HEALTH, ENVIRONMENT AND SUSTAINABLE DEVELOPMENT: INTERDISCIPLINARY APPROACH, 2025 No. 1, p. 9-15
eISSN 3030-2323; DOI: https://doi.org/10.59476/hesdia.v0i1.690 / https://ojs.kaunokolegija.lt/index.php/HESDIA

THE IMPORTANCE OF DIGITAL COMPETENCIES FOR HEALTHCARE PROFESSIONALS: FINDINGS FROM THE EQUAL TREATMENT PROJECT

Gerda Bukauskaitė-Žiūkienė[1], Aurimas Galkontas[1]

[1]*Kauno kolegija Higher Education Institution, Kaunas, Lithuania*

Abstract. The “Equal treatment” study addresses the pressing issue of health disparities faced by people with intellectual disabilities, who continue to encounter significant barriers to accessing quality healthcare despite numerous EU policy recommendations. Conducted as part of a European project implemented across Lithuania, Greece, Spain, and Finland, the research evaluated the effectiveness of a training program designed to enhance healthcare professionals' digital competencies. The findings highlight the need for tailored training to foster inclusivity, promote equal treatment, and support better collaboration among healthcare staff and other professionals interacting with people with intellectual disabilities. The study emphasizes the importance of ongoing digital education to ensure healthcare professionals are well-equipped to uphold high-quality and inclusive patient care.

Methodology. A structured survey was conducted within the Moodle environment to collect data. The survey included questions designed to evaluate participants' knowledge and skills before and after the training program. Descriptive statistics were used to summarize the data, including percentage calculations. Statistical analyses were performed to assess differences and changes in participant responses. The following statistical tests were applied: Student's t-test, Wilcoxon signed-rank test, Chi-square test. To evaluate the effectiveness of the training, average scores before and after the program were calculated. A two-way independent samples t-test was employed to examine the interaction between training and other factors. Results were considered statistically significant when $p \leq 0.05$.

Results. Approximately half of the participants reported an increase in their IT knowledge following the completion of the module. This suggests that the training was effective in enhancing digital competencies for a significant portion of the group. However, the limited overall improvement in some areas indicates room for growth in the module’s impact. Adjustments to the curriculum, such as focusing on advanced IT skills or tailoring content to diverse baseline proficiencies, may be necessary to ensure a more comprehensive increase in IT proficiency across all participants.

Conclusions. This study shows that most participants already had a solid foundation of digital skills before training, but there were still improvements across several areas. The training particularly benefited participants in areas such as problem-solving, awareness of IT limitations, and technical skills like file management and security. The most significant improvements were seen in Greece and Spain, while Finland and Lithuania participants generally remained unchanged or showed slight improvements. Ongoing investment in digital education is crucial to make sure that healthcare professionals can keep up with advancing technologies and uphold highest quality patient care.

Keywords: healthcare, digital competencies, equal treatment.

The introduction

In today's developing healthcare, digital competencies have become an essential requirement for all the healthcare professionals. As digital technologies continue to take place into the healthcare systems, it is crucial for healthcare professionals to gain the necessary skills to effectively navigate and use these tools. These competencies are not just about mastering technology; they are about to improve patient care, ensure data security, and foster continuous professional development (Stoumpos, at al., 2023). Healthcare professionals, who are proficient in using digital tools, such as electronic health records, digital medicine platforms, mobile health applications, or AI (artificial intelligence) are better equipped to provide accurate, timely, and personalized care. These technologies facilitate efficient data management, enabling healthcare providers to access comprehensive patient histories, monitor ongoing treatments, and make informed decisions quickly. This not only improves the quality of care but also ensures that patients receive treatments tailored to their specific needs, based on the latest evidence-based practices (Božić, et al., 2023).

To address disparities in healthcare, digital competency training plays a critical role in equipping professionals to meet the unique needs of vulnerable populations, such as people with intellectual disabilities. The “Equal treatment” study examines the effectiveness of digital competency training among healthcare professionals across Lithuania, Greece, Spain, and Finland. The main objective is to enhance healthcare professionals' skills in using digital tools to improve care for people with intellectual disabilities (PWID) and ensure equal access to secondary and tertiary healthcare services. The research object is the digital competencies of healthcare professionals, evaluated through a structured survey, where pre- and post-training data were analyzed.

In the digital age, the security and privacy of patient data have become primary concerns in healthcare. The increasing reliance on digital systems has brought new challenges, particularly in protecting sensitive patient information from data breaches and cyber threats. Healthcare professionals with strong digital competencies are better prepared to implement strong security measures, ensuring that patient data is handled securely and in compliance with legal and ethical standards. This not only protects patients' privacy but also reinforces trust in the healthcare system. Maintaining high standards of data security is essential for the credibility and effectiveness of healthcare services (Garcia-Perez, et al., 2023). The rapid pace of technological advancement in healthcare requires continuous professional development (Senbekov, et al., 2020). Digital competencies are crucial for healthcare professionals to adapt to these changes and stay current in their field. With new tools, platforms, and methods emerging regularly, healthcare providers are able to learn and integrate these advancements into their practice. This ability to adapt not only ensures that they continue to provide high-quality care but also helps them remain competitive in the evolving job market. Moreover, ongoing professional development supported by digital competencies contributes to the overall advancement of the healthcare sector, as it promotes the adoption of innovative practices and improves service delivery (Hermes, at al., 2020).

The ability to work together across disciplines is a key aspect of being digitally proficient in healthcare. Efficiently sharing information and collaborating in real time is essential for providing top-notch care. Electronic health records, secure communication platforms, and telemedicine systems allow various healthcare professionals to work together seamlessly. This not only improves coordination of care but also ensures that patients benefit from comprehensive treatment plans created through the collective expertise of multiple professionals. As healthcare collaboration grows, digital skills empower specialists to work more effectively, ultimately improving the availability and effectiveness of healthcare services (Foadi, et al., 2022).

In conclusion, digital competencies are a fundamental requirement for healthcare professionals in the 21st century. These skills are integral to enhancing patient care quality, ensuring the security and privacy of patient data, and supporting the continuous professional growth of healthcare workers. As the healthcare field continues to evolve, the importance of digital competencies will only increase, making it essential for both individual practitioners and the broader healthcare system to invest in the development of these skills. Ultimately, digital competencies are not just about keeping pace with technology; they are about improving patient outcomes, safeguarding sensitive information, and advancing the healthcare profession as a whole.

Research methods

The research was conducted as part of the project *"EQUAL TREATMENT: Supporting the Rights and Access of People with Intellectual Disabilities to Secondary and Tertiary Healthcare Services"* (No. ERASMUS-EDU-2021-PCOOP-ENGO-101049115). One of the project's primary objectives was to reduce barriers faced by people with intellectual disabilities in accessing healthcare services. To achieve this goal, online training was provided to healthcare professionals in Finland, Lithuania, Spain, and Greece.

The study utilized a quantitative, evaluative research design to assess the impact of a digital competencies' module on healthcare professionals. A pre- and post-evaluation approach was adopted to measure changes in participants' digital competencies following the completion of three training modules. The evaluation employed the *Europass Digital Competence Self-Assessment Grid*, a standardized tool that offers a structured framework for individuals to assess their competencies in five key areas: Information and Data Literacy, Communication and Collaboration, Digital Content Creation, Safety, and Problem Solving.

The training was delivered via the Moodle platform from March to June 2024. Data was collected through a structured survey embedded within Moodle, which included questions assessing participants' digital competencies before and after the training program.

Descriptive statistics were used to summarize the data, including percentage calculations. Statistical analyses were performed to assess differences and changes in participant responses. The following statistical tests were applied:

1. **Student's t-test**: Used to compare the means of independent groups.
2. **Wilcoxon signed-rank test**: Applied to analyze paired, non-parametric data for assessing changes before and after training.
3. **Chi-square test**: Used to compare response rates and differences between independent groups.

To evaluate the effectiveness of the training, average scores before and after the program were calculated. A two-way independent samples t-test was employed to examine the interaction between training and other factors. Results were considered statistically significant when $p \leq 0.05$.

Results

The study included healthcare professionals from Lithuania, Finland, Greece, Spain who were enrolled in a Equal treatment project modules. A total of 90 participants completed both the pre- and post-assessment questionnaires. Participants varied in age, years of professional experience, and baseline digital literacy (Table 1).

Table 1. Participants (N=90)

	Lithuania	**Finland**	**Spain**	**Greece**	**Total**
Number of participants	42	11	20	17	90
Percent	46,7%	12,2%	22,2%	18,9%	100,0%

The question "How often do you use IT at your work?" aimed to assess the frequency of information technology (IT) utilization in the respondents' professional activities. Participants were asked to indicate how often they rely on IT tools, systems, or platforms during their work tasks. The response options included a range of frequencies, such as " Every day/couple day per week", " Once a week", " A few times per month" or " Once in a while" to capture varying levels of IT integration in their workplace routines. This question provided insights into the role of IT in their professional environment and the extent to which it supports their day-to-day responsibilities. Analysis of the obtained data revealed that the majority of participants, particularly those in Lithuania and Finland, reported frequent use of IT in their professional activities. Notably, over 88% of respondents across all surveyed regions indicated that they use IT either daily or multiple times per week, highlighting the integral role of technology in their work processes. In contrast, only a small fraction of participants representing less than 12% reported infrequent use of IT, such as weekly or less often. This disparity underscores the high level of digital integration in the workplace for most respondents while suggesting that a minority may have limited reliance on technology in their roles (Table 2).

Table 2. Frequency of IT Usage at Work (N=90)

	Lithuania	**Catalonia**	**Finland**	**Spain**	**Greece**	**Total**
Every day/couple day per week	42	18	11	2	17	90
	97,6%	88,9%	100,0%	100,0%	88,2%	94,4%
Once a week	1	0	0	0	1	2
	2,4%	0,0%	0,0%	0,0%	5,9%	2,2%
A few times per month	0	1	0	0	0	1
	0,0%	5,6%	0,0%	0,0%	0,0%	1,1%
Once in a while	0	1	0	0	1	2
	0,0%	5,6%	0,0%	0,0%	5,9%	2,2%
Total	**42**	**18**	**11**	**2**	**17**	**90**
	100,0%	**100,0%**	**100,0%**	**100,0%**	**100,0%**	**100,0%**

The question "How do you rate your knowledge of IT (Out of 10)?" was designed to evaluate participants' self-assessed proficiency in information technology. Respondents were asked to rate their knowledge on a scale from 1 to 10, where 1 indicated minimal or no knowledge, and 10 represented expert-level proficiencies. This question aimed to capture participants' perceptions of their own IT skills, providing a subjective measure of their competence and confidence in using technology. The results offer valuable insights into the participants' self-evaluation of their IT expertise and help identify potential areas for improvement or additional training needs. Across all regions, participants' average self-rated IT knowledge improved following the training, with Spain demonstrating the most notable increase, rising from an average of 8.5 before the course to 9.0 after. Additionally, the standard deviation of self-assessments decreased post-training, indicating more consistent ratings across participants in different regions (Table 3).

In response to the question, "Did your knowledge of IT increase after the course?", 46.3% of participants reported a slight improvement, and 12.5% noted a significant increase in their IT knowledge. However, a substantial proportion (41.3%),

particularly in regions such as Finland, indicated that their knowledge remained unchanged. These findings highlight the variability in perceived benefits of the training program among participants.

Table 3. Self-Rated IT Knowledge (Out of 10 points) (N=90)

	Lithuania	**Catalonia**	**Finland**	**Spain**	**Greece**	**Average (Standart deviaton)**
Before training	7,33	6,94	7,73	8,5	7,47	7,36 (1,524)
After training	7,45	7,75	8,33	9,0	7,77	7,69 (1,332)

The table 4 presents the changes in participants' self-rated IT knowledge after completing the course, broken down by region (Lithuania, Catalonia, Finland, Spain, and Greece). The results are categorized into three response groups: "Very increased," "Slightly increased," and "Remained unchanged," with percentages provided for each group. A total of 80 participants were surveyed across all regions.

"Very increased": Overall, 12.5% of participants reported a significant increase in their IT knowledge. The highest percentage was observed in Greece (46.2%), while no participants from Catalonia, Finland, or Spain reported this level of improvement. Lithuania reported 9.5%.

"Slightly increased": This was the most commonly selected category, with 46.3% of participants across all regions indicating a slight improvement. Lithuania had the highest proportion in this category (61.9%), followed by Catalonia (41.7%), Finland (27.3%), and Greece (23.1%). No participants from Spain selected this option.

"Remained unchanged": A total of 41.3% of participants reported no change in their IT knowledge. Spain had the largest percentage in this group (100%), followed by Finland (72.7%), Catalonia (58.3%), Greece (30.8%), and Lithuania (28.6%). A chi-square test ($\chi^2 = 27.920$, df = 8, $p < 0.001$) revealed statistically significant differences in the distribution of responses across regions, indicating that the perceived impact of the training on IT knowledge varied significantly by location.

Table 4. Self-Assessed Increase in IT Knowledge After the Course by Country/Region (n=80)

	Lithuania	**Catalonia**	**Finland**	**Spain**	**Greece**	**Total**	
Very increased	**4a***	0	0	0	**6b***	10	
	9,5%	0,0%	0,0%	0,0%	46,2%	12,5%	
Slightly increased	26	5	3	0	3	37	
	61,9%	41,7%	27,3%	0,0%	23,1%	46,3%	$\chi2 = 27,920$ df = 8 p<0,001
Remained unchanged	12	7	8	2	4	33	
	28,6%	58,3%	72,7%	100,0%	30,8%	41,3%	
Total	42	12	11	2	13	80	
	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	

$\chi2$ – chi-square rank, df – degrees of freedom, p – statistical significance, a – in comparison to participants from Greece, b - in comparison to participants from Lithuania.

The Table 5 evaluates IT competencies before and after training, showing high agreement rates among participants regarding their skills and knowledge both before and after the training. Here is a summary of key findings: Strong Baseline Competencies: Most participants (over 90%) already demonstrated high competence in essential IT skills (e.g., using search engines, storing and retrieving files, communication tools) before training. Incremental Improvements: After training, slight improvements (1-7%) were observed in some areas, such as: Awareness of using digital tools to solve routine problems (+3.3%, statistically significant at p=0.019), Digital problem-solving and limitations awareness (+7.7%, non-significant). Producing simple digital content (+4.4%). Stable High Scores: Skills like understanding online reliability, social networking tools, or copyright awareness reached or remained near 100% agreement post-training. Minimal Change in Advanced Skills:

Advanced tasks, such as editing others' content or modifying software settings, showed little to no improvement, likely reflecting a ceiling effect due to high pre-training competence. Statistical Significance: Most improvements, while positive, were not statistically significant, suggesting that participants entered training with a robust baseline of IT skills. This analysis highlights the effectiveness of the training in reinforcing existing competencies and addressing minor gaps.

Table 5. Assessment of IT competencies before and after training (N=90)

Statements	Testing	N	% of agreement	% of improvement	Median	Z	Sig.
I can look for information online using a search engine.	Before training	90	98,9	1,1	5	-1,167	p=0,243
	After training	77	100,0		5		
I know not all online information is reliable	Before training	90	97,8	2,2	5	-1,191	p=0,234
	After training	77	100,0		5		
I can save or store files or content (e.g. text, pictures, music, videos, web pages) and retrieve them once saved or stored.	Before training	90	98,9	1,1	5	-0,088	p=0,930
	After training	77	100,0		5		
I can communicate with others using mobile phone, Voice over IP (e.g. Skype) e-mail or chat – using basic features (e.g. voice messaging, SMS, send and receive e-mails, text exchange).	Before training	90	98,9	0	5	-0,638	p=0,523
	After training	77	98,9		5		
I can share files and content using simple tools.	Before training	90	98,9	1,1	5	-0,889	p=0,374
	After training	77	100,0		5		
I know I can use digital technologies to interact with services (as governments, banks, hospitals).	Before training	90	96,7	2,0	5	-0,346	p=0,729
	After training	70	98,7		5		
I am aware of social networking sites and online collaboration tools.	Before training	90	97,8	2,2	5	-0,533	p=0,594
	After training	77	100,0		4		
I am aware that when using digital tools, certain communication rules apply (e.g., when commenting, sharing personal information).	Before training	90	96,7	2,0	5	0,000	1,000
	After training	77	98,7		5		
I can produce simple digital content (e.g., text, tables, images, audio files) in at least one format using digital tools.	Before training	90	93,4	4,4	5	-0,021	p=0,983
	After training	77	97,8		4		
I can make basic editing to content produced by others.	Before training	90	93,4	2,2	4	-0,189	p=0,850

Statements	Testing	N	% of agreement	% of improvement	Median	Z	Sig.
	After training	77	95,6		4		
I know that content can be covered by copyright.	Before training	90	98,9	1,1	5	-0,127	p=0,899
	After training	77	100		5		
I can apply and modify simple functions and settings of software and applications that I use (e.g., change default settings).	Before training	90	94,5	0	4	-1,159	p=0,246
	After training	77	94,5		4		
I can take basic steps to protect my devices (e.g., using anti-viruses and passwords). I know that not all online information is reliable.	Before training	90	95,6	3,3	4	-1,503	p=0,133
	After training	77	98,9		4		
I am aware that my credentials (username and password) can be stolen. I know I should not reveal private information online.	Before training	90	98,9	0	5	-0,467	p=0,641
	After training	77	98,9		5		
I know that using digital technology too extensively can affect my health. I take basic measures to save energy.	Before training	90	97,8	2,2	5	-0,830	p=0,406
	After training	77	100,0		5		
I can find support and assistance when a technical problem occurs or when using a new device, program or application.	Before training	90	95,6	3,3	4	-1,250	p=0,211
	After training	77	98,9		4		
I know how to solve some routine problems (e.g., close program, re-start computer, re-install/update program, check internet connection).	Before training	90	96,7	3,3	5	-2,345	**p=0,019***
	After training	77	100		5		
I know that digital tools can help me in solving problems. I am also aware that they have their limitations.	Before training	90	98,9	1,1	5	-0,563	p=0,574
	After training	77	100		5		
When confronted with a technological or non-technological problem, I can use the digital tools I know to solve it.	Before training	90	91,2	7,7	4	-1,646	p=0,100
	After training	77	98,9		4		
I am aware that I need to update my digital skills regularly.	Before training	90	98,9	0	5	-0,284	p=0,776
	After training	77	98,9		5		

*Z – Wilcoxon signed-rank test; p - statistical significance. * - comparing with before training rank.*

Summarizing the results, we can say that approximately half of the participants reported an increase in their IT knowledge following the completion of the module. This suggests that the training was effective in

enhancing digital competencies for a significant portion of the group. However, the limited overall improvement in some areas indicates room for growth in the module's impact. Adjustments to the curriculum, such as focusing on advanced IT skills or tailoring content to diverse baseline proficiencies, may be necessary to ensure a more comprehensive increase in IT proficiency across all participants.

Conclusions

In today's fast-changing healthcare landscape, healthcare professionals need to be savvy with digital skills. These skills aren't just important for understanding technology, but they also improve patient care, safeguard data, and support professional growth. Know-how with digital platforms like electronic health records, telemedicine, and AI helps providers make smart choices and offer personalized care. Being able to keep patient information safe and follow security rules is also very important for earning trust in the healthcare. As technology keeps changing healthcare, staying on top of digital skills is necessary to stay competitive and effective in the field. Using digital tools to work across different areas helps coordinate care and get the best results for patients. Bottom line, digital skills aren't just about using new technologies —they're driving healthcare forward, protecting patient privacy, and advancing the whole profession in the 21st century. These skills cover a wide range of knowledge that lets healthcare professionals use technology to improve patient care and communication between other health care providers. This study shows that most participants already had a solid foundation of digital skills before training, but there were still improvements across several areas. The training particularly benefited participants in areas such as problem-solving, awareness of IT limitations, and technical skills like file management and security. The most significant improvements were seen in Greece and Spain, while Finland and Lithuania participants generally remained unchanged or showed slight improvements. Ongoing investment in digital education is crucial to make sure that healthcare professionals can keep up with advancing technologies and uphold highest quality patient care.

References

1. Božić, V., & Poola, I. (2023). The role of artificial intelligence in increasing the digital literacy of healthcare workers and standardization of healthcare. no. April, 1-13. http://dx.doi.org/10.13140/RG.2.2.30715.80165
2. Foadi, N., & Varghese, J. (2022). Digital competence–a key competence for todays and future physicians. Journal of European CME, 11(1), 2015200. https://doi.org/10.1080/21614083.2021.2015200
3. Garcia-Perez, A., Cegarra-Navarro, J. G., Sallos, M. P., Martinez-Caro, E., & Chinnaswamy, A. (2023). Resilience in healthcare systems: Cyber security and digital transformation. Technovation, 121, 102583. https://doi.org/10.1016/j.technovation.2022.102583
4. Hermes, S., Riasanow, T., Clemons, E. K., Böhm, M., & Krcmar, H. (2020). The digital transformation of the healthcare industry: exploring the rise of emerging platform ecosystems and their influence on the role of patients. Business Research, 13(3), 1033-1069. https://doi.org/10.1007/s40685-020-00125-x
5. Senbekov, M., Saliev, T., Bukeyeva, Z., Almabayeva, A., Zhanaliyeva, M., Aitenova, N., ... & Fakhradiyev, I. (2020). The recent progress and applications of digital technologies in healthcare: a review. International journal of telemedicine and applications, 2020(1), 8830200. https://doi.org/10.1155/2020/8830200
6. Stoumpos, A. I., Kitsios, F., & Talias, M. A. (2023). Digital Transformation in Healthcare: Technology Acceptance and Its Applications. International journal of environmental research and public health, 20(4), 3407. https://doi.org/10.3390/ijerph20043407

Acknowledgements

We extend our gratitude to the project "Equal Treatment Supporting rights and access of people with intellectual disabilities to secondary and tertiary healthcare service" (101049115 ERASMUS-EDU-2021-PCOOP-ENGO) partners from The European Platform for Rehabilitation (EPR), Vocational Training Center MARGARITA, Tampere University of Applied Sciences (TAMK), Research Center of Biopolitics from Panteion University (RECEBI), Girona Biomedical Research Institute (IDIBGI), Fundacio campus Arnau d' Escala (FCAE) for their valuable insights and support in the methodology of the study and data collection.

Information about the authors

Gerda Bukauskaitė – Žiūkienė, Kauno kolegija Higher Education Institution, Faculty of Medicine, Nursing department, Lithuania. Lecturer, PhD candidate, research field: nursing, elderly health, environmental impact on health. Email address: gerda.bukauskaite@kaunokolegija.lt

Aurimas Galkontas, Kauno kolegija Higher Education Institution, Faculty of Medicine, Pharmacy department, Lithuania. Junior assistant, PhD candidate, research field: health care management, health care service provision, health care system resilience. Email address: aurimas.galkontas@kaunokolegija.lt