Journal of Gerontology & Geriatric Research

Chaudhary and Kumar, J Gerontol Geriatr Res
2017, 6:1
DOI: 10.4172/2167-7182.1000391

Short Communication Open Access

Role of Technology in Management of Health Care of Elderly

Bhupinder Chaudhary* **and Rachna Kumar**

Alliant International University, San Diego, California, USA

***Corresponding author:** Bhupinder Chaudhary, Alliant International University, 10455 Pomerado Road, San Diego -92131, California, USA, Tel: +1-619-751-2807; E-mail: bhupinder.chaudhary@alliant.edu

Rec date: Jan 23, 2017; **Acc date**: Feb 03, 2017; **Pub date:** Feb 05, 2017

Abstract

The latest trend in demography is the rapid ageing of population throughout the world. According to WHO, the elderly population will almost double from 12% to 22% within a span ranging from 2015 to 2050. A similar trend is anticipated for the US. The data seems to be encouraging in terms of increase in life expectancy and reduced mortality due to advancements in medical science. But the flipside is that, the increased number of elderly commands increase in number of, or visits by caregivers to manage the increased demand for Quality of life for the elderly. Another study focused on the increased stress level with emotional and physical fatigue among care givers. A partial solution to this problem can be provided by technological interventions through the branch of Gerontechnology. This paper is an attempt to enlist and analyze the technology, which can augment the Quality of life of elderly along with reducing the burden on formal and informal caregivers.

Keywords: Gerontechnology; Artificial intelligence; Caregiver; Quality of life

Introduction

In this era Technology plays an important role in our life. It has become an integral part of our routine. In an urge to be more efficient, all the progressive sectors like engineering, medical science, education etc. have initiated the use of high end and latest technology to provide better service in less time. Our daily schedule is now hugely assisted by gadgets which are enabled with technology. Smart phones, smart gadgets are helping us to make our work efficient with accuracy and reliability. Population from all age groups has adapted technology on the basis of their need and use. With increasing competition and professionalism at workplace for the younger generation, the elderly population feel more isolated than ever [1,2]. This is more problematic in Asian countries, where dependency on younger members of the family is more prominent for elders. Somehow the solution to this issue can be provided by the proper and judicious incorporation of technology in routine life for elders. It may increase their efficiency and reduce dependency for basic activities as, purchasing grocery, booking appointments, travelling, safety concerns, health concerns etc., An upcoming branch, Gerontechnology, focuses on these issues.

Gerontechnology

Gerontechnology is a combination of two words gerontology and technology. Gerontology means study of aging and technology means use of science to fulfil needs. Gerontechnology helps old age people to reduce their hurdles in daily life needs. Gerontechnology is a combination of different fields like healthcare, transportation system, education and information technology. It can be used to carry out different types of activities as: 1) the assessment of motor and cognitive abilities using advanced technology and systems to identify and address major deficits; 2) continuous evaluation of the performance of elderly people at home by using wearable gadgets to identify the onset of possible problems related to reduced performance; 3) increasing the level of autonomy at home by using technological aids to compensate possible deficits [3-5].

According to "One Hundred Year Study on Artificial Intelligence (AI100)," by Stanford University, over the next fifteen years the number of elderly in the USA will grow by over 50%. Home health aides will grow 38% over the next ten years (The National Bureau of Labour Statistics projections). In spite of the broad opportunities and advancements in this area, as, basic social support, IT enabled interaction and communication devices, home health monitoring, simple in-home physical aids such as walkers, little has happened over the past fifteen years. But the coming generational shift will accompany a change in technology acceptance among the elderly. Presently, someone who is in his 70s was born in 1940s and may have first experienced some form of personalized IT in middle age or later, while a fifty-year-old today is far more technology-friendly and savvy. Thus, there will be a growing interest and market for already available and maturing technologies to support physical, emotional, social, and mental health being [6,7].

Few examples to highlight this are:

- Increased independence by automated transportation (driverless cars etc.)
- Information sharing among family members to keep a track on elder member in the family.
- Monitoring daily activities and movements by smart devices and mobile applications
- Detection in mood or behaviour changes and alert to family members and care givers in case of perceived emergent conditions.

The Study Panel anticipated an explosion of low-cost sensing technologies that can provide substantial capabilities to the elderly in their homes. But, it will need integration across various areas of AI such as, Natural Language Processing, reasoning, learning, perception, and robotics in order to create a system that is useful and usable by the elderly. These innovations will also introduce questions regarding privacy within various circles, including friends, family, and care-

givers, and create new challenges to accommodate an increasingly active and engaged population far past retirement.

As per the Vitality Institute, recently, the toy company Hasbro launched a brand specifically for seniors, termed as Joy for All. Its first product line, the Companion Pet Cat, is a catlike article that purrs authentically and responds to hugs, motion and petting. The company found in a market research, that an interactive pet could alleviate risks associated with aging and improves interactions with caregivers and loved ones. It concluded that this product line addressed loneliness felt by almost 43% American seniors. These seniors are also at risk for increased rates of mortality along with reduction in physical and mental health [8].

According to Researcher Tamara Sims of Stanford Centre on Longevity "Using technology to connect with loved ones was related to higher life satisfaction, lower loneliness and general attainment of meaningful goals". Now a days People in America live longer than earlier with the help of technology. Andrew Reed and Dawn Carr at Florida state university surveyed 445 people between the ages of 80 and 93 and found that most of the adults over 80 are using technological gadget daily. As age grow age related changes and age related diseases start effecting life. Some of age related changes are:

- Vision issue
- Hearing issue
- Daily routine functional ability
- Muscular issues
- Bone issue
- Poverty

Some age-related diseases are

- Diabetes
- High blood pressure
- Cataracts
- Kidney problem
- Urinary problem
- Hypertension
- Depression
- Obesity
- Respiratory Diseases
- Alzheimer's Disease
- Osteoporosis
- Falls
- Substance Abuse

Gadgets available in market to help aged population

- Smartphone
- Tablet and E-Reader
- Fitness Tracker
- Medication Monitor
- Smart Watches
- Online Estate Repository

Significant use of technology in specific conditions: The patients suffering from Alzheimer's and dementia have symptoms and problems as:

- Memory Impairment
- Problems in face recognition
- Forgets medication
- May easily get lost
- Safety issues

Google Glass: It Can help patients keep track of their destination and also help care providers to keep track on them. It also aids the patients to identify the known persons by stimulating facial recognition.

GPS shoes: It Can be useful in keeping the patients on defined track.

Automatic pill dispenser: It reminds the patients about the time for medication and can dispense more than 25 types of medicines [9].

Home monitoring system: It is Used to control home appliances remotely, can alert when someone leaves or enters home and monitors the timing of inward and outward movement of elders. Stove guard avoids any accident due to any stove or gas related mistakes.

Aging in place with In-home technology: Aging in place signifies, maintaining quality and dignity of life while living conveniently at their own home as long as feasible. It gives a sense of autonomy as well as emotional, financial and cognitive stability.

Interactive systems: IT enabled systems like GrandCare and LivHOME Connect are potential information and care companions for the elderly.

GrandCare addresses the health care needs in a private residence instead of a nursing home or other similar care facility. It uses virtual communication through interactive touchscreen technology, video chat, active remote monitoring and telehealth. It can enable faster, better and more efficient care, with an economical ccost options as compared to traditional long term care services [10-12].

LivHOME Connect also works on the same principles with more or less same functionalities.

Robotics: University of Singapore has introduced 'Nadine' the world's most lifelike robot in 2015.

Pepper, the robot developed in Japan has been used in various domains as:

- Household companions.
- For medication adherence.
- Interaction and communication tool to connect with healthcare providers and caregivers.

According to the company, it became the first humanoid robot to be adopted in Japanese homes. Also, it is the first humanoid robot capable of recognising the principal human emotions and adapting his behaviour to the mood of his interlocutor.

ROMEO is another humanoid robot, designed to assist elderly in being independent despite their reduced autonomy.

Technologies like these are expected to minimize loneliness and maximize interactions.

Limitations

Though, Information Technology and Artificial Intelligence could make an important contribution in elder care, but there are certain areas which needs immediate concern: Issues regarding data security, privacy and confidentiality of records of conditions of elderly, should be addressed prior to implementation of any technology on large scale

[13]. Computer companions or care-bots can be emotionally dangerous for elderly can be emotionally dangerous and can have serious consequences and machines would never be able to understand abstract ideas such as loyalty or hurt as warned by Prof. Margaret Boden, (Professor of Cognitive Science at the University of Sussex). Cost and adaptability are also other factors to be taken care of, which may lead to low level of acceptance of a newer technology.

Conclusion

The transition from 20th to 21st century has been exponential in terms of advancements in Information Technology, specifically, Artificial Intelligence and Robotics. Now, as the average lifespan across all continents is increasing, there is a need to use this technology for the well-being of elderly population. It is extremely significant, as with changing professional and social priorities, the number of caregivers is declining posing a social and psychological threat for the elders. Technology can be supportive in the later years of life, but over reliance on technology can have its own consequences. Role of technology in patients with cognitive impairment has been proven, but provision of emotional and psychological support needs strict surveillance and monitoring.

References

1. Bouma H (2001) Creating adaptive technological environments. Gerontechnology 1: 1-3.
2. Fozard JL, Rietsema J, Bouma H, Graafmans JAM (2000) Gerontechnology: Creating enabling environments for the challenges and opportunities of aging. Educational Gerontology 26: 331-344.
3. Graafmans J, Taipale V, Charness N (1998) Gerontechnology: A sustainable investment in the future. Amsterdam: IOS Press 3-6.
4. Bouma H, Fozard JL, Bouwhuis DG, Taipale V (2007) Gerontechnology in perspective. Gerontechnology 6: 190-216.
5. http://joyforall.hasbro.com/en-us/companion-cats
6. http://thevitalityinstitute.org/innovations-artificial-intelligence-elderly/
7. http://www.businessinsider.com/japan-developing-carebots-for-elderly-care-2015-11
8. http://www.livhome.com/
9. http://www.telegraph.co.uk/science/2016/05/30/care-bots-for-the-elderly-are-dangerous-warns-artificial-intelli/
10. https://ai100.stanford.edu/sites/default/files/ai100report10032016fnl_singles.pdf
11. https://www.ald.softbankrobotics.com/en/cool-robots/romeo
12. https://www.grandcare.com/
13. Ortman JM, Velkoff VA, Hogan H (2014) An aging nation: The older population in the USA. Population Estimates and Projections 25-1140.