

OPINIONS ABOUT ROBOTS IN CARE FOR OLDER PEOPLE

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ABSTRACT

Mild cognitive impairment (MCI) is an intermediate state between normal ageing and dementia. This means that subjects with MCI may get worse with the passage of time, and possibly progress to dementia. However, there are also individuals with sustained MCI whose cognitive impairment remains constant for many years, and even such who get better over time. The distinction of persons with different prognoses of MCI is a difficult task. As we do not know who is at risk, non-pharmacological interventions should be incorporated in all subjects with MCI in order to possibly postpone the progression to dementia.

Within the ENRICHME project – *Enabling Robot and assisted living environment for Independent Care and Health Monitoring of the Elderly* (which receives funding from the European Union Horizon 2020 Programme, No: 643691C), a mobile service robot is used for long-term interaction and monitoring of an older person with MCI, in order to optimise their independence. The potential impact of such a solution on its users' life was assessed among both caregivers and caretakers. We used focus group discussions to collect opinions about the robot-related requirements of older people and their professional caregivers.

Three focus groups discussions were analysed: one organised in Italy which was composed of three older subjects attending a day-care centre and two health workers of the same centre, as well as two others organised in Poland (one with six older volunteers and one with six professional caregivers); all participants were willing to discuss the issues related to the introduction of a robot. The areas of interest were identified.

In conclusion: based on the results of focus groups interviews it can be stated that the use of robots by community-dwelling older persons is generally accepted by all participating groups. The robots' introduction should be preceded by competent pre-training. Future users should be involved in the process of customisation of proposed solutions, in accordance with actual needs. Ethical and practical issues should be taken into account.

Keywords: robots, older people, needs, requirements, caregivers

INTRODUCTION

European societies have been aging rapidly over the last decades. Recently, the average life expectancy has been increasing by approximately three months per year. The percentage of people belonging to the age group of 65 years and over has also grown. An even faster growth will be observed in the age group of 80 years and over [1].

There is no doubt that it is the oldest people who most often need assistance in activities of daily living. Providing them with care and support, enabling them to live independently in their own homes as long as possible, despite physical disability and cognitive impairment, is a priority for health systems and social policies of all European countries. An increasing number of individuals in need of care and limited availability of health and social care professionals call for implementation of new solutions, allowing a reduction on the burden of formal and informal caregivers working within the system. The involvement of the latter in eldercare in countries such as Poland, Italy and Greece is considerable [2]. The new system solutions to be created must also be efficient and cost effective. Such solutions may be based on the use of robots which would assist the older persons who live in the community, among whom those with mild cognitive impairment (MCI) constitute a group with special needs. MCI is an intermediate state between normal ageing and dementia. The group with MCI is not homogenous: some subjects may get worse over time, and possibly progress to dementia, however there are also individuals with sustained MCI whose cognitive impairment remains constant for many years, and even such who get better with time. The distinction of persons with different prognoses of MCI is a difficult task. As we do not know who is at risk of progression, non-pharmacological interventions should be incorporated in all subjects with MCI in order to possibly postpone the progression to dementia.

Even minor cognitive impairment significantly increases the demand for care and hampers its provision. Older persons may, for example, need supervision in taking their medications. They may forget to take their medicines even if these have been placed in a special container, or may take them at the wrong time. In such cases the family and/or carers should take control of the medication-taking regime. Such and similar cases present opportunities for solutions based on new technologies, including the deployment of robots in care for older persons.

The goal of the study was to collect opinions about the robot-related requirements of older people and their professional caregivers.

MATERIAL AND METHODS

The study was part of the ENRICHME project - *Enabling Robot and assisted living environment for Independent Care and Health Monitoring of the Elderly* (which receives funding from the European Union Horizon 2020 Programme, No: 643691C). The project is related to the usage of a mobile service robot for long-term interaction and monitoring of an older person with MCI, in order to optimise their independence. The project's first part was devoted to the collection of the opinions of potential end users about their needs and requirements related to the robots in care for older individuals. We have previously presented the results of our quantitative study based on the research tool called *Users' Needs, Requirements and Abilities Questionnaire* (UNRAQ) [3][4].

The aim of this paper is to present the results of our qualitative data from focus group discussions involving potential robot's users and their caregivers. This method is

recommended in all cases where it is necessary to understand the behaviour of participants, their motivations, and the ways in which their opinions are formed [5].

The focus group interviews were organised on the basis of a detailed script, prepared for this purpose. The participants consented to take part in the study and to the recording of their statements. The main part of the focus group discussion started with the presentation of short videos about the robot to be used, delivered by Robosoft (France). The main discussion had two sections concentrated around the stories of two vignettes (Maria and Jan). Both stories were written by a team consisting of a geriatrician, a psychiatrist and a psychologist (PUMS), based on their expertise in the field of clinical picture of MCI. The cases were discussed and accepted by all consortium partners.

Three focus group discussions were analysed. The first focus group was organised at Fondazione Don Carlo Gnocchi Palazzolo Daily-Care Centre for Elderly People in Milano (Italy). The detailed characteristic of included subjects is presented in table 1.

Table 1: Participants attending the focus group interview at Fondazione Don Carlo Gnocchi Palazzolo Daily-Care Centre for Elderly People (Milano, Italy)

Code	Age (years)	Sex	Role
1	63	Male	Subject attending the daily-care centre
2	44	Female	Health worker at daily-care centre
3	59	Male	Subject attending the daily-care centre
4	47	Female	Health worker at daily-care centre
5	83	Male	Subject attending the daily-care centre

Two other focus group discussions were organised by PUMS in Poland: one composed of older volunteers and one of professional caregivers. The interview of older individuals was organised at a day centre where various activities are organised, e.g. trips or occupational therapy including art therapy, physiotherapy, and psychotherapy. Most of the older subjects are fit enough to reach the day centres on their own. During this interview, apart from the participants, there were three students and their teacher present, with observer status. One of them was a pharmacy student of English-speaking programme of PUMS and the other two were visiting students from the University of Kentucky, College of Pharmacy (USA). The focus group of formal caregivers was composed of persons who are professionally prepared to provide care. The participants of focus group interviews in Poland are presented in table 2.

Table 2: Detailed characteristic of participants of the focus group interviews in Poznan (Poland)

Older individuals				Formal caregivers			
Code	Age	Sex	Former occupation	Code	Age	Sex	Occupation
A	78	Female	Shop assistant	a	41	Female	Physiotherapist
B	77	Female	Administrative employee	b	52	Female	Nurse
C	82	Male	Engineer – designer	c	53	Male	Art therapist
D	68	Female	Taylor	d	32	Female	Psychologist
E	86	Male	Bookbinder	e	51	Female	Social worker
F	73	Female	Graphic designer	f	45	Female	Nurse

All participants were willing to discuss the issues related to the introduction of a robot. The discussions were audiotaped and then transcribed. The analysis of the text was

performed by two independent researchers. All variables were discussed until a consensus was reached.

RESULTS

All discussion participants were deeply involved in the debate and eager to express their opinions. In most cases the opinions of caregivers and the older persons were consistent.

Focus group discussions identified six areas of interest. They were as follows:

1. Overall attitudes towards the robot

Although there were sceptical opinions regarding the use of robots, it is necessary to stress the considerable acceptance among both the older participants and their formal caregivers. This observation points to the fact that the participants acknowledge real benefits of the presence of the robot; it is associated with the belief that new technological devices are able to make life simpler. It was even emphasised, by one of the older participants of focus group discussion in Poland, that:

the robot could be a friend because one would not feel lonely at home, there would be someone there (...), someone to talk to. (B)

Some sceptical statements came from older persons taking part in a focus group discussion in Italy:

for me it's a rip off; I do not know if the robot can help me, I have many doubts, (3)

it's better to involve the older people into social activities, such as those organised here at the day centre, (2)

it is important to do some exercises but a robot would not be able to motivate me. (2)

2. Ethical issues

Participants voiced out many different ethical concerns which, on one hand, seem to indicate serious engagement in the discussion and, on the other hand, signal a potential vulnerability of the robot's users if these concerns are not properly addressed. There is thus a necessity to turn special attention to the ethical issues (which are perceived as sensitive). These issues were related to:

the question of control over the robot

It was important that the mother had to consent to her daughter having access to the life of the older person. (A)

the question of being controlled in one's own life ('Big Brother-like')

The robot may be perceived as a restriction of freedom, as a form of control. (b)

delegating care to the robot and replacing people with robots

Perplexity toward the robot... of course it is useful for 'services' such remembering to take medicines, measuring health parameters, emergencies, etc... but the fear and the risk is that when the relatives delegate everything to the robot and take care even less of their elders, this could increase the older

person's state of depression and loneliness. Technology does not have to be a substitute for human relationships. (B)

diminishing the involvement of the family in caring for the older persons who have got a robot

People could conclude that *...he/she is already protected, has some help. (A) But they would no longer fret that something is happening and they know nothing about it. (A)*

situations in which the robot can disobey its user's command

The following sentence is worth quoting: *I think that there should be some well-defined situations where the robot would not perform an order or would behave differently than desired by the owner because it has concluded that something very bad is happening to the owner, that his sanity could be limited and it is necessary to call a doctor instead of opening a window (...) there could be preconditions enabling the robot to modify its behaviour and refuse to do exactly as the owner wants it to do. (c)*

withdrawal effect of the robot

I think that if such robot turned out to be very useful then its loss would be felt very strongly. (d)

3. The scope of the robot's functions

The older individuals defined the role of the robot in caring for their age group. They had no doubts that the robot would have to play a reminding role but also would be useful in exercising body and mind. It should furthermore act as a connection to the outside world allowing *getting in touch with someone from the family, if we want to get in touch with them, (F)* but also provide a feeling of *security when one is alone, in the knowledge that it can summon a doctor and get help. (B)* Participants pointed out that *on some days I would need the robot more, on others less (F)* but *one would feel more confident with a device like that, (B)* and also mentioned the waking up function *if you ask it (...), it would come and say something to you in the morning (A), I would wake up knowing that someone is there (B)* and that it should *put me to sleep at night. (D)*

The formal caregivers observed, with respect to the robot's functions, that:

first of all, this fills a certain social vacuum, (...) the robot has some humanoid traits, (...) so a whole host of emotional problems is eliminated at the start. Another matter, in my opinion, is the automation of all these processes which cause Maria problems, i.e. remembering certain routine actions, such as measurements, taking medicines at specific times, things that can be automated this way. These appear to be the most important areas as far as I am concerned, (c)

the robot could ask how you feel every day and whether you have some pain; there could be some gradation scale. (d)

Caregiver participants also drew attention to the usefulness of the robot with regard to the reading and music replay function, and playing games, e.g. chess or bridge (they

wondered whether the robot could replace more than one partner). It was concluded that the robot could enable the older persons to continue their hobbies.

Remarkably, one of the caregivers (a psychologist) said: *I see this as a care-giving team made up of the robot: if something deteriorates by two levels we do not wait until it gets worse even further but change things and see if there is an improvement (...) the robot prepares exercises adjusted to the patient's level. If the patient does well, he/she gets to another level, but the data are gathered. One could add a question about privacy, family – individualise the exercise regime.* (d)

4. Safety issues

One of the most important issues pointed out was related to safety, hence it can be discussed as a separate topic. The question of safety must be viewed as the safety of the older person themselves but also the safety of use of the robot – as the examples below point:

the robot could be useful for someone, sure. For example, I fell down at home and I was alone (...) I had to wait one hour before someone came, I was not able to reach the phone to make a call, (1)

I also slipped from the couch and my old wife helped me to stand up again but I was tired and afraid of falling down again, (5)

it is important to meet the need for safety connected with health and with ensuring that dinner gets eaten because there is a chance that someone will remind her or even prompt her that it can be found in the fridge and that an appropriate dish should be used, and so on (...) which, I think, is very valuable.

(d)

As mentioned, attention was drawn to the need to have a sense of safety when using the robot, e.g. *some emergency phone number to call should the robot crash or stop co-operating in the way we want it to, (...) if there is suspicion of a breakdown one can phone somebody to talk about this.* (a)

5. Doubts about the preparedness of older persons for the robot

Participants from all focus groups were of the opinion that older persons may not be able to cope with advanced technology, yet the robot should be designed so as to make its use by an older individual possible. One of the participants stated that *some people already operate a computer.*

all these ambiguities in the communication between the robot and the user, you mentioned this before, there should be a user interface, this is a technical term, but generally speaking the method of communication between the older person and the robot should be simplified to a maximum, i.e. either simple symbols or simple choices, or a well-functioning voice synthesis and recognition, because this is a natural channel of communication (c)

6. Issues related to the introduction of robots into the lives of the older persons

In focus groups, both the older individuals and their caregivers stressed that the process of preparation for using a robot should be gradual, initially with considerable involvement of professional personnel. Only after gaining confidence in robot's operation the involvement of the staff should diminish, but in a flexible way, depending on the degree of confidence gained by the older person.

At the beginning there would have to be another person there because I

would be afraid to remain with it alone, (F) to learn how to live together. (B) Initially, somebody from the family or a younger person who understands all of this would have to come for two-three hours. (F)

At first, one could try to accompany her a little, during this particular phase (...) of introduction (...);it seems to me that the older people are slightly afraid, even in advance, of various novelties, and in particular, new technologies. This is why the presence of another person, not necessarily round the clock, but at regular intervals, could be useful. This person could talk to Maria and explain things based on her experiences. (c)

DISCUSSION

When introducing a new and unknown major item (which the robot is) to the system of care for older people it is vital to take the needs and expectation of end users into account. Our study points to the necessity of inclusion of various issues: functions of the robot and their acceptance as well as ethical and practical concerns. It is also imperative to consider the points of view of various stakeholders: the older persons themselves and their caregivers, as different stakeholders have different needs and expectations [6].

One of the most important recommendations regarding the introduction of the robot is giving adequate attention to the requirements of person-centred care [7], for which respecting preferences and choices resulting from past-life experiences is critical. Our study's results fully confirm this statement; the qualitative methodology had to be employed, so as to possibly embrace the whole spectrum of opinions.

It should be stressed that both older persons and professional caregivers are against a rapid immersion in high technology – a sudden appearance of a robot which is an enigma. They indicated the need to gradually accustom the user to the robot. The person introducing the robot would have to visit the future owner often, who would be allowed to receive new skills and competences, and a conviction that they would be able to cope when left alone with the robot. Wu et al. observed that older persons need to be familiarised with the robot gradually over time [8]. The importance of involvement of caregivers, family members and peers who already use the new technology and of trying out the technology in a risk-free environment was pointed by Peek et al [9].

CONCLUSION

The results of focus group interviews indicate a broad interest in the use of robots in care for older persons living in the community. There is considerable demand for robots offering the older people wide-ranging support, expressed by both these persons and their formal caregivers. It is very significant that the older persons do not expect the robot to perform everyday chores instead of them but report expectations regarding training and assistance for their own activity – they perceive the robot rather as a stimulus and not a device taking over the daily activities. The introduction of the robot must, however, be preceded by competent pre-training. It is necessary to create conditions, at the early introduction stage, allowing the older person to accept the robot and eliminate concerns regarding the ability to operate it. The future users of the robot should be involved in the process of customisation of proposed technological solutions in accordance with actual needs and preferences. Ethical and practical issues must be taken into account when designing the functions and technical environment of the robot. The participants pointed

out that they did not want to be spied on by the robot, so it would be necessary to individually consider the development of the robot's functions to avoid creating a feeling of "controlling" the life of the older person.

ACKNOWLEDGEMENTS

This research was carried out as part of the research project, funded by the European Commission under the H2020, grant agreement no. 643691C. We would like to thank all ENRICHME partners for their involvement.

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