



Training course Senior Service Worker

Ambient assisted living services in home care and community based settings for the elderly

Basic concepts of ambient assisted living services

2014-1-CZ01-KA202-002058

1. Basic concepts of ambient assisted living services

“Wisdom comes with winters.” — Oscar Wilde

If a need exists, mankind has an outstanding ability to invent a solution. The first vision aid was invented around 1000 AD, called a reading stone. It was a glass sphere that was laid on top of writing to magnify the letters. In 1808, Pellegrino Turri of Italy built the first typewriter to help his blind friend Countess Carolina Fantoni da Fivizzano write legibly. Alexander Graham Bell's patent for the telephone in 1876 was a by-product of his studies with the hearing impaired. In more recent times, Gregg Vanderheiden, a professor at the University of Wisconsin-Madison developed the first communication device for people who cannot speak, and today continues his work to make the World Wide Web more accessible for people with disabilities. The advancement of information and communication technology has started to allow health and care services to be delivered remotely, enabling vulnerable people to be supported in their own homes rather than in hospitals or residential facilities.

Assistive technology is a rigorous multi-disciplinary field that brings together academic institutions, engineers, scientists, doctors and the public from around the world to share knowledge and improve the lives of people living with chronic conditions and disabilities.

One of humanity's greatest achievements is increased longevity. People live longer because of improved sanitation, nutrition, medical advances, healthcare, education and economic wellbeing. A population is classified as ageing when older people gain a proportionately larger share of the total population. Global ageing, driven by falling fertility rates and remarkable increases in life expectancy, is pervasive and unprecedented in human history.

According to United Nations forecasts, individuals aged 60 years and over are expected to increase from 688 million in 2006 to 2 billion (22 per cent of the world's population) by 2050. For the first time, there will be more elderly people than children under 15 years. Different countries are at very different stages of the process and the pace of this change differs greatly. For instance, Japan has seen very rapid ageing and has had to respond quickly to this phenomenon, whilst the population of countries such as Australia are ageing much more gradually. Many developing countries are ageing rapidly.

Many facets of human life will be affected by population ageing including work, housing, transport, leisure, health and relationships. The best formula for success in an ageing world



is for governments and for policy makers to become aware of both the challenges and opportunities resulting from this longevity phenomenon.

Ageing should not be viewed as a negative process. In 2006, a global ageing survey covering 21 countries and approximately 21,000 persons aged 40 years and over found that individuals generally felt good as they aged. The survey also showed that older generations are not simply passive recipients of increasing amounts of care; they continue to provide important support within the family, the community and the workplace. In many countries, older residents have higher levels of education and better financial resources than those of previous generations.

Improvements in life expectancy have led to a shift in the leading causes of death and disease. At the beginning of the 20th century, the major threats to life were infectious and acute diseases. Today, one of the major epidemiologic trends is the rise of disabilities due to chronic and degenerate diseases such as cardiovascular disease, diabetes, cancer, vision and hearing loss, and dementia. These diseases affect populations across the world regardless of income level. According to the World Health Survey more than a billion people are estimated to live with some form of disability (about 15 per cent of the world's population)¹

With greater purchasing power, older people want to remain fit, active, and self-reliant. Health and social care sectors are not well-equipped for modern needs. In the developed world, hospital-centric systems still dominate with frequently disjointed services often locked in provider-led silos, whilst in many countries in the developing world, health and social care services remain poor or non-existent.

For people with chronic conditions and/or disabilities, the ability to participate in society depends on their needs being actively addressed. Without such support, individuals can become dependent on family members who may have to give up paid employment to care for them. In many cases this has resulted in both parties having a poorer quality of life due to reduced income and social exclusion. For example, in the UK, a 2011 survey revealed that 4 in 10 people were in debt as a result of caring, and 1 in 2 had been adversely affected by the

1 Leeson, G W & Harper S (2008) Some descriptive findings from the Global Ageing Survey (GLAS): Investing in Later Life. Oxford: Oxford Institute of Aging, University of Oxford.



stress of financial strain related to caring². Emerging technologies have the potential to facilitate better access and to reduce the costs associated with health and social care.

In recent decades, information and communications technology has become ubiquitous throughout society. The advancements of sensor technology, and the Internet-based tools have created new ways of delivering health and social care services. Along with these developments, new terms have been coined such as assistive technology, telemedicine, telecare, telehealth, e-health and m-health. While each covers a different subject area, there are considerable overlaps.

Assistive technologies

The term embraces a wide variety of devices including “no-tech” items such as Velcro to allow easy fastening of clothing, “low-tech” solutions such as a walking cane or stair lift, and “high-tech” devices in the home such as sensors that monitor falls, fire or flooding, as well as “telecare” and “telehealth” care packages. These systems can be supportive, preventive and responsive and can be classified according to their role. Assistive technology can also help caregivers. Instead of a husband having to read a letter to his wife because she has severe sight loss, she could use a magnifier or scan-and-speak software. A family member that lives miles from their loved one can keep in touch through video calls or monitor their movements around the home using sensor software through the internet.

Types of assistive technologies

Assistive technologies can be supportive, preventive, or responsive and can be classified according to their role.

Supportive technologies help individuals perform tasks they may find difficult, e.g.:

- Medication reminder unit
- Stair lift
- Hearing aid
- Magnifier

² . Carers UK (2012) Future Care: Care and technology in the 21st century. Technology Strategy Board: London



Responsive technologies help individuals manage risks and raise alarms, e.g.:

- Pendant alarm
- Gas detector

Preventive technologies help to prevent dangerous situations and raise alarms, e.g.:

- Fall predictors
- Monitors for assessing physiological symptoms
- Room occupancy monitors.