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ENHANCING PATIENT COMMUNICATION THROUGH HEALTH PROFESSIONALS' DIGITAL LITERACY

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Abstract

Digital health literacy has been defined as the 'ability to seek, find, understand, and appraise health information from electronic sources and apply the knowledge gained to address or solve a health problem' (Norman and Skinner, 2006). Health literacy and digital health literacy are essential in order to reach universal health coverage and to reform the processes of the healthcare systems (WHO, 2018). Healthcare professionals need to treat patients in a continuous evolving structure (WHO, 2013). The research question that guided the paper is 'How can Romanian health professionals' digital health literacy be used to improve communication with their patients?'. The aim of the study is to explore Romanian health professionals' level of digital literacy, to identify how it can improve the communication with the patients. 20 interviews with resident and senior medical doctors, medical students and nurses were conducted. The interviews were audio recorded, transcribed and then stored as Word documents in a password-secured environment. From the data gathered in the interviews four major themes emerged: (a) digital health literacy; (b) communication with the patients; (c) improvements for the National Health Strategy 2014-2020; (d) time as a barrier in communication. Data was analyzed using thematic analysis through the MAXQDA2018 software.

Keywords: human resources in health, digital health literacy, communication, patients, quality of care.

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1. Introduction

At the intersection of health literacy and digital literacy, digital health literacy (DHL) has been defined as the 'ability to seek, find, understand, and appraise health information from electronic sources and apply the knowledge gained to address or solve a health problem' (Norman and Skinner, 2006). Norman and Skinner describe DHL as an interference of more components – named the Lily model – that are not just static but evolve as new technologies emerge and transform (Norman and Skinner, 2006). The components that serve as the Lily model are the following: traditional literacy and numeracy, computer literacy, media literacy, science literacy, information literacy, health literacy (Norman and Skinner, 2006). All the components are equally important and in order to have a good literacy all components require education and development.

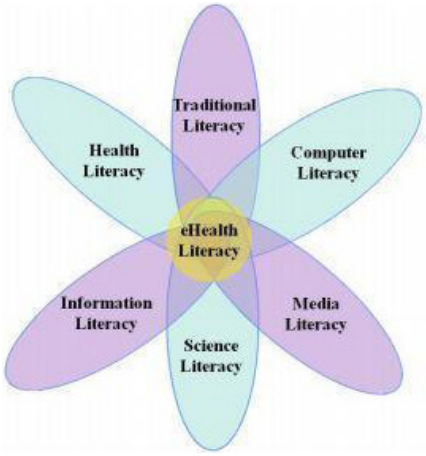

Figure 1: The Lily Model

Source: Tennant *et al.* (2015, p. 3)

2. Literature review

In the framework 'Towards a Roadmap for the Digitalization of National Health Systems in Europe', the World Health Organization (WHO) states that programs for health literacy and digital health literacy should be mandatory for the general public and health professionals (WHO, 2018). These are essential in order to reach universal health coverage, to disrupt and transform healthcare, and to reform the processes of the healthcare systems (WHO, 2018). This highlights the need for courses and training, for both professionals and the general public, that are necessary in order to maximize the effects of the technology that we have access to.

When it comes to health, health literacy was transposed in e-health and in the new era of medical care. The emphasis on e-health gives digital health literacy an equal value of health literacy as or even bigger than of the latter (Benjamin, 2010). Digital health literacy is increasing in importance for both health professionals and patients. For example, the large amount of online information increases the importance of patients' DHL (Silver, 2015). In order to be able to use proper e-health solutions, to be effective and to ease the burden put on the system, health professionals need to be digitally literate and have a high level of proficiency (Oliver, 2011). Furthermore, in the 'E-health Competency Framework', digital health literacy is put under definitory knowledge that an expert clinician has to hold and is imperative for e-health implementation (Oliver, 2011).

The correct use of e-health will lead to less wasteful spending that currently occurs in our systems. One-fifth of health spending is wasteful, and it could be eliminated by maintaining the same quality of services (OECD, 2017). Wasteful spending appears when patients receive unnecessary tests and treatments. This could be prevented if the Patient Electronic Record would be correctly used and the health practitioners would have the abilities to understand and to appraise the background of the patient using electronic sources (European Commission and OECD, 2018).

Digital health literacy is increasing in significance as new evidence shows that individuals with better digital literacy are more inclined to have a more positive attitude and behavior towards embracing and accepting new technologies (NHS and Royal College of Nursing, 2018). DHL is critical at this point for Romania as a shift is being made towards the digitalization of the healthcare system and more e-health services are employed to streamline the services provided (Ministry of Health, 2013). The lack of digital literacy has been shown to lead to a low level of patient satisfaction (de Normanville and Scott, 2016) which should be of high interest for Romania, where less than 35% are satisfied with the health care system (Burcea, Toma and Papuc, 2014). The medical workforce needs to improve their training in order to enable their patients to increase their health and well-being using modern solutions (NHS, 2019).

Just one out of two nations in Europe and Central Asia have strategies or policies in place to improve digital health literacy. According to the 'Digital Health in the European Region: The ongoing journey to commitment and transformation' report, just 19 countries have established recommendations on how to evaluate digital health interventions,

which is critical for ensuring their safety and effectiveness. Besides that, slightly more than half of the WHO European Region's nations have developed digital health literacy policies and implemented a digital inclusion strategy (WHO, 2023).

Digital literacy levels have been proven to influence staff involvement with information systems, with weak computer abilities and expertise cited as one of the primary impediments to adoption of electronic health records (EHR). In Australia, a survey of over 4,000 nurses found that nurses' expertise and confidence in using information and communication technology are restricted to basic computer programs, with nurses indicating low confidence in utilizing computer-based applications. Similarly, a study of computer hardware and software utilization found that American nurses working in a community hospital had minimal computer literacy (Kuek and Hakkennes, 2020). Another example is Ethiopia, which is currently working on various eHealth projects, although many of its existing health information systems have sustainability issues. Low acceptance and sustainability of EHR systems are mostly due to a lack of digital literacy among healthcare practitioners. Healthcare practitioners in low-income countries should have at least basic understanding of digital technology. Studies suggest that healthcare staff need to improve their digital skills to sustain high-quality health services (Tegegne *et al*., 2023).

Digital health and digital health literacy are tightly intertwined with public administration and policy in various important ways:

1. Transforming public administration digitally: by incorporating digital technologies, public administration can boost transparency, efficiency, and accountability. This digital transformation helps governments deliver better services and increases citizen engagement and participation (Digitalist Magazine, 2018; Iyamu *et al.*, 2021).
2. Incorporating digital health in public policy: governments are key in developing public health policies that utilize digital health technologies. Policymakers must create frameworks that encourage the use of these technologies while ensuring data privacy and security (Gordon, Perlman and Shukla, 2017; European Commission, 2018; Wong *et al.*, 2021).
3. Enhancing digital health literacy: for digital health initiatives to succeed, the public needs to be digitally health literate. Public administration and policy should prioritize educating citizens on how to use digital health tools effectively and safely (Campanozzi *et al.*, 2023; Zhao *et al.*, 2024).
4. Digitizing public health data: converting analog public health data into digital formats improves data management, analysis, and sharing among stakeholders, including public health authorities and policymakers (Azzopardi-Muscat and Sørensen, 2019; Perez Sust *et al.*, 2020; Iyamu *et al.*, 2021).
5. Utilizing digital technologies for public health: technologies like mobile health apps, telemedicine, and wearable devices can enhance public health outcomes, track disease outbreaks, and promote healthy behaviors. Public administration and policy should support the development and use of these innovations (Meskó *et al.*, 2017; Car *et al.*, 2019; NHS, 2019; Iyamu *et al.*, 2021).

The aim of the study is to explore Romanian health professionals' level of digital literacy, to identify how digital health literacy can be used in order to improve the communication between health practitioners and patients, and advance broader health system goals.

The objectives of this paper are: (I) to explore current and future health professionals' level of digital health literacy; (II) to explore the impact of digital literacy on health professional – patient communication; and (III) to identify the domains where improvements are needed in order to reach the general objective 6 of the National Health Strategy 2014–2020: i.e. Increasing the efficiency of the health system through increasing the usage of modern information and communication technologies (ICT) e-health (Ministry of Health, 2013). The research question that guided the paper is 'How can Romanian health professionals' digital health literacy be used to improve communication with their patients?'.

3. Methods

The research approach chosen is qualitative as the subject of the research is more complex and under-researched. This design offers a more comprehensive answer to the research question, the information is more in-depth, and it might result in more sensitive information that would not be obtained through a quantitative approach (Bowling, 2014). Communication with patients is a subjective matter, which can be difficult to measure through a quantitative approach. As the objectives of the study are to explore digital health literacy and communication, an in-depth and thorough method was needed.

The study is exploratory, and it employed a qualitative approach, by conducting semi-structured in-depth interviews with medical doctors, nurses and medical students. The exploratory design was chosen as the research topic is relatively new and the Romanian health professionals and stakeholders have to be familiarized with the subject (Babbie, 2010).

Before conducting the interviews, an informed consent was provided to the participants, to ensure that the participants are aware of the study's aims, procedures and legal rights. The informed consent included two parts: (1) Informed Consent Form, which offered information about the purpose of the research, type of research intervention, participant selection, voluntary participation, procedures involved, duration, risks, benefits/reimbursements, sharing the results, right to refuse or withdrawal and who to contact; and (2) Certificate of Consents, where the participant signs and agrees to be interviewed and participate in the study.

For a better understanding of the topic, the questions for the interview were grouped into four categories:

- (1) competence in the use of digital technologies, which included questions related to the importance of digital technology, frequency in using digital technology, types of devices used, levels of competence and complexity of the tasks undertaken with the use of technology;

- (2) digital technologies and health, that focused on role of digital technology in the health system, opinion on digitalization of the medical field and the value of technology for healthcare professionals;
- (3) doctor-patient relationship and e-health, which targeted the communication of the healthcare professionals with the patients, the digitalization role in the patient-patient and patient-physician relationship; and
- (4) the future and e-health, that centered on the necessary future steps to achieve the eHealth goals of the National Health Strategy 2014–2020.

Data was collected on the premises of the health professionals interviewed, as agreed with them. This was decided in order to make the interview a comfortable and pleasant experience, without interfering with their practice. The study population is represented by a convenience sample of Romanian health professionals, nurses, and medical students from Cluj-Napoca. Resident and senior medical doctors were invited to take part in the study, as well as medical students and nurses. The number of the sample is twenty (20), five (5) persons from each of the four groups. We reached information saturation from the 20 interviews we conducted; therefore, no additional interviews were needed. The sampling unit was the individual – either the senior medical doctor, resident medical doctor, nurse, or medical student.

To reach saturation, we used the snowballing sampling – interview participants were asked to make a referral of one or more individuals from their social network who may be interested in participating in the study (Mack *et al.*, 2005). The first person interviewed in each group was a convenient sample – an individual already known to the research team, and from that person a referral was asked for another possible participant. The process continued until no new information was provided during the interviews. As in one case no referral was made, the previous person was asked for another referral (Dudovskiy, 2018). The interviews were audio recorded and a notebook was available to the operator in order to take notes or/ and write questions that emerged from their answers (Hennink, Hutter and Bailey, 2010). The process was guided by a semi-structured interview guide with open-ended questions.

The main variables of interest were the level of digital literacy of health professionals and the communication with their patients. For the measurement of the variables, validated scales were used, such as 'European Digital Competence Framework for Citizens' (Vuorikari *et al.*, 2016) or 'eHealth Literacy Scale' (IC-HEALTH, 2018).

From the main points of interest, the objectives of the paper and the data collected, 4 themes emerged: (a) digital health literacy; (b) communication with patients; (c) improvements for the National Health Strategy 2014–2020; and (d) time as a barrier in communication.

The study respected the research ethics and human subject protection by not doing any harm neither to the subject, not the community, no human rights were violated, and the participants were permitted to end the interview when they felt uncomfortable. The questions were not offensive nor productive of harm. At the beginning of the interview,

they received the consent form where they were informed about their rights and what their participation in the study can produce. The transcribing of the interviews was done only by accredited users (holders of Human Subject Protection certificate) and all the elements that could lead to the identification of the subjects were coded. The proposal was exempted from the Institutional Review Board from Cluj School of Public Health as it is an educational practice project.

Data obtained through the interview was audio-recorded, transcribed and then stored as Word documents in a password-secured environment accessible only for the research team. Afterward, the data was analyzed with the help of a software – MAXQDA. Thematic analysis was used to explore the main areas of interest. Analysis was carried out in Romanian – as the interviews have been conducted in Romanian – with quotations translated for the final report (Panaitescu *et al.*, 2014). A codebook was developed based on the output of the interviews and the main variables of interest. The codebook was elaborated both deductively and inductively. Deductive analysis was directed by the researcher's theoretical or analytical concern. Inductive thematic analysis was derived from the interviewee's inputs (Braun and Clarke, 2006). The principal investigator listened to the interviews, read and re-read the transcripts and observed what patterns exist across the data.

4. Results

The following results were gathered through twenty interviews. The average length of the interview was 35 minutes and 12 seconds with the maximum value of one hour and 7 minutes and the minimum of 20 minutes and 44 seconds. The average age of the sample was 34.1 years, with the maximum of 56 years and the minimum of 23 years. The main outcomes of the paper are represented by:

4.1. Digital health literacy

Importance

The significance of the skill was recognized as ranging from important to very important by respondents. Digital health literacy is seen as a necessary skill as digital technologies are everywhere and 'without it you cannot do anything today' (female, senior medical doctor, 47). The respondents identified both the positive and negative aspects of the increased usage of digital technologies, as 'at a certain point can be harmful, but you cannot live without it' (female, medical student, 23). On the other hand, it was recognized as 'very important as it eases the daily life' (male, resident medical doctor, 26) and even 'vital in the context in which we are living' (male, resident medical doctor, 27).

Purpose

The purpose of digital health literacy is highly important, and it is embedded in every aspect of their daily lives. It 'eases the day-to-day work' (male, resident medical doctor, 27) if one has the adequate level and 'it streamlines the work and you can spend more time with the patient, doing medicine' (male, senior medical doctor, 47).

Self-reported level of digital literacy

During the conversations, the principal investigator explained to participants how digital health literacy is measured, and they did a short self-assessment of their skills. The vast majority of the sample reported their level as average or above. As half of the sample was represented by medical students and resident medical doctors, they are proficient in using digital technologies – 'I would say I am advanced because I'm from the generation that grew up with computers' (male, resident medical doctor, 27) – and this might have influenced the level of digital health literacy of the sample as the sample with a rich experience in the field had a lower level – 'as I have a different education and I had to work with them, but I do not like it that much' (female, senior medical doctor, 47). They acknowledged that 'it is a field where you can constantly grow and learn' (female, nurse, 50).

Digital literacy of patients

A recurring aspect of the interviews is represented by the digital health literacy of the patient that is influencing the patient-doctor relationship and communication. 'The problem is about the validity of the sources of information from the online' (male, medical student, 24) as 'there are information that are causing more harm than good' (male, resident medical doctor, 27) and 'patients should be aware where they are searching for medical information' (female, nurse, 45). Lack of digital health literacy leads to situations where 'the healthcare professional is disregarded' (female, nurse, 26) and 'they often do what they read online instead of listening to the advice given by the doctor' (male, resident medical doctor, 26).

4.2. Communication with the patient

The interviewees have conflicting opinions on communication as they have different specialties and different levels of interaction with patients. The most reencountered motifs when talking about communication were the communication with patients with its influencing factors and e-health communication in the future.

Health professional-patient communication

'As any communication is very complicated, nothing standardized. Normally now, in practice, you have an anamnesis where you ask questions, but you often do not ask them all because it doesn't come to mind, you cannot, you do not have time, you have no resources. It's complicated, it is subjective, the patient can lie to you, hide, do all sorts of things. There is nothing objective, you cannot have clear, accurate data. It's very difficult to communicate with the patient. Communication in general is very difficult in the medical field. No matter from what part you see it.' (male, senior medical doctor, 47).

Influencing factors

They acknowledge the impact of e-health on communication – 'I believe that because of the digitalization, we now have more time to talk with the patient, to listen to his problems. But sometimes, the system makes the communication more difficult with the patient

because it does not always work at full capacity, but there are always advantages and disadvantages' (female, nurse, 29). And some talk about a different reality in communication: 'Unfortunately, most of the time, after a rigorous basic anatomy lesson, physiology and body functioning, you have to use your authority and your medical training. You have to use phrases such as – You can treat yourself if you are not happy with what I am doing. They are reluctant, they feel like they know better' (male, resident medical doctor, 26).

The communication is tougher, 'usually is not because they read on the internet or have no education but rather because of their position. I've seen people from more influential positions, they have a higher or extra-high education, and they have great talents, and generally these are the most recalcitrant patients, that is, the unremarkable arrogant. Generally, we also meet people with higher or non-education who have always had patience, modesty, common sense, and so on, to bring the medical act to an end' (female, senior medical doctor, 36).

E-health communication in the future

E-health could positively impact the health professional-patient communication maximizing the time, making it more efficient and easing the burden put on the medical system. 'A communication more like between partners among the physician and the patient. E-health will eliminate the idea that the doctor, this abstract entity that speaks a very strange language and tells the patient just throws some diagnoses and treatments. Patients will no longer have the reluctance to ask if they do not understand' (female, senior medical doctor, 45).

4.3. National Health Strategy 2014-2020

The Romanian National Health Strategy 2014-2020 is the strategic document released by the Ministry of Health every seven years and it sets the main direction for those years (Ministry of Health, 2013). In spite of the importance of the strategy, most of the interviewees did not know of the existence of such a document or if they heard of it, they did not know of its content or any other exact details.

The most frequent answer focused on its dissemination – 'I think once it is that the world needs to know about it, this would be the first step. I do not know how doctors are informed, but myself, as I am not in the system yet, I am not so up to date. No one taught us about it. The first step should be to inform doctors and the medical world about this. And first of all, explain to those in the medical system what it implies, because we do not know much about it many times. We reject an idea without knowing too much about it just because you were not informed by who you should have and, in a way, correct' (female, medical student, 24).

Those that were in contact with the strategy emphasized that firstly the already existing problems in the healthcare system should be solved and afterwards, implement and adjust an e-health system. 'Well, we have many other unresolved problems, so let these problems from the system work first, without discussion' (female, senior medical doctor, 45).

4.4. Time

Time, or lack of time, has been mentioned by every interviewee. They mentioned it as a barrier to proper communication or as something that e-health should improve about the health system. When they are referring to time, they talk about the burden put on the system and on them, as the human resources in health are limited and time is limited.

> '...the MD has theoretically on paper 20 minutes for a patient. Maybe I do not have time to explain everything, maybe I try to explain, maybe they do not understand the language, maybe I try to translate it into his language, but maybe it's not all clear. Then a clarification on the internet is not a bad thing. To have a second opinion, to look a little on the Internet, to inform yourself, it's not a bad thing. There are some patients who know their illness, and from reading from validated sources, much better than some residents, because they suffer from a chronic disease for 10–20 years and they know everything about that illness' (male, senior medical doctor, 47).

They mention how e-health services could ease the burden and maximize time:

> 'This could bring a benefit for the patient, a benefit for the medical doctor, a benefit to the healthcare system because it will save some money. A benefit for everything that means processing and streamlining the system because it will save a lot of time. The moment in which I already have the patient's history I've already saved 10 minutes or maybe even more, depending on the case' (male, medical student, 24).

5. Discussions and conclusions

In the studied sample it was observed that the level of digital health literacy tends to be higher in the younger generations that were in contact with this world from a younger age.

The present piece of research, even in its most incipient form, showed to bring a huge impact in the public health community. It presents the status quo in a matter of global, international and national interest, which is under-researched in Romania and needs more attention. This offers an in-depth snapshot of the healthcare system and of the current state of e-health and its implementation among professionals.

As many of the interviewees stated, we need evidence-based decision making. The healthcare system, especially, needs programs and projects based on the real need and issues in day-to-day practice. To effectively implement evidence-based decision-making in healthcare, it is essential to create programs and projects that address the real needs and challenges faced in daily practice (Connor *et al.*, 2023). This method ensures that healthcare practices are based on solid judgment and the best available evidence, leading to better quality care, increased patient safety, and improved clinical outcomes (Jordan *et al.*, 2019; Connor *et al.*, 2023).

Key elements of evidence-based decision-making include:

- clinical evidence and expertise: develop clinically sound options;
- patient/ family goals and preferences: create options that are meaningful to the patient and their family;
- biological, sociological, and psychological contexts: tailor options to the individual patient and their family;
- shared decision-making: engage in dialogue between clinicians and patients to agree on the best approach for the patient; and
- evidence-based tools: use tools to facilitate discussions about treatment options and patient values, aiding the decision-making process (Shafaghat *et al.*, 2022; Connor *et al.*, 2023).

By integrating these components and using evidence-based tools like horizon scanning, evidence synthesis, and others, healthcare systems can better connect evidence generation with its application in real-time decision-making (Majid *et al.*, 2011; Shafaghat *et al.*, 2022).

The paper can form the basis of future studies as the interviewees emphasized many issues of the Romanian healthcare system. The future National Health Strategy can use findings from the current research to inform activities aimed at health workforce skill development. The paper concluded that the new generation of health professionals has a higher level of digital health literacy. The more experienced medical doctors and nurses have an adequate level as the shift was made towards a more digitalized health system and they were compelled to work with e-health services.

The impact of e-health services was observed to be important, either in a positive or a negative manner. It either facilitated it or it acted as a barrier – 'it increased the consultation time, but not in the favor of the patient. We have between us a screen that is a barrier – a physical and ideological one as the system often does not work' (female, senior medical doctor, 56).

A surprising aspect of the paper is that a large part of the sample did not know about the existence of the Romanian National Health Strategy 2014–2020.

The conclusions and data uncovered within this article about Romanian (and Cluj-Napoca) healthcare system can be relevant to other countries in several ways:

1. Challenges and solutions: the analysis of Romania's healthcare system highlights common global challenges like insufficient funding, medical staff shortages, and service delivery issues. Understanding Romania's approach to these problems can offer valuable insights for other countries facing similar difficulties (OECD, 2018; OECD/ European Observatory on Health Systems and Policies, 2023).
2. Digital health literacy: the new generation of health professionals in Romania is more digitally literate due to the system's digitalization. This trend is likely relevant to many other countries and can help shape strategies to improve digital health literacy among healthcare professionals worldwide (Ministry of Communications and Information Society, 2015; WHO, 2018; WHO, 2021; Alanazi, 2022; European Commission, 2022).

3. E-Health services impact: Romania's experience with e-health services can provide important lessons for other countries looking to implement or enhance their digital health systems. By understanding the challenges and benefits Romania has encountered, other healthcare systems can develop more effective e-health services (Car *et al.*, 2019; NHS, 2019; European Commission, 2022; Pana *et al.*, 2023).
4. Health workforce skill development: research on Romania's healthcare system can guide future studies and strategies for developing healthcare workforce skills in other countries. The lessons learned in Romania can help improve the skills and competencies of healthcare professionals globally (Azzopardi-Muscat and Sørensen, 2019; NHS, 2019; Robbins *et al.*, 2020; Al Knawy, 2021; Pfob *et al.*, 2021; Iyamu *et al.*, 2022; Alknawy *et al.*, 2023; Tegegne *et al.*, 2023).

By examining Romania's healthcare system, other countries can gain valuable lessons and insights to improve their own systems, tackle common issues, and enhance the quality of care they provide.

There are a few limitations of the study that should be considered. Although the research followed a rigorous methodology, the personal beliefs of the principal investigator might have influenced the outcome of the research. Secondly, the sample of the study is not representative as the snowball sampling was used, thus the beliefs and opinions of the participants might be similar. The subjectivity of the interviewees should be considered as well.

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