IJVCDC
Indonesian Journal of Visual Culture, Design, and Cinema

E-ISSN: 2829-1808
Vol. 4 No. 1, April 2025, 1-6
DOI 10.21512/ijvcdc.v4i1.13297

Visual Communication Design

Research notes

The Involvement of Artificial Intelligence in Addressing Elderly Social Interaction

Noachbriantte Zwezda Sutomo[1] & Mita Purbasari Wahidiyat[2]

[1](Ini) Seni Geni, Art Workshop, Jakarta, Indonesia

[2]Graphic Design and New Media Program, School of Computing and Creative Arts, Bina Nusantara University, Jakarta 11480, Indonesia

Correspondence Author:
nbzwezda@gmail.com

Abstract: Social isolation and loneliness among the elderly have become significant global issues, negatively impacting their mental and physical health. With the advancement of technology and the emergence of artificial intelligence (AI) systems, various potential solutions can be utilized to address these challenges. This study explores the possible involvement of AI in enhancing elderly social interactions, focusing on technologies that help them stay connected with family, friends, and their social environment. This research employs a qualitative approach, including a literature analysis of AI applications that can support elderly social interaction. The findings reveal that AI systems such as social robots, virtual assistants, and chatbot applications hold great potential in reducing loneliness and increasing social connectivity among the elderly. These technologies not only facilitate more frequent social interactions but also provide emotional and cognitive support, ultimately improving their quality of life. Although AI systems offer numerous benefits, challenges such as dependence on technology, initial resistance from the elderly, and limitations in non-verbal communication remain obstacles that need to be addressed. This study concludes that AI involvement in supporting elderly social interactions has great potential. However, its implementation must consider accessibility, comfort, and proper training to ensure its effectiveness in reducing social isolation.

Keywords: Elderly loneliness, social isolation, assistive technology, artificial intelligence, social interaction

INTRODUCTION

With the increasing life expectancy, the number of elderly individuals worldwide continues to grow. In Indonesia alone, the elderly population is projected to reach 33.69 million in 2025 and increase to 48.19 million by 2035. This growth has been evident since 2013 when the percentage of the elderly population in Indonesia was 8.9%, compared to 13.4% globally. These percentages are expected to rise even further by 2050, reaching 21.4% in Indonesia and 25.3% worldwide. This trend is driven by the increasing life expectancy, which continues to impact the elderly population over time. Since the year 2000, Indonesia has been categorized as an aging population country due to its elderly population exceeding 7% (Noor, et al., 2023).

This situation has significant implications for the social and psychological well-being of the elderly. Social isolation and loneliness have become major issues, specially when their children

grow up and establish their own lives. A similar theme is depicted in the film When Life Gives You Tangerines (2025), which tells the life story of Ae-Sun and Gwan-Sik, who grew up in the 1950s and built a family together, transitioning from adolescence to old age. The film highlights how human social interactions evolve over time, reflecting the changes in relationship dynamics as people age (Wikipedia, 2025). In their later years, Ae-Sun and Gwan-Sik's lives are filled with silence and loneliness, adding to their emotional burden. Each day passes with unchanging routines, shallow conversations, and unspoken loneliness as they struggle to find happiness in increasingly rare moments. The film effectively portrays the sense of isolation and alienation that comes with aging. Many elderly individuals feel disconnected from the outside world as their social interactions decline. This loneliness not only affects their quality of life but also worsens their mental and physical health, potentially leading to conditions such as depression, anxiety, and cognitive disorders (Wijayanti, et al., 2024).

With technological advancements, particularly in artificial intelligence (AI), there is potential to address these challenges. AI applications, such as social robots, virtual assistants, and chatbots, have the ability to create more frequent and meaningful social connections for the elderly, offering a sense of belonging that has diminished over time. These technologies serve as bridges between the elderly and their social world, enabling them to maintain communication with family, friends, and communities while reducing feelings of loneliness. One emerging innovative approach is the use of AI to develop platforms that support elderly social interaction.

Therefore, this study aims to explore the potential involvement of artificial intelligence in supporting elderly social interactions and to assess both the opportunities and challenges associated with its implementation. This research is expected to provide insights into how technology can be utilized to enhance the quality of life for the elderly and offer practical solutions to address their social issues.

METHODS

This study employs a qualitative approach using literature analysis to explore the potential involvement of AI in addressing social isolation and enhancing elderly social interactions. The literature analysis is conducted to understand how AI can be applied in various social contexts, particularly in supporting communication and social connectivity among the elderly. The data sources for this study consist of secondary sources, including scientific publications, official reports and statistical data, as well as case studies on the use of AI to improve elderly social well-being, such as the implementation of social robots, chatbots, and virtual assistants. Data is collected through a systematic literature review process, which includes source identification, literature selection and evaluation, and thematic analysis. Meanwhile, the data analysis technique is carried out using content analysis, which involves data coding to identify key patterns and themes in the collected literature, interpretation of findings to examine the relationship between AI and elderly social interaction, and synthesis of research results to provide a comprehensive insight into the potential application of AI in mitigating elderly loneliness.

RESULTS & DISCUSSION

Elderly are those who have reached the age of 60 and above, possessing the same rights in social, national, and state life (Akbar, et al., 2021). As human beings go through the process of growth and development, they eventually experience aging, which is a natural and unavoidable

process. Over time, the physical abilities of the elderly decline, leading to reduced performance in daily activities and increased dependency (Setiarsih, et al., 2020). Physical, psychological, and social deterioration are some of the factors contributing to the dependency experienced during the aging process (Yuzefo, 2015). Meanwhile, the World Health Organization Quality of Life (WHOQOL) defines quality of life as an individual's perception of their position in life within the context of their cultural environment and value systems, as well as their goals and expectations (Organization, 2024). Quality of life can be understood as an assessment of well-being in relation to an individual's health. There are four key aspects of quality of life: physical health, psychological well-being, social relationships, and environmental interactions. Issues in an elderly person's life can lead to a decline in their quality of life if any of these aspects are compromised (Rohmah, et al., 2012).

One of the most vulnerable aspects of aging is social relationships, which directly impact psychological well-being. Social isolation and loneliness among the elderly can have negative effects on both mental and physical health, increasing the risk of depression, anxiety, and neurodegenerative disorders such as dementia (Cattan et al., 2005). Various efforts have been made to address this issue, ranging from community programs to technology-based interventions. In recent years, the development of AI has emerged as a potential solution to help the elderly stay connected with their social environment. In response to this challenge, innovations in technology have been developed to mitigate social isolation among the elderly. AI offers various solutions that enable older adults to stay engaged with their social surroundings through more dynamic and adaptive virtual interactions. Technologies such as social robots, virtual assistants, and chatbots have shown potential in providing emotional support and enhancing social engagement among the elderly (Broadbent et al., 2018). With the ability to adjust conversations, recognize emotions, and respond to user needs, AI is expected to serve as an alternative approach to addressing loneliness in older adults.

Based on the literature analysis conducted, AI has been found to have great potential in addressing social isolation and enhancing social interactions among the elderly. Several social robots have been developed as assistive tools for personal healthcare. These social robots are primarily designed to help older adults stay engaged in group-based health activities. They are used to reduce loneliness and improve social interactions among the elderly (Ghafurian, et al., 2024). Other studies have also been conducted to create synergy between humans and robots in psychological interventions. Research by Muhiddin found that using assistive social robots as psychological intervention tools can encourage behavioral changes and enhance the psychological well-being of older adults (Muhiddin, 2023).

Another tangible application of AI in elderly life is seen in activity and health monitoring through sensors and the Internet of Things (IoT). A literature review conducted by Kurniawan explored studies related to the definition, objectives, impact, challenges, and ethical considerations of AI implementation in elderly care. The findings revealed that AI applications in healthcare services enable the collection of personal health data through home monitoring sensors and activity tracking devices. This data helps in monitoring physical activity, movement, and responses of elderly patients, thereby supporting early detection of health risks and appropriate interventions (Salwa, et al., 2024) (Chou, et al., 2023).

The following research also reveals that chatbots and virtual assistants can be used for social interaction with the elderly. AI designed specifically to converse with older adults, such as chatbots or other virtual assistants like Alexa and Google Assistant, allows seniors to interact without relying on the physical presence of others. This interaction provides a sense of social connection, which is crucial for elderly individuals who often feel isolated. Additionally, this

technology can remind seniors to manage their daily schedules, provide entertainment information, and engage in conversation to reduce loneliness (Liu, et al., 2023). Meanwhile, other technologies, such as AI-implemented automatic video call systems, can be used to schedule periodic video calls automatically between seniors and their family members or relatives. This system enables elderly individuals to stay connected with others even if they are far apart. Furthermore, AI can detect whether a senior is feeling lonely based on their activity patterns and notify their family to initiate a video call (Wang, et al., 2020).

Furthermore, the implementation of AI technology in the form of social companion robots or humanoid robots equipped with AI can provide companionship, entertainment, and even assist seniors in communicating with others. The prototype design of these robots has been developed to recognize elderly individuals' emotions and respond systematically to help reduce feelings of loneliness (Sudarsono, et al., 2025).

Thus, from the review of the aforementioned literature, this research can be categorized into three main themes. The first theme concerns the impact of social isolation on the elderly. Loneliness in seniors negatively affects their psychological and physical well-being. Studies indicate that social isolation increases the risk of depression, anxiety, and cognitive disorders such as dementia (Wijayanti et al., 2024). Elderly individuals experiencing isolation tend to suffer a decline in their quality of life, with diminishing social interactions over time. The representation shown in the film When Life Gives You Tangerines (2025) illustrates how seniors may experience silence and isolation after their children build lives of their own. This confirms findings from research suggesting that changes in family dynamics can exacerbate elderly loneliness.

The second theme focuses on the role of artificial intelligence in enhancing social interaction among the elderly. AI has been utilized in various forms to support seniors, including social robots, virtual assistants, and chatbots. A study by Santosa & Dewi (2021) found that social robots such as Paro and ElliQ help seniors by providing emotional responses and conversational stimulation, which significantly reduces their feelings of loneliness. AI-based chatbots like Replika AI and Woebot can serve as virtual companions for the elderly, offering text- and voice-based interactions that help maintain their emotional well-being.

The third theme addresses the challenges and implementation of AI for the elderly. While AI offers potential solutions for improving social interaction among seniors, several obstacles must be overcome. One major challenge is the lack of digital literacy among many elderly individuals, who may struggle to use AI technology, especially applications or complex software. Another challenge is the limitation of non-verbal communication, as AI still has difficulties understanding facial expressions and body language, which can reduce the effectiveness of social interactions. Additionally, there is initial resistance from seniors who may feel reluctant or uncomfortable interacting with AI, as they are more accustomed to human communication (Noor et al., 2023).

Based on the findings, AI can serve as an innovative solution to address social isolation among seniors by providing more frequent and meaningful social interactions. However, its implementation still faces various challenges that require a more inclusive and adaptive approach. AI adoption should consider factors such as comfort and accessibility for the elderly. Special training or user-friendly UI/UX designs are necessary to help seniors adapt to this technology more easily. Furthermore, AI should not completely replace human interaction but rather complement and support social connections between seniors, their families, and their communities. Additionally, regulations and policies are needed to support AI use for the elderly, particularly regarding data privacy and ethical considerations in social interactions.

In other words, the findings of this research indicate that AI involvement in social interactions among the elderly has a positive impact. However, its implementation must still be adjusted to meet the needs and preferences of seniors to ensure it functions effectively and sustainably.

CONCLUSION

In conclusion, social isolation among the elderly has a significant impact on their quality of life, particularly in terms of psychological and social well-being. AI technology has shown great potential in addressing this issue by enhancing social interactions through social robots, virtual assistants, and chatbots. The use of AI for seniors can help mitigate social isolation and loneliness by providing more personalized interactions and supporting their daily lives. AI can facilitate communication, such as chatbots that engage in conversations with seniors, offer virtual companionship that is always available, and enhance social connectivity through digital platforms. Additionally, AI technology can provide intelligent health monitoring systems, remind seniors to take their medication, and reduce anxiety by improving their sense of security. Thus, AI not only alleviates loneliness but also supports elderly individuals in maintaining their independence in daily life. Despite these benefits, AI implementation still faces challenges, such as low digital literacy and limitations in understanding non-verbal communication. Therefore, a more inclusive approach and user-friendly design are necessary to ensure this technology delivers effective and sustainable benefits for seniors. Based on the findings of this study, recommendations for implementing AI to address social isolation among seniors include focusing on user-friendly design and training programs to improve digital literacy among the elderly. These training programs can help seniors adapt to technology and optimize their social interactions. Additionally, regulations are needed to ensure data privacy and ethical AI use while maintaining human interaction as a crucial element in supporting the psychological well-being of seniors. A more inclusive approach will further strengthen the benefits of AI for the elderly.

REFERENCES

Akbar, F., Darmiati, Farmin, A., & Putri, A. A. Z. (2021). Pelatihan dan pendampingan kader posyandu lansia di Kecamatan Wonomulyo. Jurnal Abdidas, 2(2), 392-397. Diakses dari http://abdidas.org/index.php/abdidas.

Broadbent, E., Stafford, R., & MacDonald, B. (2018). Acceptance of healthcare robots for the older population: Review and future directions. International Journal of Social Robotics, 10(5), 635-643. https://doi.org/10.1007/s12369-018-0476-x

Cattan, M., White, M., Bond, J., & Learmouth, A. (2005). Preventing social isolation and loneliness among older people: A systematic review of health promotion interventions. Ageing and Society, 25(1), 41-67. https://doi.org/10.1017/S0144686X04002594

Chou, Y.-H., Lin, C., Lee, S.-H., Chang Chien, Y.-W., & Cheng, L.-C. (2023). Aplikasi Kesehatan Seluler yang Berpotensi untuk Meningkatkan Kesehatan Mental Lansia: Tinjauan Sistematis. Clinical Interventions in Aging, Volume 18 (September), 1523–1534. https://doi.org/10.2147/cia.s410396

Garcia-Mendez, S., Arriba-Perez, F., Francisco, J., Gonzales-Castano., Regueiro-Janeiro, J A., & Gil-Castineira, Felipe. (2021). Entertainment Chatbot for the Digital Inclusion of Elderly People Without Abstraction Capabilities. IEEE Access. Diakses dari https://ieeexplore.ieee.org/stamp/stamp.jsp?arnumber=9432816

Ghafurian, M., Chandra, S., Hutchinson, R., Lim, A., Baliyan, I., Rhim, J., Gupta, G., Aroyo, A. M., Rasouli, S., & Dautenhahn, K. (2024). Systematic review of social robots for health and wellbeing: A personal healthcare journey lens. ACM Transactions on Human-Robot Interaction, 14(1), 1–48. https://doi.org/10.1145/3700446

Liu, M., Wang, C., & Hu, J. (2023). Older adults' intention to use voice assistants: Usability and emotional needs. Heliyon, 9 (11), e21932, https://doi.org/10.1016/j.heliyon.2023.e21932.

Muhiddin, S. (2023). Sinergi manusia-robot: Penggunaan robot bantu-sosial sebagai intervensi psikologi. ResearchGate. https://doi.org/10.13140/RG.2.2.14640.53760

Noor, Rizkia Amartya, Harliansya, & Widayanti, Etty. (2023), Hubungan Kualitas Hidup Terhadap Harga Diri Lansia Selama Pandemi Covid-19. Cerdika: Jurnal Ilmiah Indonesia. 3 (1), Januari. Hal. 12-19. Diakses dari https://cerdika.publikasiindonesia.id/index.php/cerdika/article/download/515/747/4829.

Salwa, N D K. (2024). Mengulas Pemantauan Lansia Jarak Jauh Berbasis IoT. Cloud Computing Indonesia. Diakses dari https://www.cloudcomputing.id/pengetahuan-dasar/pemantauan-lansia-iot.

Setiarsih, D., & Syariyanti, I. (2020). Hubungan Harga Diri Dan Interaksi Sosial Dengan Fungsi Kognitif Pada Lansia. Indonesian Journal of Professional Nursing (IJPN), 1(1), 10–17. https://doi.org/10.30587/ijpn.v1i1.2015

Sudarsono, R A & Muda, N R S. (2025). Disain Robot Humanoid sebagai Pendamping Lansia Dipole_31: Solusi Teknologi untuk Perawatan Sehari-Hari. Jurnal Nasional Teknologi dan Inovasi. 1 (1), Januari. DOI: http://dx.doi.org/10.13140/RG.2.2.33092.54406

Wijayanti, dkk. (2024). Menjaga Ingatan Lansia. Seminar Nasional Psikologi 2024. Universitas Ahmad Dahlan. Diakses dari https://eprints.uad.ac.id/71688/1/1.%20Fungsi%20Kognitif_Seminar%20NasionaL%20Psikologi_Genap%202023-2024.pdf

Wikipedia contributors. (2025). When Life Gives You Tangerine. Wikipedia, The Free Encyclopedia. Diakses dari https://en.wikipedia.org/wiki/When_Life_Gives_You_Tangerines

Yuzefo, M. A. (2015). Hubungan Status Spiritual Dengan Kualitas Hidup Pada Lansia. Riau University.