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Abstract title

Toward a smart home solution for domiciliary assistance in Alzheimer's diseases

Abstract body (350 word limit) should include:Background:

The number of people with Alzheimer in the European Union is estimated to be 5.8 million and is expected to double or treble by 2050. Alzheimer's patients should be constantly assisted or at home by caregivers or in nursing home by skilled workers. Some studies showed that a specific domiciliary care of Alzheimer's patients in initial stages of the syndrome can slow down the course of the illness.

However, because of the complexity of this disease, these persons are early institutionalized in nursing home with negative consequences for patients themselves and welfare costs (nursing home costs three time the domiciliary one).

In order to increase quality and time of domiciliary cares, innovative technologies, integrated in patients' domestic environments, and assistance to caregivers are crucial to perform a sterling service. The present study shows a smart domestic sensors network to help caregivers in patient monitoring and avoiding unsafe events.

Methods:

A multidisciplinary work-team consisting of clinicians, psychologists, therapists and engineers identified the potential patients to involve in the experimentation. Patients and their caregivers were interviewed to point out their life styles, habits, needs and features of their houses. The interventions and the technological solutions to be provided to subjects were defined and then developed and evaluated with a custom protocol to highlight their usability and acceptability by patients and caregivers.

Results:

A smart domestic system was produced with a ZigBee wireless sensor network (ZWSN), assistive devices and software tools.

The ZWSN is composed of a coordinator to process data sensors, identify patient's activities and send warning to caregiver if request, and of sensor nodes (beds/chairs, posture, location) and outdoor/indoor alert systems (microGSM, buzzer).

A drug dispenser, an advanced phone and a fingerprint recognition sensor for cabinets and water/gas valves security were also included.

Software tools were developed for cognitive stimulation and for outdoor localization through GPS technology and GoogleMaps website to pick patient up when he/she gets lost.

Conclusions:

The preliminary experiments showed that the system is suitable and reliable for patients' assistance and caregivers' workload reduction and highlights that it is also particularly appropriate for assistance in nursing home.