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# Non-Pharmacological Approaches in the Treatment of Dementia

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## Abstract

Currently, a pharmacological disease-modifying treatment for dementia is not available, but different non-pharmacological approaches appear to be useful. In this chapter, we describe traditional treatments such as cognitive and emotion-oriented interventions, sensory and multi-sensory stimulation interventions and also potentially alternative interesting options such as behavioural therapy, animal-assisted therapy, home-adaptation therapy and assistive technologies to support patient with dementia. Many non-pharmacological treatments have reported benefits in multiple research studies, but there is a need for further Randomized controlled trials (RCTs) with an adequate sample size to improve the strength of evidence in order to apply these approaches.

**Keywords:** dementia, neuropsychiatric symptoms, activities of daily living, cognitive and emotion-oriented interventions, sensory and multi-sensory stimulation interventions

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## 1. Introduction

Dementia is a term that describes disorders causing cognitive impairment capable to significantly affect functional status [1]. Worldwide, 46.8 million people have dementia, and every year, there are over 9.9 million new diagnosed cases [2], with a total global societal costs of US \$ 604 billion in 2010 [2]. Alzheimer's disease (AD) is the most common form of dementia [3]

and represents one of the major causes of disability, dependency, burden and stress of caregivers increasing institutionalization among older people worldwide [4].

This condition also leads to severe social consequences: decreased quality of life and well-being, increased family burdens and healthcare demand and longer term utilization of care facilities that generate very significant impacts on healthcare services demand and consequently costs [5]. The symptoms of dementia are grouped under three main headings: cognitive aspects, functional aspects and neuropsychiatric symptoms (NPSs). Dementia is a disease characterized by a cognitive decline involving one or more cognitive domains (memory and learning, executive function, language, complex attention, perceptual-motor, social cognition, etc.) [6]. The deficits must correspond to a decline from previous level of function and could be severe enough to interfere with daily functions and independence. Memory impairment is one of the main cognitive issues that contribute to the inability to live independently [4, 7, 8]. In the early stages of AD, it limits memory processes and reduces older people's autonomy in performing more complex daily activities, and it concurrently causes deterioration of emotional control, social behaviour and motivation [4, 6].

The functional aspects can be described in two broad classes: (1) basic activities of daily living or BADL [9, 10] and (2) instrumental activities of daily living or IADL [11]. BADLs are physical tasks essential to maintaining the independence and include the ability to go to the toilet, feed, dress, groom, bathe and ambulate. IADLs are activities typically more cognitively demanding than BADL and include the ability to successfully use the telephone, shop, prepare food, do the housekeeping and laundry, manage medications and finances and use transportation outside of the home (e.g., driving a car, using public transit or riding in a taxi). In the early stage of dementia, most patients are independent with BADL, but they begin to need help with some IADLs [12]. In the moderate phase, cooking, housework and shopping require direct assistance, and BADL require assistance for set-up and safety. Moreover, the presence of NPS could increase anger, frustration and difficulty in communicating needs [13]. As dementia enters the severe stage, independence is progressively lost and caregivers must offer consistent direct care with most if not all BADL [14–17].

NPS are common features of Alzheimer's disease (AD) [18, 19] and are one of the major risk factors for institutionalization [20]. NPS may be correlated to AD independently of cognitive impairment severity or emerge in the course of the illness being a significant cause of a more rapid cognitive decline [21]. It was found that over 80% of AD patients had NPS in the history of the illness [21, 22]. Four separate neuropsychiatric syndromes were identified: hyperactive, psychotic, affective and apathetic [19, 23]. In particular, agitation, euphoria, disinhibition, irritability and aberrant motor behaviour were defined as hyperactive syndrome; delusions, hallucinations and night-time disturbances as psychotic syndrome; depression and anxiety as affective syndrome, and apathy and eating abnormalities as apathetic syndrome.

Currently, there is no effective disease-modifying cure, and treatment is directed mainly to manage the symptoms of dementia [24].

The limited efficacy of the drug therapy and the plasticity of the human brain are the two most important reasons that explain the growing interest in non-pharmacological intervention for dementia patients.

Several non-pharmacological treatments targeting cognitive, functional and neuropsychiatric aspects have been proposed for patients with dementia [25, 26].

This chapter describes the most used non-pharmacological treatment for dementia in accordance to the best-practice recommendations in the research literature [27–30] and the Standards for the Reporting of Diagnostic accuracy studies in dementia (STARDdem) [31].

## 2. Methods

A narrative review was performed using qualitative data and best-practice recommendations in the research literature [32, 33]. The searches were performed in the MEDLINE, PubMed, EMBASE, CINAHL and PsycINFO databases.

The search queries included 'dementia', 'non-pharmacological treatment' and 'cognitive rehabilitation', and were limited to English language articles.

The inclusion/exclusion criteria used for this review protocol are the following.

Inclusion criteria were as follows: (1) age  $\geq 60$  years, (2) diagnosis of dementia according to the criteria of the National Institute on Aging-Alzheimer's Association (NIAAA) [34], (3) use of non-pharmacological tools to treat the cognitive and functional impairment in dementia and (4) acceptable clinical measures of cognitive impairment, disability, quality of life and global clinical assessments.

Exclusion criteria were as follows: (1) no English editing (because we had no resources for translation) and (2) diagnosis of non-dementia.

Quality of study reporting was assessed using the Standards for the Reporting of Diagnostic accuracy studies in dementia (STARDdem) [35].

## 3. Cognitive and emotion-oriented interventions

Cognitive and emotion-oriented care approach seeks to improve cognitive, emotional and social functioning by supporting patients with dementia [36]. The treatments commonly used are reminiscence therapy, reality orientation therapy and validation therapy.

### 3.1. Reminiscence therapy

Reminiscence therapy is a common and widely diffused intervention in dementia care although based on a few high-quality and sufficiently robust studies. Two studies explored group reminiscence [37, 38]. A study evaluated effects on neuropsychiatric and cognitive

symptoms [37]. Another reminiscence group intervention [38] evaluated effectiveness in preventing cognitive impairment progression and enhancing affective function. The results showed improvement in most variables including cognition and depression than controls.

### 3.2. Reality orientation therapy

Reality orientation (RO) is a technique of cognitive stimulation [39, 40]. It entails presenting the patient by continuous memory and orientation information associated with personal environment and issues. Several methods of implementing RO have been explained [40–42]. Throughout the treatment sessions, the patient is supported to talk about various arguments linked to his daily routine and recent events. Encouraging the patient to connect socially is a very significant component of the therapy [40, 42, 43]. Following the first publication of a review about RO, interest in the subject increased dramatically and most subsequent articles reported substantial benefits following the use of these strategies [40, 42, 44].

RO focuses on new cognitive stimulation strategies emerged in recent studies. The cognitive stimulation therapy (CST) is an example [40, 45]. Beyond the features assessed in RO, the CST is based also on multi-sensory stimulation and reminiscence [40, 44, 46].

Some reviews about RO confirmed earlier findings of substantial benefits and also identified existing and new areas where further work is required [39–41].

### 3.3. Validation therapy

The validation therapy (VT) was developed stages: to address the shortcomings of other approaches, such as RO, in approaching patients who have more advanced dementia. The VT was the result of an attempt to provide practical solutions for difficulties experienced by patients and caregivers.

Important characteristics of VT include: means of classifying behaviours, provision of simple, practical techniques that help restore dignity, provision of an empathic listener, respect and empathy for older adults with dementia and acceptance of the person's reality [47].

The way in which these rules are applied to provide specific interventions depends on the dementia severity categorized into mal orientation, time confusion, repetitive motion and vegetation. Each stage is recognized through defined cognitive and behavioural features and defined VT interventions address the various cognitive and neuropsychiatric characteristics showed by dementia people at each stage [47]. Various observational studies have indicated that the application of VT determine positive effects about amount and duration of interactions that participants are able to make during validation groups session [48, 49]. Though, other studies showed no significant effects of VT [50].

## 4. Sensory and multi-sensory stimulation interventions

Sensory stimulation and multi-sensory stimulation refer to a variety of techniques used to stimulate the senses in order to increase alertness and reduce agitation [51]. Sensory stimula-

tion includes auditory, visual, olfactory, tactile, taste and kinaesthetic stimulation [52, 53]. Several studies examined sensorial and multi-sensorial interventions. In this chapter, seven therapy types were identified.

#### **4.1. Art therapy**

Art therapy is the therapeutic use of art making within a professional relationship. It has been suggested as a treatment for people with dementia as it has the potential to provide meaningful stimulation, improve social interaction and improve levels of self-esteem [54]. Activities such as drawing and painting are thought to provide individuals the opportunity for self-expression and the chance to exercise some choices in terms of the colours and themes of their creations.

#### **4.2. Music therapy**

Music therapy is defined as the clinical and evidence-based use of music interventions to accomplish individualized goals within a therapeutic relationship by a credentialed professional [55]. Two studies showed the effect of music on neuropsychiatric symptoms [56, 57]. It was tested a live-music intervention on decreasing anxiety and agitation [55]. Results showed no significant differences in anxiety and agitation. However, a study [56] showed a statistically significant decrease of the agitation in a group music-listening intervention.

#### **4.3. Occupational therapy**

The primary focus of occupational therapy (OT) is to improve patients' ability to perform activities of daily living, promote independence, reduce caregiver burden and ultimately improve quality of life.

OT offers interventions associated with awareness of self-care, leisure activities, occupational identity and productivity [58]. Studies showed an association between cognitive impairment and occupational performance [59, 60]. Therefore, patients with dementia can be assisted through OT trying to preserve an adequate performance level in BADL and IADL [61]. Furthermore, caregivers can adopt OT techniques, in the family or institution, to stimulate patient performing daily activities, preventing disruptive behaviour, wandering and aggression.

#### **4.4. Aromatherapy**

Aromatherapy is the fastest growing of all complementary therapies, in terms of public interest [62]. It aids interaction while providing a sensory experience. Aromatherapy appears to have several advantages over the pharmacological treatments used for dementia [63]. It seems to be well tolerated in comparison with sedative or neuroleptic medication [63]. The two essential oils used in aromatherapy for dementia patients are extracted from lavender and Melissa balm and could be administered in numerous methods such as bathing, inhalation, massage and topical application in cream [63]. Aromatherapy can be addressed to patients with several behaviours. Recent controlled trials showed significant reductions in agitation, with excellent compliance and tolerability [63–65].



#### 4.5. Bright-light therapy

Bright light therapy (BLT) consists of exposure to daylight or specific wavelengths of light using polychromatic polarised light, laser, light-emitting diodes, fluorescence lamps, dichroic lamps or very bright, full-spectrum light. Four studies tested the effect of BLT on behavioural symptoms [66–69]. Two studies compared the effect of morning BLT and afternoon/evening BLT with normal light [66, 67]. Other studies compared one single type of BLT with usual light [66], and no differences were found between morning and evening. Limited evidence of reduction in agitation and aggression among those receiving BLT was found [67, 70].

#### 4.6. Activity therapy

Activity therapy (AT) implicates recreation activities such as dance, sport and drama. It was found that physical exercise can have health benefits for dementia patients, reducing the number of falls and improving mental health, sleep [63, 70] and mood [71]. In addition, it was found that daytime exercise aided to decrease daytime agitation and night-time restlessness [63, 72]. Perrin described an interesting approach to dance therapy: he employed a form of dance known as ‘jabadeo’, which allows the patients to engage with each other in interactive movements [63, 73].

#### 4.7. Snoezelen multi-sensory stimulation

Snoezelen is a multi-sensory setting for implementation of several sensory-based tools. Snoezelen offers sensory stimuli to primary senses of hearing, touch, sight, smell and taste, by the use of music, odour of essential oils, lighting effects and tactile surfaces [74]. Several studies define snoezelen approach as a support therapy for dementia patients [75]. The goals of such therapy are to promote positive behaviours and to reduce maladaptive behaviours [76, 77].

Over the past decade, the clinical application of Snoezelen has been extended from the field of learning disability to dementia care. Its use resides in providing a sensory environment that capitalizes on the residual sensorimotor abilities of dementia patients. Moreover, encouraging results were obtained in the area of promoting adaptive behaviours [78]. In practice, snoezelen capitalize on the residual sensorimotor abilities of dementia sufferers and present a few attentional and intellectual demands [76].

### 5. Other interventions

#### 5.1. Behavioural therapy

Traditionally, behavioural therapy has been based on principles of conditioning and learning theory using strategies aimed at suppressing or eliminating challenging behaviours. More recently, positive programming methodologies [79] have used non-aversive methods in helping to develop more functional behaviours. Moniz-Cook suggests that behavioural analysis is often the starting point of most other forms of therapeutic intervention in this area

[80] and can be wholly consistent with person-centred care. Behavioural therapy requires a period of detailed assessment in which the triggers, behaviours and reinforcers are observed and their relationships made clear to the patient. The therapists use chart or diary to collect information about the behavioural symptoms, and interventions are based on an analysis of these findings.

For Emerson, planning an intervention should be focussed on three key features: identifying the individual's preferences; changing the context in which the behaviour occurs; and using reinforcement strategies and schedules that reduce the behaviour [63, 81].

A few studies showed the efficacy of behavioural in the context of dementia [63, 82]. There is some evidence of successful reductions in wandering, incontinence and other forms of stereotypical behaviours [83].

## **5.2. Animal-assisted therapy**

Animal-assisted therapy (AAT) most commonly involves interaction between a patient and a trained animal, facilitated by a human handler, with a therapeutic goal such as providing relaxation and pleasure, or incorporating activities into physical therapy or rehabilitation. The therapeutic effect has been described by Baun and McCabe with reference to the stage of dementia and the positive effect on caregivers [84]. A review showed that AAT may ameliorate NPS in patients with dementia [85].

## **5.3. Home adaptation therapy**

Home modifications for patients with dementia should promote safety for the patient and peace of mind for the caregiver. The modifications allow patients with dementia to receive ongoing care in the least restrictive environment possible and may be implemented as the need arises [86]. Home modifications for patients with dementia are associated with improved caregiver effectiveness and less caregiver upset [87].

## **5.4. Assistive technologies**

In recent years, there have been significant innovations in the application of assistive technologies (ATs) to support healthcare for patients with dementia. These technologies can be used by the patients with dementia, by the caregivers, and can run automatically (the so-called 'ambient intelligence') [88].

AT applications have the potential to support aging in place for patients with dementia, and they range from internet-based information and support groups to robotic companions comprising also the use of smartphones to report symptoms [89–91].

Several studies describe the responses of caregivers and patients with dementia (PWD) to technology [92–94]. In general, the objective of AT is to allow people to remain more independent and reside at home safely [91–93]. In an another study, it was found that involving the patients with dementia in the process of developing technological applications enhanced usability and acceptability and contributed to a sense of empowerment [95].



## 6. Conclusion

Great efforts have been made to develop strategies to improve the quality of life of dementia patients. A shared feature is the need to work with systems (families, professional careers, organisations, etc.) [63]. Care staff and families are regularly integral to treatment strategies and are essential in obtaining reliable information and constructing appropriate interventions [63]. It is evident, therefore, that training of carers (both professional and family) is an important part of most treatment programmes. A study suggested that the most common interventions for psychological and behavioural symptoms of dementia were not necessarily specific therapies but working with carers to change the attitudes and behaviour of those in their care [96]. The field of dementia care is growing, with an increasing number of articles about psychosocial interventions [63]. Though, there is a fundamental limitation within the current literature that clearly requires addressing. A care plan that focused on non-pharmacological interventions is considered best practice as the first-line management of most NPS of dementia. They can significantly improve quality of life and satisfaction of patients with dementia and their caregivers.

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