

## Smart Skirting Board: Snoezelen System in Alzheimer

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### Summary

Alzheimer's disease is the most common cause of dementia in old people. We used the Smart Skirting Board® (SSB®) that integrates, among other things, a Snoezelen system, a laser system, music, video and aromas for multisensory and cognitive stimulation. The SSB® allows a non-pharmacological intervention, and the brain stimulation is achieved, improving the elderly person's attention span, memory, mood, verbal skills and concentration and helping them to relax and offering an atmosphere of security and mental and physical relaxation. Based on a study that was conducted, the smart skirting board as a therapeutic tool, contributed significantly to the improvement of the quality of life of the elderly with psychomotor deficits and particularly those showing signs of Alzheimer's.

### Introduction

Dementia is one of the biggest public health issues in this century. According to the results of the "European Collaboration on Dementia- Eurocode" Project conducted by Alzheimer Europe there are currently 7.3 million European citizens suffering from one or various forms of dementia [1]. One in every 20 people over the age of 65 has Alzheimer's disease (AD), the most common cause of dementia [2]. Experts predict that this number double in Western Europe and treble in Eastern Europe by 2040 [3]. Every year, 1.4 million European citizens develop dementia, which means that every seven seconds a new case is diagnosed. In Portugal there are 160 000 people with dementia, of which 90 000 have AD diagnosed [4,5]. But the real number of people affected by dementia is much larger than these statistics suggest.

Due to the increasing number of early diagnoses of people with dementia, there is a growing demand for treatments, different from the conventional that may improve cognitive functions, apart from a possible delay of the disease. Consequently, there is a need for non-pharmacological interventions such as the SSB® – a gerontodesign and gerontotechnology artifact – integrating a Snoezelen system, a laser system, music, video and aromas for multisensory and cognitive stimulation [6]. Through the Snoezelen system along with other systems introduced into the skirting board, brain stimulation is achieved, improving the elderly person's attention span, memory, mood, verbal skills and concentration and helping them to relax and offering an atmosphere of security and mental and physical relaxation.

### Materials and Methods

Forty-five patients with AD with ages between 75 and 95 years old were submitted to this study. The diagnosis of probable AD was established following the neurological criteria.

For this study we used the SSB® with a Snoezelen system, an incorporated laser system, music, video and aromas (Figure).



**Figure 1:** (A) SSB® and its equipment: Video camera at ground level, preserving privacy; Intercommunication for voice contact; Motion sensors inside the space; Detection sensors to detect if the user leaves the space (warns caregiver through light or sound); Automatic proximity light to the door; Night light; Emergency light; Charging point for mobile phone; Surround sound system; Snoezelen System -for cognitive stimulation/relaxation. (B) Room with a SSB® installed.

Along with the smart skirting board, we create a new set of testes to stimulate the cognition: Mini Exam for Gerontotranscendence and Psychomotricity Evaluation (ME-AGP); Mini Evaluation Exam Oculo-manual (ME-OME); Mini Battery Game Development and Cognitive Stimulation (MB-JDEC). Each person did 20 sessions of 20-30 min. All the data were registered in specific software that was developed to this study.

The subjects or their caregivers gave informed consent to the procedure.

## Results

The SSB® was created with the following objectives: 1 - To facilitate the mobility and safety of elderly people who may (or may not) be in a wheelchair and who reveal (or not) depressive disorders or dementia; 2 - Provide safety and well being to the elderly with cognitive deficits, particularly those suffering with Alzheimer's; 3 - Encourage cognitive modifiability through the cognitive and multisensory stimulation of elderly with dementia; 4 - To stimulate cognitive and spiritual functions through meditation and hypnosis.

At the end of this preliminary study we verified that all the elderly people showed a big improvement. We verified that the SSB® stimulating the senses, it helps reconnect the dementia patient to the world they left behind; by providing an enjoyable experience, it helps to reduce antisocial behavior and provides an environment that encourages meaningful relationships among staff and patients, promoting relaxation, and reducing psychological stress and staff burnout. Other benefits include relaxed patients, increased sense of happiness and interest, reduced sadness and fear, an increase in sociability and level of interest, and a decrease in disruptive behaviors and levels of anxiety.

## Conclusions

Based on a study that was conducted, the SSB® as a therapeutic tool, contributed significantly to the improvement of the quality of life of the elderly with psychomotor deficits and particularly those showing signs of Alzheimer's.

Our exploratory and qualitative research in elderly patients with Alzheimer's revealed a significant improvement in long-term memory. Elderly patients with other diseases such as arthritis, anxiety, depression, etc., revealed a significant improvement in their affective and psychomotor skills.

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