

High Demand of Digital Health Technologies for Elderly and Dementia Care during COVID-19 Pandemic

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Krishna Prasad Pathak^{1*} and Luiz Ramos Robberto²

¹*Nepal Open University, Alzheimer Related Dementia Society Nepal. Department of Preventive Medicine, EPM/UNIFESP, Nepal*

²*Department of Preventive Medicine, EPM/UNIFESP*

***Corresponding Author:** Krishna Prasad Pathak, Nepal Open University, Alzheimer Related Dementia Society Nepal. Department of Preventive Medicine, EPM/UNIFESP, Nepal.

COVID-19 is a global pandemic, with the highest rates in the US [1]. Many countries have enforced lockdown and social distancing as a process to control the epidemic [2]. Despite such stringent global efforts, the numbers of cases are again continuing to rise [3], and all aspects of society are being impacted [4]. The cases of COVID-19 in South Asian are comparatively less than developed countries, even though poor health care facilities are available [5]. Internationally, health authorities and governments are warning older people (those over 65 years old) of the high risk of negative outcomes associated with COVID-19 [6]. Older people and those with dementia are at high-risk of COVID-19 due to their age and multiple comorbidities.

An important element to consider is that people with dementia may have limited access to information on COVID-19 and experience difficulties in applying safety strategies (social isolation, self-quarantine measures, wearing masks, and personal hygiene). Therefore, people with dementia may be more dependent on family members and social caregivers to support them [7] to live within government guidelines. This is further impounded by the provision of information through social media and the implementation of digital health technologies. Older people with dementia living in residential settings have not been able to engage with their family members due to the banning of visitors and with the cessation of group activities [8], older people, and those with dementia, are becoming further isolated [9].

The consideration of the impact of COVID-19 on older people and those with dementia is essential due to the aging global population [10]. The global population of those over 65 years of age was estimated to be over 562 million in 2012, and the population of older adults rose by 55 million in 2015, which is projected to be double by 2050 [11]. Cognitive impairment is common in the older population, although is not a natural part of ageing [12]. The cognitive function of an individual may decrease with age, but mild cognitive impairment and dementia impacts on the person's ability to independently complete their own activities of daily living, as well as impacting on their memory, language, and orientation. Recent studies showed that the use of computer helped in cognitive stimulation and improved cognitive function with mild cognitive impairment of elderly people [45]. The combined intervention of digital inclusion and physical exercise helped to prevent cognitive and

functional loss with elderly [46]. Cognitive decline is a significant issue in aging and it is associated of dementia patients and increases independence, quality of life and falls. Thus, dementia can negatively impact on a person's quality of life and life expectancy [13]. Dementia poses a challenge to the long-term financial sustainability of health systems worldwide [14]. Likewise, the number of people living with dementia in the developing countries will reach to 71% by 2040 [15] in developed countries such as Western Europe 9.9%, in North America 9.2%, and in America 9.1% of the population by 2040 [16] furthermore, older adults with dementia require further care services such as; care delivery, medication management, education and training for family members and informal caregivers, cognitive interventions, but also leisure activities to support a person with dementia to remain independent, all of which are currently extremely limited [17].

Interventions to support people with dementia at home, have begun to use video telehealth, which has been found to be feasible to deliver cognitive rehabilitation [18] and improve cognitive performance [19, 20]. Face to face videoconference [21], pharmacological interventions [22], technology-based behavioral interventions [23] and cognitive assessments [24]. These approaches demonstrate that technology-based interventions for older people and those with dementia appears both affordable [25] and reliable [26]. COVID-19 has forced and enabled the adoption of technology in dementia support and care in the form of prevention, early detection, care, management and diagnosis [27]. The applications of these technologies could support older people and those living with dementia in rural areas, and those who have migrated and may have linguistically diverse languages. The COVID-19 crisis has provided the opportunity to embrace technology, to support older people, and those with dementia to maintain their connections with the outside world during self-isolation. Health policy makers, service providers and clinicians need to consider these innovative opportunities and support the technological transformation of dementia practice in the coming years [28].

Digital health technologies can support a reduction in the provision of care in hospital settings, and support the management of infections [29]. Considering a significant contribution of digital technologies, the American Academy of Neurology has developed guidelines to implement telemedicine services for clinicians to assess and examine their patients, although some limitations have been acknowledged, such as the follow-up appointments [30]. However, this has not been converted into clinical practice as yet. COVID-19 has forced nations to consider the use of digital health, such as telehealth and e-health, which can contribute to the management of communicable diseases during the pandemic and possibly slow the infection rate of COVID-19 through supporting social distancing [31]. Digital health technologies provide and improve patients' health, and reduces expenses and as well as the need for care facilities [32]. Telemedicine and mobile care tele-mentoring, tele critical care were significantly useful to offer care facilities during COVID-19 [33]. Within the specialist field of dementia memory screening tools, care, management of behavioral and psychological symptoms in dementia and consultations [34], have occurred through the use of remote technology. This approach has supported the difficult balance of maintaining social distancing and continuing to support people living with dementia, and those caring for them, but has also enable a significant cost reduction to the health system and decreased the risk of infections [35]. Furthermore, these processes have enabled clinical decisions, diagnoses and outcomes to be supported in a timelier manner, supporting earlier intervention opportunities [36] to support and improve mental health.

Technology can also contribute to the reduction of the burden on healthcare institutions and professionals [37]. Technology has also been applied through satellite monitoring, health sensors and apps, Drones (drones were applied in carrying medicine), spraying disinfectants and 3D Printing which was deployed to mitigate shocks to the supply chain and export bans on personal protective equipment [38]. Digital health technologies have not only supported older people and those with dementia, through remote screening and the facilitation of care during a pandemic [39]. Telehealth played directly and indirectly in reducing the contamination by enabling physical distancing, tracking symptoms and detecting timely using interventions [40]. Further, telehealth supported to bring out put with patients' safety, reliable and flexible regulatory [41]. Virtual care using technologies in home patients and out patients care in health institution, initial COVID-19 hospital surge, and post pandemic recovery was most effective for the care of the dementia patients [42].

Emerging technologies are changing our daily lives under lockdown. The COVID-19 crisis has shown a further way that emerging technologies like the internet and artificial intelligence are not just tools, they are essential to the functioning of our society and econo-

my in this 21st century. Thus, such digital tools must adapt as essential developmental procedure as the time progress. It is not only for COVID-19 issues but also should be implemented to make our daily life easiest than before to fight with communicable disease. Digital technology enables to educate from remote to health workers and populations to follow better care in limited resources and accurately using the Chatbots information getting update of current health systems and patients care home location of their activities and protect from the spread of the virus. Also, saved time, money and to all the sectors and will be cost effective [43].

However, is still a gap in the research regarding how and which digital health (DH) technologies can be effective to support older people and those with dementia patients. But the reality is we are seeking more reliable proof to apply and implement the full potential of this growing area in health science [44]. Therefore, supporting older adults with dementia and maintaining their well-being during COVID-19 has become an urgent to apply digital health technology.

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