Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Elsevier hereby grants permission to make all its COVID-19-related research that is available on the COVID-19 resource centre - including this research content - immediately available in PubMed Central and other publicly funded repositories, such as the WHO COVID database with rights for unrestricted research re-use and analyses in any form or by any means with acknowledgement of the original source. These permissions are granted for free by Elsevier for as long as the COVID-19 resource centre remains active.
Older Adults Knowledge about using smart technology during the Covid-19 crisis-a qualitative pilot study

Ana Marija Hošnjak*, Ana Pavlović**

*University of Applied Health Sciences, 10000 Zagreb, Croatia, Alma Mater Europaea - ECM, 2000 Maribor, Slovenia (e-mail: Anamarija.hosnjak@zvu.hr)
** Sestre milosrdnice University Hospital Center, 10000 Zagreb, Croatia

Abstract:

Introduction: The exponential increase of the older population is coinciding with the growing challenges of digital technology in the different socio-cultural environments. This pilot study aimed to examine the knowledge of institutionalized elderly people about the use of technology and digital literacy and to analyze the perspectives of older users on the impact of smart technology on their lives during the Covid-19 pandemic.

Methods: 10 users of the Home for the Elderly and Infirm "Jordanovac", Zagreb participated in a semi-structured 1:1 interview conducted in January 2021 after the approval of the Ethics Committee, respecting all epidemiologically prescribed measures. All narratives were recorded, then transcribed into tables, and went through a content analysis process.

Results: All 10 participants (average age: 83.4) use and own a mobile device, but only 4 of them use smart devices. They mostly use ordinary calls for communication, and of the applications, with only 3 users, Viber, WhatsApp, and video calling are equally represented. Only one user uses Skype to communicate with their family.

Discussion: Despite long-term isolation, respondents do not see technology as an opportunity to establish and maintain social contacts and do not have enough knowledge about using it. Most were educated on their own or by their families, which can be a good starting point for developing strategies in the form of activating volunteers who would teach the elderly about the possibilities of using digital content after the Covid crisis.

Copyright © 2021 The Authors. This is an open access article under the CC BY-NC-ND license (https://creativecommons.org/licenses/by-nc-nd/4.0/)

Keywords: smart technology, COVID-19, older people, Home for the elderly and infirm
1. INTRODUCTION

Since research on Internet use in older age began in 2011, the results have shown that adults aged 75 and over were the least represented subscribers with only 20% of users, and in 2019 that percentage will still rise to 47%. Today's statistics show that 83% of elderly users know how to use the Internet (Office of National Statistics 2019).

Rapid and daily changes in the development of technology and its integration into everyday life prove that technology is no longer just an optional supplement but the basis of every individual's life. Namely, digitalization provides some benefits to improve the lives of all persons, especially the most vulnerable populations in underdeveloped places (Lewin et al. 2019).

The benefits of using digital technology in old age are many: it reduces feelings of loneliness and social isolation, allows for independent living by others, allows for control over one's own decisions, and active participation in community life. (Audit Commission 2004; Department for Communities and Local Government 2008).

Last year was anything but an ordinary year. The whole world felt the effects of isolation and closure. Suddenly, all the work moved to a safe home environment, to the living room. Day by day we learned to use new applications, tools to make tasks easier, ordering online. We moved from the macrocosmic to our microcosmos. Technology has become every day, internet access the most basic non-physiological need. However, in the whole crisis, the most vulnerable suffered the most - our elderly fellow citizens who lived in homes for the elderly and infirm who began to close themselves out by government decisions.

Internationally, health authorities and governments have warned older people that they are at a greater risk of more serious and possible outcomes caused by the COVID-19 virus. Therefore, the global recommendation for the elderly population included social isolation, which includes staying at home and avoiding contact with other people, possibly for a longer period (Brooke and Jackson 2020), which is currently estimated at almost 11 months. Social isolation includes avoiding social contact with family members and friends, organizing the delivery of basic groceries where social distance measures should again be adhered to. Considering the instructions around the world regarding the new situation and the COVID-19 pandemic, all media, news, tabloids especially emphasize the importance of isolating the elderly from the outside world. The problem that arises is the appearance of social isolation and loneliness.

Social isolation and loneliness are related, but different concepts. Social isolation refers to a lack or limited of social contact with others or physical separation from family, friends, or wider social networks and a lack of involvement in social activities (Valtorta and Hanratty 2012) due to environmental constraints rather than an individual's ability not to create or maintain social relationships (Tanskanen and Anttila 2016). While loneliness, on the other hand, is the perception of subjective feeling of being lonely with a lack of connection or togetherness with others (Victor et al. 2005).

The literature suggests that the meaning of life among older people is greater when they have access to family and friends, more interpersonal intimacy, mutual help in daily life, higher levels of education, emotional support, better health status (Lewnard and Lo 2020).

In the best intention to protect them and save their lives as the most vulnerable group, we have forgotten to respect their feelings and that institutional isolation easily leads to personal isolation that leads to anxiety and depression. Timely recognition of the social isolation and loneliness of older people is paramount because of the detrimental impact on their physical and mental health, which has been discussed for almost two decades. Social isolation and loneliness increase the risk of anxiety, depression, cognitive dysfunction, heart disease, and ultimately mortality (Shankar et al. 2017; Santini et al. 2020; Morley and Vellas 2020).

Smart technology is extremely important for older people during the Covid-19 pandemic, but there is still not enough research and knowledge on how Covid-19 affects the quality of life among older people from different cultures and how technology is related to their meaning of life during the Covid-19 pandemic (Trzebiński, Cabański, and Czarnecka 2020).

Based on these assumptions, the main aim of this pilot study was to examine the knowledge of institutionalized elderly people about the use of technology and digital literacy.

2. METHODS

2.1. Participants

The study was conducted at the Home for the Elderly and Infirm "Jordanovac", Zagreb on their 10 beneficiaries who met the following conditions for inclusion: (1) age 65 years or older; (2) the person owns a mobile device and/or uses digital technology, (3) clearly understands the purpose and goals of this study and wants to participate, (4) without acute symptoms of the disease. Participation was voluntary, respecting all prescribed epidemiological measures. The Ethics Committee gave a positive opinion for the implementation on this study.

2.2. Data collection

In January 2021, the co-author of this paper — a nurse — conducted semi-structured interviews with all participants. In the first phase of conducting the interviews, they were recorded and later literally transcribed into an excel table. The interviews were conducted in the premises of the Home for the Elderly and Infirm and each lasted about 15 minutes. The questions asked to the respondents were as follows: (1) What devices do they use for communication (mobile phone, tablet, computer, laptop…) ?; (2) Do they know how to use applications and if so, what are they (Viber, WhatsApp, Messenger, video call…); (3) Who taught them to use these applications ?; (4) How often do they communicate in this way with their family ?; (5) How long has it been since they...
saw no one from their family because there was a ban on visiting; (6) How did they feel during the isolation?
In the second phase, collected interviews were checked by the authors of this paper for content analysis. After reading these interviews, the data were distributed to create content units.

3. RESULTS

10 users of the Home for the Elderly and Infirm "Jordanovac", Zagreb were included in this study. The youngest respondent is 67 years old, the oldest user who participated in the study is 92 years old, the average is 83.4 years. Looking at the distribution by gender the interview was attended by 6 women and 4 men. Demographic data and data on smart device ownership are shown in Table 1.

| NAME      | GENDER | AGE | HAS A "SMART" DEVICE |
|-----------|--------|-----|----------------------|
| Jasna     | F      | 84  | NO                   |
| Zvonimir  | M      | 84  | NO                   |
| Željko    | M      | 67  | YES (smartphone and laptop) |
| Ivanka    | F      | 79  | YES (smartphone)     |
| Mirjana   | M      | 67  | NO                   |
| Marijan   | M      | 75  | YES (smartphone and tablet) |
| Slavko    | M      | 90  | YES (smartphone and laptop) |
| Alojzija  | F      | 92  | NO                   |
| Vera      | F      | 90  | NO                   |
| Ladislava | F      | 85  | NO                   |

3.1. Device for communication and frequency of communication with the family

All 10 respondents have their mobile devices, but only 40% of them use smartphones, while others use devices only with the ability to make calls and send SMS messages and answered that they do not know/have never heard/used applications or understand their purpose. 4 people who have smartphones know and use them and use applications such as Viber (Mirjana and Slavko), WhatsApp (Mirjana and Marijan), video calls (Mirjana and Slavko), while only Željko uses Skype, Facebook, and e-mail. All four have a smartphone, two of them additionally use a laptop, and one a tablet. Since the beginning of the pandemic, they have not been allowed close contact with the closest family member. They can be seen only over the fence or from balconies and windows, which is difficult for everyone, but on average they are heard with them 1-3 times a week by phone. People who use the apps communicate with their family more often: daily versus 1-3 times/week for people who don’t use smartphones.

3.2. Education on the use of technology

In previous years, Željko, Mirjana, and Ladislava learned to use mobile phones on their own, while everyone else mentioned a member of their immediate family (usually grandchildren) who had been trained with them on the use of mobile devices.

3.3. Personal comment on the pandemic and isolation

Despite long-term isolation, respondents do not see technology as an opportunity to establish and maintain social contacts. Most of all, they lack close live contact, walks with family, and the opportunity to have coffee with them. They are aware of the current situation and all 10 participants stated that they have adapted to the new way of life and that they are no longer as sad and anxious as at the very beginning of the pandemic. With strong optimism, they emphasize that now, after vaccination, everyone has better times.

4. DISCUSSION

One of the main challenges for the aging individual today is to adapt to the demands of the modern world, and among them is the need to use modern technology and access the Internet. The Internet allows older people to communicate with relatives and friends, expand their circle of friends and fill their free time. Digital barriers can become an element of exclusion for older people, which can deprive them of the opportunity to participate in the present time (Ordonez, Yassuda, and Cachioni 2011).
Research by Small et al (2009) confirms that Internet use potentiates cognitive skills and confirms current knowledge.
Furthermore, they found that some areas of the brain were more active in decision-making tasks and complex reasoning tasks after a person participated in several internet search sessions. These results suggest that, despite changes in neurobiological functioning caused by aging, complex activities such as Internet browsing may improve mental capacity in the elderly and consequently improve their cognitive skills (Small et al. 2009). Some studies suggest that the use of modern technology increases self-confidence, social interaction, satisfaction with one's life, and reduces depression and feelings of isolation. (Chen and Persson 2002).

Although the literature states that older people use modern technology and smart devices (e.g., personal computers, smartphones and tablets, software, Internet) daily to communicate via e-mail, via the Internet video/phone calls, online chat/instant messaging, using search engines, social networking sites, applications, word processing, and online shopping (Finn 2020), the results of our study suggest otherwise. A small number of respondents own a smart device and use applications.

Data from around the world indicate that the use of smart technology is a significant predictor of reduced loneliness, higher levels of social support, fewer symptoms of depression, better self-esteem, less chronic illness, greater life satisfaction among older individuals. (Finn, 2020). Most elderly patients are unable to use the technology as effectively as the younger population. Elderly patients suffering from Alzheimer's disease and dementia or having some physical limitations such as arthritis or Parkinson's disease will continue to be at a disadvantage due to their mental and/or physical restrictions. Another factor is digital literacy, as some older people are reduced digitally literate compared to younger people (Elbeddini et al. 2020). We must also consider the cultural influence on using technology in population older people (von Humboldt et al. 2020). As already shown in the results, the closest family members participated in the education of our respondents on the use of technology, and due to the protocol of social exclusion and isolation, the conditions for continuing education have further deteriorated. Revenue is also an important factor because a device that supports applications is initially more expensive and using the Internet and data traffic is an additional cost. Gonzales-Onate (2015) and his colleagues concluded that older people are slowly adapting to new technological advances and that this is mainly the result of insufficient training and education in the field of information and communication technologies. These results are encouraging for new start-ups targeted at this specific group with methodologies tailored to their needs, capacities, and constraints. The technology industry must offer a wide range of products and services tailored to the needs of the elderly that allow easy adaptation, use, and application (González-Oñate, Fanjul-Peyró, and Cabezuelo-Lorenzo 2015).

We see the solution for this problem in organized non-formal learning of digital technologies by volunteers or as part of a project. By developing these strategies and meeting the expected goals, we believe that in the next similar study, the results would be significantly better in terms of application use and that older people would finally realize all the benefits of this type of communication, especially in situations as forced isolation and lockdown.

5. CONCLUSION

Despite the faster growth of modern technology and daily new information in the digital market, older people still do not have enough knowledge about using it. Through socially useful learning, volunteer communities, various associations, consideration should be given to activating volunteers in homes that would have the task of conducting direct education on modern technology for the elderly. In this way, users would be able to socialize, acquire new useful knowledge, increase self-confidence, and prevent personal isolation and anxiety.

LACK OF STUDIES

Too few respondents met the required criteria. The goal in the future is to repeat the study on more respondents and in more homes when epidemiological measures will allow us to implement more easily. Until then, we guard and protect ourselves and them.

THANKS

The authors thank the Home for the Elderly and Infirm "Jordanovac" for allowing them to enter the home and conduct research.

REFERENCES

Audit Commission. (2004). Assistive technology. National Report. London, UK.
Brooke, J., and Jackson, D. (2020) Older People and COVID-19: Isolation, Risk and Ageism. J of Clin Nurs 29 (13-14): 2044-46.
Chen, Y., and Persson A. (2002). Internet use among young and older adults: relation to psychological well-being. Educ Gerontology, 28 (9): 731-44.
Department for Communities and Local Government. (2008). *A National Strategy for Housing in an Ageing Society.* London, UK

Elbeddini, A., Prabaharan, T., Almasalkhi, S., Tran, C., and Zhou Y. (2020). Barriers to Conducting Deprescribing in the Elderly Population amid the COVID-19 Pandemic. *Research in Soc and Admin Pharmacy,* 17 (1): 1942–45.

Finn, C. (2020). How tech is helping elderly fight coronavirus lockdown loneliness. *Al Jazeera.com*

González-Oñate, C., Fanjul-Peyrò, C., and Cabezuelo-Lorenzo F. (2015). Use, Consumption and Knowledge of New Technologies by Elderly People in France, United Kingdom and Spain. *Comunicar* 23 (45): 19–28.

von Humboldt S., Mendoza-Ruvalcaba, N.M., Arias Merino, E.D., Costa, A., Cabras, E., Low, G., and Leal. I. (2020). Smart technology and the meaning in life of older adults during the Covid-19 public health emergency period: a cross-cultural qualitative study. *International Review of Psychiatry,* 32 (7-8).

Lewin, C., Smith, A., Morris, S., and Craig, E. (2019). Using Digital Technology to Improve Learning. *Evidence Review.* London: Education Endowment Foundation.

Lewnard, J.A., and Lo, N. (2020). Scientific and Ethical Basis for Social-Distancing Interventions against COVID-19. *The Lancet Inf Diseases,* 20 (6): 631–33.

Morley, John E., and Vellas B. (2020). “COVID-19 and Older Adult.” *The J of Nutr, Health & Aging,* 24 (4).

Office of National statistics. (2019). Internet Access - Households and Individual, Great Britain.

Ordonez, T. N., Sanches, Y.M., and Cachioni, M. (2011). Elderly Online: Effects of a Digital Inclusion Program in Cognitive Performance. *Arc of Geront and Geriatrics,* 53 (2): 216–19.

Santini, Z.I., Jose, P., York, C. E., Koyanagi, A, Nielsen, L., Hinrichsen, C., Meilstrup, C., Madsen, K., and Koushede V. (2020). Social Disconnectedness, Perceived Isolation, and Symptoms of Depression and Anxiety among Older Americans (NSHAP): A Longitudinal Mediation Analysis. *The Lancet Pub Health,* 5 (1): e62–70.

Shankar, A., McMunn, A., Demakakos, P., Hamer, M., and Steptoe A. (2017). Social Isolation and Loneliness: Prospective Associations with Functional Status in Older Adults. *Health Psychology,* 36 (2): 179–87.

Small, G.W., Moody, T.D., Siddarth, P., and Bookheimer, S.Y. (2009). Your Brain on Google: Patterns of Cerebral Activation during Internet Searching. *The Amer J of Geri Psych,* 17 (2): 116–26.

Tanskanen, J., and Anttila, T. (2016). A Prospective Study of Social Isolation, Loneliness, and Mortality in Finland. *Amer J of Pub Health,* 106 (11): 2042–48.

Trzebiński, J., Cabański, M., and Czarnecka J.Z. (2020). Reaction to the COVID-19 Pandemic: The Influence of Meaning in Life, Life Satisfaction, and Assumptions on World Orderliness and Positivity. *J of Loss and Trauma,* 25 (6–7): 544–57.

Valtorta, N., and Hanratty, B. (2012). Loneliness, Isolation and the Health of Older Adults: Do We Need a New Research Agenda? *J of the Royal Soc of Med,* 105 (12): 518–22.

Victor, C. R., Scambler, S. J., Bowling, A., and Bond, J. (2005). The Prevalence of, and Risk Factors for, Loneliness in Later Life: A Survey of Older People in Great Britain. *Age and Soc,* 25 (6): 357–75.