Intelligent Health Systems – From Technology to Data and Knowledge
E. Andrikopoulou et al. (Eds.)

doi:10.3233/SHTI250366

From Healthcare Technology to Care Robot-Literate Practitioners

Tuuli TURJA[a,1], Anna-Aurora KORK[b]
[a] *Tampere University, Tampere Finland*
[b] *University of Vaasa, Vaasa Finland*
ORCiD ID: Tuuli Turja 0000-0001-7815-9511
ORCiD ID: Anna-Aurora Kork 0000-0002-2658-0918

Abstract. Current forms of health technology literacies fail to fully address the multifaceted nature of care robot literacy (CRL). As an occupational asset for healthcare practitioners, CRL involves the ability to use and interact with mobile, artificially intelligent (AI) -driven mechatronic devices within the working environment. A variety of new generation technologies are introduced in healthcare. However, occupational and ethical standards need to be in line with utilization of any novel technologies. Based on a synthesis on existing literature, this poster will discuss the socio-temporal preconditions and further steps to develop CRL among healthcare practitioners.

Keywords. Artificial intelligence, Digitalization, eHealth literacy, Ethics, Robots

1. Introduction

Intelligent robots are increasingly facilitating healthcare tasks. Care robots are used in interaction (e.g. seal robot Paro), logistics (e.g., transporter robot TUG), telecare (e.g., telepresence robot Double), and other automated tasks in health and welfare services [1]. However, their deployment in the sensitive and highly regulated domain of healthcare raises ethical concerns [2].

From a socio-temporal perspective, two key forces emerge in existing discussions about healthcare robotization. First, technocratic principles suggest that as technological advancements occur, they should be utilized without delay [3]. Second, ideological and ethical considerations emphasize the sensitive context of healthcare environment, where robots share space not only with healthcare workers, but also with patients and individuals in vulnerable situations [2,4].

2. Method

In this study, we explored the socio-temporal preconditions necessary for fostering care robot literacy (CRL) among healthcare practitioners. First, we synthesized existing literature on AI ethics and technological literacy [5], which allowed us to identify and integrate themes and values relevant to CRL. The concept of CRL was then adapted to fit within the socio-temporal theory model. We advanced our framework by specifically analyzing the social context and time-based factors that promote implementation of CRL in healthcare settings.

[1] Corresponding Author: Tuuli Turja, PhD, Faculty of Social Sciences, Tampere University, Kalevantie 5, 33014 Tampere, Finland; E-mail: tuuli.turja@tuni.fi.

3. Results

Social factors in CRL are related to human-technology interaction, particularly the use of digital skills, and the knowledge of various technologies, eHealth systems, and applications. Healthcare practitioners also need understanding of data safety and privacy, which require knowledge of both, AI ethics and occupational ethics. While digital skills need continuous updating, ethical standards are considered more stable. CRL requires ethical and situational awareness to evaluate which situations are care robot-compatible.

Temporality, then, stood out as the requirement of healthcare development in terms of promoting new healthcare technology and good practices in care work. Care robot-literate practitioners know how and when to use robots without compromising high-quality healthcare and patient well-being.

4. Discussion and Conclusions

From the socio-temporal perspective, CRL is a precondition for the healthcare practitioners to develop their expertise in the changing societies and innovative working-life.

CRL has particular relevance for the field of informatics. First, as healthcare increasingly incorporates robotic systems for social interaction, understanding how robots function in specific working environments is essential for those who integrate these technologies into healthcare systems.

Second, enhanced understanding of CRL allows informatics to better navigate the ethical implications of robotic use in healthcare, including improved patient privacy and data management.

Finally, healthcare practitioners need to be proficient in interacting with robots. Informaticians play a crucial role in designing training programs and support systems that promote CRL, ensuring effective use of these technologies in daily care work.

Acknowledgements

The study was funded by the Strategic Research Council (SRC) established within the Academy of Finland (project number 31213358418).

References

[1] Teng R, Ding Y, See KC. Use of robots in critical care: systematic review. J Med Internet Res. 2022 May;24(5): e33380.
[2] van Wynsberghe A.: Service robots, care ethics, and design. Ethics Inform. Technol. 2016 Apr;18(4):311–321, doi:10.1007/s10676-016-9409-x
[3] Zhang S. How Does Culture Travel? Narratives and Practices of Japan's Social Robotics in a "Post-Cultural" World. In Social Robots in Social Institutions (pp. 249-258). IOS Press, 2023
[4] Boada JP, Maestre BR, Genís CT. The ethical issues of social assistive robotics: a critical literature review. Technol. Soc. 2021;67:101726
[5] Turja T, Kork AA, Ilomäki S, Hellstrand I., Koistinen A-K. Care robot literacy: integrating AI ethics and technological literacy in contemporary healthcare. AI Ethics. 2024 Sep, doi: 10.1007/s43681-024-00576-6