Summary of the Social Innovation

“Long-Term Care in Motion” (LTCMo)

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1. Overview

The interdisciplinary research project “Long-Term Care in Motion” (LTCMo) is part of the consortium “INNOVAGE—Social Innovations Promoting Active and Healthy Ageing” (Health-F3-2012-306058) funded by the European Commission. The overall aim of INNOVAGE is to generate knowledge that is able to raise the healthy life expectancy (HLE) and overall quality of life in older adults (active and healthy ageing model). In particular, INNOVAGE aims to showcase a range of social innovations which are able to contribute to this goal. The primary objective of LTCMo is to promote physical activity (PA) related behaviour in the nursing home (NH) setting.

In this document, we start with a description of the importance of being physically active in old and advanced old age and the current situation of PA in the NH setting. We then provide a description of the ambition and goals of the social innovations developed in LTCMo. Next, we provide key elements of our social innovation and describe our efforts so far to implement the programme and increase its dissemination. We finally point to the ongoing evaluation study that will offer a first empirical test of the programme.

2. Importance of PA in community-dwelling and institutionalised elderly

As is well-known, the majority of the current NH population is beyond the age of 80 years and characterized by high rates of multi-morbidity, frailty, mobility impairment, severe cognitive deficits, behavioural disturbances and depression. In terms of day-to-day behaviour, an essential feature of NH residents is their very low PA, even compared to non-institutionalized older adults in advanced old age. However, PA is not only an important marker of physical impairment, but also an essential pathway to improve quality of life and enhance cognitive and social functioning of old and very old individuals. That said, empirical evidence supports rather large positive effects of PA on a range of important endpoints such as cardio-vascular fitness, gait and balance, fall reduction, cognitive function, and well-being in the general older population. Moreover, PA training has revealed sizable positive effects in terms of physical and functional ability related endpoints even in those with dementia-related disorders, provided that the application format was tailored to the remaining competencies of this specific group.

1http://www.innovage.group.shef.ac.uk/
2Although we know that the term “nursing home” is an ambiguous term, which may refer to different living arrangements in different countries or even does not apply to specific countries, we use this term in a technical sense to indicate living arrangements for older adults with a strong institutional character. In Germany, for example, such living arrangements continue to play an important role in serving particularly very old adults and those with dementia-related disorders. In Germany, about 700,000 residents live in nursing homes.
There is also beginning evidence that PA can unfold positive effects in the NH setting, such as increased activity and social involvement, but the existing research in this area has remained scarce and rather inconclusive (see our systematic review by Jansen, Claßen, Wahl & Hauer, 2015³).

Against this background, the primary aim of LTCMo was to enhance physical activity among nursing home residents as it might improve the living conditions and quality of life in nursing homes in line with the main concept of INNOVAGE (active and healthy ageing).

3. **Ambitions and Goals of LTCMo**

**Where we started from: Existing barriers for implementing “Long-term Care in Motion”**: The implementation of social innovations such as LTCMo is challenged by a number of factors. PA related behaviour in an institutionalised setting is substantially determined by setting specific constraints, interests, and attitudes – with the staff as a major factor to influence residents’ PA behaviour. Lack of specific knowledge and insecurity how to support PA related behaviour represent crucial limitations for the implementation of such innovative models. Residents’ low physical and cognitive health and functional status including gait and balance problems and sensory impairments likely hinder residents, relatives and staff to imagine that a considerable increase in their PA is possible and feasible without taking too many risks. So staff can have a tendency for dependency-enhancing behaviour regarding residents, thus possibly helping too much and fostering independent behaviour too less. Indeed, positive effects of training should be weighed against potential negative effects as such as increased risk exposure for falls and also adverse effects should be operationalised. All in all, these barriers may result in a vicious circle, in which an overall sedentary life style in the NH ecology is reinforced because of a variety of reasons, which may lead to a further decline of physical and cognitive functioning and a situation of low engagement in everyday life.

Starting from this situation, LTCMo assumed that a social innovative intervention could have the potential to overcome these barriers and improve the quality of life even in such a vulnerable population. Driven by the idea of a *natural lab* (see below), our ambition has been a procedure that comes with significant improvements in terms of its intervention components as well as its assessment methods.

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³ European Journal of Ageing. Published online (DOI: 10.1007/s10433-015-0344-1).
**Aims of LTCMo.** Our social innovation was based on three main objectives: (1) Conceptualization of a *multidimensional intervention programme* operating at different levels of the NH ecology (resident and staff oriented) with the potential to counteract the existing barriers which typically prevent PA exertion. (2) Development of an *innovative assessment strategy* to comprehensively assess residents’ PA behaviour as well as intervention effects, respectively. This assessment concept represents the natural lab component of LTCMo’s social innovation and the attempt to unify a practical and hopefully quality of life-enhancing strategy (i.e., the multidimensional intervention) with an ambitious and innovative research and measurement concept in the NH setting. The assessment concept as a whole was envisaged to be as reliable, valid, cost-effective, and unobtrusive as possible. That is, residents’ habitual PA behaviour was comprehensively depicted using automated, objective assessment methods, i.e., accelerometers and life-space sensor-based data. Assessment of the intervention effects included pre-, post-, and 3-month follow-up measurement occasions to estimate the short and long-term effects of the intervention in exemplary manner. A waiting control condition was realised consisting of a second comparable NH ecology in Heidelberg (same care provider), in which at the first stage of assessment no intervention programme was conducted to document the natural course without interventional effects. (3) *Disseminating the findings* to relevant stakeholders and users through different channels (e.g., user friendly description of our model project, training module to allow practical translation of project findings into real life application in interested nursing homes).

4. **Content Description of LTCMo**

**Aims and description of the PA intervention programme.** The overall goal of the PA intervention programme was to enhance PA in NH residents. The physical exercise intervention comprised different organisational and methodological approaches with the aim to offer a comprehensive training tailored to different target populations within the nursing home, with different needs, abilities, and limitations. Our training programme included multiple exercise approaches: supervised group sessions at different motor impairment levels (less vs. severe impaired), group training for patients with behavioural disorders, specific individual training in severely impaired persons, and a serious games approach. The training was based on functional and strength exercises and aimed to improve key motor functions, i.e., mobility, auton-

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4 More details can be found in a preliminary version of our *Guidebook Describing the Intervention Components* that can be downloaded from the INNOVAGE website.
omy, and motion security. Additionally, the intervention pursued the goal to improve psycho-social outcomes such as participation, self-efficacy, depression, and quality of life. The programme is specifically designed for the target group of NH residents, characterized by old age, advanced frailty, multi-morbidity, including motor and cognitive impairment and relies on the existing evidence of successful PA intervention in multi-morbid, frail, older persons with and without cognitive impairment as well as the long-term experience of the working group. It is important to note that all residents could participate in the exercise training, given they were able to at least stand up when aided.

The training was progressively increased to allow training progress but was also tailored to individual ability of participants. The programme started with simple, less strenuous and less complex exercises. When basic motor functions were stable, participants could progress to advanced levels of exercise, i.e., complexity and challenge of tasks were increased. Communication to participants and supervision of training were based on principles developed in previous intervention studies of the research group and are related to care concepts such as “validation” and “patient centred approach”. The training programme is based on repetitive and standardized training tasks, which guarantee effectiveness, but will possibly not attract all participants. To optimise adherence to training and increase PA we offered alternative training strategies based on the serious games approach, in which motivational aspects are driven by a game setting, and effectiveness is supported by a “serious”, evidence-based exercise task. The Serious Games approach used in this project is a stepping video game which is based on a modified version of “StepMania Dance and Rhythm Game” Figure 1).

![Illustration of the Serious Games Approach](image-url)

**Figure 1: Illustration of the Serious Games Approach.**
The serious game represents a supervised cognitive-motor training that is conducted in small groups of three to four residents with only one person playing at a time. To play the game, the participant has to stand on a dance plate which is connected to a computer via USB. The dance video game screen is projected on a TV screen. A display of squares moving up, down, right or left across the screen cues each move and participants have to execute the indicated steps (forward, backward, right, or left) when the moving square is congruent to the squares at the top, bottom, right or left side of the screen. Alternately, participants will have to perform 10 levels of 90 seconds duration each. Progression of performance is controlled by an automated modification of the difficulty level (higher movement speed of the squares) according to the performance in the previous level.

**Aims and description of the competence training for staff.** The major aim of this component was to enhance staff’s competence to elicit PA in NH residents. We assumed that such an enhancement of skills will further add to the implementation of the programme and enhance its impact. Staff members received theoretical input (education about the role of PA in later life, about the role of aging stereotypes in this regard, about barriers and facilitators of being physically active and about ways to overcome related obstacles). They also learned about how to use communication and interaction techniques to encourage residents to be more active. In role plays, staff members got extensive practice opportunities. The aim of the subsequent four case discussions was to apply the communication strategies to actual caring routines and current problems in the interaction with residents, to develop strategies for upcoming challenges, and to monitor the achievement via feedback-loops.

5. **Implementation of LTCMo**

On the one hand, responsible staff members need to be trained to ensure a successful implementation and a long-term establishment of the newly introduced structures after researchers have left the NH ecology. Therefore staff was successively incorporated under a regular supervision of the research team (expertise of psychologists and sports scientists). The supervision will be kept up until the end of the project to reach an appropriate continuation of the programme. On the other hand, the competence training for the staff team was integrated into the regular in-house training schedule and regular ‘intervision’ groups could be established. Figure 2 illustrates the implementation procedure.
Furthermore, we have developed a guidebook (see footnote 4) with the intention to address NH leading personnel, such as directors or care managers with an interest in enhancing their residents’ PA and by this, as we assume, also their quality of life at large. Doing so might also increase the NH’s reputation as many elders as well as their relatives are interested in an active and healthy lifestyle when moving to a NH. The guidebook also addresses other key professionals in NH settings such as physiotherapists, activity coordinators, nurses, or ward managers. The guidebook may also be of interest to organizations (e.g., senior organizations) engaged in improving the lives of older people. We also hope that the guidebook may also stimulate new PA related intervention research in the NH context. It contains a detailed description of our training programme and also a checklist with fundamental principles which might be helpful when someone intends to implement such an intervention programme in a NH setting. Table 1 gives an overview about fundamental principles for a successful implementation of our programme.

Table 1: Overview about implementation strategies

- Involve the whole system (leading management, staff, relatives, legal representatives and residents) during every study phase.
- Don’t neglect hierarchical structures.
- Provide detailed information about the importance of PA in NH residents and the training concept.
- Provide detailed information about the study progress.
- Respect existing structures and try to integrate the training components in the established system.
- Adapt the training intensity to the individual cognitive and physical functioning.
- Be attentive to postural instability and risks of falls.
- Train responsible institution members and stay in close contact to the institution to ensure sustainability.
- Take potential barriers into account and try to overcome them.
Finally we currently develop a training concept to allow the implementation of the model LTCMo into the care routine of interested nursing homes. Therefore, training courses will be piloted and included as a regular course in the Agaplesion Academy, a well-established care and health educational institution in Heidelberg with nation-wide outreach to achieve the overall goal of LTCMo and increase quality of life even in this vulnerable population of nursing home residents.

6. Ongoing Evaluation and Dissemination of the Intervention Programme

We are currently running an evaluation of the intervention programme that aims to provide first data on how the programme works in reality. The fundamental design of this study is illustrated in Figure 3.

![Figure 3: Fundamental Design for Evaluation.](image)

Details of our research design can be found in the published study protocol (Jansen et al. 2014). Further publications on the intervention effects later this year and an update of the guidebook supplemented by the experiences of the last project phase will help to disseminate the results.

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