The value of augmentative and alternative communication strategies for adults with Broca's aphasia: a narrative literature review

O valor das estratégias aumentativas e alternativas de comunicação para os adultos com afasia de Broca: uma revisão narrativa da literatura

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Keywords
Adult; Broca's aphasia; review literature as topic.

Abstract

Introduction: Broca's aphasia is a language disorder and the most significant deficit occurs in oral communication, with a non-fluency of the discourse. This clinical condition is a devastating subjective experience, which has a remarkable impact on personal, family, and social life, and consequently on the quality of life. People with Broca's aphasia have the right to language recovery and to communicate effectively. Using compensatory strategies or alternatives to natural speech is especially important for people with Broca's aphasia. This will inherently minimize the suffering associated with impaired communication. No literature review was found about the specific value of augmentative and alternative communication strategies to adults with Broca's aphasia.
Aims: To explore current knowledge and update the understanding of the usefulness of augmentative and alternative communication strategies for adults with Broca's aphasia.
Material and method: A narrative literature review was developed based on the research question: What is the usefulness of augmentative and alternative communication for adults with Broca's aphasia? The research was carried out in the CINAHL and MEDLINE databases between January 8 and 21, 2021.
Results: 15 articles were included, published between 2011 and 2020. Specific augmentative and alternative communication approaches (no-tech, low-tech, and high-tech), advantages, and factors that influence the effectiveness of this communication support were also identified. This review evidence that augmentative and alternative communication (mainly high-tech) is efficient in optimizing communication and in the language recovery of people with Broca's aphasia.
Conclusions: Augmentative and alternative communication should be employed in adults with Boca's aphasia with two main aims: compensatory and restorative. High-technology strategies have a particularly positive impact.

Palavras-chave
Adulto; afasia de Broca; literatura de revisão como assunto.

Resumo

Introdução: *A afasia de Broca é um distúrbio da linguagem e o déficit mais significativo ocorre na comunicação oral, com um discurso não fluente. Esta condição clínica é uma experiência subjetiva devastadora, que tem um impacto marcante na vida pessoal, familiar e social e, consequentemente, na qualidade de vida. As pessoas com afasia de Broca têm direito à recuperação da linguagem e a comunicarem efetivamente. Utilizar estratégias compensatórias ou alternativas à fala natural é especialmente importante para pessoas com afasia de Broca. Tal irá, inerentemente, minimizar o sofrimento associado à comunicação comprometida. Não foi encontrada nenhuma revisão da literatura sobre a importância específica das estratégias de comunicação aumentativa e alternativa para os adultos com afasia de Broca.*
Objetivos: *Explorar o conhecimento atual e atualizar a compreensão sobre a utilidade das estratégias de comunicação aumentativa e alternativa para os adultos com afasia de Broca.*

Material e método: *Foi desenvolvida uma revisão narrativa da literatura com base na questão de pesquisa: Qual a utilidade da comunicação aumentativa e alternativa para os adultos com afasia de Broca? A pesquisa foi realizada nas bases de dados CINAHL e MEDLINE entre os dias 8 e 21 de janeiro de 2021.*

Resultados: *Foram incluídos 15 artigos, publicados entre 2011 e 2020. Foram identificadas abordagens específicas de comunicação aumentativa e alternativa (sem tecnologia, baixa tecnologia e alta tecnologia), vantagens e também fatores que influenciam a eficácia destes suportes de comunicação. Esta revisão evidencia que a comunicação aumentativa e alternativa (principalmente de alta tecnologia) é eficiente na otimização da comunicação e na recuperação da linguagem de pessoas com afasia de Broca.*

Conclusões: *A comunicação aumentativa e alternativa deve ser utilizada em adultos com afasia de Boca com dois objetivos principais: compensatório e restaurador. As estratégias de alta tecnologia têm um impacto particularmente positivo.*

Introduction

Communication is a dynamic process in which people share thoughts, feelings, and information, interact, socialize, and express needs through symbols.[1] Efficient communication is essential in daily life and for optimal patient care, and when there is a communication failure, it can generate adverse health outcomes, and reduce safety and wellbeing.[2]

Broca's aphasia is an acquired language disorder,[3] that generates a barrier to communication and a devastating experience. This clinical condition is one of the most common and, possibly, iconic types of aphasia and has received disproportionate attention in the literature compared with other aphasia types.[4] It is mainly caused by an injury that affects the left hemisphere, being a stroke the principal etiology. Clinically it can correspond to an extensive lesion that involves the foot of the third frontal circumvallation, a region known as the "Broca's area" and also the neighboring frontal regions and the subcortical white matter, which may extend to the basal ganglia.[3] The most significant deficit occurs in oral communication in which the discourse is not fluent.[3,5] People with Broca's aphasia have a great loss of speech fluency, which is effortful and often slow, and pauses between words may outnumber the words themselves.[5] Their manner of speaking is labored and flat, and the melodic modulation that characterizes normal speech is lacking.[5] In its severest form can exist a total absence of speech. The ability to repeat and name objects or figures is compromised, but usually, language understanding is not altered.[3,6]

Due to communication impairment, people with Broca's aphasia communicate less with family and friends and have smaller social networks, impacting their social interactions and life experience.[1] Participation in different aspects of life is affected, with a decrease in the participation in activities related to domestic life, interpersonal interactions and relationships, education and employment, community, and civic and social life. Interpersonal interactions and relationships tend to change after the onset of aphasia with shifts in contacts from friends to professionals, and shifts in roles as partner, family member, parent, friend, and citizen.[1] Communication difficulties also affect confidence, self-esteem, and self-concept. People with Broca's aphasia are usually aware of their difficulty in communication, which can cause feelings of sadness and frustration when they fail to communicate, and also impair their quality of life.[1] Due to the uniqueness of each person, context, and injury that causes it, Broca's aphasia also translates into an idiosyncratic experience.

The use of augmentative and alternative communication (AAC) can increase communicative effectiveness ensuring that communication is accessible for everyone,[2] providing opportunities for individuals to actively participate in life activities and thereby improve their quality of life.[7] Besides language recovery, people who experience impaired verbal communication have the right to communicate effectively[8] and require support using compensatory strategies or alternatives to natural speech. AAC is usually brought into consideration when aphasia is moderate or severe.[9]

AAC can be perceived as any additional (augmentative) or replacement (alternative) communication system beyond natural language that helps to achieve a person's communication goals,[9] including people with Broca's aphasia. It is augmentative when used additionally or to complement existing natural speech, and alternative when used to replace absent or non-functional speech.[10] AAC can be temporary or permanent and can be unaided and aided. Unaided forms of AAC do not require an external tool and require some degree of motor control, including no-tech strategies[10]

(facial expressions, body language, gestures, and manual signs[11,12]). Aided forms of AAC require some form of external support and embrace low-tech devices, which do not need batteries or electricity to work[10] (such as words, phrases, paper and pencil for writing and drawing, objects, photographs, pictures and/or symbols, combinations of images, and images associated with written words, phrases, or sentences on a board or in a book such as communication boards/books)[7,9,11,12,13]; and high-tech systems (electronic instruments that need batteries or electricity to work).[10] These high-technology devices include: electronic devices that produce artificial voice, by synthesized voice output (with text-to-speech software capabilities that allow speech production electronically, through the selection of symbols or text) and/or digitized voice output (natural speech that has been recorded, stored, and reproduced) or has software that allows the dynamic representation of symbols/language. This includes speech-generating devices, mobile devices (e.g., computers, tablets, smartphones), AAC applications for mobile devices, and dynamic systems that allow you to share photos and messages.[9,12,13]

Considering the importance that AAC strategies can have for adults with Broca's aphasia, it is important to reflect on and identify AAC's usefulness to this population. This will help this population, improve the quality of life and also help professionals choose the best strategy that fits each person. It wasn't found any literature review about the specific value of AAC strategies to adults with Broca's aphasia. A narrative literature review was carried out to explore current knowledge and update the understanding of the usefulness of AAC strategies for adults with Broca's aphasia, based on the research question: What is the usefulness of augmentative and alternative communication for adults with Broca's aphasia?

Material and Method

A narrative literature review, incorporating methods used by the Joanna Briggs Institute[14] was developed. The following eligibility criteria have been defined:

Study inclusion criteria:

- Population: adults aged 19 years or over, with no age limit, with Broca's aphasia addressing AAC.
- Context: ambulatory and hospital context.
- Studies: reviews, theoretical articles, and primary studies, with access to the full text, published in periodical journals in the last ten years to access the latest scientific evidence, in the languages understood by the researchers: Portuguese, English, and Spanish.

Study exclusion criteria:

- Population: children and individuals under 19 years old; people with understanding language impairment; people diagnosed with dementia and with other neurological or cognitive impairments.
- Studies written in other languages than English, Spanish and Portuguese, as well as articles written previously 2011.

The narrative literature review was carried out from the 8th to the 21st of January 2021 and was performed a search in the CINAHL (Cumulative Index to Nursing and Allied Health Literature Complete) and MEDLINE (Medical Literature Analysis and Retrieval System Online Complete) databases. In the CINAHL database, the search strategy was: *(MH "Aphasia, Broca") OR (MH "Aphasia") AND (MH "Alternative and Augmentative Communication")*. In the MEDLINE database, the search strategy was: *(MH "Aphasia, Broca") OR (MH "Aphasia") AND Alternative and Augmentative Communication*. In addition to the databases, other studies were considered based on included studies references.

The selection of the studies was carried out according to the inclusion and exclusion eligibility criteria. It started with the titles and abstracts lecture, followed by reading the full text of the studies assessed for eligibility. Studies that did not meet the inclusion criteria were excluded. The selection of sources of evidence was performed by two reviewers, who performed the titles, abstracts, and full-text lectures. Discrepancies in the inclusion or exclusion of articles in the review were resolved by the consensus of the third reviewer.

Results

A total of 133 articles were obtained from the search in CINAHL and MEDLINE databases. After removing the duplicates, applying the inclusion and exclusion criteria, reading the titles, and analyzing the abstracts and the full texts, 199 articles were

excluded because they did not concern the topic under study and didn't meet the inclusion criteria. 14 studies were selected and 1 more article was added from included studies' references, totaling 15 articles.

In this narrative literature review, 15 articles published between 2011 and 2021 were included. There is a high prevalence of United States of America publications (12 publications representing 80% of the total articles).[2,7,9,11,13,16,17,18,19,20,21,22] One Australian,[15] one Argentine,[12] and one Dutch[23] article are also part of the selected articles. The methodology used varied from 4 review papers, 7 theoretical articles, and 4 primary studies (one multiple case study, one case series study, one control group design study, and one phenomenological case study). All of the selected articles included people with Broca's aphasia and only one of the studies includes Broca's aphasia participants exclusively.

The data were extracted from the articles using an instrument constructed based on the guidelines of the Joanna Briggs Institute[14] which included the authors, year of publication, country, aim, and AAC's usefulness (Table 1).

The results extracted from the 15 articles were organized into three main categories that emerged from the analysis of the evidence: AAC strategies that can optimize communication (in the acute and chronic phases), AAC interventions that can optimize Broca's aphasia recovery process, and factors that influence the effectiveness of using these communication supports.

Table 1 – Results extraction

Authors/year/country	Aim(s)	AAC's usefulness
Beukelman, D, Hux, K, Dietz, A, McKelvey, M, Weissling, K[13] 2015 United States of America	To describe the use of photographic images for developing communication supports for people with chronic and severe aphasia.	– Visual Scene Displays can support intervention activities for people with chronic, severe aphasia and the communication interactions; – Mobile technology with integrated cameras and the ability to transfer images remarkable opportunities to create shared communication spaces.
Brandenburg, C, Worrall, L, Rodriguez, A D, Copland, D[15] 2013 Australia	To review accessibility issues and the potential uses of mobile computing for people with aphasia.	– Improving access to mobile computing technology by aphasic people has the potential for enhancing both social participation and management of aphasia.
Dietz, A, Ball, A, Griffith, J[16] 2011 United States of America	To highlight the literature regarding supported reading comprehension and written expression techniques for people with aphasia in the context of Web-based communication and information sharing.	– Web-based communication strategies must be considered during the aphasia rehabilitation process; – Word prediction, speech-to-text, and voice banking can support written expression including; – Interventions should be adapted to meet the increasing trend to utilize Web-based technology to maintain or redefine social roles.
Dietz, A, Thiessen, A, Griffith, J, Peterson, A, Sawyer, E, McKelvey, M[17] 2013 United States of America	Understand the use of communication strategies when attempting to reclaim previous social roles by aphasic people.	– AAC strategies provided aphasic people with a means to communicate their opinions, feelings and find their voice when redefining their roles and identity.
Dietz, A, Vannest, J, Maloney, T, Altaye, M, Holland, S, Szaflarski, J[18] 2018 United States of America	To examine the feasibility of providing a high-tech AAC treatment to people with chronic aphasia, to evoke changes in spoken language.	– Implemented AAC treatment can be a manner that simultaneously facilitates language recovery across a variety of aphasia types and severity levels while compensating for residual deficits in people with chronic aphasia.
Dietz, A, Wallace, S, Weissling, K[11] 2020 United States of America	To revisit the role of AAC in post-stroke aphasia rehabilitation.	– AAC can be used to empower people with aphasia to participate fully and engage in life activities with increased independence; – AAC can be viewed as a dual-purpose: improved language performance while offering a communication alternative.
Frankoff, D, Hatfield, B[7] 2011 United States of America	Highlight strategies for re-establishing communication competence to maximize natural speech and language skills via a range of technologies.	– AAC strategies can help enhance communication effectiveness and provide opportunities for individuals to participate in life activities actively and thereby improve their quality of life.
Griffith, J, Dietz, A, Weissling, K[19] 2014 United States of America	To examine how the interface design of an AAC device influences the communication behaviours of people with aphasia during a narrative to retell a task.	– For narrative retells, line drawings may serve as practical visual support when photographs are unavailable. Individual assessment is necessary to determine the optimum combination of supports in AAC systems.

Table 1 – Results extraction (cont.)

Authors/year/country	Aim(s)	AAC's usefulness
Holland, A, Weinberg, P, Dittelman, J[20] 2012 United States of America	Provide some general guidelines for selecting applications that are appropriate for aphasic people.	– Mobile applications can be used to communicate or to facilitate communication by aphasic people; – Several applications may benefit aphasia treatment, used to improve speech/language capabilities.
King, J, Simmons-Mackie, N[2] 2017 United States of America	Summarize how to incorporate communication supports into varied forms of discourse, and all aspects of aphasia rehabilitation and care align with best clinical practices and national accreditation requirements.	– AAC can increase communicative effectiveness and reduce de risk of adverse outcomes related to health care and safety by ensuring that each person with aphasia can communicate effectively when using different types of AAC at different points of the rehabilitation process.
Nicholas, M, Connor, L[9] 2016 United States of America	To discuss how impairments of executive functioning might be expected to interact with the ability of aphasic people to use AAC effectively.	– AAC is typically brought into consideration when aphasia is moderate or severe; – AAC can be an additional (augmentative) or replacement (alternative) communication system that helps achieve a person's communication goals.
Russo et al.[12] 2017 Argentina	Synthesize communication intervention studies that involved the use of high-technology communication devices to enhance linguistic communication skills for adults with post-stroke aphasia.	– High-technology devices represent a compensatory strategy to enhance communicative skills in individuals with post-stroke aphasia.
Taylor, S, Wallace, S, Wallace, S[21] 2019 United States of America	To explore current knowledge about factors influencing the successful use of high-technology AAC in post-stroke aphasia.	– High-technology AAC has the potential to enable communicative autonomy for many people with aphasia who experience chronic communication difficulties.
Ulmer, E, Hux, K, Brown, J, Nelms, T, Reeder, C[22] 2016 United States of America	To analyze the performance of individuals with aphasia as they observed, captured photographs of, and later participated in a conversation.	– Include photographs in conversational interaction increases content specificity and facilitates communication.
Van de Sandt-Koenderman, W[23] 2011 Netherlands	Discuss how computers are used in aphasia rehabilitation.	– Within the functional treatment approach, AAC, specifically the high-tech strategies, plays a central role.

The usefulness of AAC in optimizing communication

AAC strategies in the context of aphasia intervention, including in Broca's aphasia, can facilitate communicative competence and can play a central role in improving a patient's verbal and non-verbal communicative abilities.[13,23]

The advantages of using AAC strategies at home, at work, in social groups, and in other environments are numerous.[12] AAC can be tailored to each individual to meet conversations and specific basic needs, deliver information, and improve successful communication (including specific acts, such as answering the phone, asking for help, and placing orders in restaurants or stores), enabling them to develop social relationships, academic or employment skills, to engage with family members and enhance the participation in activities and social life, including renegotiating social roles (regain roles or to re-establish new ones according to their current communication abilities). AAC strategies provide a means for these people to communicate their opinions, and feelings, find their voice in redefining their identity, and facilitate involvement in decision-making.[17]

Providing individuals with the appropriate tools to establish communication skills at the beginning of their recovery and training them can lead to greater acceptance of AAC strategies and contribute to more efficient communication, despite the severity of the communication impairment.[7] When these strategies are employed, even those with moderate-severe aphasia can successfully voice their opinion regarding the desired course of aphasia rehabilitation, which supports the decrease in dependency on substitutes during rehabilitation planning at the level of participation.[17] This increased independence is essential for living successfully with aphasia and improving quality of life.[11,12] In this line, the use of AAC can increase communicative effectiveness and safety of health care, ensuring that communication is accessible for everyone so that they can comment, request, and/or question what is happening in their lives, to remain connected to others, and maintain a healthy sense of self.[2] AAC approaches can provide

people with moderate to severe aphasia, including Broca's aphasia, with the tools they need to express their perspective on the psychosocial impact of aphasia on their lives.[17]

No-tech and **low-technology strategies** can and should be used early, considering a variety of personal and contextual factors, like individuals' strengths and weaknesses, their activities, and participation.[7]

Visual scene displays or grid-type displays are examples of communication supports that can optimize the communication of adults with Broca's aphasia.[2] Visual scene displays can include text boxes and either personally relevant photographs or line drawings.[2,19] They can be in paper form or stored in a computer in a digital format (i.e., in a software program on a tablet or in a speech-generating device that allows the production of synthesized speech or a digital recording upon selection).[2,19] High-context photographs, text boxes, and speak buttons have also been reported as adequate communication supports for people with chronic Broca's aphasia.[19]

Technology, including mobile, with a particular focus on smaller, handheld mobile devices incorporating touch screens, such as smartphones, tablets, and computers, with the aid of communication **applications** (e.g. *SmallTalk Aphasia or Proloquo2go*), has a growing place in daily life. These are more readily available than ever, including for Broca's aphasic people, who explore high-tech AAC devices to help to express themselves, co-construct messages, and optimize their communication.[11,15,19] In this line, several applications function as communication supports, available in a portable and economical form, and can be used to communicate spoken, written, or visual messages to others, or to facilitate or clarify otherwise unclear communication attempts made by aphasic people to others, including individuals with Broca's aphasia.[20] On the other hand, some applications are not explicitly designed for people with language disorders but may be helpful like some *Google* tools (e.g. *Google Translator*).[20]

Mobile computing devices that feature internet connectivity and a variety of sensors, including microphones and GPS, that are easily programmable using downloadable applications available to the public and can also act as a voice recorder, camera, personal diary, therapy program by computer and social network device in everyday life environments can act as facilitators of communication.[15] The internet offers opportunities to improve social participation for people with aphasia and may help support social interaction and interpersonal relationships through applications like *Facebook*, *Twitter*, *Skype*, and email, but this can be limited by the person's writing skills.[11,15,23] Mobile technology with integrated cameras and the ability to transfer images to other devices (selecting appropriate photographs to support communication of people with varying degrees of aphasia and photographs that have personal relevance to a person) offers remarkable opportunities to create shared communication spaces, including for people with chronic and severe aphasia.[13]

The word prediction software, which can be integrated into a high-tech AAC device, generates a list of possible target words, given the initial spelling of a word, and helps the editor with spelling, word generation, and sentence formulation, reducing physical effort during writing.[16] The compatibility of word prediction programs with various web-based communication tools, including *Facebook*, blogs, and instant messaging, can allow some people with aphasia to connect socially with family and friends while communicating in an environment that encourages short messages.[16]

The usefulness of AAC in improving language recovery

The implementation of AAC strategies provided early in rehabilitation alongside traditional therapy may yield widespread positive effects and result in increased acceptance of AAC, better long-term participation outcomes, and improved spoken language, which inherently leads to more confidence and motivation to communicate, optimizes communication and increases the quality of life.[11]

The inclusion of **high-tech AAC systems** in activities of daily living can be an opportunity to facilitate rehabilitation therapy and improve the language.[12] **Mobile computing** has a range of functions to manage a person's aphasia in their environment, including providing therapy.[15] In this line, several **apps** may be beneficial for aphasia treatment, used to improve basic speech/language capabilities by providing targeted drills, practice, or exercises used as supports for traditional impairment-based treatment or to replace treatment by individuals who live in remote settings.[20]

A perfect AAC should be employed as a dual-purpose tool with a restorative and compensatory aim,[12] including high-tech AAC devices.[18] This

is intended to improve language performance and the restoration of language function while offering a communication alternative that increases communicative independence, including in rehabilitation.[11,13]

Factors that influence the effectiveness of AAC strategies

One of the problems with high-technology and low-technology AAC is the heterogeneity, once people differ in linguistic capabilities, cognitive functioning, non-verbal communicative capabilities, communicative needs, and opportunities. Any computerized communication aid for aphasia should be dynamic and flexible to enable personal tailoring.[23] In a review carried out, the authors identify factors that contribute to or detract from successful high-technology AAC use by aphasic people.[21] These include body structure and function factors such as language impairment and associated cognitive deficits; personal factors such as age, insight, and people expectations and environmental factors such as social support, duration, and intensity of input, and therapists' perspectives and beliefs. According to a study, a person's experience and confidence can also influence the use of technology.[15]

Additionally, motor deficits or impaired vision can constitute barriers to using technology, influenced by the size of text, graphics, and buttons on technology interfaces. Another barrier to the use of high-technology AAC is that it cannot keep up with the speed of everyday conversation, and people with aphasia will often need more time to construct messages.[23] Furthermore, when using high-tech AAC, professionals must consider other factors that influence the use of these devices, such as reliability; technical support; voice and language of the device; time that is spent to generate a message; family support; responses from communication partners and staff knowledge and skills.[24]

Teaching health professionals and people with aphasia about using AAC strategies, including mobile technology in day-to-day life, can result in the successful use of AAC. This often requires the involvement of well-trained communication partners, such as family, friends, and colleagues.[13] When aphasic people are communicators dependent on AAC tools, which means they depend on others to build the message to communicate, it is essential to adapt to the environment and identify and train communication partners.[11]

Discussion

From the analysis of the selected articles emerged the AAC's usefulness and the efficiency of using AAC strategies (especially high-tech devices) by adults with Broca's aphasia, regardless of etiology and severity, in optimizing communication and in the recovery process. Inherently, this has a positive impact on wellbeing and quality of life.

Regarding optimizing communication, no-tech, low-technology, and high-tech AAC strategies (such as mobile computing devices, applications, and other mobile computing functions) were identified. AAC systems can be useful to this population to communicate basic needs, deliver information and maintain social closeness.[25] In line with these significant findings, other studies investigating AAC intervention using dedicated speech-generating devices or separate graphic symbol software programs demonstrated that, in experimental contexts, persons with chronic severe Broca's aphasia can access, identify, and combine graphic symbols to produce simple sentences and phrases.[26] Besides optimizing communication, mobile technology's benefits include increased consciousness and social acceptance of AAC, better empowerment in accessing AAC solutions, increased adoption of AAC technologies, more considerable functionality, and interconnectivity.[27]

Concerning improving language recovery, it was identified principally the importance of high-tech AAC strategies (such as mobile computing functions and apps). In agreement with the review findings, AAC was primarily used to support people with aphasia's communication needs as a compensatory strategy, but presently, studies reported that AAC could facilitate language recovery.[25]

Additionally, in this review emerged factors that influence the effectiveness of AAC strategies, particularly in the context of high-tech AAC systems. It is important to mention that the AAC type can also influence the effectiveness. Strategies that include symbols, images, pictures, or photos are particularly useful for people who don't know or can't read or write. Also, strategies with symbols are the most suitable for people with family members with high deficits in reading.[28] Regarding low-technology AAC strategies, motor deficits also influence and can make writing impossible. In these cases, an alphabet board can be used to point to relevant letters.[29] Using this type of strategy, it is recommended that the message receiver goes pointing to the letters or read the words as the person points, instead of waiting

for him to write the entire message (because the receiver may not be able to decode the message if he misunderstood a letter or a word).[30] In using communication books and communication boards, the organization of the vocabulary is an important factor that influences its effectiveness.[29] Moreover, a vocabulary needs to be adapted regularly, because the communicative needs of a person change over time.[29] Ideally, low-technology AAC strategies should be individualized, and "tailor-made".[29]

Conclusions

The literature review shows that AAC, with the particular value of high-tech tools, can improve effective communication and give people with Broca's aphasic a voice that has been lost, especially in people with moderate to severe aphasia. This study also showed that AAC strategies, with emphasis on high-tech systems, can facilitate the recovery process in different aphasic severity levels. Ideally, the AAC approach must combine both and aim to restore and compensate to reach the best linguistic and functional performance. These strategies can be used both in the acute and chronic phases, regardless of etiology. AAC needs can vary and may change over time, depending on their goal, linguistic and communicational skills, evolution, and other factors intrinsic and external to the person.

Health professionals who contact and care for adults with Broca's aphasia must choose the ACC strategy that best suits each specific person and responds to their needs, instead of choosing an AAC strategy in a standardized way. People also can use both aided and unaided AAC strategies, depending on the communication context and the recovery progress. Individual assessment is fundamental for determining the optimum combination of AAC systems. The aim is to ensure that each individual has access to a way of expression and improve language recovery, well-being, and quality of life. It is important to raise awareness about the crucial value of using AAC strategies among health professionals who care directly for people with Broca's aphasia.

As a suggestion for future research, it would be pertinent to specifically evaluate the efficiency of concrete low and high-technology strategies for people with Boca's aphasia. It also would be interesting to research the health professionals' training needs for using AAC strategies in clinical practice with Boca's aphasia person.

Conflict of interest statement

The authors declare that there is no conflict of interest. The authors are responsible for the content and writing of the paper.

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