

Speech-language intervention in expressive aphasia: integrative review

Intervenção fonoaudiológica na afasia expressiva: revisão integrativa

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ABSTRACT

Introduction: Aphasia symptoms can be improved via speech and language therapy. **Purpose:** To analyze speech-language intervention methods in expressive aphasia. **Research strategy:** An integrative review of the literature was performed using SciELO, PubMed and PsycINFO databases, from February to April 2018. The following search terms: “non-fluent aphasia”, OR “broca” OR “transcortical motor aphasia” OR “motor aphasia” OR “amnesic aphasia” OR “semantic aphasia” OR “dymanic aphasia” OR “anomi*” AND “intervention” OR “therapy” OR “rehabilitation” OR “treatment” were used for PubMed and PsycINFO databases. In SciELO database, only the search term “aphasia” was used. **Selection criteria:** Articles published in the last ten years (from 2009 to 2018) in Portuguese, English or Spanish, whether or not they were open access journals. Studies with participants older than 19 years were selected. Articles not related to traditional therapy were excluded, as well as those which did not present participants with expressive aphasia and those which treated speech motor disorders such as pure dysarthria and pure apraxia. Literature review studies and studies involving bilingual participants were also excluded. **Results:** One hundred and seventy-four articles were found. After analysis and application of the established selection criteria, 32 complete articles were selected. Word retrieval therapy, melodic intonation therapy and conversation therapy were the traditional methods found in this study. **Conclusion:** Word retrieval therapy was the method most commonly used.

Keywords: Aphasia; Rehabilitation; Speech Therapy; Language; Review

RESUMO

Introdução: Por meio da intervenção fonoaudiológica, é possível diminuir os sintomas da afasia. **Objetivos:** Verificar os métodos de intervenção fonoaudiológica na afasia expressiva. **Estratégia de pesquisa:** Trata-se de uma revisão integrativa da literatura. Realizou-se a busca nas bases SciELO, PubMed e PsycINFO, no período de fevereiro a abril de 2018. Para as bases de dados PubMed e PsycINFO foram estabelecidos os descritores em inglês “non-fluent aphasia”, OR “broca” OR “transcortical motor aphasia” OR “motor aphasia” OR “amnesic aphasia” OR “semantic aphasia” OR “dymanic aphasia” OR “anomi*” AND “intervention” OR “therapy” OR “rehabilitation” OR “treatment”. Para base SciELO, apenas o descritor “aphasia”. **Crerios de seleção:** Artigos publicados nos últimos dez anos (de 2009 a 2018) em português, inglês ou espanhol foram incluídos, sendo ou não de periódicos de acesso livre, além de estudos com indivíduos com idade superior a 19 anos. Foram excluídos artigos não relacionados à terapia tradicional, estudos que não apresentassem indivíduos com afasia expressiva e aqueles que tratavam de distúrbios motores de fala, como disartria e apraxia pura. Estudos de revisão de literatura e que envolvessem participantes bilíngues também foram excluídos. **Resultados:** Um total de 174 artigos foram encontrados. Após análise e aplicação dos critérios de seleção estabelecidos, foram selecionados 32 artigos completos. Entre as terapias tradicionais encontradas, observaram-se: terapia de recuperação de palavras, terapia melódica e terapia conversacional. **Conclusão:** A terapia de recuperação de palavras foi o método tradicional mais utilizado.

Palavras-chave: Afasia; Reabilitação; Fonoaterapia; Linguagem; Revisão

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INTRODUCTION

Aphasia is a language disorder acquired after brain injury, which affects some or all of the language modalities: speech and reading comprehension, reading and writing⁽¹⁾. Approximately one third of people with stroke have aphasia⁽²⁾.

The aphasic population is heterogeneous; individuals may present language impairments that vary in severity and type of language processing deficiency, including speech and comprehension of speech, reading, writing, and gesture⁽³⁾. The impact and implications of aphasia on people's lives, their family and society indicate that rehabilitation is crucial, since it aims to reduce the effects of aphasia and restore language functions^(4,5).

Choosing the type of treatment depends on several factors, e.g., size and locus of the lesion, etiology, hand dominance, patient's age and schooling⁽⁶⁾, etc. It also depends on the theoretical approach used by therapists. Still, aphasias can be classified into expressive (non-fluent) and receptive (fluent)⁽⁷⁾. Such classifications assist the choice of therapeutic approach.

Speech and language therapy involving traditional therapeutic approaches refers to interventions aimed at restoring a subject's language skills, focusing on levels of impairment and disability. Such approaches prioritize intensive stimulation of language, through visual and auditory stimuli, repetition, in linguistic and situational contexts^(6,8,9).

There are several methods of speech therapy applied for treatment of aphasia; for example, pragmatic, neurolinguistic, cognitive-linguistic, functional, conversational, damage-based, *constraint-induced*, verbal comprehension, computer-assisted, semantic, social, or outcome-based approaches^(5,10). However, there is still no gold standard for the treatment of aphasia⁽⁷⁾.

Most language and speech therapists agree that a treatment is effective if the patient has improvements in speech, which can be generalized to untreated language structures and/or other contexts⁽⁷⁾. A systematic Brazilian review⁽¹¹⁾ which sought to analyze the methodological characteristics of studies on rehabilitation of expressive aphasia (between 1999 and 2011) found 56 articles involving rehabilitation techniques (22 focusing on lexical processing, 18 on syntax stimulation, seven with the aim of developing speech and nine with multiple objectives). The present research was conducted to update these data and to complement studies in this field because there is great deal of aphasic patients and there is a need to deepen the knowledge about language and speech therapy in cases of expressive aphasia.

OBJECTIVE

This integrative review was carried out with the objective of analyzing methods of speech-language intervention in expressive aphasia.

RESEARCH STRATEGY

As a method, this study made an integrative review of the literature to produce a summary of a particular subject and possible practical uses of the studies, based on scientific knowledge⁽¹²⁾.

To support the bibliographic search, the following question was formulated for the present research: What speech and language therapy models have been used in expressive aphasic patients over the last ten years?

To collect data about these studies, a search was made in the Scientific Electronic Library Online (SciELO), Public Medicine Library (PubMed) and American Psychological Association (PsycINFO) databases, from February to April 2018. These databases were selected by the authors because they contain studies that are consistent with the proposed theme.

To perform the search, the following descriptors were established in English, in the PubMed and PsycINFO databases: "*non-fluent aphasia*", OR "*broca*" OR "*transcortical motor aphasia*" OR "*motor aphasia*" OR "*amnesic aphasia*" OR "*semantic aphasia*" OR "*dynamic aphasia*" OR "*anomi**" (descriptors searched on *title/abstract*) AND "*intervention*" OR "*therapy*" OR "*rehabilitation*" OR "*treatment*" (descriptors searched on *title*). In the SciELO database, the search was performed only with the keyword "*aphasia*", because articles compatible with the proposed theme were not found when inserting the descriptors used in the other databases.

SELECTION CRITERIA

To refine the search, only articles published in the last ten years (from 2009 to 2018) in Portuguese, English and Spanish were included, whether or not they were from open access journals. In addition, the study population was limited to individuals over 19 years of age.

Studies about neurosurgical intervention, medication, transcranial stimulation and group therapy were excluded from this integrative review. Studies were also excluded if subjects did not have expressive aphasia and if they addressed speech motor disorders, e.g., pure dysarthria and pure apraxia. Reviews of the literature, as well as studies involving bilingual participants, were also excluded from this review.

DATA ANALYSIS

The selected papers were analyzed separately by two authors to check the inclusion criteria, to read the abstract and, later, to read the publications in full. References that were duplicated in the queried databases were excluded. In case of disagreement between the two researchers, they analyzed the papers again to reach a consensus.

RESULTS

A total of 174 articles were found; 56 in PubMed, 65 in SciELO and 53 in PsycINFO databases. After analysis and application of the selection criteria mentioned above, 32 articles were selected for the study (Figure 1).

All study participants had left hemispheric lesion as a result of stroke. Most of the subjects investigated in the studies are anomia; the most frequent types of aphasia were anomalous aphasia and Broca's aphasia. Intervention time ranged from two to sixteen weeks and from eight to thirty-two sessions. In some studies, total intervention time and type of aphasia were not

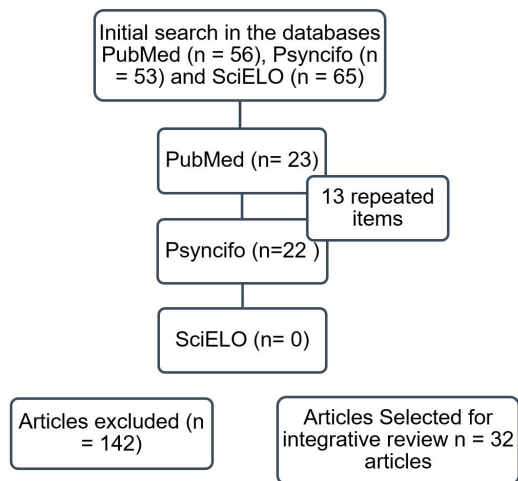


Figure 1. Flow of analysis of selected articles in PubMed, Psycinfo and SciELO databases
Caption: n = number of articles

described. Chart 1 shows data on authors, year of publication, number of subjects, type of aphasia, method, intervention and results of the selected studies.

Most of the selected studies - 30 studies (93.7%) - used the word retrieval treatment. In two of these articles, word retrieval treatment was used together with intentional gestures. These studies were based on the use of nouns and/or verbs. This type of treatment was effective in most of the selected studies; they had significant benefits, especially in picture naming, as well as improvement of speech and of untreated items.

In addition to the studies that used the word retrieval method, one article (3.13%) used singing and one (3.13%) used conversation as a treatment. With the singing treatment, which involved rhythm and melody, followed by picture naming, half of the participants had improved semantic memory after intervention, in which the words of the songs were used in speech. In the conversation treatment, there were also significant improvement in language skills after using video clips.

Chart 1. International and Brazilian studies in PubMed, PsycINFO and SciELO databases on therapeutic approaches in aphasic patients

Authors/Year	Participants	Intervention used	Methods	Main results
Adrian et al. (2011) ⁽¹³⁾	15 aphasic: 5 with mixed aphasia, 2 with Broca's aphasia, 4 with Wernicke's aphasia, 3 with anomic aphasia and 1 with conduction aphasia.	Word retrieval therapy.	200 items (objects and actions) were applied through the Spanish Computer-assisted Anomia Rehabilitation Program (CARP-2). Three types of tasks were used: picture naming; picture naming with unrelated distractor; picture naming with a semantic or visual distractor.	All participants showed significant benefits in naming skills after therapy. Most were able to name untreated items.
Akanuma et al. (2014) ⁽¹⁴⁾	10 aphasic patients: 7 with Broca's aphasia and 3 with unidentified aphasia.	Singing therapy.	A familiar melody was used with new lyrics, containing words that the participants could not name during assessment. Subsequently, picture naming training was carried out.	Half of the subjects improved their speech function after training; the therapy resulted in semantic memory effects, and enabled subjects to speak using words from the song.
Altmann et al. (2014) ⁽¹⁵⁾	14 aphasics: 5 with conduction aphasia, 5 with anomic aphasia, 3 with Broca's aphasia and 1 with motor transcortical aphasia.	Word retrieval therapy using intentional gestures.	Participants were divided into two groups. Both groups received treatment for anomia, which consisted of three phases: naming 50 photos; subjects trained in naming 50 different photos; generation of one example for each of 40 different categories. Only in one of the groups were intentional left gestures incorporated into the therapy.	Both groups improved naming of trained items and untrained items, and had significant improvements in speech. The group of gestures presented greater generalization of the treatment to their speech.
Best et al. (2011) ⁽¹⁶⁾	13 aphasics: 3 with Broca's aphasia, 4 with anomic aphasia, 1 with mixed aphasia and 5 with unspecified non-fluent aphasia.	Word retrieval therapy.	Pre- and post-treatment evaluations were carried out with 200 pictures for the purposes of naming and conversation with a partner (which was recorded). Therapies involved cues to improve noun retrieval (100 items). If participants did not name the picture after 5 seconds, they received progressive cues or were shown the word and had to repeat it in the presence of the picture. Participants should also record 10 minutes of conversation throughout the day.	There was a significant improvement in word retrieval in picture naming, as well as in the number of nouns produced in 5 minutes and during conversation.
Best et al. (2013) ⁽¹⁷⁾	16 aphasics: 4 with Broca's aphasia, 5 with anomic aphasia, 2 with Wernicke's aphasia, 4 with unspecified non-fluent aphasia and 1 with unspecified fluent aphasia.	Word retrieval therapy.	8 participants could choose between phonological cues or orthographic cues in the treatment, while the other 8 individuals received phonological and orthographic cues. Progressive cues were provided to facilitate the naming task. In addition, if they still could not name the picture, the participants were given the word to repeat it in the presence of the picture.	The majority of participants had a significant improvement in naming the treated items. Only subjects with less semantic difficulty and with more phonological deficit generalized to untreated items.

Chart 1. Continued...

Authors/Year	Participants	Intervention used	Methods	Main results
Carragher et al. (2013) ⁽¹⁸⁾	9 non-fluent chronic aphasics (unspecified).	Word retrieval therapy.	80 verbs were divided into treatment set and control set. The participants received a multi-component verb retrieval therapy, consisting of semantic feature analysis, gesture production and phonemic cueing.	The participants obtained significant and sustained gains in naming the treated verbs. In untreated verbs, the effects were more modest. In conversation, 3 participants obtained greater verb retrieval, in addition to qualitative changes related to the syntactic contexts of the retrieved verbs.
Carragher et al. (2015) ⁽¹⁹⁾	9 individuals with Broca's aphasia.	Word retrieval therapy.	The intervention was divided into 3 levels. To familiarize the participants with the syntactic structure, a comprehension task was first performed, administered only at the beginning of levels 1 and 2. At level 1, an action picture was shown and participants were asked to produce a reduced syntactic (agent-verb) construct. Level 2 largely replicated Level 1, with the addition of a theme. Level 3 expanded the three-constituent constructions with the addition of adverbial phrases; Homework tasks were used to complement the therapy.	The treatment was effective in sentence construction tasks for both trained and untrained sentences. In addition, there were some generalizations to narrative retell tasks, but little evidence in everyday conversation.
Choe et al. (2015) ⁽²⁰⁾	2 aphasics: 1 with transcortical motor aphasia and 1 with Broca's aphasia.	Word retrieval therapy.	36 target items were selected for each participant. In the presence of the target picture, the participants received increasing and decreasing cues, involving semantic and phonemic cues, first letter, written word and verb naming models. In addition, upper limb tasks were performed.	Both participants presented better performance on trained items, upon presentation of decreasing cues.
Conroy et al. (2012) ⁽²¹⁾	4 aphasics with difficulty in word retrieval.	Word retrieval therapy.	At each therapy session, 10 target words were introduced, in a total of 100 items (50 nouns and 50 verbs) for 10 sessions. Decreasing hierarchy of cues was used to foster naming accuracy.	All participants achieved significant improvements in naming accuracy for treated items at baseline when compared to control items.
Dignam et al. (2016) ⁽²²⁾	28 unspecified aphasics.	Word retrieval therapy.	Participants performed a 48-hour program of intensive and distributed treatment: 14 hours of commitment therapy (30 items treated using analysis of semantic and phonological features), 14 hours of functional therapy (practice of strategies and communication skills, such as dramatization and script training), 14 hours of computer therapy (reinforcement of commitment therapy items) and 6 hours of psychosocial therapy (in a group).	23 participants had significant improvement in naming accuracy for the treated items. In 8 subjects, there were significant improvements in naming accuracy for untreated items. Learning new words enhanced gains in anomia habilitation. In addition, intensity of the therapy did not influence the results of the treatment.
Dignam et al. (2017) ⁽²³⁾	32 unspecified chronic aphasics.	Word retrieval therapy	Participants performed a 48-hour program of intensive and distributed treatment: 14 hours of commitment therapy (30 items treated using analysis of semantic and phonological features), 14 hours of functional therapy (practice of strategies and communication skills, such as dramatization and script training), 14 hours of computer therapy (reinforcement of commitment therapy items) and 6 hours of psychosocial therapy (in a group).	26 participants had significant improvements in naming accuracy for treated items. 9 subjects were able to name untreated items. In addition, cognitive and language variables influenced the gains of the therapy.

Chart 1. Continued...

Authors/Year	Participants	Intervention used	Methods	Main results
Faroqi-Shah et al. (2011) ⁽²⁴⁾	2 individuals with Broca's aphasia.	Word retrieval therapy.	35 verbs were selected for the study, 14 <i>cut verbs</i> , 14 <i>contact verbs</i> and 7 nonverbal expressions. 7 of each <i>cut verbs</i> and <i>contact verbs</i> were used in the treatment and the remainder were used to evaluate the generalization effects of the treatment. The sets of verbs presented different semantic characteristics. The treatment was divided into 4 steps: naming the action on a video; generation of semantic characteristics; analysis of semantic characteristics and generation of sentences.	Both participants improved their verbal retrieval strategies, although they showed limited performance in the trained verbs. Participants did not present generalization within or outside the class to untrained verbs.
Friedman et al. (2017) ⁽²⁵⁾	3 unspecified aphasics.	Word retrieval therapy.	Treatment alternated overtesting and overstudying conditions. In the overstudying condition, the pictures were presented on a screen, with their names written down and played aloud through a previous recording. The participants had to repeat the word aloud and then "study" the image and the word. During testing, participants were asked to name the pictures and then the correct word was reproduced to provide feedback.	There was an advantage of testing compared with studying. All participants showed greater maintenance for words that were overtested than for words that were overstudied. After the end of the treatment, this benefit remained for 1 month and 4 months.
Harnish et al. (2014) ⁽²⁶⁾	8 aphasics, 2 with Wernicke's aphasia, 2 with Broca's aphasia, 2 with anomic aphasia, 1 with conduction aphasia and 1 with transcortical motor aphasia.	Word retrieval therapy.	Drawings were presented randomly, on a computer. The target images represented nouns of various semantic categories. Participants were expected to name each item on 8 occasions. A different tip was presented in each occasion: (1) independent naming, (2) orthographic cueing, (3) repeating, (4) naming after a 3-second delay, (5) semantic cueing, (6) phonological cueing, (7) repeating, and (8) naming after a 3-second delay.	Most participants achieved significant improvement in trained items after the first session, while the remainder achieved significant improvement after the third session. 3 participants showed a significant increase in untrained items between the second and sixth sessions.
Herbert et al. (2014) ⁽²⁷⁾	1 aphasic with agrammatism and severe anomia.	Lexical therapy and noun syntax therapy.	Lexical therapy was used first; phonological cues were used to facilitate naming. After that, noun syntax therapy was performed with determiner plus noun constructions.	There was improved naming of treated words after the two therapies; however, gains were 23% in the lexical therapy while the noun syntax therapy resulted in gains by 18%. There was no impact of the lexical therapy on narrative, while the syntax therapy led to greater noun production in conversation.
Kendall et al. (2015) ⁽²⁸⁾	26 aphasics with anomia.	Word retrieval therapy	A 60-hour (6 weeks, 2h / day, 5 days / week), multimodal (orthographic, auditory, articulatory-motor, tactile-kinesthetic, visual and conceptual) phonetic treatment was performed using isolated phonemes and phoneme sequences of 1, 2 and 3 syllables, combining real words and pseudowords. Color photographs were used.	There was improved naming of untrained nouns, maintained for 3 months. In addition, phonological processes were generalized.
Kendall et al. (2014) ⁽²⁹⁾	8 unspecified aphasics.	Word retrieval therapy.	Nouns distributed into 6 semantic categories (clothing, body parts, household items, animals, transportation and school) were used. The pictures were presented and the participants were expected to name them. When this did not occur, semantic, phonological, repetition and orthographic cues were provided.	All participants achieved significant improvement, and 5 of them maintained it for 3 months after the end of the treatment. There was minimal generalization in the semantic category.

Chart 1. Continued...

Authors/Year	Participants	Intervention used	Methods	Main results
Kiran et al. (2011) ⁽³⁰⁾	6 aphasics: 4 with anomic aphasia and 2 with conduction aphasia.	Word retrieval therapy.	30 typical and atypical items (each of 2 categories) were selected. Generative naming for 2 categories was tested during baseline and treatment. Each treatment session was performed in 4 steps: category generation, category sorting, feature generation/selection, and yes/no feature questions.	Atypical training items in the category resulted in generalization for typical untrained items. Only 1 patient generalized atypical untrained examples and 2 patients did not generalize untrained atypical examples.
Kunst et al. (2013) ⁽³¹⁾	1 individual with non-fluent aphasia (unspecified).	Word retrieval therapy.	The activities were contextualized to the participant's daily life, and the following strategies were used: facilitation, elicitation and articulation, with the aid of music and subjects of his interest. News and lyrics were used to develop writing.	Significant advances resulted from the therapy. Early language and speech therapy helped reorganize language activity.
Lavoie et al. (2016) ⁽³²⁾	1 subject with mixed aphasia.	Word retrieval therapy.	The stimuli were presented on a tablet. It is a self-administered treatment, composed of picture naming tasks and a verb naming task. A set of images was used, representing human beings performing actions.	Treatment strategies proved to be effective. The effects of the naming treatment were generalized to untreated items, as well as to verb naming, evaluated with a noun-to-verb production task.
Macoir et al. (2012) ⁽³³⁾	1 individual with anomic aphasia.	Word retrieval therapy.	It involved semantic and phonological treatments. 66 items were selected and divided into 3 sets of stimuli with black and white pictures: Set A (34 stimuli); Set B (25 stimuli semantically related to items from set A) and Set C (7 stimuli semantically unrelated to items from lists A and B). The pictures were presented with their name written down.	The semantic treatment resulted in generalization to closely semantically related untreated items. Moreover, this beneficial effect was maintained at the immediate posttreatment level for at least 3 months. The phonological treatment resulted in improvement only for treated stimuli.
Marangolo et al. (2013) ⁽³⁴⁾	8 subjects with Broca's aphasia. 20 healthy individuals.	Conversation therapy.	15-minute video clips were used, reproducing situations of daily life. 3 of these video clips were used to promote spontaneous conversations between the therapist and the patient and the other 3 video clips were used before and after therapy to control generalization effects. After watching the videos, each participant described them as they wished. This procedure was performed in both groups.	There was a significant increase in the ability to produce verbs, nouns, adjectives, adverbs, pronouns, articles and conjunctions, in addition to well-formed sentences. There was generalization of the effects of the treatment for 3 videos that were presented before and after the therapy.
Ralph et al. (2010) ⁽³⁵⁾	33 anomic aphasics.	Word retrieval therapy.	Treatment was based on progressive phonemic and orthographic cueing. Up to four progressively longer cues were provided for each picture	Naming ability assessed in the pretreatment, predicted gain after therapy for anomia.
Raymer et al. (2012) ⁽³⁶⁾	8 aphasics: 4 with Broca's aphasia, 2 with transcortical motor aphasia, 1 with transcortical sensory aphasia and 1 with Wernicke's aphasia.	Word retrieval therapy and gestural facilitation.	All participants underwent the 2 treatments. The errorless naming treatment protocol was used, in which the participants should respond to the stimulus only when they were certain of the correct word. The subjects were expected to: (1) repeat the correct image name 3 times; (2) read the written word aloud three times; (3) memorize the name of the word, after the written word had been withdrawn; (4) name the target image again, repeating it 3 times, only if they remembered the correct name. If they forgot it, they were told the name of it and should repeat it. Subsequently, after testing the 24 pictures, the participants were expected to produce the word only if they were certain of the correct answer. When they did not know, the picture was set aside and, at the end, they received the example for the purpose of repetition. In the gestural facilitation training, the same steps of the errorless naming therapy were used, and gestural components were added.	Both treatments resulted in improved naming of trained words. 3 subjects presented small gains for generalization.

Chart 1. Continued...

Authors/Year	Participants	Intervention used	Methods	Main results
Routhier et al. (2015) ⁽³⁷⁾	2 aphasics: 1 with mixed aphasia and 1 with Broca's aphasia.	Word retrieval therapy.	During therapy sessions, 5-second action videos were presented and participants were asked to watch and name the corresponding verb in up to 15 seconds. Cueing, feedback and a list of questions were offered increasingly.	The strategy of semantic-phonological cues provided the participants with significant improvement. There was no improvement after observation of the action. In addition, there was no generalization for untreated verbs.
Silkes (2015) ⁽³⁸⁾	4 aphasics with anomia: 1 with non-fluent aphasia and 3 with fluent aphasia, both unspecified.	Word retrieval therapy.	Participants were instructed to just watch what appeared on the screen and try to name the image when they watched it for the fourth time. For each participant, 2 semantic categories were trained.	All participants achieved some gains in naming trained items. Such gains were higher than for untrained items. There were minimal changes for general language skills. There was little or no generalization for items of the same category and, in some participants, there was generalization between categories.
Silkes (2018) ⁽³⁹⁾	6 aphasics with anomia.	Word retrieval therapy.	Nouns were used in 14 semantic categories. For each participant, 2 semantic categories were trained in a series. Color photographs were used. Lists of stimuli were created individually for each participant.	Most of the participants had immediate improvement in naming trained items. Generalization within and between semantic categories was considered to be limited.
Van Hees et al. (2013) ⁽⁴⁰⁾	8 unspecified aphasics.	Word retrieval therapy.	On a computer screen, the images were presented and the participants were asked to name them. Type of therapy task was alternated in each session. Half of the sessions involved Semantic Feature Analysis (SFA) and the other half, Phonological Component Analysis (PCA).	In items treated with PCA, 7 participants showed improvement, which was maintained in 6 of them at follow-up. In the SFA-treated items, 4 of the 8 participants presented significant improvement, and 3 of them maintained it at follow-up. Benefits were greater with the phonological therapy.
Van Hees et al. (2014) ⁽⁴¹⁾	8 aphasics: 2 with conduction aphasia and 6 with anomic aphasia. 14 healthy individuals	Word retrieval therapy.	Semantic and phonological tasks were used to improve naming skills of aphasic individuals. 120 items were selected for each participant. Of these items, 30 were correctly named in previous assessments with the naming battery and 90 were incorrectly named. The latter items were divided into 3 sets: one set was treated with phonological component analysis therapy, one set with semantic feature analysis therapy and one set was not treated. In addition to the language assessments, magnetic resonance imaging was performed in both groups.	After treatment for anomia, white matter integrity was improved, connecting language-associated cortical regions.
Wambaugh et al. (2013) ⁽⁴²⁾	9 aphasics: 6 with Broca's aphasia, 2 with anomic aphasia and 1 with Wernicke's aphasia.	Word retrieval therapy.	The study used a modified version of the semantic feature analysis therapy and a semantic judgment task, with 15 yes/no questions about the semantic features of a target item.	8 participants had improvements in naming trained stimuli. There was generalization of response for 5 participants. There was no generalization for untreated words.

Chart 1. Continued...

Authors/Year	Participants	Intervention used	Methods	Main results
Yeung et al. (2010) ⁽⁴³⁾	12 subjects with moderate and severe aphasia (unspecified).	Word retrieval therapy	Ortho-phonological marking method to facilitate the naming task in 4 naming phases: pre-treatment, training, treatment and follow-up. At the baseline, each participant was expected to name all the pictures at least 3 times. There was a change of less than 10% in the error rate over 3 sessions. These items were materials for the treatment. Each participant had 14 or 15 training stimuli. During pre-treatment training, participants were taught to self-generate syllabic cues. In the treatment, the participants should name the stimuli presented without the feedback of the clinician. If they could not name a given stimulus, hierarchical cues were provided to make naming easier.	10 participants had a significant improvement in naming the treated items. 8 participants were able to maintain treatment gains for at least one month. There were phonological generalization effects in 2 participants.
Yeung et al. (2009) ⁽⁴⁴⁾	5 anomic aphasics.	Word retrieval therapy.	The study used a baseline in which participants were asked to name the images. 15 treated items were chosen for each participant. A treatment protocol was used, with the English alphabet as phonemic cues to facilitate name retrieval.	All participants had improvements in naming of treated items, however, only 2 presented significant gains in naming untrained and phonologically related items.

DISCUSSION

This article reviewed studies that addressed therapeutic methods currently used in cases of expressive aphasia, and investigated the method they used. It was found that the traditional treatment methods most frequently used were word retrieval treatment, melodic intonation therapy and conversation therapy.

Notably, most of the studies were particularly focused on treating subjects' language disorders, regardless of the rehabilitation strategy chosen for the treatment. This information is in line with a systematic review study, which also reported the use of different strategies to deal with the symptoms of expressive aphasia⁽¹¹⁾. In the present review, it was found that anomia was the most prevalent symptom; it is one of the most common symptoms of aphasia which negatively influences a subject's communication skills in different language-related aspects⁽³⁹⁾. The results of the studies were very similar, and improvements in language disorders were reported in most of them, as shown in Chart 1.

Regarding type of treatment, it was found that word retrieval was the most frequent treatment; within this approach, some methods seek to activate/strengthen semantic-lexical connections while others aim to strengthen lexical-phonological connections⁽⁴⁵⁾. Picture naming and word to picture matching were the strategies most used⁽⁴⁶⁾. Most studies used picture naming, and tablets and computers were frequently used, especially for the purpose of presenting the stimuli^(13,25,26,32,37,40,47). To improve word retrieval, some studies used progressive cueing^(16,17,20,21,26,35,37,43) as it appears in the literature. It is a type of word retrieval therapy, in which cues are given hierarchically; they may start with a minimum number of cues and increasing it, or, in a reverse way, gradually decreasing them⁽⁴⁵⁾.

Most studies used lexical-phonological stimuli^(16-18,20,22,23,26-29,33,35,40,41,43,44) and semantic stimuli^(13,15,25,30,31,36,38,39,42),

and some studies used verbs^(19,21,24,32,37). Another study also reported picture naming as the main task used during word retrieval treatment. However, the author considered the treatment to be more effective within a sentence context, as they have more language input⁽⁴⁶⁾.

The objective of word retrieval is generalization of words trained during treatment to untrained words⁽⁴⁶⁾. A 2002 study⁽⁴⁸⁾ reported that gains in generalization are limited, as observed in some of the selected studies^(24,36,37,39,42). However, findings from some studies of this review have shown that participants treated within this approach had gains in generalization to untrained items^(13,15,19,28,32).

Another goal of word retrieval therapy is generalization to a non-clinical setting of improvements in naming skills observed during therapy⁽⁴⁵⁾. This aspect was commented in another study, in which the tests often showed positive changes after intervention, but such changes did not occur in the subject's daily life⁽¹¹⁾. In the present review, generalization occurred for conversation^(15,16).

Conversation therapy was found only in one study⁽³⁴⁾; the aim of this therapy is to recover conversation skills^(49,50). Conversation therapy is rooted in the study of conversational analysis by Schegloff et al.⁽⁵¹⁾, who showed that conversation has a structure, presenting turn-taking organization, theme, repair and sequence. In the study cited, conversation therapy used video clips to spontaneously encourage verbal interaction between patient and therapist. In addition, other methods have been reported in the literature; e.g., group therapy, which facilitates language use and socialization in a way that is more similar to everyday practices^(52,53).

Another type of treatment for rehabilitation of aphasic patients is the use of singing, which uses melodic intonation and rhythm as a way to facilitate and improve language production⁽⁵⁴⁾. Of the selected articles, only one⁽¹⁴⁾ was based on singing training;

after the end of the training, therapies were performed with picture naming. As a result, three subjects improved after the singing intervention, two subjects showed improvement only after singing therapy followed by naming therapy, while the other five subjects participating in the study did not show an improvement; they had lesions in the left basal ganglia or the temporal lobe⁽¹⁴⁾. For this reason, the authors of the study concluded that indication singing therapy can be effective for subjects with intact right basal ganglia and left temporal lobes, as well as preserved right hemispheric glucose metabolism⁽¹⁴⁾. The benefits of the singing therapy may be due to the fact that singing activates areas in the right temporal lobe related to compensation, or the peripheral areas of language, serving as a trigger for speech⁽⁵⁵⁾.

As in the selected article, another study was found in the literature, and it was aimed at recovering language through preservation of the singing skills of a patient with Broca's aphasia. It used a rehabilitation program based on melodic intonation therapy (MIT)⁽⁵⁶⁾. As a result, the participant had significant improvements in verbal fluency, reducing anomia and increasing the number of words produced per minute during speech. Also, the participant improved neuropsycholinguistic functions⁽⁵⁶⁾. MIT⁽⁵⁷⁾ is considered to be the oldest and most used rehabilitation program for non-fluent aphasia. It is recommended for patients with preserved right hemisphere^(58,59).

Many studies may not have been found, since few databases were used, which is a limitation of the present study.

CONCLUSION

Word retrieval therapy is the most used traditional method, mainly through picture naming with the aid of facilitating cues. It is assumed that word retrieval is still the most used method because the intervention itself is simple, aphasics have the need for verbal expression, and because this type of treatment has been shown to be effective in several studies in the field. Traditional methods of intervention for aphasic patients have been well-documented and published in the international literature. However, there are few Brazilian studies, possibly because it is difficult to randomize the cases, as well as perform segment research.

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