

The design and implementation of an online home exercise program that fits the needs of patients with mild cognitive impairment

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Introduction

The support of independent living in the older adult population is important to preserve quality of life for as long as possible. Due to the socioeconomic challenges to the healthcare system, new technologies are expected to contribute to providing this support. As such, we developed a home-based exercise program for pre-frail older adults to promote physical well-being (www.perssilaa.eu). This is a self-management program of 3 months of home based exercising for 30 minutes each time and consists of two modules: (1) a home based personalized training module which enables older adults to train independently in their home environment. in three different categories: strength, balance and flexibility; and (2) a communication module which gives older adults the possibility to indicate how the exercises were performed and whether they have any questions to a physiotherapist about the exercises.

As the population ages, especially risks for cognitive decline threaten independence and quality of life for older adults. As a result, many ehealth applications have been developed to support people with cognitive problems and their family and formal caregivers [1,2]. Unfortunately, many ehealth applications are not used by them, because they do not match their needs and capacities [3]. Therefore, we aim to adapt the home based exercise program to the needs of older adults with mild cognitive impairment (MCI). Involving informal and formal caregivers and inclusion of older adults with

MCI in the development and design process are key features. In this paper, we present the development and the design process of the home based exercise program for older adults with MCI.

Methods

A user centred design approach, which involves all the end-users in the design process, is crucial to ensure adoption by these users and the chance of successful implementation in daily care [4]. As such, two focus groups were organized at Trivium Meulenbelt Zorg in the Netherlands. Older adults with MCI and (in)formal caregivers who attend 'day activity/care' were asked to participate. In the second workshop, only formal caregivers were invited to further discuss the design and implementation of the program. All participants had to fill in an informed consent. The aim of these workshops was to gain insight in (1) adaptations needed for the exercise program; and (2) ideas about the implementation strategy in daily care. The focus group sessions were audiotaped. The focus group results were analyzed according to the PACT framework [6] to elicit the MCI related requirements of the home based exercise program. The PACT stands for People (the primary end-users of the system), Activities (the activities between the end-users and the system), Context of use (the environment of the system), Technology (applications and components of the system).

The AD8 Dementia Screening Interview questionnaire (AD8) was filled out to gain insight in the user group with regard to their memory problems [5]. The following cut points are provided: 0-1: normal cognition; 2 or greater: cognitive impairment is likely to be present.

Results

In the first focus group, 38 persons participated with a mean age of 80.3 +/- 8.1 years (range 54-92) and the group consisted of 14 males and 24 females. Seventeen persons were living alone and 8 persons were caring for an older adult. Twenty-two participants scored a 2 or higher on the AD8 and 10 persons scored a 0 or 1. Six persons didn't fill out the questionnaire correctly. In the second workshop, 10 formal caregivers participated, who were all female.

(1) Main adaptations needed following the PACT framework

People: Patients using the program have mild cognitive impairment and co-morbid condition with age-related cognitive and physical problems and low attention/concentration possibilities. Twenty-two of the 30 older adults with MCI that were present in the focus group had never used a computer or internet before and only three of the participants used a computer on a daily basis. So patients that are envisioned to use the program are expected to have low literacy levels. However, the older adult with MCI needs to be able to use the program independently (without a caregiver being present). This means that the program:

- should have high user friendliness
- should contain as little information as possible
- should consist of a program of max 20 minutes
- should have minimal communication possibilities and questions

Activities: (in) Formal caregivers will be the first person to introduce the program to the older adult with MCI. They will support the person when using the program which is difficult and takes time. Both patient and (in) formal caregivers log in with a username and password to make sure the data of the patients are safe.

This means that:

- instruction should be simple and quick, relying on the intuitiveness of the system and its accessibility features.
- password and username should be easy to remember

Context: The users live independently in their home environment or day care facility as well as residential care. Support will depend on the person with cognitive impairment and their existing knowledge of ICT. When the disease progresses, they might need more and more functional support and supervision.

This means that the program:

- should provide a clear overview to the (in) formal caregiver in case action is needed

Technology: The program will be used in different settings such as the home environment and the day care facility. As such, the program

will be accessed by different means being smartphones, tablet or computer.

This means that:

- the program should work on different operating systems (e.g. Windows 95, 98, XP) and different browsers (e.g. Internet Explorer 5 or 6, Chrome).

(2) Ideas about the implementation strategy in daily care

The program will at first be implemented in the care setting where patients can start using the program under supervision of a formal caregiver and train in groups when needed. After a while, the patient can decide to continue using it in their home environment when they feel familiar enough with the program.

Discussion

We aimed at developing a program which will have high chance of adoption by the end-users. As such, this paper presents the requirement elicitation and development of an innovative ehealth program for older adults with MCI following the PACT framework. This methodology seems to be an effective and easy way to adapt an existing program to the needs of patients with MCI. We found that adaptations are mainly on the level of usability and implementation compared to older adults without MCI and not specifically on the content of the program. The next step would be to validate the requirements in the care organization with patients and (in) formal caregivers, which will be done mid 2016.




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