TechCare - Training on the Adaptability of Assisted Living Technologies in Home and Community Care

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Abstract. On the one hand we are an ageing society due to the demographic change and on the other hand Assisted Living Technology (ALT) progress rapidly to meet this demand. So that it is expected in the following years to become an abrupt part of the long term care (LTC) services and the care of older people. Under this perspective the digital literacy of the target group (formal/informal caregivers, health care and personal care workers in LTC) is more than essential in the newly shaping, technologically driven, care giving environment. The scope of the three year Erasmus+ project TechCare was to further progress the digital literacy-related knowledge of the direct target group. The digital literacy should go beyond the simple knowledge of the function of ALT's, to the critical adaptation and evaluation of ALT's into the long term care environment according to the specific needs of each beneficiary. In other words: The main objective of the TechCare project was to promote an ethically sound and practically viable adaptation of assisted living technologies in long term care. The project's contribution to this objective was to train carers as evaluators and primary level counsellors upon the ethical and practical challenges that determine the acceptability of assisted living technologies (ALTs) into home and community care.

1 Introduction

In the last decades, under the mounting pressure of demographic ageing, there has been a veritable proliferation of Assisted Living Technologies (ALTs) designed to help older people remain autonomous and have a good quality of life [1]. The concept of Assistive Technology and ICT based solutions can be broadly defined as systems and resources that take a holistic approach towards tracking, monitoring and fostering the overall health, security, safety and quality of life of its users. It can include systems, software, products, devices, practices as well as a combination of any two or more of these to address the needs of its users who have some form of limitations or disabilities [2].

Older people have a huge array of needs and requirements that they face with increasing age. The variation of these requirements relate to age, gender, background, experience, skills, knowledge and so on. Apart from the impact these varying needs and

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challenges may have on autonomy and independence, they also limit the abilities of older adults to perform Activities of Daily Living (ADLs) indepently [3]. Given this profound shift in the age distribution of the population and the prognosis for the future, it is inevitable that in Europe the ratio of older people in need of care to active workers will increase [4]. This phenomenon causes problems and challenges for the society since there will not be enough health care workers to support the older [5]. Therefore, technology-based services and Assisted Living Technologies which aim at supporting older people in performing their daily routine tasks and in sustaining their independent living and quality of life in a supported environment are starting to be more important and are therefore on the rise [5, 6]. On the same direction, EU is focusing on the prioritization of home care, and into this domain assisted living technologies can play a substantial part.

Nevertheless seniors, their relatives and caregivers are often still uncertain and skeptical about the various new technologies in older people care. Acceptability of new technologies is a very complex issue entailing several crucial factors that have impact on the final decision on behalf of the patients and their caregivers. The complexity is mainly due to the fact that while new technologies aim to maximize the autonomy, general wellbeing and self-determination of the patients and in parallel to soften the overload the caregivers experience, they may produce some negative effects to other equally important aspects around the personality and the personal requirements of the patients. There is a delicate balance in the form of a trade-off between what technology offers and what it takes that should be considered, under the specific characteristics that constitute a patient's personal and social environment. Subsequently, there is an obvious need, in European societies, the rapid advance of the assisted living technologies to be followed by a corresponding knowledge and patient-centered critical evaluation of the services and applications offered.

Towards the European wide goal of integrated care, patients, caregivers and healthcare professionals should be placed at the center of healthcare innovation and policy reforms. This implies supporting people to lead healthy lives and in being engaged in the management of their conditions and risk factors, in adhering to treatments and in having a voice in care decisions [7].

First of all, we have to start with raising awareness on the role and impact of assisted living technologies in older people's care and on having an understanding of what their function and services are.

The lack of awareness of the potential added-value and trust towards ICT-based support solutions requires strategies to raise awareness among all stakeholders—including policy makers, health care professionals, informal caregivers, and care recipients—about support opportunities offered by ICT [8] and ALT's.

At first, care recipients and caregivers should understand the impact new technologies may have in relation to their wellbeing, way of living and ethical integrity. This first approach and critical stance towards assisted living technologies, as a new necessary part in health care and especially in care of older people, is the objective of the TechCare project (http://techcareproject.eu/blog/). The scope of the project is to contribute towards the wider implementation of digital solutions serving towards the so-called "digital transformation" as an essential key to the success of implementation of innovation in health-care systems, at micro-level [9]. In order to obtain that, TechCare focuses on the

ability of formal and informal caregivers to act as practical evaluators and primary level counselors upon the ethical challenges posed by ALT's that determine the acceptability of ALT's into home and community care. Respectively, the TechCare e-learning platform was developed to deal the above issues through the following six modules:

1. How can I identify the needs with the older person?
2. Search and find available information about ALT.
3. What are the ethical issues that emerge from the use and presence of ALTs?
4. What is the best solution to meet the needs of a specific older person?
5. How and who should introduce an ALT solution?
6. The ALT solution that I chose, was it useful and worthy?

The platform (https://techcare.httc.de/course/) provides caregivers with specialist knowledge in order to assess and weigh up ethical, social and legal aspects of new technologies. The course is offered through "blended learning", a combination of face-to-face offers and distant learning but it can also be used completely online.

The course has been developed based on 1. a literature review offering a taxonomy of ICT for home and community care, 2. a list of concerns of patients and caregivers in relation to ALTs as they emerge from specialized social science literature, and 3. Semi-structured interviews conducted by the authors in three different European countries: Germany, Greece, and Spain. The interviews were conducted using an adapted version of the Unified Theory of Acceptance and Use of Technology is (UTAUT2) [10, 11].

2 Methodology

The main innovation of the TechCare training is the focus on the ethical and practical validation of assisted living technologies for home and community care of elderly people that directly affect the quality of life of both the beneficiaries and their formal and informal caregivers, as it is:

a) The practical parameters that determine the patient's acceptability of ALT's.
b) The role of the caregiver in this new environment and the smooth cooperation between the caregiver and the ALT's.
c) The impact assisted living technologies have on the ethical and social sphere of the beneficiaries, namely - Privacy - Autonomy - Obtrusiveness - Passivity - reliance on automation - Reduction of social interaction.

The second innovation is the development of a flexible pedagogical framework that is needed to underpin e-learning environments in order to ensure that they address effectively the individual learning approaches of the diverse population of formal and informal care giver and social worker in partner countries.

Two consecutive pilot studies were conducted to evaluate the feasibility, usability and usefulness of the e-learning platform as well as to assess the achievement of objectives. These objectives were translated into the following research questions:

1. How many participants enroll and finish the TechCare training? (Adherence)

2. Are the modules as well as the e-learning platform feasible? (Feasibility)
3. Are the modules as well as the e-learning platform accepted? (Acceptance)
4. Is the e-learning platform usable? (Usability)

To answer these questions, the following methodology was chosen and agreed upon by all partners in the Final Methodological Plan. The Methodological Plan contained specific instructions, goals, and deadlines for the pilots. (please, see the website of the project).

Two consecutive pilot studies were conducted in Belgium, Germany, Greece and Spain. Both pilots focused on the modules (content), the TechCare e-learning platform as well as the overall concept (content mediated via e-learning platform). The feedback from the participants in the first pilot was used to adapt the content, the e-learning platform as well as the procedure for the second pilot. Each pilot ran for six weeks. In both pilots, quantitative measures were used through questionnaires. Roughly, the procedure was as follows: 1) Training for the trainers; 2) Recruitment of participants; 3) Introduction for learners; 4) Implementation of the e-learning platform and content for six weeks; 5) Evaluation.

3 Recruitment

As each partner organizations had diverse preconditions (different care systems per country, existing networks, possibilities to reach the target group, focus on formal versus informal carers, etc.), each partner organization was in charge for the recruitment process by itself. Different approaches were chosen. A short overview of the strategies is provided below. Next to the successful recruitment strategies, also problems will be mentioned as the reach of the target group became very difficult.

Belgium: The Belgium partner belongs to the Interdisciplinary Research Group on Law Science Technology & Society at the University and faced some problems to recruit learners from the social care domain which was the original target group of the project. The partner contacted a day care center for people with dementia to involve the care givers but due to lack of time they could not participate. Then he contacted the faculty of health and could involve some experts.

Greece: For the Greek partner there was no particular problem in recruiting the participants. Frontida Zois has a large deposit of collaborating caregivers so addressed to them to participate into the pilots.

Germany: As the German partner is an organization providing all kinds of services they have direct access to formal caregivers. An education center providing VET also is part of the organization. The partners recruited one nursing class (health care professionals in elderly care) per pilot to reach formal carers in training. In order to include even more learners the partner involved Bachelor students from two different Universities studying nursing science, nursing management or social work.

Spain: The Spanish partner organization sent information about the project and an invitation to follow the training to several associations (gerontology and health social work societies, and several health social work student forums). Mainly social workers and informal carers were interested and connected to the platform. Unfortunately not all

completed the course even though they were given all the time they needed to complete it. Some entered the platform and downloaded the material, without doing any activity.

4 Procedures (Training and Implementation)

140 Formal and informal caregivers and social workers from Belgium, Germany, Greece and Spain took part in two consecutive pilot studies. Participants were recruited per country, following different and individual recruitment strategies according to the pre-conditions of each partner organization. At first two trainers from each partner country attended the common three-days training activity in Greece acquiring information in the TechCare learning methodology and training framework in order to deliver and supervise the pilot programs.

The first pilot study was conducted between January and the middle of March 2020. The second pilot was supposed to start in the Middle of April and end in May 2020. The second pilot faced unsurpassed problems due to the COVID-19 pandemic. In the first pilot all partners except the Spanish used the blended learning methodology. This means the learning material was delivered through a combination of face-to-face and self-directed learning in order to ensure that the learning outcomes depend heavily on learning interaction and sufficient face to- face sessions. As the Spanish partner is a University delivering all courses fully online they used their proofed methods to deliver the TechCare training. After the first pilot the evaluation questionnaires were filled out by the participants. The data were collected by the partners/study coordinators in each country and summarized. Then some changes to the TechCare e-learning platform as well as the training content where made according to the received feedback. Due to the COVID-19 pandemic all partners had to change to distant learning in the second pilot phase.

5 Results

As the objective was to test the feasibility, acceptance, adherence, usability of the training material and the e-learning platform the TechCare training course is evaluated positive in its biggest parts. The e-learning platform is usable and user friendly, the information provided are comprehensible and appropriate for the target group. The platform fully covered the expectations and demands of the learners. The division of the training content into learning units accompanied by specific interactive educational videos, that provided visualization of the training content, assisted learners to comprehend better the educational points, and to be able to produce in the same way their own cases.

Many participants were not familiar with the training content and its narration of new approaches in care combined with the use of new technological applications. This resulted into a restrictive interaction of the participants with the training content. Several contacts between the trainers and the learners were made to help learners match their experiences with the training examples and be able to extract their own conclusions.

For many of the learners the educational content was their first introduction to the function and requirements of the Assisted Living Technologies. For this reason, the training content itself, had to confront the same problems it was developed for, as it is

hesitation towards the unknown, lack of previous familiarization with the issue, fear for the impact that technologies may have on the caregiving tasks. Consequently, the piloting of the training content was the study of the parameters that impact ALT acceptance and at the same time their real time experience. All these factors it seems that in general resulted to a problem of interest in the course. In this sense, during the needs analysis, the caregivers interviewed already seemed to be more interested in the existing ALT catalogue and how to use it in their daily practice, rather than in the ethical issues involved. This is something they see as less useful and inapplicable, especially if, and this is particularly important, neither the care receivers nor their families requested the use of ALTs, let alone were worried about the ethical issues implied in it. But here a question arises: Should we act proactively for when the ALT's will become an irreplaceable reality into home and community care? Should we start to consider this development already?

6 Conclusion

Assisted living technologies are the new reality in older people care and in long term care. Providing to caregivers the opportunity to get to know with these technologies and to learn how to evaluate them in a primary level is very important for improving the performance of their tasks and for lessening their workload without compromising the safety and the quality of life of the beneficiary.

The conclusion deriving from the TechCare project's pilots is that the caregivers regard yet as distant or - when the time comes – as complementary the incorporation of assisted living technologies into home and community care. Apparently, this estimation relates to their limited experience on the field, not to mention their probable self-fulfilling perception.

Another valuable conclusion that came out from TechCare project is that the introduction of formal and informal caregivers into assisted living technologies and ICT should focus at first into their digital health literacy. Even though the ability to search and do the right selection of new technologies was in details analyzed in TechCare, the digital literacy in terms of getting to know what the purpose of the equipment is and how it works should be a training priority.

That is why the consortium of TechCare already works on the components of such a digital health literacy training that will come up hopefully as TechCare 2.

Nevertheless, one of the major issues nowadays is the integration of care, meaning the connection and collaboration of the different care levels and different health provision stakeholders. Assisted living technologies is an essential part of it, as they can increase the efficiency of the health and social care systems and respond to a series of pending problems related to the lack of caregiving workforce and the avoidance of hospitalization. TechCare by training caregivers to act as agents for the successful and acceptable implementation of assisted living technologies into home and community care, seeks above all to ensure the empowerment of the patients and of their caregivers.

Above all, digital innovations and assisted living technologies, should meet the needs and expectations of health-care professionals, patients, and carers, respecting the importance of human contact, not replacing it but complementing it, notably in terms of quality and personalization [12].

For the participating organizations, regarding the care provision organizations, it was presented the opportunity to update the knowledge deposit of their personnel aiming to incorporate new services into the ones already provided.

For the Academic Institutions, TechCare presented an excellent opportunity for the involved experts to search the impact of new technologies in elderly care environments and to prepare the ground for further research and publications on the field.

Furthermore, it is essential to develop a communication channel between the assisted living manufacturers and the care providers, and TechCare project can empower the critical abilities of the care providers towards better and more individualized devices [13].

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