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

doi:10.3233/SHTI250541

Insights on Training and Certification in Digital Health Technologies

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Abstract. Digital health is growing rapidly with several technologies aiming to revolutionize the healthcare domain. In this context, the need for training and certification programs becomes imperative. Although such programs do exist, they need to be further expanded and enhanced to cover the pressing needs of the current landscape. In this paper, we describe insights on training and certification in digital health technologies as these were obtained through a related workshop. We outline the profiles and the expertise of the workshop's participants, the main gaps in knowledge and competencies, the governance and legislation issues and the need for certification in the digital health domain.

Keywords. Training, certification, education, skills, digital health

1. Introduction

The integration of digital health technologies [1] is transforming the global healthcare landscape, offering new ways for diagnosis, treatment, and patient management [2]. Innovations such as telemedicine, mobile health applications, electronic health records, wearable devices, and AI-based clinical decision support systems are reshaping how care is delivered and monitored [3]. These technologies promise to improve patient outcomes, enhance efficiency in healthcare systems, and increase access to care, especially in underserved and remote areas. However, their successful implementation depends a) on

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access to the technology, and b) on the proficiency of healthcare professionals in their use and management [4].

To bridge the gap between the introduction of digital health technologies and their effective clinical application, robust and up-to-date training and certification programs have become essential [5]. These programs equip healthcare providers with the necessary skills to safely and effectively navigate digital health tools, ensuring standardized competency and building trust among providers and healthcare organizations. Certification validates proficiency in digital health, bridging technological advancements with their ethical and practical applications.

Studies highlight the need for continuous education to keep healthcare professionals aligned with evolving technologies [6]. Training programs focus on competencies like data privacy, telehealth platform use, and AI-driven health data analysis [7], [8]. Despite their importance, implementation challenges persist, including limited time, high costs, and insufficient resources [9]. Certification frameworks, which vary by focus—such as telemedicine or broader digital health skills—typically include assessments, continuing education, and accreditation. However, inconsistent standards and rapid technological changes complicate the creation of comprehensive global programs [10].

This paper describes the main outcomes of the workshop entitled "Training and certification in digital health technologies" that took place in MIE'24, highlighting the insights and practical strategies shared with participants. These initial outcomes offer valuable guidance for healthcare organizations and policymakers seeking to establish robust certification programs that can ensure healthcare professionals are well-prepared to utilize digital health innovations safely, effectively, and in alignment with industry standards. Ultimately, this exploration contributes to the ongoing dialogue on the importance of standardized education and certification in advancing the digital transformation of healthcare.

2. Methodology

As discussed earlier, this paper reflects on the outcomes from the workshop titled "Training and Certification in Digital Health Technologies," held at the 2024 Medical Informatics Conference. During that workshop, a set of questions, both multiple choice ones and open ended, were provided to the participants through the Mentimeter[2] online tool. Then, the participants were given a specific amount of time to provide their reply for each question and once the replies of all participants were collected a brief discussion took place. In total, 13 participants replied to 11 questions (specified in the following section) that were related both to their personal profile, role and knowledge and to their opinion in topics related to training and certification in digital health.

3. Results

In this section, we will outline and discuss the replies to the questions presented in the previous section. Regarding the first question, "What is your primary role in healthcare?" 43% of the participants described their role as *researcher*, 21% as *educator*, 14% as *IT professional*, another 14% as *student*, while 7% as *other*. Given that this workshop took

[2] https://www.mentimeter.com/

place as part of a scientific conference, the fact that the majority of the participants were researchers and educators was expected.

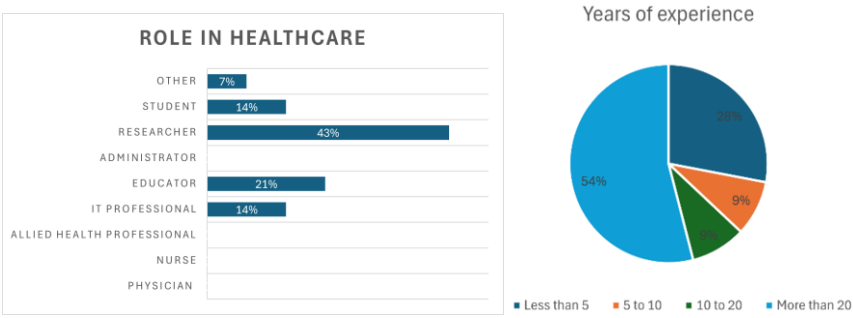

Figure 1. Role in healthcare and years of experience of workshop's participants.

Concerning the second question, "How many years of experience do you have in the healthcare field?" 54% of the participants have more than 20 years of experience, 9% between 10 and 20 years of experience, another 9% between 5 and 10 years of experience and approximately 28% have less than 5 years of experience (fig. 1). These replies show that the workshop attracted both experienced participants, but also younger ones with small experience in the field achieving good representation of different generations.

Regarding the third question, "What is your primary area of expertise or experience?" 45% mentioned *research* as their area of expertise, 28% *Public Health* and 27% *IT*. The replies to this answer show a blend of both academic and research and industrial backgrounds of the workshop's participants (fig. 2).

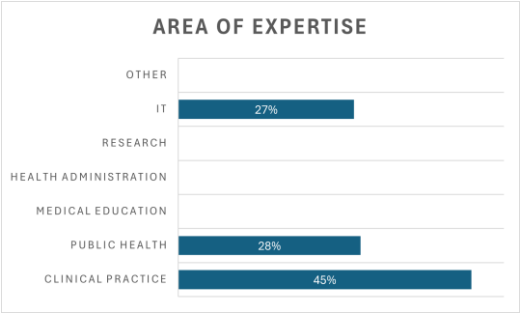

Figure 2. Area of expertise of the workshop's participants.

Regarding the fourth question, "In which region do you primarily practice or work?" 80% of the participants stated that they are based in Europe, while another 20% stated that they are based in the US.

As to the fifth question, "How familiar are you with digital health technologies in your professional work?" 73% of the participants describe themselves as *very familiar* and another 27% as *familiar*. Through the replies to this question, it became evident that all the participants have some experience and familiarity with digital health technologies in their professional work. This was expected since MIE is a conference specified to medical informatics.

As to the sixth question, "How well do you think current healthcare education prepares professionals to work with emerging digital health technologies?" 73% of the

participants believe that healthcare education prepares professionals *poorly* and another 27% believe that it prepares professionals *adequately*. The replies to this question outline the understanding from the community that the related education that is provided nowadays is not advanced enough to cover the demanding needs for professionals proficient in digital health technology and applications.

Regarding the seventh question, "What specific skills or knowledge do you think are most lacking in current healthcare training programs related to digital health?" several answers were provided and the main ones being, *lack of systematic education in digital health*, *legal and ethical*, data g*overnance*, *translation* amongst others. These replies outline a wide range of technical, practical and legal issues that the participants consider important when educating students and professionals in digital health.

Concerning the eighth question, "What challenges have you faced or observed when trying to implement digital health technologies in your practice?" several answers were provided the main ones being, *legislation issues*, l*imited available open datasets*, *slow adoption of the standards*, *lack of substantial education and resources*, *lack of motivation*, *resistance*. The unavailability of datasets, standards and legislation are mentioned amongst others and seem to be prohibiting participants from implementing digital health applications.

With regard to the ninth question, "What topics you observed are challenging when trying to implement digital health technologies in your practice?" several answers were provided and the main ones being, *terminology*, *multilingualism*, *data transformation between standards*, *competing terminology and standards*, *governance*. In this question, the participant seems to agree that the availability of standards or the poor adoption of them is a crucial limiting factor when trying to implement digital health applications.

For the tenth question, "Have you previously participated in any certification programs related to digital health technologies, as a trainer?" 100% of the participants replied negatively. Finally, in the eleventh question, "Have you previously participated in any certification programs related to digital health technologies, as a trainee?" 82% of the participants replied negatively, while 28% of them replied positively. The two final questions show that the engagement of the participants in certification programs is poor and a lot of space for improvements is available.

4. Discussion

The workshop results reveal a diverse participant profile, primarily comprising researchers and educators, with a strong representation from Europe and extensive experience in healthcare. Despite being familiar with digital health technologies, participants highlighted significant gaps in healthcare education, especially regarding systematic training in digital health, legal and ethical considerations, and governance of data. The challenges faced in implementing digital health technologies, such as legislative barriers, limited datasets, resistance, and slow adoption of standards, underscore systemic issues that hinder progress. Furthermore, difficulties with terminology, multilingualism, and data transformation emphasize the need for harmonization and practical solutions in the field. Notably, the lack of engagement in certification programs, both as trainers and trainees, highlights an opportunity for improvement in fostering structured learning pathways and professional development in digital health. This discussion underscores the pressing need for enhanced educational frameworks and collaborative efforts to overcome barriers in digital health adoption.

5. Conclusions and Future Work

The workshop revealed significant gaps in healthcare education and challenges in implementing digital health, including legislative barriers and data standards. Low participation in certification programs highlights the need for structured training to better prepare professionals for the demands of digital health. Future work should focus on developing comprehensive digital health certification programs, emphasizing standardized curricula, collaboration among stakeholders, and ongoing professional support. Research should address the needs of healthcare professionals at various career stages and identify scalable solutions to enhance participation, ensuring all professionals are prepared for the evolving digital healthcare landscape.

Acknowledgment

This work was co-funded by the European Union's Horizon 2020 Innovation Action programme, 'HosmartAI - Hospital Smart Development Based on AI,' under Grant Agreement No. 101016834, and by the European Union's Horizon Europe 'COMFORTAGE- Prediction, Monitoring and Personalized Recommendations for Prevention and Relief of Dementia and Frailty' under Grant Agreement No. 101137301.

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