is crucial that AAC methods and techniques are taught in accordance with the specific needs and cultural contexts of local communities to ensure their sustainability [13].

Given these challenges, instruction in AAC methods should ideally be provided by experienced professionals. Currently, our understanding of the AAC methods employed by professionals in Armenia is limited. By identifying the primary AAC techniques utilized and understanding the obstacles that impede their application, we can develop additional support strategies and programs aimed at promoting the broader and more effective use of AAC methods in practice.

The literature underscores the critical role of AAC in facilitating communication for individuals with complex communication disorders. While significant challenges remain, ongoing research and collaborative efforts can pave the way for more effective AAC practices. By addressing barriers to implementation and emphasizing culturally responsive approaches, we can enhance the accessibility and impact of AAC systems in diverse settings. Further studies are needed to explore the experiences of professionals in applying AAC, as understanding these dynamics is key to developing effective strategies and support systems.

Despite the potential benefits of AAC, several barriers hinder its broader implementation. Awareness among professionals and families regarding the potential of AAC as an intervention is limited [6]. Additionally, two primary barriers impede the extensive adoption of AAC systems. The first barrier is the professional experience and motivation. The degree to which professionals incorporate AAC Systems into their practice is influenced by their prior experiences, educational backgrounds, and motivation to learn new techniques to meet emerging challenges. The second barrier is the cultural relevance and sustainability. AAC Systems must be adapted to align with the specific needs of local communities and cultural contexts. Effective instruction should ideally be provided by experienced professionals. To better understand the AAC systems currently employed by professionals in Armenia and the challenges they face, we initiated this study. The study was conducted as part of the "Testing the Alternative Communication Armav Application" project in collaboration with UNICEF Armenia.

Aim of the work is to gather research data to evaluate the experiences of professionals working with individuals who have complex communication disorders in applying alternative and augmentative Communication Systems. This evaluation is essential for informing further support and developing strategies and programs that enhance the accessibility of AAC Systems.

Methods.

Participants: The study involved 51 participants, all of whom were female professionals. This group included 25 speech and language pathologists, 17 special educators, 6 psychologists, and 3 occupational therapists. The average age of the participants was 34.3 years (±6.4), with an age range of 22 to 54 years. Participants were selected based on the availability of speech therapy services in various regions, resulting in a non-random sampling approach. This uneven distribution of services accounts for the varying numbers of participants from each area in the survey. Among the surveyed specialists, 19 were working in Yerevan, 4 in Shirak region, 8 in Armavir region, 10 in Tavush region, 2 in Ararat region, 4 in Gegharkunik region, and 3 in Kotayk region, and 1 in Syunik region. The majority of participants had 5–10 years of work experience.

Research Design:

The online survey method was used to collect data from the participating professionals for the report. We used the Tennessee Talks Virtual AAC Institute questionnaire [14] for recording specialists' fields and years of work experience for several reasons. The questionnaire has a comprehensive structure and is designed to gather detailed information about professionals using Alternative and Augmentative Communication (AAC) Systems, making it suitable for understanding their backgrounds. It includes questions which are relevant to speech therapy practice that directly relate to the practical application of AAC techniques, allowing for insights into how different fields (e.g., speech pathology, special education, psychology) approach AAC. Using a standardized instrument like this questionnaire ensures consistency in data collection, facilitating comparisons across different specialists and their experiences. The inclusion of specific questions about years of work experience helps to contextualize the participants' responses, enabling researchers to analyze the impact of experience on AAC implementation and expertise. The questionnaire can be modified to include additional sections or questions relevant to the research focus, such as specialist fields, without losing its original intent.

Data Collection and analysis: The "Google Forms" platform was used for the survey. The questionnaire used is a modified version of the Tennessee Talks Virtual AAC Institute questionnaire [14], to which a small section of the specialists' data collection questionnaire was added to record the specialist's field and years of work experience.

Data were analyzed by using SPSS software (version 22). Student's t-test was applied for comparison of means and P value less than 0.05 was considered statistically significant.

The structure of modified questionnaire:

The modified questionnaire consists of 24 questions from the original Tennessee Talks Virtual AAC Institute questionnaire, along with 13 additional questions focused on professional experience. The modified version incorporates considerations of the hindering factors and conditions discussed in the introduction. After translation, the questionnaire was evaluated by six experts in speech and language pathology, who assessed the clarity of the questions, and the accuracy of the terminology used. Minor corrections were made based on their feedback. This review process ensured that the elements of the questionnaire were appropriate and relevant to the target contexts. The questionnaire was then translated from Armenian back to English by a professional translator and subsequently reviewed by the same panel of experts. No discrepancies were found between the original and reverse translations.

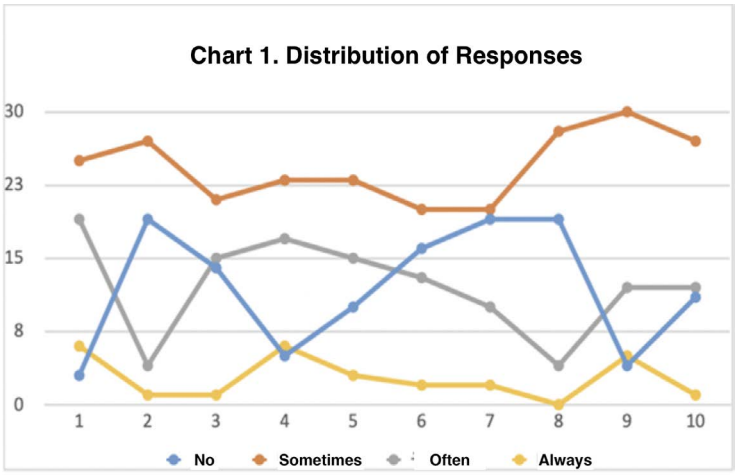

Figure 1. *Illustrates the use of picture-based communication Systems across different environments, displaying responses to 10 questions that assess their accessibility and frequency of use. Four of these 10 questions do not require numerical responses as requested in the questionnaire but instead ask to enumerate various types and complexities of AAC systems that the specialists employ in their work.*

Results.

The first eight questions of the questionnaire focus on children with communication difficulties who have been supported by the participating specialists. These questions aim to identify the specific types of augmentative and alternative Communication systems available to children in various settings and at different times (see Table 1).

Responses categorized as "no" and "sometimes" are considered negative, while "Often" and "Always" are regarded as positive. The data shows a clear predominance of negative responses ("No" and "Sometimes") compared to positive ones. Statistical comparisons of the mean values (364 for negative responses and 149 for positive responses) reveal a significant difference ($P < 0.0001$).

Moreover, low-tech AAC systems are utilized more frequently (49%) than high-tech systems (10%), with this difference also being statistically significant ($P < 0.0001$). This distinction is visually represented in the diagram below, where the lines for "Sometimes" and "No" responses are notably elevated.

Assessment of Specialists' Work and Requirements for Applying AAC Systems:

The purpose of this section of the questionnaire is to clarify how knowledgeable the specialists are about AAC systems and the types they use in their work, and their implementation of core vocabulary concepts in their daily work. The results are presented in Table 2[2].

Responses to inquiries regarding the need for professional support again revealed a predominance of "negative" responses compared to "positive," with consistently reliable differences in proportions. This persistent prevalence of negative values underscores the limited utilization of AAC Systems by professionals and highlights the insufficient skills required for their effective application. While positive responses were noted for three specific questions (7, 12, and 13), all pertained to the needs of experts—such as resources and training—thus indirectly validating the concerns raised.

The participants' usage of different AAC systems was also compared. According to the data collected, 82.36% of the participants (42 specialists) reported using low-tech AAC, while only 1.96% (1 participant) used mid-tech AAC, and 11.76% (6 participants) utilized high-tech AAC. The higher prevalence of low-tech tools can be attributed to their accessibility, whereas the limited use of high-tech options is related to some specialists employing applications in the Armenian language. Statistical evaluation using the Chi-squared test indicates a significant difference ($P < 0.0001$) between the utilization of low-tech tools and the other two categories. However, the difference between groups using low tech and mid-tech was not statistically significant ($P < 0.0514$).

The remaining three questions aimed to identify the most commonly used types of AAC systems across various levels of complexity. Additionally, another question (see Table 3) sought to explore the potential resources and tools that specialists believe would facilitate the distribution and effective application of AAC systems, as well as the necessary knowledge for their implementation.

Required Resources for Using AAC systems:

This section of the questionnaire focuses on the essential resources identified by respondents as necessary for addressing the challenges highlighted in the research. Notably, the expressed needs were largely similar among participants. However, specialists often struggled to articulate their needs clearly, frequently resorting to vague phrases such as “All resources needed for planning and organizing activities,” “The need for appropriate equipment,” and “All up-to-date systems.”

Additionally, it became evident that specialists occasionally confuse computer programs with applications. For example, one response listed "Bigmack, Step-by-Step, Cheap Talk apps" as needed resources, despite these being programs rather than true applications.

The types of AAC methods and the number of specialists using them:

The purpose of this section of the questionnaire is to clarify which AAC methods the specialist’s use.

The summarized information in Table 4 indicates that there were 112 instances of employing no-tech methods, compared

Table 1. *Evaluation of the application and accessibility of AAC Systems in different environments.*

	No	Some-times	Often	Always
1. Students with severe communication difficulties have access to low-tech alternative communication (AAC) systems at our institution.	3	25	19	6
2. High-tech AAC systems are accessible at our institution for students with severe communication difficulties.	19	27	4	1
3. Our students with severe communication difficulties use AAC Systems when moving from one environment to another (room to room, classroom to classroom, etc.) or from one specialist to another.	14	21	15	1
4. Our students with severe communication difficulties use AAC systems in individual sessions, planned and clearly structured interventions.	5	23	17	6
5. Our students with severe communication difficulties use AAC systems during group sessions/lessons.	10	23	15	3
6. Our students with severe communication difficulties use AAC systems during recess/break/free play.	16	20	13	2
7. Our students with severe communication difficulties use AAC systems to interact with their peers.	19	20	10	2
8. Our students with severe communication difficulties use AAC systems outside our institution to express themselves.	19	28	4	0
9. Our students with severe communication difficulties can express their needs through AAC systems.	4	30	12	5
10. Our students with severe communication difficulties can express their emotions through AAC systems.	11	27	12	1
The total number of responses	120	244	121	27
"Positive" and "Negative" responses	364		149[1]	

[1]A score of "0" is also included as an answer. In the questionnaire, the answers are presented in separate columns: No; Sometimes; Often; Always.

Table 2. Assessment of Competencies and Requirements for the Application of AAC Systems in Specialists' Professional interventions.

	No	Some-times	Often	Always
1. I use no-tech AAC Systems (gestures, symbols, images, etc.)	0	9	25	17
2. I use mid-tech AAC devices (battery operated) (Bigmack, Step-by-Step, Cheap Talk, etc.)	43	7	1	0
3. I use high-tech AAC devices (applications, computer programs).	29	16	5	1
4. My students use low-tech AAC systems during daily routines as well.	11	26	13	1
5. My students use high-tech AAC devices during daily routines as well.	14	25	11	1
6. I am familiar with the ``key vocabulary" used in working with children with severe communication difficulties.	6	22	19	4
7. I need training to familiarize myself with the "key vocabulary" of children of different ages.	2	11	13	25
8. I am familiar with online resources that can be used when implementing AAC interventions.	12	23	14	2
9. I can effectively work with a child who is an AAC user in collaboration with the family to ensure the proper utilization of AAC tools.	25	15	10	1
10. I can effectively work with a school/pedagogues in implementing AAC tools for a child who is an AAC user, ensuring proper utilization.	15	22	14	0
11. I can adapt AAC tools to the unique needs of students with special needs.	6	20	19	5
12. I need a course on AAC systems, devices, and communication strategies to enhance my knowledge and proficiency.	1	10	16	24
13. I need more resources to plan and organize interventions for children using AAC.	1	12	16	22
14. I seek assistance from other colleagues to inquire about the use of AAC tools during the course of interventions with my students.	10	28	12	1
The total number of responses	175	246	188	104
"Positive" and "Negative" responses	422		294[1]	

[2]A score of "0" is also included as an answer. In the questionnaire, the answers are presented in separate columns: No; Sometimes; Often; Always.
[3]A score of "0" is also included as an answer. In the questionnaire, the answers are presented in separate columns: No; Sometimes; Often; Always.

Table 3. *The required resources for using AAC systems.*

List the resources you find necessary to plan and organize intervention for children using AAC
• Gain a thorough understanding of both mid- and high-technology • Establish regular communication with the people surrounding the child: family, class, teachers • Availability of appropriate devices or equipment • New methods and accurate work planning • Various technological tools, computer programs • Educational games, communication boards, battery-operated devices, and voice output communication aids (VOCAs) • Up-to-date technologies • Learn new methods • Mid and high technologies • All up-to-date methods • Adaptation of the environment and appropriate devices for the target group • All those resources that will ensure the planning and organization of activities • A guidebook or training that will enable the competent use of AAC • Tablets with communication applications • Applications like Bigmack, Step-by-Step, and Cheap Talk • Contemporary computer programs, games • Support from other specialists • Didactic materials • Organized training for acquiring practical skills • Trainings on using low, mid and high-tech AAC • Armenian applications (for various age groups)

Table 4. *The types of AAC methods mentioned during the questioning process and the number of specialists utilizing them.*

No tech AAC	specialist	Mid-tech AAC	specialist	High-tech AAC	specialist
Pointing device	1				
Audio books	5	AAC app for Android	1		
Pictures	31	Step by step	1		
PODD	4	Bigmack	1		
Communication boards	9	Computer	3		4
PECS	30	Picture books	1	Apps	
Gestures	1	Picture cards	2	Armav AAC App	3
Communication applications	2	Gestures,	1	Expressia	
Pictograms	4	Symbols,	1	Computer interactive tasks	1
Symbols	12	Thematic books	2	Innovative games	1
Didactic materials	3	Phone	2	Aregak learning apps	1
Plot illustrations	1	Tablet	1	Tobii	3
Blackboard with symbols		Otto mouse	1	Tablets	1
Visual timetable	1	Recording devices, Adaptive keyboard	1	Computer programs	1
Computer games	1	Mouses	1		
Talking Tiles	4	Music books	1		
Lotteries	2	Picture books	1		
Encouragement boards	1	PECS	1		
	1				
	112		23		15

to only 23 instances of mid-tech and 15 instances of high-tech AAC methods. This clearly shows that the use of low-tech methods far exceeds that of the other alternatives, with pictures and PECS being the most commonly utilized. The table also highlights that participants often struggle to differentiate between low, mid, and high-tech methods; some mistakenly categorize apps as low-tech. Additionally, specialists sometimes refer to audio books, picture books, music books, and interactive tasks as AAC methods of varying technology levels. The responses further reveal issues with computer literacy, as there is confusion between programs and applications, with terms like computer, phone, and tablet being mentioned as alternative means of communication rather than specific programs or applications.

Responses of Specialists to the Questionnaire on the Use of AAC Methods:

Table 5 presents the responses of all 51 specialists. The last column of the table displays individual scores from the AAC questionnaire, which are categorized by region. Scores range from 0 to 72, with each of the 24 questions assigned a maximum of 3 points. The average score and standard deviation for all 51 specialists were 28.4 ± 0.8. The average scores by region are as follows: Yerevan: 31± 7.8; Armavir: 27.5± 7.3; Gegharkunik:

Table 5. The regional breakdown of specialists participating in the survey.

	Region of residence	Gender	The age of the specialist	The age of the students	AC application questionnaire score
1	Ararat region	Female	25	0-5	17
2	Ararat region	Female	27	2-6	25
3	Armavir region	Female	35	6-18	17
4	Armavir region	Female	47	7-8	16
5	Armavir region	Female	40	6-19	28
6	Armavir region	Female	45	11-14	33
7	Armavir region	Female	42	6-18	34
8	Armavir region	Female	42	3-18	21
9	Armavir region	Female	37	3-18	31
10	Armavir region	Female	34	6-14	40
11	Gegharkunik region	Female	31	2-18	30
12	Gegharkunik region	Female	46	3-12	22
13	Gegharkunik region	Female	37	3-6	28
14	Gegharkunik region	Female	54	5	21
15	Yerevan	Female	47	14	11
16	Yerevan	Female	42	5-14	25
17	Yerevan	Female	27	3-14	30
18	Yerevan	Female	27	3-16	34
19	Yerevan	Female	25	6	33
20	Yerevan	Female	32	4	33
21	Yerevan	Female	30	2-16	42
22	Yerevan	Female	26	6-18	48
23	Yerevan	Female	41	10-15	25
24	Yerevan	Female	43	0-15	32
25	Yerevan	Female	35	2-8	33
26	Yerevan	Female	39	0-6	40
27	Yerevan	Female	27	0-5	35
28	Yerevan	Female	33	3-20	51
29	Yerevan	Female	44	0-5	29
30	Yerevan	Female	33	3-14	31
31	Yerevan	Female	25	3-18	24
32	Yerevan	Female	32	2-15	17
33	Yerevan	Female	34	1.5-8	16
34	Kotayk region	Female	34	3-18	28
35	Kotayk region	Female	24	2-15	18
36	Kotayk region	Female	29	2-6	10
37	Shirak region	Female	26	2-9	26
38	Shirak region	Female	43	2-6	39
39	Shirak region	Female	40	2-6	15
40	Shirak region	Female	42	2-5	31
41	Syunik region	Female	31	6-14	23
42	Tavush region	Female	33	3-5	37
43	Tavush region	Female	39	5-7	30
44	Tavush region	Female	42	3-18	21
45	Tavush region	Female	24	6-12	44
46	Tavush region	Female	22	4-18	25
47	Tavush region	Female	28	5-6	25
48	Tavush region	Female	38	3-18	30
49	Tavush region	Female	28	6-7	32
50	Tavush region	Female	22	6-17	28
51	Tavush region	Female	27	3-10	32

25.3± 3.0; Tavush: 30.4± 4.3; Shirak: 27.8± 5.8; and Kotayk: 18.7± 4.7.

The consistency of ratings across various regions is evident, as reflected in the similar average scores. However, discrepancies are noted in the regions of Ararat, Syunik, and Kotayk, where the number of respondents was significantly lower (1-3). This similarity in questionnaire scores is further illustrated in the accompanying scatterplots.

The regional and gender breakdown of specialists participating in the survey.

According to the table, the age of the participants in the survey ranges from 25 to 54, and all of them are female. The age of the students ranges from 18 months to 19 years old.

The analysis of the research data revealed that the experience of 51 specialists working with individuals with severe communication difficulties in Armenia shows consistency across various regions. Participants predominantly utilize no-tech AAC methods in their practice, with only a minority reporting experience with mid- and high-tech methods. The most commonly employed methods are pictures and the Picture Exchange Communication System (PECS). There is a clear need for training sessions and opportunities to share experiences related to the use of AAC methods. Guidelines and resources for AAC approaches in the Armenian language are essential. Specialists exhibit confusion regarding the methods, approaches, and terminology associated with AAC. For instance, some refer to musical books or illustrated books as mid-tech AAC methods.

Discussion.

AAC systems are not widely utilized by specialists in many countries, including Armenia, for several reasons. Many professionals have lack of training and do not master the methods necessary for effective AAC instruction. Another limiting factor is reluctance to participate, as there is hesitance to engage in training, primarily due to the absence of licensing requirements and limited specialized training opportunities. Lack of time commitment needed for the preparing essential materials, such as communication books and visual aids. Both parents and professionals often fear that using AAC may inhibit a child's speech development and result in dependency. Many practitioners continue to rely on outdated Soviet and Russian literature on speech therapy, which may not align with current best practices [11].

The only research conducted in Armenia regarding AAC was by Avagyan, which examined the use of PECS in conjunction with speech therapy for 44 children with autism aged 2 1/2 to 8 years. Results indicated that verbal speech developed in 78% of the children, demonstrating that AAC can serve as an effective temporary tool that facilitates the eventual production of speech. In some cases, PECS remained a supplementary means of communication, while in 9% of cases, it became the child's sole communication method. In 13% of cases, PECS supported connected speech development for children with limited verbal skills [15-17].

The findings of the presented study underscore critical insights into the landscape of Augmentative and Alternative Communication (AAC) implementation in Armenia. The consistency of experiences among the 51 specialists indicates a shared framework of practice across various regions, yet it also highlights a significant gap in the utilization of advanced AAC technologies.

The predominance of no-tech AAC methods, particularly pictures and the Picture Exchange Communication System (PECS), reveals a practical inclination towards accessible solutions. While these methods can be effective, their over-reliance may limit individuals' opportunities to engage with more sophisticated AAC systems that could enhance communication capabilities. Previous research has shown that mid- and high-tech AAC systems can provide more versatile communication options, allowing for greater personalization and engagement [18,19]. The underutilization of these tools in Armenia suggests an urgent need for comprehensive training and awareness programs that can demonstrate the benefits and applications of these technologies.

The findings highlight a clear demand for training sessions focused on AAC methodologies. Specialists expressed a desire for opportunities to share experiences and best practices, indicating a collaborative approach could be beneficial. This aligns with literature that emphasizes the importance of ongoing professional development in fostering effective AAC use [20]. By providing structured training programs, stakeholders can enhance the skills of professionals, ensuring they are equipped to support individuals with complex communication needs effectively.

The lack of guidelines and resources in the Armenian language represents a significant barrier to effective AAC implementation. The necessity for culturally and linguistically appropriate materials cannot be overstated, as access to such resources directly influences the ability of professionals to implement AAC strategies confidently [21]. This gap highlights the importance of developing and disseminating Armenian-specific AAC resources that reflect local contexts and communication practices.

The confusion among specialists regarding AAC methods and terminology is particularly concerning. Misinterpretations, such as classifying musical or illustrated books as mid-tech AAC, suggest a need for clarity in definitions and classifications. Previous studies have identified similar issues within AAC practice, indicating that inconsistent terminology can hinder effective communication and understanding among professionals [22]. This underscores the necessity for standardized terminology and comprehensive training to promote a unified understanding of AAC methodologies.

The study identifies several barriers to AAC implementation, including a lack of training, reluctance to engage in professional development, time constraints, and fears regarding dependency on AAC. These findings echo previous research that has explored the challenges faced by professionals in adopting AAC strategies [23]. Addressing these barriers requires a multifaceted approach, including advocacy for policy changes, increased funding for AAC initiatives, and the promotion of success stories that demonstrate the effectiveness of AAC in enhancing communication.

While this study offers valuable insights into the barriers affecting the implementation of AAC systems in Armenia, several limitations must be acknowledged. First, the reliance on an online survey may have limited participation from professionals in regions with limited internet access or digital literacy, potentially skewing the representation toward more urban and technologically connected populations. Additionally, the use of self-reported data may introduce biases, such as social desirability or selective memory, which could affect the accuracy of responses. Another limitation is the scope of the survey instrument itself. Although the Tennessee Talks Virtual AAC Institute questionnaire provided a structured framework for data collection, it may not have fully captured all culturally specific factors or the nuanced challenges faced by professionals in Armenia. The study did not include perspectives from AAC users or their families, which would offer a more comprehensive understanding of the effectiveness and accessibility of AAC interventions. Future research should aim to expand the sample size and diversity, particularly by incorporating rural and underserved communities, as well as conducting in-depth qualitative studies such as interviews or focus groups. Exploring the lived experiences of AAC users and their caregivers could provide deeper insight into practical barriers and support needs.

Conclusion.

In conclusion, this study sheds light on the significant challenges facing AAC implementation in Armenia. While no-tech methods dominate practice, there is a pressing need for enhanced training, resources, and clarity surrounding AAC methodologies. By addressing these barriers and investing in professional development, stakeholders can improve the communication support provided to individuals with severe communication difficulties, ultimately fostering a more inclusive environment for all.

REFERENCES

1. Burnham SPL, Finak P, Henderson JT, et al. Models and frameworks for guiding assessment for aided Augmentative and Alternative communication (AAC): a scoping review. Disabil Rehabil Assist Technol. 2024;19:1758-1772.
2. Avagyan A, Mkrtchyan H, Shafa F.A, et al. Effectiveness and Determinant Variables of Augmentative and Alternative Communication Interventions in Cerebral Palsy Patients with Communication Deficit: a Systematic Review. CoDAS. 2021;33:e20200244.
3. An S, Feng X, Dai Y, et al. Development and evaluation of a speech-generating AAC mobile app for minimally verbal children with autism spectrum disorder in Mainland China. Mol Autism. 2017;8:52.
4. Lackey S, Watson Hyatt G, Batorowicz B, et al. Barriers and facilitators to accommodations in the workplace for adults who use augmentative and alternative communication (AAC): a systematic review. Augment Altern Commun. 2023;39:181-197.
5. Mkrtchyan H, Margaryan T, Hovhannisyan H, et al. EFFECT OF A METHOD FOR DEVELOPING COMMUNICATION SKILLS ON PHYSICAL ACTIVITY IN CHILDREN WITH INTELLECTUAL DISABILITIES. Health Problems of Civilization. 2022;16:246-257.
6. Ganz JB, Pustejovsky JE, Reichle J, et al. Participant characteristics predicting communication outcomes in AAC implementation for individuals with ASD and IDD: a systematic review and meta-analysis. Augment Altern Commun. 2023;39:7-22.
7. Mirenda P. Revisiting the Mosaic of Supports Required for Including People with Severe Intellectual or Developmental Disabilities in Their Communities. Augment Altern Commun. 2014;30:19-27.
8. Brittlebank S, Light JC, Pope L. A scoping review of AAC interventions for children and young adults with simultaneous visual and motor impairments: Clinical and research Implications. Augment Altern Commun. 2024;40:219-237.
9. Coan-Brill J, Teachman G, Costigan FA, et al. Exploring augmentative & alternative communication assessment practices for children with limited functional speech & motor skills: a scoping review utilizing the Participation Model of AAC. Disabil Rehabil Assist Technol. 2025:1-24.
10. Soto G, Vega J. Designing Cultural Adaptations of Caregiver-Implemented Interventions for Latinx Caregivers of Children Who Use Augmentative and Alternative Communication: Key Considerations. Am J Speech Lang Pathol. 2024;33:2266-2279.
11. Tichá R, Abery B, Johnstone C, et al. Inclusive Education Strategies: A Textbook. Minneapolis, MN, USA: University of Minnesota; Yerevan, Armenia: UNICEF Armenia & Armenian State Pedagogical University. 2018.
12. World Bank. Country and lending groups. 2012. http://data.worldbank.org/about/country-and-lending-groups
13. Petrosyan T, Mkrtchyan H, Martirosyan N. Can behavioral interventions increase physical activity in youth with cerebral palsy? A scoping review. Health Prob Civil. 2021;15:315-322.
14. https://www.tennesseetalks.org/aac-toolbox
15. Petrosyan TR, Avagyan AV, Petrosyan AA, et al. Psychometric and Logometric Properties of the Armenian Version of Augmentative and Alternative Communication Assessment Questionnaire: Assessing Reliability and Validity. J Psycholinguist Res. 2022;51:135-150.
16. Avagyan A, Mkrtchyan H, Petrosyan T. Rare neurological diseases in children: current paradigm of communication interventions and inclusion. Psychology. 2018;24:11-26.
17. Petrosyan T, Mkrtchyan H, Harutyunyan Z, et al. Preliminary assessment of the need and awareness of augmentative and alternative communication systems in Armenia. Iranian Journal of Public Health. 2019;48:173-175.
18. Tönsing K, Bartram J, Morwane RE, et al. Designing electronic graphic symbol-based AAC systems: a scoping review. Part 2: application of human-centred design. Disabil Rehabil Assist Technol. 2024;19:1092-1102.
19. Kidwai J, Brumberg J, Gatts J. Aphasia and high-tech communication support: a survey of SLPs in USA and India. Disabil Rehabil Assist Technol. 2024;19:566-575.
20. Østvik J, Granlund M, Seim AR. Mental health and mental health problems among users of AAC: a scoping review. Augment Altern Commun. 2024:1-13.
21. Todres L, Galvin KT, Holloway I. The humanization of healthcare: a value framework for qualitative research. Int J Qual Stud Health Well-being. 2009;4:68-77.

22. Philip VS, Geetha S, Abraham AN. Aided Augmentative and Alternative Communication (AAC) interventions in India: A scoping review and quality appraisal. Augment Altern Commun. 2025:1-13.

23. Flores C, Dada S. The effect of AAC training programs on professionals' knowledge, skills and self-efficacy in AAC: a scoping review. Augment Altern Commun. 2025;41:65-77.