

Towards a more Comprehensive  
Approach to Non-Pharmacological  
Therapies for Alzheimer's Disease and  
other DementiasRosa Redolat<sup>1\*</sup> and Mercedes Fernández-Ríos<sup>1,2</sup><sup>1</sup>Department of Psychobiology, Universitat de València, Spain<sup>2</sup>Alzheimer Valencia Family Association (AFAV), Valencia, Spain

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## Abstract

The significant rise in life expectancy and the growing ageing of the world's population are accompanied by an increase in the prevalence of neurodegenerative diseases. These disorders have a multidimensional impact on the quality of life for both patients and their caregivers and constitute a major challenge for social protection systems. Alzheimer's Disease (AD) represents an increasing burden for patients, their caregivers and the society. For that reason, it is necessary to assess all the factors involved in the disease pathogenesis of AD in order to address a more comprehensive approach to the management of the disease. In the absence of disease-modifying pharmacological treatments, interest for in non-pharmacological therapies has recently increased as a complement to other types of interventions in people with AD and other dementias. Non-pharmacological interventions for behavioral and psychological symptoms in dementia patients should take into account the caring environment as well as the support and education of the caregivers. Individualized and person-centered models tailored to the tastes and preferences of each patient could offer better results than the more traditional ones. Information and communication technologies can also provide assistance to people with dementia and to their caregivers. We can conclude that there is a need for developing pharmacological and non-pharmacological treatments aimed to different therapeutic targets and that can be applied in the early stages of the disease development. A more comprehensive approach to the management of AD and an increasing interest in dementia prevention could contribute to the development of new therapeutic strategies. These interventions are expected to have positive impact on the quality of life of people with AD and their caregivers.

## Introduction

Demographic data reflect a growing ageing of the world's population and the forecasts indicate that there will be a significant increase in the percentage of the population over the age of 65 [1,2]. Among the consequences of this significant rise in life expectancy an important increase in the prevalence of neurodegenerative diseases stands out [3]. The dramatic growth in the number of elderly people in some countries also represents a global challenge at economic, social and health levels [4]. This change in demographics has urged governments, institutions and other social agents to take actions to respond to the escalating pressure of the elderly population groups [5,6]. The ageing of the population will undoubtedly affect to the care needs of these groups of subjects with different types of pathology [7] and will be accompanied by an increase in dependency ratios and in health care costs [8]. A deep understanding of these demographic issues will make possible to identify the multiple challenges associated with the significant increase in the proportion of older persons, contributing to change attitudes towards dementia and its treatment [9].

Alzheimer's Disease (AD) is a chronic neurodegenerative pathology that significantly affects and modifies the quality of life of the patients themselves and of the caregivers since the demands for care and social protection increase as the disease progresses [10,11]. Throughout the course of the disease different instrumental and functional limitations influence daily living and, consequently, lifestyles and socialization of the patients are altered [12]. This multidimensional impact of neurodegenerative disorders constitutes a major challenge for social protection systems (8). In modern society AD represents an increasing burden for patients, their caregivers and the society in general [11,13].

Recently the classification system for AD has changed again [14] and this new research framework, based more in neuropathological changes than in clinical symptoms, will influence new approaches to the treatment since is expected to be accompanied by an earlier identification of at-risk patients [15,16]. It is necessary to assess all the factors involved in the disease pathogenesis of AD in order to address a more comprehensive approach to the search of new pharmacological treatments and the development of non-pharmacological therapies for the management of behavioral and psychological symptoms [17,18]. Some authors suggest that it would be necessary to reach a better knowledge of all the processes underlying biological ageing in order to develop new therapeutic

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strategies for AD and to better identify the factors that increase the vulnerability to this neurodegenerative pathology [19].

## Non Pharmacological Therapies for Alzheimer's Disease

In the absence of a pharmacological treatment that cures or slows down the evolution of AD, interest has increased in non-pharmacological therapies as a complement to other types of interventions in people with AD and other dementias [20-22]. The aims of non-pharmacological therapies are to maintain or improve cognitive function, the ability to perform activities of daily living as well as the reduction of behavioral and affective symptoms [23,24]. These interventions can also have a positive impact on the quality of life of people with AD and their caregivers [25].

Olazarán and colleagues [26] characterized non-pharmacological therapies for AD as non-chemical interventions that can be addressed both to the patient and to the caregiver [26]. In the management of symptoms and signs of dementia, cognitive deficits are generally those that have received more attention. However, non cognitive symptoms should also be taken into account in a more holistic approach to the disease [27-29]. It has been recently proposed that the therapeutic approach to dementia treatment should be systematic and multidisciplinary, considering also the importance of the prevention and treatment of all the symptoms [30]. This viewpoint has great potential for the personal and social well-being of AD patients [27,31,32]. Given the limited success of pharmacological treatment for the treatment of behavioral and psychological symptoms in dementia (generally based on the use of atypical antipsychotics), non-pharmacological therapies are considered first-line strategies for this purpose [22,24,33]. Caspar and colleagues [34] have emphasized the idea that non-pharmacological interventions for behavioral and psychological symptoms in dementia patients should also take into account the physical and social environment as well as the support for the caregivers [34].

Recent reviews have indicated that individualized and person-centered models could offer better results than the more traditional ones [32,35-37]. These personalized interventions need to be tailored to the tastes and preferences of each patient. For that reason we can hypothesize that these type of therapies (emotion-oriented, behavioral or cognition-oriented interventions) will connect better with their life histories, helping the patients to link with their own identities [38,39]. Reisberg and colleagues [37] recently suggested that a more comprehensive and individualized person-centered management of patients with dementia showed significant improvement of behavioral and psychological symptoms in comparison with more traditional pharmacological and non-pharmacological approaches (Figure 1).

## Technology as a Support in the Care of People with Dementia

A more holistic approach in the field of gerontology and in the treatment of dementias, taking into account the interest and needs of elderly people, has been proposed by different authors [29,40,41]. Recently, both in elderly day-care centers and in nursing homes we can observe a progressive transformation in models of care. The change is being developed from a medical, more traditional model (focused on the delivery of care based on deficits) to a Person-Centered Care Model (PCC) in which the person is the central axis

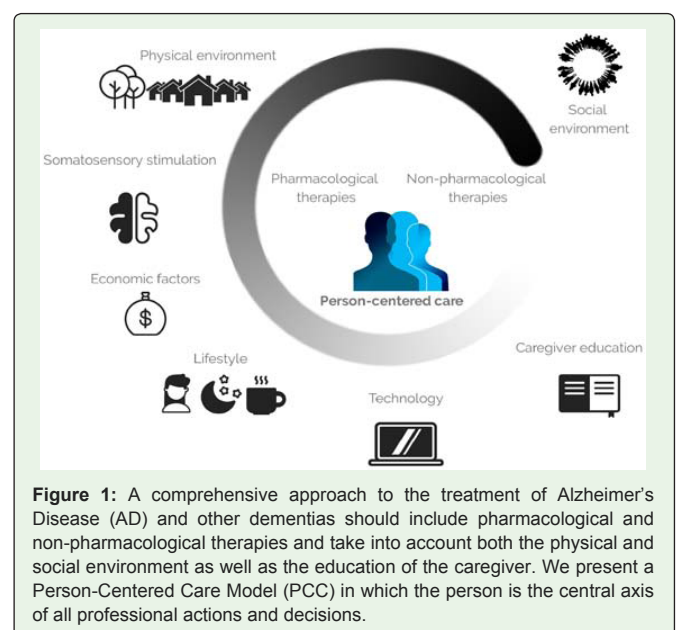
of all professional actions and decisions. This model seeks to promote the autonomy and the consideration of the personal preferences of the patients [41,42].

The technologies can provide assistance to people with mild cognitive impairment, or with dementia as well to their caregivers. Different functions of technology have been identified: provision of care, management, support, social interaction support [43]. The technology is generally designed to promote activities of daily living or to compensate for possible sensory deficiencies [44]. Robotic technology has also shown benefits in areas such as communication, quality of life and improvement of the community ties for elderly people [45-47]. New technologies can also contribute to safer environments by enabling older people to live independently and healthily for longer periods of time. Some interventions (e.g., those based on tele-assistance or geolocation) would allow older people to maintain independence in different activities of daily living and contribute to create safer environments [48-50].

We agree with the idea emphasized by different authors indicating that the use of these technologies or social robots should not have as final objective to replace human contact but should be considered as a complementary tool for the management and provision of care [51]. Furthermore, information and communication technologies present the opportunity to monitor people remotely when they are not able to monitor their physical and mental health [52]. Recently some authors have underscored the important market niche that will be available in the near future for new tools such as those based in robotics [53,54] or in digital phenotyping [55].

## Towards an Integrative Approach to the Treatment of Alzheimer's Disease

The poorer quality of life reported by people with dementia may be mediated, at least in part, by a low participation in social activities and decreased somatosensorial stimulation received. Interventions based on the idea of environmental enrichment aimed to promote different types of stimulation can be approached from a



**Figure 1:** A comprehensive approach to the treatment of Alzheimer's Disease (AD) and other dementias should include pharmacological and non-pharmacological therapies and take into account both the physical and social environment as well as the education of the caregiver. We present a Person-Centered Care Model (PCC) in which the person is the central axis of all professional actions and decisions.

multidimensional perspective [56-58]. Recently, it has been proposed a more holistic approach to the treatment of Alzheimer's disease and other neurodegenerative diseases [29]. The individualization of the care, the caring environment and the need of education of the caregiver are considered key factors of non-pharmacological therapies for the treatment of behavioral and psychological symptoms of dementia [34,59]. All non-pharmacological interventions should consider the sensory and cognitive capabilities and motor skills of the person with dementia [60].

Numerous studies assessing the role of psychosocial or environmental factors (such as high education, an enriched environment, physical exercise or mental activity) or dietary aspects (such as caloric restriction or the role of certain foods) in the development of AD are raising new avenues for intervention [61-63]. Some authors have proposed a longitudinal perspective for the prevention of Alzheimer's disease that includes all the life-span [64,65]. Different factors (lifestyle, genetic and epigenetic factors) can influence memory aging [66] and several studies evaluating dementia prevention are on the move: FINGER, US-POINTER, MIND-CHINA... [63].

Next steps in the development of appropriate treatments for AD may need to incorporate a combined treatment regimen similar to that applied in other chronic conditions. Another possibility would be to combine pharmacological therapies with behavioral interventions, an approach that needs more research [68,69]. Due to the complexity of AD, therapies that target different therapeutic targets and can be applied in the early stages of disease development may be of great interest [16,17,21]. We can conclude that dementia prevention is a topic of growing interest to which more and more attention is being devoted [16,21,70].

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