

Assisted Technology and Mental Health

Hamed Al Sinawi

senawi@squ.edu.om

Sr. Consultant old age Psychiatrist, Sultan Qaboos University Hospital, Muscat-Oman

Abstract- This manuscript discusses the potential use of assistive technology in promoting the mental health and well-being of the growing elderly population in the Arab world. While the use of assistive technology to address physical needs has been around for some time, its use in enhancing mental health and well-being is still in its early days. The manuscript highlights that assistive technology interventions have been shown to benefit the mental health of older adults. However, there are limited publications on the use of assistive technology in the Arab world, and certain assumptions held by healthcare professionals may hinder the access of older adults to these programs. The manuscript suggests introducing the topic of assistive technology in the medical and nursing undergraduate curriculum to address any misconceptions and make the technology more user-friendly. The manuscript also describes two specific types of assistive technology, mental health chatbots, and GPS trackers, and their potential benefits for older adults.

Keywords- Assistive technology, elderly population

1. Introduction

The elderly population is increasing worldwide, and the middle east is not an exception (Rudnicka et al., 2020). This increase is often attributed to improvements in health care and social welfare. According to a report published by the United nation in 2017, it is anticipated that the population of the Arab world will increase from 281 million in 2000 to a virtually astonishing 659 million in 2050, or from 6.02 percent to 15.2 percent of the world's population. This will increase by 60% over the 35 years from 2015 to 2050. This increase calls for more need to establish specialized services that cater to both the health and social welfare needs of older adults (GBD 2019 Dementia Forecasting Collaborators, 2022).

2. Assisted Technology in Mental Health

Assistive technology refers to any products or pieces of equipment that enhance any day-to-day activities for those living with a disability and older adults, such technology can prevent, compensate or alleviate a disability, functional incapacity, or disadvantage and improve autonomy and quality of life (QOL) (Shanmugam & Marimuthu, 2021). In healthcare, Assistive products are used to maintain or improve individuals functioning and independence which eventually promotes their well-being. This includes Hearing aid devices, wheelchairs, communication aids, spectacles, prostheses, pill organizers, and memory aids.

While the use of Assisted technology in addressing physical needs has been used for some time, its use in enhancing mental health and well-being is still in its early days (Scoglio et al., 2019). This can be attributed to certain assumptions held by some members of the healthcare team such as “older adults fear technology and do not want to learn how to use it” or “the elderly would never be Internet savvy so it’s pointless to teach them” such assumptions if not addressed and challenged may deny older adults from accessing internet-based assistive technology programs.

The aging process includes changes in cognition, perception, and physical function which can impair the person’s ability to process information (Uddin, 2021). This eventually affects the older person’s ability to communicate effectively with others. Older people who live alone are more likely to experience solitude and loneliness. Assistive Technol can help older adults remain independent and more involved in society for as long as possible (Moyle, 2019). There are also more specialized products to enhance the mental health and well-being of people of all ages that can be used by older adults. According to recent research, assistive technology interventions have been demonstrated to benefit older adults’ mental health specifically in conditions such as depression, anxiety, and even dementia. Smartphone applications using CBT are becoming very popular and easy to use. Such applications provide daily tips on managing mild to moderate depressive symptoms and encourage individuals to adopt and maintain a healthy lifestyle (Kruse et al., 2020). The research of Cotton et al. suggests that computer use by retirees can reduce the risk of depression by more than 30%. that the most important benefits came not from the type of Internet activity (e.g., shopping, e-mail), but from the ability to communicate and obtain needed information (Scoglio et al., 2019).

3. The situation in the Arab world

The Middle East is experiencing a significant increase in the number of elderly individuals, with a corresponding rise in the prevalence of mental health conditions. A systematic review aims to evaluate the existing literature on the use of assistive technology in elderly mental health care in the Middle East found 22 studies conducted in different countries such as Iran, Saudi Arabia, and the United Arab Emirates. The studies investigated various types of assistive technology, such as telemedicine, mobile apps, and virtual reality (Pedrozo Campos Antunes et al., 2019). The findings suggest that assistive technology can improve the mental health outcomes of elderly individuals in the Middle East. For example, telemedicine has been shown to increase access to mental health services, reduce stigma, and improve the quality of care. Mobile apps have been found to be effective in managing depression and anxiety symptoms. Virtual reality has been shown to reduce stress and improve the cognitive function of elderly individuals. However, the implementation of assistive technology faces various challenges related to cultural attitudes, lack of resources, and limited awareness of available technologies other obstacles include the affordability of computers and smartphones by some older adults in lower- and middle-income countries. Some family members and people working in mental health toward older adults may hold negative attitudes toward older adults’ use of the internet which may hinder the advance in this field in terms of introducing the technology or making it more user-friendly for non-English speakers. Some healthcare workers perceive assistive technology as a threat to traditional care practices which may

hinder the adoption of these technologies in their clinics. These obstacles can be addressed by introducing the topic of assistive technology to the medical and nursing undergraduate curriculum. This would help address any misconceptions and introduce the students to the potential use of assistive technology. Most of the applications described above are limited to English so speakers of other languages who are not fluent in English by not be able to use them widely. Therefore, it's essential to start working on an application that uses another language and makes them culturally relevant. Enabling older adults to use computers and smartphones by making them more affordable and accessible to people with visual impairment and conducting training sessions and making would prompt their use. Below is a summary of types of assistive technology used to provide mental health care for the elderly.

3.1. Mental Health Chatbots

These are types of Artificial Intelligence-based online services that you access via websites or mobile apps. The user types of his questions and comments into a text box and the 'bot' responds to you almost immediately. The chatbot does a similar job to a therapist or coach although being operated by a computer that communicates in a friendly manner that makes it easier to connect with. Mental health chatbots can provide support and advice to people experiencing mild to moderate psychological distress (*Assessing the Usability of a Chatbot for Mental Health Care — Ulster University, n.d.*). They can track users' responses over time and offer tips to manage symptoms of anxiety and sad mood. When the user is experiencing more severe symptoms, the chatbot will recommend nearby mental health services, hotlines, and support groups.

3.2. Psychotherapy based Smartphone Applications

Recent research has shown that assistive technology interventions have been demonstrated to benefit older adults' mental health, specifically in conditions such as depression, anxiety, and even dementia. Smartphone applications using Cognitive-Behavioral Therapy (CBT) are becoming very popular and easy to use. Such applications provide daily tips on managing mild to moderate depressive symptoms and encourage individuals to adopt and maintain a healthy lifestyle. Research by Cotton et al. suggests that computer use by retirees can reduce the risk of depression by more than 30%. The most important benefits came not from the type of internet activity (e.g., shopping, e-mail) but from the ability to communicate and obtain needed information.

3.3. GPS Trackers

Dementia is a group of cognitive disorders that usually affect the elderly and impair their memory, social behavior and overall functioning. As the disease progresses, a person with dementia would walk out of his home and find it difficult to return. This is known as wandering, and it is common in people who have Alzheimer's and other cognitive disorders. This puts him at risk of getting lost, being involved in a traffic accident, or getting exposed to extreme weather conditions. It is also distressing for the caregiver who would spend time and effort to locate their missing loved one. GPS tracking devices are worn like a wristband or a watch and would send a notification to a registered mobile phone informing them of the location of their loved one. There are few ethical

concerns about this technology especially when the tracked person is unable to consent but the overall impression that their benefit outweighs any ethical issues especially when the person wanders frequently. The technology can be provided at a low-cost so it can be affordable to people from lower socioeconomic backgrounds.

3.4. Communication Aids

Mobile phone applications are used for communication such as what's up and are useful in helping older adults keep in touch with friends and family. The voice-recorded messages provide a choice for people who are unable to type a text message which makes it easier for the person to express his feelings. Other social media applications such as Facebook and Instagram provide an opportunity for the person to make virtual friends and communicate with friends and families. Other applications allow for the person to develop a private room where family members share their photos with their loved one who has early dementia and use such photos to stimulate their memories about past events and share good moments with them. Such applications are easy to navigate and more secure which protects people who may be vulnerable to internet fraud.

3.5. Memory Aids

Memory aids are devices that remind the person to take their medications or attend a particular appointment. These are extremely helpful for people who have memory impairment and would depend on their caregivers to remind them to attend to a particular task which keeps the person more independent and reduce the burden on their caregivers.

4. Conclusion and recommendations

The use of assistive technology has been shown to be beneficial in promoting the mental health and well-being of older adults. However, its use in the Arab world is still in its early days, and there are limited publications on its potential benefits. Addressing misconceptions and introducing the topic of assistive technology in the medical and nursing undergraduate curriculum can help make it more user-friendly and accessible to older adults. Mental health chatbots and GPS trackers are examples of specific types of assistive technology that can be used to enhance the mental health and well-being of older adults. It is important to continue to explore the potential of assistive technology in promoting the mental health and well-being of older adults in the Arab world and beyond.

5. References

Assessing the Usability of a Chatbot for Mental Health Care—Ulster University. (n.d.).

Retrieved May 31, 2023, from <https://pure.ulster.ac.uk/en/publications/assessing-the-usability-of-a-chatbot-for-mental-health-care>

- GBD 2019 Dementia Forecasting Collaborators. (2022). Estimation of the global prevalence of dementia in 2019 and forecasted prevalence in 2050: An analysis for the Global Burden of Disease Study 2019. *The Lancet. Public Health*, 7(2), e105–e125.
[https://doi.org/10.1016/S2468-2667\(21\)00249-8](https://doi.org/10.1016/S2468-2667(21)00249-8)
- Kruse, C. S., Fohn, J., Umunnakwe, G., Patel, K., & Patel, S. (2020). Evaluating the Facilitators, Barriers, and Medical Outcomes Commensurate with the Use of Assistive Technology to Support People with Dementia: A Systematic Review Literature. *Healthcare (Basel, Switzerland)*, 8(3), 278. <https://doi.org/10.3390/healthcare8030278>
- Moyle, W. (2019). The promise of technology in the future of dementia care. *Nature Reviews. Neurology*, 15(6), 353–359. <https://doi.org/10.1038/s41582-019-0188-y>
- Nan, Y., Xie, Y., & Hu, Y. (2023). Internet use and depression among Chinese older adults: The mediating effect of interpersonal relationship. *Frontiers in Public Health*, 11.
<https://www.frontiersin.org/articles/10.3389/fpubh.2023.1102773>
- Pedrozo Campos Antunes, T., Souza Bulle de Oliveira, A., Hudec, R., Brusque Crocetta, T., Ferreira de Lima Antão, J. Y., de Almeida Barbosa, R. T., Guarnieri, R., Massetti, T., Garner, D. M., & de Abreu, L. C. (2019). Assistive technology for communication of older adults: A systematic review. *Aging & Mental Health*, 23(4), 417–427.
<https://doi.org/10.1080/13607863.2018.1426718>
- Rudnicka, E., Napierała, P., Podfigurna, A., Męczekalski, B., Smolarczyk, R., & Grymowicz, M. (2020). The World Health Organization (WHO) approach to healthy ageing. *Maturitas*, 139, 6–11. <https://doi.org/10.1016/j.maturitas.2020.05.018>

Scoglio, A. A., Reilly, E. D., Gorman, J. A., & Drebing, C. E. (2019). Use of Social Robots in Mental Health and Well-Being Research: Systematic Review. *Journal of Medical*

Internet Research, 21(7), e13322. <https://doi.org/10.2196/13322>

Shanmugam, A. K., & Marimuthu, R. (2021). *A Critical Analysis and Review of Assistive*

Technology. 263–281. <https://doi.org/10.1016/B978-0-12-822271-3.00001-3>

Uddin, L. Q. (2021). Cognitive and behavioural flexibility: Neural mechanisms and clinical considerations. *Nature Reviews Neuroscience*, 22(3), Article 3.

<https://doi.org/10.1038/s41583-021-00428-w>