Social Robo to control symptoms in elderly institutional patients with dementia

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Abstract

The world's population is bursting rapidly and the need for long-term care is increasing, especially in circumstances such as dementia. Complementary therapies have been shown to be helpful in managing the symptoms of dementia, especially animal therapy (AAT). Due to the limitations of the use of animals in institutes, social robots with summer morph properties have been developed as an alternative, and some models have already been shown to have AAT-like effects.

1. Introduction

Robotics has evolved in education and technology. Since then, efforts have been made to create a robot that can actively interact with people at a social level. The robots developed so far are inspired by the famous life forms that you can find on our planet. Therefore, their design is mainly anthropomorphic or summery. With the advent of collection technology, it became possible to open up new horizons and thereby find new areas to use. This includes the ability to study human-robot interactions, for example to study robots as facilitators of social interaction, as well as their direct influence on human cognitive functioning and behavior [1-4].

According to current demographic data, the world population is growing rapidly, mainly due to declining global birth rates. Compared to data from fifty years ago, the population lives more than twenty years on average, increasing the prevalence of inactive diseases. Thus, the need for long-term care is increasing exponentially as many older people lose the ability to live independently and take care of themselves [5].

2. Overview of Dementia

Understanding how a pet robot can be widely marketed as a contextual adaptation can stimulate social interaction and improve the quality of life of institutional patients with dementia. Dementia is known as a disease that primarily affects cognitive function. Therefore, it directly affects the patient's ability to communicate, making him or her more prone to depression. As a result, patients experience isolation and develop a sense of loneliness, which further improves their mental well-being. As this is a progressive and life-limiting condition, you should increase...
the use of additional medications to improve control of symptoms (eg acceleration and depression) and try to postpone prognostic action. Disease by stimulation of cognitive and motor activity. Robotics has found implementation here as a means of relieving patient symptoms and improving cognitive and motor activity [6]. Complementary therapies are designed to stimulate, facilitate and change patient routines, the most common forms of animal care, music therapy and art therapy in patients. Animal care is one of the treatments with one of the most characteristic effects [7]. This can be understood from the many years of interaction between humans and animals - the first fossil evidence of a connection between species such as Homo erectus and the dog dates back half a million years. [8]

Figure 1: Social Robos Application

There are two theories that justify this: the biophilia hypothesis and the social support hypothesis. The first justifies that man has the ability to care for and attract other animals or living things. Assumptions about social support say that pets themselves are already social assistance [8].
Fig2: animal-related therapeutic interventions

However, figure 1 shows the animal-related therapeutic interventions are difficult to investigate for hygienic, allergic or institutional reasons. Progress has been made in research into the effects of summer morphine robotic filling therapy, which have been shown to have similar effects on the Animal Support Center, such as the ability to increase social interaction, reduce restlessness, aggression, and depressive symptoms. [9-13] These results are evaluated by analytical testing, imaging and electrophysiological monitoring methods [14-16]. The results were also observed for increased nutrition and reduced demand for medication and doctor visits. As for cognitive functions, there is no evidence yet. In this context, animal-shaped social robots are studied. There are many different models, including a giant commercialized robot known as the Furby. This robot is designed for children and is designed to interact with children, touch, sound and movement [17]. So using it for older people is not far away as it can get worse due to old age or illness.

Furby has emotional traits that are mainly expressed in voice and movements (e.g., his voice becomes happier when he is happy. Ear and body movements increase). The robot has face removal and tries to detect them through the LCD screen.

The project was developed in collaboration with Furby with support from the Innovation and Research Department of the Department of Joint Service Planning and Organizational Development in the Ministry of Health. We have developed observations to understand how a widely commercialized pet robot developed for children can stimulate both context change and
social interaction and improve the quality of life for institutional patients with dementia. The observation took place in a residential area of the Portuguese city of Simbra, and participants were randomly selected (all participants had a degree of cognitive impairment). To assess the degree of cognitive impairment, the cognitive activity of the selected participants was related to the activity directed at the robot. For this purpose, a short portable questionnaire on men's situation was used.

3. Approaches to find the Dementia with Nano Robo

A qualitative study of six participants with randomly selected cognitive disorders from the living community of the elderly in Portugal. Awareness was assessed with a short portable mental questionnaire. Participants were exposed to the Furby model for a week in 2012 and an interaction was observed. A theoretical basic technique was used to analyze the collected data. The authors feared that to maintain patient dignity, a number of people and physical conditions were being emptied. Three questions were systematically used to assess patients' memory and behavior: "Do you remember him?", "What's his name?", "Do you want a pet? Is he?" All moments were recorded on a video recorder. The interview was recorded while viewing and the behavior was coded according to the most common patterns ("smiling", "motor activity" and "spontaneous speech").

The total number of participants was six institutions living in the same institution, daily (4 participants) or just for a week (2 participants). For a week, each participant had daily contact with Furby. After this week, there was a four-day gap in which participants did not communicate or mention Furby. On the fifth day, participants were again personally exposed to Furby. The timing of the interaction with Furby is not determined by the duration of the patient's attention. Written consent was sought in the institution where the participants lived, as well as from the patients and / or their legal representative. This finding was made by the Researcher Institutional Audit Committee.

4. Results and Analysis:

The results show that Furby affected people with moderate to severe dementia. Almost all the participants laughed in their interaction with the robot and walked around to perform simple tasks. He also encouraged spontaneous dialogue and interpretive thinking. Analyzing the results, it was found that Furby showed a change in the patient's behavior (both in patients with moderate and severe dementia). Since almost all the participants made fun of the interaction with the robot, it can be seen as a sign of their comfort and well-being. Interaction with Furby also increased motor activity as elderly patients moved their arms and hands to perform simple tasks such as squatting or standing. In addition, he helped patients speak spontaneously (they told him stories and asked questions) and also interpreted the thought as some participants tried to understand the sounds of Furby and translate them into words.
The results also show that Furby also showed improvements throughout the facility - from day three, other residents got up from their seats and were contacted to participate in Furby. We also included places where the elderly shared their feelings, met and laughed when a robot was placed between them. In addition, some residents even ran to Furby and asked to be contacted when they saw the room.

We also saw that Furby was curious about the healthcare staff working at the facility. They were supposed to hang out with them, even though most of them became "boring".

To limit these observations, we cannot ignore the hawthorn effect, a term used to describe a change in behavior due to the participant's attention [18]. Patients first interacted with the robot and the therapist, but the reporting allowed us to focus on observing the participants who interacted with the robot. During the four-day break, the researchers also wanted to reduce the effect of hawthorn. Another limitation was the time spent on the robot so that the patient's well-being did not change and was not disturbed, the authors had to adjust the interaction time with Furby to the patient's current condition. Mind. As such, it became impossible to determine the desired shutter speed.

In addition, the design of the Furby was also limited. Sometimes patients had difficulty absorbing and storing because it was a relatively small robot (this was more evident in bedridden patients due to muscle atrophy). Moreover, Furby's voice and personality were difficult to control. Furby has a rapidly changing personality, so the therapist should always anticipate his "happy" personality before giving it to the participant. Either way, this person has extended the reach of the participants as it involves loud noises and sudden movements of the ears and body.

The purpose of the study was to find out how a child's summer pruning robot can also be used commercially as a therapeutic robot for the elderly. In summary, Furby has positive results for elderly patients with dementia living in the facility. It has shown results both in the resident patients and in the day care where they lived, as a means of expressing positive emotions and stimulating motor and cognitive activity.

However, Furby has shown that it has several design limitations, especially in patients in bed and by controlling their own personality and voice. Demographics show that the world's population is growing rapidly, which goes hand in hand with more common diseases. Mortality is one of the diseases associated with age, and complementary therapies have been shown to play an important role in improving patients' well-being. Because the use of summer grandma robots is inspired by animal care, some of the symptoms associated with dementia are more likely to improve and decrease.

5. Conclusion:
The robot, widespread among children, promoted positive behavior in elderly patients with dementia who lived in the facility. It has proven to be a way of expressing positive emotions and a stimulus for motor and cognitive activity. However, has some design limitations, especially in bedridden patients and in terms of personality and tone control.
References:


