WWW.IJRPR.COM

International Journal of Research Publication and Reviews

Journal homepage: www.ijrpr.com ISSN 2582-7421

Impact of AI Assisted Monitoring Systems on Caregiver Burden and Quality of Human Touch in Women's Nursing Environments

Dr. Sana Hashmi

Assistant Profesor, Al-Barkaat College of Graduate Studies, Aligarh
Hashmisana2@gmail.com

ABSTRACT

The aim of this was to analyze the role of Artificial Intelligence (AI) in improving the quality of life for elderly women, particularly in the domains of healthcare, social connectivity, and daily assistance. With an aging global population and the feminization of old age, it became essential to address the gender-specific needs of older women. This study focused on existing AI applications, their accessibility, and effectiveness to meet the unique challenges faced by this demographic by using both qualitative as well as quantitative method. This research paper highlighted the real-world examples, identifies gaps, and offered recommendations for inclusive AI-driven elder care. Findings of this study underscored the need for intersectional and inclusive AI technologies that can bridge generational and gendered divides in digital health ecosystems.

Keywords- Ageing, Artificial Intelligence (AI), Elderly Women, Health Care, Social Connectivity and Technology.

Introduction

The growing trend of population aging is transforming societal frameworks, creating profound challenges for healthcare systems and social policies (Osareme et al., 2024). Within this aging demographic, women represent a larger proportion, as they tend to outlive men. However, this longevity often brings with it distinct difficulties rooted in persistent gender inequalities (Perianayagam, 2024). Over their lifetimes, women are more likely to experience lower earnings due to wage disparities, career interruptions for caregiving responsibilities, and reduced access to pension programs. Consequently, many older women encounter economic vulnerability, characterized by limited savings and insufficient retirement benefits (Enda and Gale, 2020; Hashmi, 2021).

In addition, older women often continue to bear a disproportionate share of caregiving responsibilities—not only throughout their younger years but sometimes even into old age, providing care for spouses, disabled relatives, or grandchildren. This sustained caregiving role frequently limits their capacity to access medical care and social support, thereby heightening their vulnerability (Sharma, N., Chakrabarti, S., & Grover, S., 2016).

Older women are more likely to live alone in later life, often as a result of widowhood, divorce, or the decision not to remarry. This solitary living arrangement heightens their vulnerability to social isolation, which has been associated with poorer overall health and an increased risk of mental health conditions such as depression and anxiety (Hashmi, 2021). Furthermore, elderly women face higher incidences of chronic illnesses, including osteoporosis, arthritis, and cardiovascular diseases, frequently compounded by limited access to healthcare services and inadequate community support networks (Chen, T. Y., Geng, J. H., Chen, S. C., & Lee, J. I., 2022).

The intersection of financial insecurity, social isolation, and health-related challenges highlights the urgent need for gender-responsive social policies and healthcare reforms. Effectively addressing these inequities necessitates a comprehensive approach that promotes improved financial planning opportunities for women, expands access to healthcare services, and strengthens community support networks to combat isolation and enhance the overall well-being of older women (WHO Commission on Social Determinants of Health & World Health Organization, 2008).

The advancement of Artificial Intelligence (AI) in elderly care presents a promising opportunity to enhance health support and improve quality of life for older adults. AI technologies hold significant potential to assist older women in managing their health, maintaining social interactions, and sustaining independence. Innovations such as predictive health monitoring, conversational agents, and robotic assistants are redefining traditional caregiving approaches. Nevertheless, the extent to which these technologies effectively address the distinct socio-cultural, emotional, and physical needs of older women remains insufficiently examined (Padhan, S., Mohapatra, A., Ramasamy, S. K., Agrawal, S., & Ramasamy, S., 2023).

AI-driven predictive health monitoring systems utilize wearable devices and sensors to continuously track vital signs and health metrics, enabling early detection of potential health issues. For instance, platforms like Senior Life. AI employ vision AI and predictive analytics to assess fall risks and cognitive

health, allowing for timely interventions. Such technologies can be particularly beneficial for elderly women, who face higher risks of chronic illnesses and mobility challenges (Khan, A. O. R., Islam, S. M., Sarkar, A., Islam, T., Paul, R., & Bari, M. S., 2024).

Conversational AI agents, such as ElliQ and ChatWell, provide companionship and cognitive stimulation to seniors. These agents engage users in daily conversations, offer reminders for medications, and facilitate virtual social interactions. By addressing feelings of loneliness and social isolation—conditions prevalent among elderly women living alone—these technologies can enhance mental well-being and quality of life (Broadbent, E., Loveys, K., Ilan, G., Chen, G., Chilukuri, M. M., Boardman, S. G., ... & Skuler, D., 2024).

Robotic assistants are being developed to aid with daily activities and provide physical support. For example, AI-powered robots can assist with tasks such as navigation within the home, medication reminders, and even companionship. These innovations aim to reduce the caregiving burden and promote autonomy among elderly individuals (Sawik, B., Tobis, S., Baum, E., Suwalska, A., Kropińska, S., Stachnik, K., ... & Wieczorowska-Tobis, K., 2023).

Despite the potential benefits, the adoption of AI in elder care encounters challenges, especially related to the unique needs of older women. Factors like digital literacy, accessibility, and cultural sensitivities can influence the effectiveness of these technologies. Additionally, there is a necessity for researching and focusing on how AI solutions can be customizedto address the specific health issues, emotional needs, and social contexts of elderly women (Chu, C. H., Nyrup, R., Leslie, K., Shi, J., Bianchi, A., Lyn, A., ... & Grenier, A., 2022).

While AI technologies try to enhance elder care, especially targeted to older women, it is difficult to conduct comprehensive studies to understand their efficacy fully. By addressing the socio-cultural, emotional, and physical needs of elderly women, AI can be harnessed to provide personalized and effective care solutions (Ho, A., 2020).

Review of Related Literature

Previous research indicated that AI-driven solutions such as wearables, fall detection systems, and conversational agents had shown promise in elderly care. Topol (2019) argued that AI has the potential to reshape healthcare delivery by enabling personalized medicine and early diagnosis. Broadbent et al. (2018) explored the effectiveness of social robots in reducing loneliness among elderly users.

However, several studies have pointed out the limitations of existing AI applications to recognize the diverse experiences of aging. Calasanti and King (2020) emphasized that older women experience aging differently due to lifelong gender-based inequalities, which influence their interactions with technology. In addition, a report by the World Health Organization (2021) warned about the digital divide and the risk of technological exclusion faced by elderly populations, especially women with limited digital literacy.

Crawford (2021) highlighted the potential for algorithmic bias in AI systems, noting that technologies trained on non-diverse datasets might fail to account for older users or female-specific health indicators. This reinforced the need for inclusive design principles in AI development.

Objectives of the Study

- To evaluate the impact of AI technologies on the quality of life for elderly women, focusing on healthcare, social connectivity, and daily assistance.
- To identify barriers to accessibility and effectiveness of AI-driven solutions for elderly women, considering factors such as digital literacy, affordability, and gender-specific needs.
- To recommend strategies for designing intersectional and inclusive AI technologies that address the unique challenges faced by elderly women, ensuring equitable access in digital health ecosystems.

Research Methodology

For conducting this research both qualitative as well as quantitative research approach has been used to gain in-depth insights into the experiences of elderly women using AI-based tools. Ninty women (90) aged 65 and above, residing in urban and semi-urban areas of Aligarh City was selected through purposive sampling.

This study used a combination of descriptive and explanatory research designs. Both primary and secondary sources were utilized for analysis. Primary data was gathered over a period of three months using structured interview schedules, which enabled participants to share their perspectives openly. The interviews focused on areas such as patterns of AI use, perceptions, challenges encountered, and emotional or psychological effects. In addition, secondary data was drawn from books, research articles, journals, and reports. The collected information was examined through thematic analysis to identify common trends, experiences, and existing gaps in the integration of AI in elder care.

Ethical considerations were strictly followed, ensuring confidentiality, informed consent, and sensitivity to participant vulnerabilities. The study aimed not only to document the current state but also to explore the potential improvements needed in AI deployment for elderly women residing in and around Aligarh.

Significance of the Study

This study is significant in highlighting the intersection of gender, aging, and technology. It brings attention to the fact that AI technologies, while promising, are often developed without sufficient consideration of older women's specific needs. By documenting their experiences, the study contributes to a growing body of knowledge that can inform inclusive AI design.

It also has policy implications: governments and health organizations can use this evidence to promote age-friendly digital inclusion programs. AI developers and companies are encouraged to incorporate feedback from elderly women during the design and testing phases of their products.

Limitations of the Study

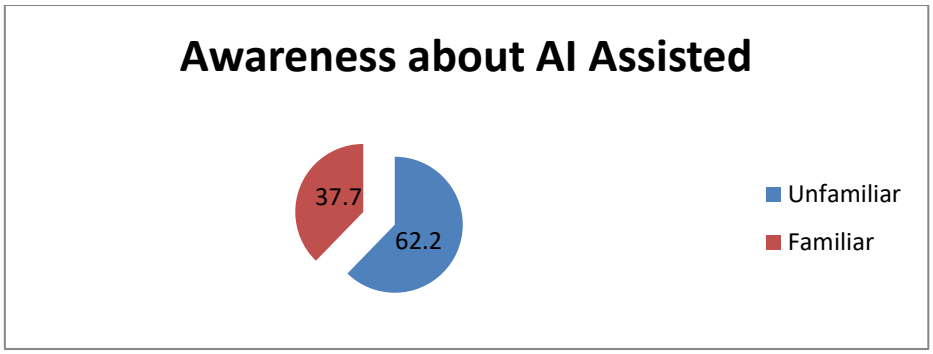
In this study, there are some limitations while the findings provide valuable insights, there are notable limitations. The sample size is small, limiting the generalizability of the results. Participants of this study were mostly from urban and semi-urban areas, excluding rural women who may face additional barriers. Moreover, the study focused only on user perception without integrating quantitative assessments of health outcomes or AI efficiency.

The technological landscape is also rapidly evolving; newer tools may address some of the limitations discussed. Future research could expand the demographic base and combine qualitative and quantitative methods to evaluate the long-term impact of AI in elder care.

Findings and Analysis

Awareness and Use

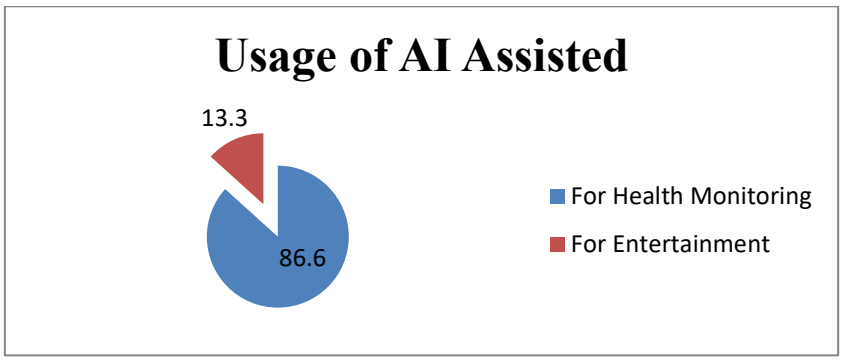
Figure: I- Awareness about AI Assisted



The use of AI is still low due to various factors. These factors include low digital literacy, limited access to gadgets, and reluctance to adopt new technologies. The above given figure revealed that most participants, comprising 62.2 percentage elderly women, were unfamiliar with the term "Artificial Intelligence" (AI), whereas the remaining 37.7 percentage elderly women reported awareness of the term through different sources. This data is indicating a lack of awareness of the technology's broader implications and functioning.

Apart from the above discussion, it is interesting to note that despite this limited understanding, many of these individuals or we can say that almost 90 elderly people (100 percentages) regularly interacted with AI-enabled devices in their daily lives. For instance, voice assistants such as Amazon's Alexa and Google Home are frequently used for tasks like setting reminders, checking the weather, or playing music.

Figure: 2 – Usage of AI Assisted



Additionally, majority participants (86.6 percent) owned smartphones equipped with health-related applications that track physical activity, monitor vital signs, and send medication alerts. These technologies often operate seamlessly in the background, providing convenience and support without users

necessarily recognizing them as forms of AI. 13.3 percent elderly women of this study use AI devices just for their entertainment like play music, see drama series etc.

This observation under covers a significant disconnect between the use of technologies usage and its conceptual understanding. Although people may enjoy the advancement of AI-driven powered, they often lack awareness of the underlying technologies that drive these conveniences. This gap in knowledge can respect their capacity to maximize the benefits of these tools to a limited understanding of potential privacy and data security concern. Additionally, this lack of awareness can hinder their ability to critically participants in conversations about technological process, policy making and the ethical issues limited to AI.

Bridging this gap through targeted education and user-friendly explanations could empower individuals to make more informed decisions about their technology use. It would also enhance their ability to advocate for transparent and ethical AI practices, particularly in areas such as health monitoring, smart home devices, and automated medical care.

Health Monitoring and Chronic Illness Management

Data from the study revealed that almost all participants, individual managing chronic conditions like diabetes, hypertension, or arthritis, repeated significant benefits from using AI Powered health monitoring apps. These tools helped them track critical health metrics, including blood pressure and pain levels, to better manage daily health needs. Participants in this study emphasized that these apps offers timely medication reminders, effectively preventing missed doses. A key strength lies in their capacity to identify abnormal health patterns and swiftly notify caregivers, facilitating rapid intervention during potential health emergencies. AI-driven health monitoring tools empower individuals to manage their conditions more independently, significantly reducing their reliance on family members for daily health supervision by giving these facilities.

Apart from this collected data showed that AI-driven health monitoring technologies also provide an opportunity to the younger generation by easing the ongoing burden of caring for older family members with long-term illnesses. As the excessive burden of their own needs and desires younger generation feel less stressed and can concentrate on their own education, professions, and personal lives while still making sure their elders are well thanks to technology-managed reminders, tracking, and alarms.

Companionship and Mental Well-being

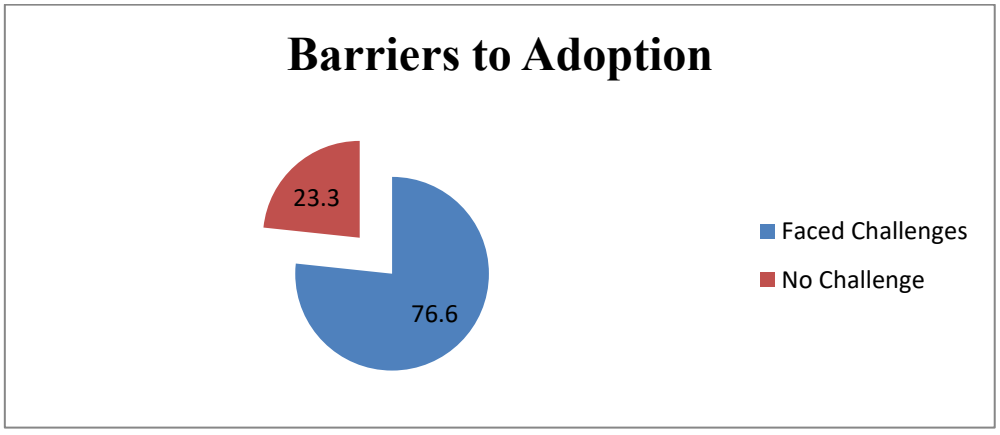
This study focused on how AI-enabled devices have become valuable companions for elderly women who live alone or have limited social interactions. These devices, such as virtual assistants like Siri, Alexa, or Google Assistant, serve multiple purposes that go beyond simple task management. They can provide reminders for daily activities, such as taking medication, attending appointments, or completing household chores, helping users maintain a structured routine. In addition, these virtual assistants are not only limited to these but it also can play music, share news updates, and answer questions, creating a sense of interaction that helps alleviate feelings of loneliness.

As per data collected for this study it is found that some of the elderly women i.e., 53 respondents of this study especially those who visit community centers on regular bases, there is also the opportunity to engage with social robots—advanced AI-driven machines designed specifically for interactive companionship. These robots can hold conversations, recognize faces, and even respond to emotional cues, making elderly women a comforting presence for those who might not have regular human interaction due to various reasons. These technologies also provide cognitive stimulation through engaging activities and conversations, helping to keep the mind active and engaged.

Overall, AI-enabled devices and social robots serve as crucial tools for combating isolation, offering companionship, and supporting mental well-being for elderly women residing in and around Aligarh who live alone or lack regular social engagement.

Barriers to Adoption

Figure:-3 Barriers to Adoption



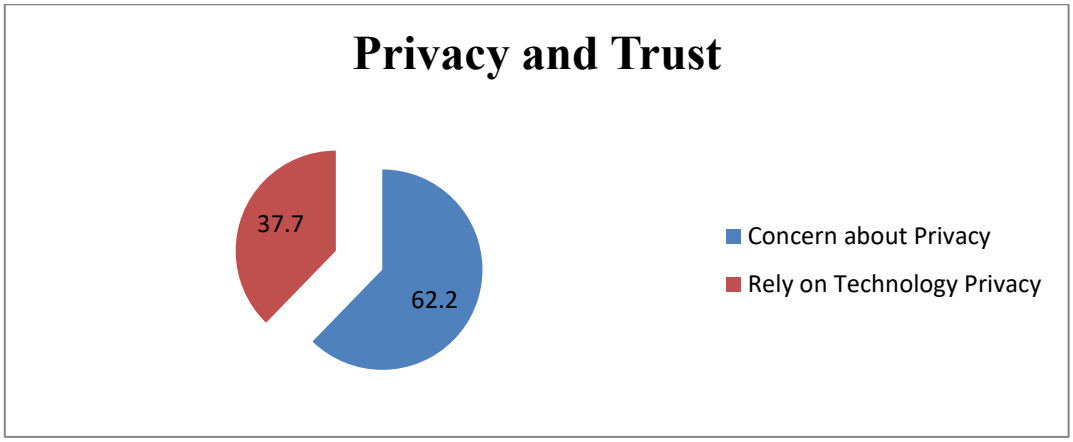
On the other side, it is noticeable in the above give figure that majority participants i.e. 76.6 percent respondents of this study faced challenges when using AI-enabled devices due to issues related to digital literacy, affordability, and design flaws. They depend on young members of the family to navigate apps or configure device settings. High costs associated with advanced AI technologies, such as home automation systems, robotic companions, and wearable health monitors**,** also discouraged widespread adoption. Furthermore, participants highlighted several design flaws that made these devices less accessible for older adults, including small font sizes, low audio output, and complex user interfaces that were not intuitive. These barriers collectively limited the effectiveness and accessibility of AI technologies for many users, particularly the elderly. While on the other part, 23.3 percentage elderly women reported that they do not have face any challenges during the use of AI Assisted.

Privacy and Trust

This study revealed that many respondents (62.2 percent) were concerned about the security and privacy of their health data when using AI-enabled health monitoring devices. These concerns were particularly related to technologies such as wearable health trackers, smart home assistants, and health monitoring apps, which constantly gather sensitive data, including heart rates, blood pressure, glucose levels, medications schedule and even real time location information. For several users, the ongoing collection of this information led to disconnect and mistrust.

A common concern is that AI devices could be constantly '*listening'.* Ex- Virtual assistants like Amazon Alexa, Google Assistant, and Siri use voice detection, meaning their microphones are always on to detect wake words. This lead to concern that private conversations may be unintentionally recorded and saved without users' permission. These worries also apply to health monitoring apps that collect personal medical data as users fear possible data breaches or unauthorized access to their sensitive information.

Figure: 4- Privacy and Trust



These concerns also triggered broader questions about ethical AI design and transparent data usage. Figure-4 showed that approximately 62.2 percent respondents wanted clearer information about how their data is collected, stored, and shared, as well as stronger assurances that their health information would remain private and secure. 37.7 percent elderly women felt that technology companies should be more transparent about their data-handling practices and implement stricter safeguards to protect user privacy.

Overall, these concerns underscore the need for ethical considerations in AI development, particularly in sensitive areas like health monitoring, where privacy and data security are paramount for user trust and comfort.

Conclusion

It highlighted how AI can greatly improve the lives of older women by helping them stay healthy and feel connected. Tools like health apps, smart assistants, and robots can remind them to take medicine, track their health, assist with daily tasks, and keep them company, improving both their body and mind. However, not everyone has equal access to or confidence in these technologies. Many older women, especially those from disadvantaged backgrounds, face challenges such as limited digital skills, high costs, and privacy worries, which prevent them from fully benefiting from these innovations.

To make AI truly inclusive, it is important to understand and meet the different needs of older women. This means designing AI with an intersectional approach that considers how factors like gender, age, income, and culture shape their experiences. For example, older women may face unique health issues, have different levels of tech comfort, and deal with certain types of social isolation. Recognizing these realities is key to creating AI tools that are accessible, relevant, and empowering for them.

As global populations continue to age, it becomes increasingly important for societies to prioritize inclusive innovation in elder care. Bridging the existing gender-tech gap can lead to stronger, healthier, and more resilient communities, where elderly women are not left behind in technological advancements. The future of elder care, therefore, depends not just on building smart machines but on ensuring that these technologies are designed with empathy,

inclusivity, and a deep understanding of human needs. True progress will be marked by AI solutions that are as compassionate as they are intelligent, paving the way for equitable and dignified aging.

Bibliography

1. Broadbent, E., Garrett, J., Jepsen, N., Li, J., & MacDonald, B. (2018). Socially Assistive Robots for Older Adults: Systematic Review and Meta-Analysis. *International Journal of Social Robotics*, 10(3), 463–475. https://doi.org/10.1007/s12369-018-0471-6
2. Broadbent, E., Loveys, K., Ilan, G., Chen, G., Chilukuri, M. M., Boardman, S. G., ... & Skuler, D. (2024). An AI-driven Social Robot to Alleviate Loneliness: Progress and Lessons Learned. *The Journal of Aging Research & Lifestyle*, *13*, 22-28.
3. Chen, T. Y., Geng, J. H., Chen, S. C., & Lee, J. I. (2022). Living alone is associated with a higher Prevalence of Psychiatric Morbidity in a Population-based Cross-sectional Study. *Frontiers in Public Health*, *10*, 1054615.
4. Chu, C. H., Nyrup, R., Leslie, K., Shi, J., Bianchi, A., Lyn, A., & Grenier, A. (2022). Digital Ageism: Challenges and Opportunities in Artificial Intelligence for Older Adults. *The Gerontologist*, *62*(7), 947-955.
5. Coeckelbergh, M. (2020). *AI ethics*. MIT Press.
6. Crawford, K. (2021). *The Atlas of AI: Power, Politics, and the Planetary costs of artificial intelligence*. Yale University Press.
7. Enda, G., & Gale, W. G. (2020). How does Gender Equality affect Women in Retirement?. *Wealth After Work*, *73*.
8. Hashmi, S. (2021). Elderly Women of Marginalized Sections of Aligarh City: Problems and Challenges'. *International Journal of Physical and Social Science*. 11 (04), ISSN- 2249-5894.
9. Ho, A. (2020). Are We Ready for Artificial Intelligence Health Monitoring in Elder Care?. *BMC geriatrics*, *20*(1), 358.
10. Khan, A. O. R., Islam, S. M., Sarkar, A., Islam, T., Paul, R., & Bari, M. S. (2024). Real-time Predictive Health Monitoring using AI-driven Wearable Sensors: Enhancing Early Detection and Personalized Interventions in Chronic Disease Management. *International Journal for Multidisciplinary Research*.
11. Padhan, S., Mohapatra, A., Ramasamy, S. K., Agrawal, S., & Ramasamy, S. (2023). Artificial Intelligence (AI) and Robotics in Elderly Healthcare: Enabling Independence and Quality of Life. *Cureus*, *15*(8).
12. Peek, S. T., Wouters, E. J., Van Hoof, J., Luijkx, K. G., Boeije, H. R., & Vrijhoef, H. J. (2014). Factors Influencing Acceptance of Technology for Aging in Alace: A Systematic Review. *International journal of medical informatics*, *83*(4), 235-248.
13. Perianayagam, A. (2024). Gender Disparities in Health and Wellbeing of Older Population in India. *NPJ Women's Health*, *2*(1), 44.
14. Petsolari, M., Ibrahim, S. B., & Slovak, P. (2024, May). Socio-Technical Imaginaries: Envisioning and Understanding AI Parenting Supports through Design Fiction. *Proceedings of the 2024 CHI Conference on Human Factors in Computing Systems* (pp. 1-27).
15. Sawik, B., Tobis, S., Baum, E., Suwalska, A., Kropińska, S., Stachnik, K., ... & Wieczorowska-Tobis, K. (2023, April). Robots for Elderly Care: Eeview, Multi-Criteria Optimization Model and Qualitative Case Study. *Healthcare*, 11 (9), p. 1286). MDPI.
16. Sharma, N., Chakrabarti, S., & Grover, S. (2016). Gender Differences in Caregiving among Family-Caregivers of People with Mental Illnesses. *World journal of psychiatry*, *6*(1), 7.
17. Taipale, V. T. (2014). Gerontechnology and NGOs in the Field of Ageing. *Gerontechnology*, *13*(1), 1-4.
18. Topol, E. (2019). *Deep medicine: How Artificial Intelligence can make Healthcare Human Again*. UK: Hachette.
19. Weisel, K. K. (2021). *Innovations in Digital Mental Health-Transdiagnostic Approaches Patient Perspectives Effect Modifiers and Smartphone Apps*. Friedrich-Alexander-Universitaet Erlangen-Nuernberg (Germany).
20. WHO Commission on Social Determinants of Health, & World Health Organization. (2008). *Closing the Gap in a Generation: Health Equity through Action on the Social Determinants of Health: Commission on Social Determinants of Health final report*. World Health Organization.
21. World Health Organization. (2021). Global report on ageism.