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The concept of "Montessori for Seniors" (Sensory Activation) in the Diagnosis and Speech Therapy of Seniors with Neurocognitive Disorders: Practical Implications

Koncepcja „Montessori dla seniorów" (aktywacji sensorycznej) w diagnozie i terapii logopedycznej osób w wieku senioralnym z zaburzeniami neuropoznawczymi – praktyczne implikacje

Keywords: Maria Montessori, "Montessori for seniors", sensory activation, speech therapy diagnosis, speech therapy, neurocognitive disorders

Słowa kluczowe: Maria Montessori, „Montessori dla seniorów", aktywacja sensoryczna, diagnoza logopedyczna, terapia logopedyczna, zaburzenia neuropoznawcze

Abstract

The article discusses the theoretical foundations of the concept of "Montessori for seniors" (also known as sensory activation), which is an example of a holistic support program for the elderly and people suffering from dementia, which was described by Austrian researchers Lore Wehner and Ylva Schwinghammer. In addition, the paper indicates practical ways of applying elements of this concept in the diagnosis and speech therapy of seniors with neurocognitive disorders.

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Streszczenie

W artykule omówiono teoretyczne podstawy koncepcji „Montessori dla seniorów" (inaczej aktywacji sensorycznej), będącej przykładem holistycznego programu wsparcia dla osób w podeszłym wieku i cierpiących na demencję, który został opisany przez austriackie badaczki Lorę Wehner i Ylvę Schwinghammer. Ponadto w opracowaniu wskazano praktyczne sposoby zastosowania elementów tej koncepcji w diagnozie i terapii logopedycznej osób w wieku senioralnym z zaburzeniami neuropoznawczymi.

Introduction

Ageing is an inevitable and natural process in human life. It leads to changes in the mental and physical functioning of the individual, manifesting itself in a decline in cognitive functions (memory, attention, thinking, concentration, understanding, planning, inference, abstraction, orientation, etc.) and language functions (speaking, speech comprehension, interaction). In the course of both physiological and pathological ageing, seniors experience cognitive, language, communication and interaction difficulties or disorders of varying degrees of severity. Speech and communication disorders in the elderly are associated with cognitive deficits, mainly in memory and recall, reasoning, thinking, counting, abstract thinking, decision-making or orientation in time and space.

Geriatric speech therapy is a field of speech therapy that focuses on senior citizens and the actions aimed at them. Its area of interest includes:

1) preventive activities (speech therapy prevention) aimed at having a positive influence on the course of physiological ageing in the cognitive-linguistic sphere;
2) diagnosis of changes in the verbal communication process of elderly people ageing physiologically as well as language and communication disorders in ageing individuals with concomitant health pathologies (e.g. dementia, Alzheimer's disease);
3) organising therapeutic activities, including appropriate methods and forms of working with the patient with an aim of slowing down the regression of changes and maintaining and/or improving language and communication skills as well as physiological functions (i.e. breathing, swallowing);
4) organising indirect therapy activities (speech therapist – patient's family/carers/facility staff) to modify the communication behaviour of carers and develop optimal ways of communicating with the patient [cf. Pluta-Wojciechowska, 2014; Domagała, 2015; Maciejewska, 2015; Wolańska, 2015; Tłokiński, Milewski, Kaczorowska-Bray, 2018].

Geriatric speech therapy (in the case of neurocognitive disorders[1]) forms part of a comprehensive (multi-specialist) form of support for the elderly. It can be found alongside non-pharmacological interventions, such as psychological therapy, validation therapy, reminiscence therapy, occupational therapy, sociotherapy, music therapy, cognitive therapy, motor rehabilitation, milieu therapy, bibliotherapy, dance therapy, art therapy, play therapy, hortitherapy [cf. Kłoszewska, 2012; Krajewska, 2014; Panasiuk, 2015; Wolańska, 2015; Wójcik-Topór, 2018].

Speech therapy for speech disorders in the elderly is aimed to "activate interaction and overcome impairments in understanding and producing non-verbal and verbal messages in the spoken and written language subcodes" [Panasiuk, 2018, p. 409, translation mine]. Activation of cognitive processes and communication behaviour in the elderly has a significant impact on improving their functioning as well as both their own and their families' quality of life [Panasiuk, 2018, p. 407].

A speech therapy programme for adults with communication disorders in the course of pathological ageing should consider several factors, including [Panasiuk, 2018, p. 408]:

1) the nature of the disorder (relatively well-preserved mental functions, impaired functions, depth of the disorder, extent of central nervous system damage);
2) personal characteristics of the patient (age, education, profession, interests, self-esteem, attitude towards own difficulties, motivation to work);
3) the nature of the patient's environment (attitudes of family members, potential for cooperation).

This article aims to discuss the theoretical basis of the concept of "Montessori for seniors" (or sensory activation) being an example of a holistic support programme for the elderly and patients with dementia which was described by Austrian researchers Lore Wehner and Ylva Schwinghammer [2017]. In addition, the paper outlines practical ways to apply elements of this concept to the diagnosis and speech therapy of seniors with neurocognitive disorders.

The notion of sensory activation

Sensory activation (or "Montessori for seniors") is a proposed therapeutic solution for senior citizens described by Lore Wehner i Ylva Schwinghammer [2017]. It is based on the principles of Maria Montessori's pedagogy. It is recognised as an innovative, holistic concept for the support of both healthy seniors and those struggling

1 The term "neurocognitive disorders" is used in the DSM-5 classification. It includes major and mild cognitive disorders caused by the Alzheimer's disease, frontotemporal degeneration, Lewy body dementia, vascular disease, traumatic brain injury, substance/drug use, HIV infection, prion disease, Parkinson's disease or Huntington's disease [Morrison, 2016].

with neurodegenerative disorders, with the aim of sustaining or restoring some basic competencies to enable them to maintain independence in daily life.

Sensory activation is defined as "activation that engages all the senses" [Wehner, Schwinghammer, 2017, p. 15, translation mine] to stimulate motor, cognitive and communication skills. The numerous specific objectives of sensory activation highlighted by the authors of the concept include, amongst others, the following [after Wehner, Schwinghammer, 2017, pp. 16–18]:

1) preserving orientation in space and time;
2) supporting gross and fine motor skills;
3) stimulating the senses of touch, smell, hearing and taste as well as the stereognostic sense;
4) working with memories and memory training;
5) enhancing communication skills and active listening skills with comprehension;
6) creating new communication opportunities;
7) developing verbal and non-verbal forms of communication;
8) language skills, including the ability to find words and use them correctly;
9) expanding vocabulary;
10) training in skills needed for everyday activities;
11) maintaining eye-hand coordination;
12) training the dominant hand, exercising hand dexterity;
13) developing concentration and attention;
14) stimulating curiosity and interests;
15) stimulating brain activity and mental training, activating thought processes;
16) renewing and sustaining social contacts, establishing and maintaining relationships with relatives and friends, integrating with a group of residents of a given facility;
17) creating conditions for senior citizens to take their own decisions and initiatives;
18) stimulating intrinsic motivation;
19) sustaining the readiness of seniors to cooperate and act;
20) preparing an environment enabling various forms of physical and mental activity;
21) creating conditions for the expansion and transfer of knowledge;
22) arranging a space for peace and relaxation;
23) musical activation.

The principles of Maria Montessori's pedagogy

Maria Montessori's pedagogical concept (of education)[2] is based on the assumption that educational efforts should be directed towards shaping the child's personality, i.e. the strengths inherent in a person, including the cultivation of his or her potentialities [Surma, 2016]. Maria Montessori stressed two aims of education: biological and social: "From the biological side we wish to help the natural development of the individual, from the social standpoint it is our aim to prepare the individual for the environment" [after Miksza, 2018, p. 23]. Thus, it is important to focus on the child's holistic development alongside fostering their individuality.

Maria Montessori's concept of education advocates learning by doing. This means that children acquire knowledge, skills and competences through their own activity. In Montessori schools, children independently choose the type, place and form of work. They carry out tasks at their own pace. They learn to keep order and follow social rules. They can count on individual attention from the teacher [Guz, 1998]. Due to a well-prepared environment with teaching aids referred to as developmental material, the teacher can take note of the child. The teaching aids are characterised by their simplicity. They are adapted to the developmental age of the child. In addition, they are thematically structured and incorporate the learning content so that the children can acquire multiple skills as well as freely express their own needs [Stein, 2003; Gutowska, 2017; Kamińska, 2019].

Montessori pedagogy is based on several pillars [Wehner, Schwinghammer, 2017, p. 37]:

1) working with simple developmental materials while playing to develop children's sense of exploration;
2) organising time in such a way as to include joint recreation and shared meals to develop social learning processes and foster the sense of forming part of a group;
3) the teacher is an astute observer who monitors the learning process according to the principle "help me to help myself".

The concept of "Montessori for seniors" (or sensory activation)

A key tenet of Maria Montessori's pedagogy is lifelong learning: not only in childhood but also in adulthood. Some of the researcher's postulates were used to design ways

2 Maria Montessori (born 1870 in Italy, died 1952 in the Netherlands) was an Italian physician living at the turn of the 20th century. She completed her degree in medicine, psychology, philosophy and pedagogy. She worked at a psychiatric clinic in Rome with children with intellectual disabilities and then she headed the Casa dei Bambini orphanage, where she continued her research also among healthy children. She is recognised as the founder of the educational system known today as the Montessori method, which is currently used in the education of children throughout the world.

of working with seniors both physiologically ageing and in the course of neurocognitive disorders occurring as a result of neurodegenerative diseases (e.g. the Alzheimer's disease). In addition to the concept of sensory activation discussed in this article, it is also worth mentioning two other concepts of support for the elderly known in Poland, albeit still not discussed sufficiently in the literature, which are also based on the assumptions of Maria Montessori's pedagogy. These are "Montessori Senior – Montessori Lifestyle®" by Cameron Camp [2010] and "The joy of learning throughout life" by Christine Mitterlechner [after Kamińska, 2019].

Maria Montessori's concept of education highlights several educational areas:

1) faith development,
2) practical life,
3) sensorial,
4) language,
5) mathematics,
6) understanding the world,
7) music.

In the geragogical implementation of Maria Montessori's pedagogy, attention is paid to establishing the role of religion in a person's life and the importance of social, family and political development. In addition, exercises in everyday life remain essential, including:

1) activities dedicated to building social relationships (maintaining the ability to relate and willingness to converse, developing tolerance towards others);
2) exercises to increase independence and autonomy (daily life training, self-care exercises);
3) exercises associated with the environment (cleaning work, e.g. in the garden);
4) physical exercises (coordination and balance training, fine and gross motor skills exercises).

The senses also remain an important educational area. Sensory stimulation has a positive impact on the senior citizen's feelings about their own existence, environment, and past life. Multisensory cognition, i.e. using all the senses (touch, sight, hearing, smell and taste) supports memory training since the use of sensory material helps seniors to recreate past impressions, experiences and emotions stored in the brain. The events (memories) stored in the memory are revived through sensory stimulation. The reminiscence sessions are in turn a pretext for practising dialogue/conversation building. Another educational area covered by the concept of "Montessori for seniors" is the language activity, the most important goals of which are:

1) memory and language training;
2) retaining social competence;
3) training in communication choices and forms (verbal and non-verbal training);
4) strengthening the sense of self-determination which is closely linked to the possibilities of linguistic expression.

An important objective of the concept in question is also to preserve numeracy skills (mathematical skills). Mathematical activity exercises should be organised through targeted activities for seniors, e.g. shopping or cooking a selected dish as well as solving mathematical tasks and puzzles as part of mental training. Understanding the world includes, for instance, biological and geographical issues. Activities related to the outside world can be supported by organising outings, e.g. excursions to museums, the theatre, the park, or by carrying out experiments (e.g. nature experiments). The final educational area is music. The objectives of the musical activity involve [Wehner, Schwinghammer, 2017, pp. 37–45]:

1) encouraging movement;
2) supporting memory training;
3) stimulating motor activity;
4) supporting coordination in motor activity (music and movement classes);
5) maintaining spatial orientation;
6) working with musical instruments;
7) free improvisation and evoking the sense of rhythm, bringing joy and having a positive impact on the individual's mental well-being.

In accordance with the concept of "Montessori for seniors" it is the human being who is at the centre of attention. The implementation of a Montessori session should follow certain principles. Therefore, it is important to remember about [Wehner, Schwinghammer, 2017, pp. 45–77]:

1) supporting the ability to concentrate (polarising attention) through the use of Montessori materials with a specific focus (supporting the senses and creativity) and proposing exercises that support skills which are related to everyday activities, but which do not lead to excessive strain through fatigue and failure; moreover, it remains important to clarify the purpose and sense of the proposed activities to motivate seniors to be active;
2) preparing the environment, i.e. create an orderly, well-planned environment adapted to the senior citizen's condition and their cognitive and motor abilities, including working with appropriate materials in a structured space; exercises should be conducted using materials that stimulate the senses and teaching aids in the form of commonly used goods (e.g. familiar items, a suitcase of memories, a box of herbs); the use of Montessori materials allows working with memories (memory training and verbal expression exercises);
3) presentation and instruction, i.e. the carer demonstrates how to do the exercise (using clear, unambiguous instructions). It is important to remember that the presentation is intended to motivate seniors to be active by working independently and voluntarily with the material;
4) organising the group and conducting exercise (Montessori group sessions), taking into account several principles, such as:

- the nature of the group (the number of mentally alert individuals and dementia patients),
- learning about the person's life and illness history in order to be able to prepare the environment (tailored to the age and individual preferences of the subjects),
- the size of a group of able-bodied and active persons is a maximum of eight persons while that of a group of persons with sight and hearing impairments or dementia is four,
- individual work is preferable for individuals with special needs,
- ensuring free access to materials (appropriate choice of room, considering the size and nature of the group);

5) the carer remains an active observer who supports the senior according to Maria Montessori's principle "help me to help myself"; other essential elements of the carer's work include attentive, empathetic and committed care in daily life, active observation and solving ongoing problems; it is also important to identify the needs of the subject (including their wishes, dreams, desires) by establishing a detailed biography of the individual and completing a needs sheet; the source of knowledge about the senior is the family (their active role during the completion of the information folder and biographical sheet about the senior and their participation in meetings, workshops and sessions);
6) using special orientation aids, such as door signs with the names and photographs of residents in the room, signs related to the current season of the year (date, photographs and images related to the season, holiday symbols), signs with residents' birthdays, signs with menus (daily list of dishes, etc.);
7) conducting psychomotor activation of seniors according to motogeragogy principles, whose key elements include, for example, memory training using sensory stimuli, active work with memories, stimulating the ability to retrieve words from memory and use them correctly as well as expanding the vocabulary. In addition, activities should be enriched with elements of gymnastics, movement exercises to the rhythm of music and dance.

The use of sensory activation in speech therapy procedure in seniors with neurocognitive disorders

A prerequisite for effective speech therapy for elderly people with neurocognitive disorders is an accurate speech therapy diagnosis, including [Panasiuk, 2015; 2018]:

1) an analysis of documents and results of multispeciality examinations, including neurological, psychiatric, neuropsychological, neuroimaging examinations, which will allow to outline the general clinical profile of the subject;
2) interview and observation;

3) speech therapy examination (results of questionnaire tests, experimental-clinical trials and evaluation of utterances).

In line with the concept of sensory activation, the speech therapy diagnosis of the elderly can be extended to include the completion of a sheet on the recognised needs of the patient, such as [cf. Wehner, Schwinghammer, 2017, p. 179]:

1) the need for touch, including massages, stroking, hand holding, greeting, saying goodbye;
2) paying attention and verbal contact (conversing, reading together, watching films, looking at a photo album together);
3) listening (seeking an active listener);
4) movement (physical activity, exercise, walks, trips, etc.).

The effectiveness of speech therapy for individuals with communication disorders in the course of neurodegenerative diseases (e.g. Alzheimer's disease) is dependent on the correct diagnosis of the disorder and an appropriately designed speech therapy programme for the patient. In accordance with the concept of "Montessori for seniors" it is advocated that the needs of the patient and his biography should be considered in its construction. Therefore, it is important to consider the following information obtained during the speech therapy diagnosis and recorded in the so-called biography sheet:

1) the severity of the symptoms of the disease and the stage of neurocognitive impairment (cognitive impairment: memory, attention, concentration, thinking, understanding, planning, abstract thinking, inferring, etc.);
2) retained communication and language skills (retained capacity for verbal and non-verbal expression);
3) retained social competences (relations with family or neighbours) and ability to cooperate with relatives;
4) retained motor skills, including hand dexterity, gross motor skills, maintaining balance;
5) physical condition and level of independence in daily activities (self-care);
6) biographical information about the past (childhood, youth, family home, major events and related experiences, all issues and problems which the person often mentions);
7) individual tastes and interests (favourite clothes, colours, foods, beverages, music, flowers, smells, places, animals, hobbies, wishes, expectations and concerns);
8) the patient's personality (self-confidence, belief in one's own abilities, sense of self-determination);
9) ways of reacting emotionally to some more challenging situations, including one's own language difficulties (aggression, withdrawal, anxiety).

The above-mentioned points form the so-called biography sheet, which can be completed by the mentally alert senior citizen or by the speech therapist based on regular biographical interviews with the patient and/or their relatives and carers.

The choice of the form of work, namely individual or group direct therapy, remains an important therapeutic step in a speech therapy procedure. When working with people with neurocognitive disorders, it is also recommended to implement indirect therapy, the aim of which is to modify the communicative behaviour of the carers and develop optimal ways of communicating with the patient through guidance on how to communicate with the person with dementia given by the speech therapist during meetings with the patient's relatives or carers [Domagała, 2015]. The "Montessori for seniors" concept implies a variety of forms of support yet Montessori sessions tend to be group-based while individual sessions are introduced for individuals with special needs.

Goal-setting and selection of methods, strategies and teaching materials/aids (developmental materials) are other important elements of programming of geriatric speech therapy. The author of this article considers the primary goal of speech therapy in the Montessorian spirit for communication disorders in neurodegenerative diseases to be the activation of cognitive processes and the improvement (retention) of language skills and communicative behaviour through various therapeutic measures. This includes, above all:

1) memory training;
2) training of language and communication functions;
3) training of lexical and semantic skills;
4) literacy training;
5) daily life activities training;
6) movement, speech and music therapy classes;
7) multi-sensory stimulation;
8) auditory functions training.

Stimulation of the language functions of individuals with speech disorders in the course of a given neurodegenerative disease should be carried out in conjunction with exercises in cognitive functions, especially memory. Memory training for senior citizens is a significant part of speech therapy. It is conducted as part of reminiscence therapy. In the "Montessori for seniors" concept, the so-called reminiscence sessions form part of the Montessori sessions. They use photo albums and films showing notable events in the life of the patient and his or her family, as well as various family heirlooms important to the patient[3].

In the process of memory training, various memory games are proposed, such as:

3 Speech therapy of a patient with the Alzheimer's disease uses the so-called memory books. These are notebooks/books/diaries/albums created for the patient with the Alzheimer's disease by the carer/relatives (in cooperation with the speech therapist), which feature basic information about the patient and his/her daily life (i.e. life events, memories, current information about the given person) [cf. Domagała, 2014; 2016].

1) wooden tactile memory game – this is a sensory game which involves using the sense of touch to find pairs of identical (of the same texture) wooden discs; the aim of the game is to develop the sense of touch and fine motor skills;
2) sound memory boxes – it is a game which consists in finding pairs of boxes that make the same sound when shaken; the aim of the game is to stimulate auditory perception and improve hand function;
3) illustration and word memory cards – it is a game that involves matching an illustration with the corresponding label, which is the caption for that illustration; teaching aids of this type tend to cover a particular thematic circle (e.g. animals, seasons, occupations, holidays, monuments, etc.); Montessori cards are based on a realistic, carefully selected photographs; the aim of the game is to develop lexical and semantic fluency as well as improve reading skills;
4) left-hemisphere puzzles, which are exercises involving imitating patterns presented on boards, assembling them from memory and reconstructing sequences using wooden (often multi-coloured) blocks; the aim of the game is to stimulate mental functions, logical thinking skills, memory and concentration as well as improve language skills.

Training of language functions includes speech comprehension activities and verbal expression exercises, i.e. in the creation of monologue and dialogue statements and narrative forms such as descriptions and stories. Communication training also includes exercises in initiating and maintaining a conversation and discussing topics that are important to the senior citizen (from daily life and the patient's field of interests).

Training in lexical and semantic skills is of paramount importance in speech therapy of patients with communication disorders in a given neurodegenerative disease who are diagnosed with symptoms of dysnomia or anomia (i.e. naming disorders). These may consist in creating thematic illustration and word dictionaries together with the patient and their carer/relative, in which words from a given lexical-semantic field are written down and graphically illustrated. In addition, communication boards using symbols can be used as a support for patients with anomic problems. As part of vocabulary-stimulating exercises, it is suggested that the lexical material in the given subject area is updated, using the so-called Montessori three-part cards which consist of three elements:

1) cards with the image and label together;
2) cards with only the image and
3) cards with only the label of the image.

They are based on realistic carefully selected photography. Working with them involves looking for a pair of pictures or matching word labels. The cards can also be used to practise classifying objects or forming sets or to train memory and perceptiveness in a memo game (i.e. looking for pairs). In addition, the Montessori cards provide an excellent opportunity to create stories and talk about certain topics.

Literacy training for seniors should include:

1) graphomotor exercises forming part of hand therapy;
2) exercises with the so-called movable alphabet, which is used to teach writing skills by composing (arranging) words from letters; the letters are cut out of wood; vowels are always red while consonants are blue; they include both lower case and upper case letters;
3) exercises in reading letters and syllables or assembling words or even whole sentences using wooden cubes with individual letters of the alphabet or magnetic letters (magnetic board);
4) the use of a set of so-called rough letters, i.e. plates with small or capital letters of the Polish alphabet. The letters are cut out of fine sandpaper; they are divided into vowels and consonants in accordance with the generally accepted rules: vowels are on the red boards, consonants on the blue boards; this aid can be used to practise recalling the shapes of the letters of the alphabet;
5) exercises using the so-called sets for language learning and reading material at different levels of difficulty, including, for example, reading word lists and themed Montessori reading books.

Examples of activities of daily living training may comprise:

1) exercises in labelling (naming) rooms, utensils, household appliances or everyday objects;
2) working with the calendar and the clock;
3) drafting a shopping list and, in doing so, estimating the costs of purchases;
4) creating a daily/weekly schedule.

During movement, speech and music therapy activities with seniors, the following activities are proposed:

1) auditory and motor exercises aimed at shaping spatial orientation, motor memory and eye-hand coordination;
2) rhythm and movement exercises (including the use of musical instruments) organised to develop the sense of rhythm, tempo and dynamics and improve auditory and motor coordination, memory and attention;
3) word and rhythm activities using music (tunes, songs, chants) suitable for seniors.

Multi-sensory stimulation involves the use of the following materials:

1) sound boxes;
2) chromatic and diatonic bells;
3) scented and flavoured bottles;
4) tactile (multi textured) boards, tiles, puzzles;
5) cylinders (weights of different sizes) for inserting into wooden blocks, or a kind of wooden sorter;
6) sound cylinders;
7) balls, building blocks and sensory mats;
8) puzzles with geometric figures and blocks in the shape of geometric solids and figures;

9) illuminated panels, boards and tables;
10) coloured tokens for sorting;
11) coloured beads or buttons for threading.

The aim of auditory training for patients with neurocognitive disorders is to improve auditory perception by practising auditory memory and attention, training differentiation and identification of environmental sounds, practising discrimination (differentiation) of speech sounds, training phonemic hearing and speech comprehension in noise. During exercises, it is proposed to use recordings of environmental sounds, speech and music for seniors.

Conclusion

Speech therapy using the "Montessori for seniors" concept has an individual character tailored to the developmental abilities and interests of the individual patient. It offers the possibility to choose the place and form of work along with developmental material as well as the time and pace of work. It is based on the strengths of the patient.

Another advantage of "Montessori for seniors" is the organisation of speech therapy exercises in which the so-called multisensory learning takes place, i.e. one using all the senses: touch, sight, hearing, smell, and taste. This is facilitated by the use of interesting and varied teaching aids.

Furthermore, speech therapy based on this concept is comprehensive. It enables the improvement of many competences, functions and skills, such as language functions, communication skills, auditory perception, fine motor skills, cognitive functions, reading and writing skills.

Despite the fact that the concept of "Montessori for seniors" (sensory activation) proposes innovative solutions for the rehabilitation of patients with neurocognitive disorders, it remains sparingly described in Polish research publications and insufficiently used in therapeutic work with seniors since the group of trained professionals still remains narrow.

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