

DIGITAL LITERACY OF HEALTHCARE PROFESSIONALS AS A CONDITION FOR EFFECTIVE PROFESSIONAL INTERACTION

Sokolova OV¹ ✉, Smirnova AV¹, Isaeva IYu², Alekseeva KS¹

¹ Yaroslavl State Medical University, Yaroslavl, Russia

² Clinical Hospital No. 2, Yaroslavl, Russia

In this article, the issues of digital literacy that arise during communication of medical and pharmaceutical workers have been reviewed. The right for digital literacy, access to education that improves comprehension and develops digital skills while using medical information systems relates to one of the issues. The goal of the research is to assess digital literacy of healthcare professionals, which is essential for professional interaction during clinical research. Applicable laws and scientific publications regulating healthcare digitalization were used as instructional material. Circulation of medicinal preparations used in clinical research was examined through summary reports of medical companies in 2022–2024. Data from registered databases served as a basis for sociological research to determine digital literacy of professionals. According to the survey results, over 90.0% of respondents have computer-assisted workplaces, about 50.0% of them assessed their level of digital competence as average, and 67.4% need to improve their digital literacy. Optimal organizational solutions allow to improve digital literacy of all healthcare professionals producing a positive effect on ethics of professional interaction.

Keywords: digital literacy, pharmaceutical worker, medical worker, interaction, clinical research, ethics, medicinal product

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✉ **Correspondence should be addressed:** Olga V. Sokolova
Respublikanskaya St., 81, Yaroslavl, 150065, Russia; sova293@yandex.ru

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ЦИФРОВАЯ ГРАМОТНОСТЬ СПЕЦИАЛИСТОВ ЗДРАВООХРАНЕНИЯ КАК ФАКТОР ЭФФЕКТИВНОГО ПРОФЕССИОНАЛЬНОГО ВЗАИМОДЕЙСТВИЯ

О. В. Соколова¹ ✉, А. В. Смирнова¹, И. Ю. Исаева², К. С. Алексеева¹

¹ Ярославский государственный медицинский университет, Ярославль, Россия

² Клиническая больница № 2, Ярославль, Россия

В статье рассмотрены аспекты цифровой грамотности при взаимодействии медицинских и фармацевтических работников. Одним из таких аспектов является право на цифровую грамотность, обеспечение доступа к образованию для улучшения понимания и развития цифровых навыков в использовании медицинских информационных систем. Целью исследования явилось изучение цифровой грамотности специалистов здравоохранения для осуществления профессионального взаимодействия при проведении клинических исследований. Материалами стали нормативно-правовые акты, научные публикации, регламентирующие цифровизацию здравоохранения. Оборот лекарственных препаратов, участвующих в клинических исследованиях, изучался исходя из сводных отчетов медицинских организаций за 2022–2024 гг. Основой социологического исследования для определения цифровой грамотности специалистов послужила информация из зарегистрированных баз данных. По результатам анкетирования установлено, что более 90,0% респондентов имеют компьютеризированные рабочие места, при этом около 50,0% оценили собственный уровень владения компьютером как средний и 67,4% имеют потребность в повышении компьютерной грамотности. Оптимальные организационные решения позволяют повышать уровни цифровой грамотности всех специалистов здравоохранения, что влияет положительно на этику профессионального взаимодействия.

Ключевые слова: цифровая грамотность, фармацевтический работник, медицинский работник, взаимодействие, клинические исследования, этика, лекарственный препарат

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✉ **Для корреспонденции:** Ольга Вячеславовна Соколова
ул. Республиканская, д. 81, г. Ярославль, 150065, Россия; sova293@yandex.ru

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In modern conditions, the status of healthcare professionals such as medical and pharmaceutical workers is experiencing growth due to progress in medicine and pharmacy. This was made possible due to introduction of personalized innovative medicines into medical practice. Clinical trials, which evaluate interventions, including the use of medicinal preparations, for efficacy and safety are related to one stage of drug circulation [1].

Clinical trials are conducted in medical organizations that have approvals to carry out such studies. In accordance with Good Clinical Practice (GCP), medical organizations require adequate material resources (premises, equipment) and sufficient qualified personnel including medical and pharmaceutical workers to conduct high-quality research [2,3].

Table 1. Computer competence level description

No	Level	Level description
1	Initial (basic)	Simple operations with files and texts. Ability to create, rename, copy, transfer a file, print in a text editor, save a document, etc.
2	Average	Knowing how to use e-mail. Confident work with a text editor and tables, graphic editors, and presentations (basic elements of Microsoft Office programs).
3	Confident	Knowing how to work with Microsoft Office programs (full set), specific software, and any browsers. Ability to solve working tasks through software.
4	Advanced	Having programming skills. Ability to eliminate software errors, etc.

Peer relationships among medical professionals are based on ethical principles such as the doctrine of ethical actions for medical and pharmaceutical workers within the entire healthcare system and how they perform in their field. Pharmaceutical ethics and medical ethics have much in common. However, significant differences are also present as a pharmaceutical worker neither conducts medical examinations nor prescribes medicinal preparations [4].

The International Pharmaceutical Federation (FIP) enunciates peer cooperation between pharmacists, colleagues and other specialists, as well as respect for their values and professional abilities. The "Code of Ethics of the Russian Pharmacist" also emphasizes that "a pharmacist and a physician work together during pharmacotherapy", ... and that pharmacists are also "obliged to consult, within the limits of their knowledge, on the properties of medicinal preparations, as well as their chemical and pharmacological analogues" [5].

Now, when healthcare is getting digitalized, cooperation between medical and pharmaceutical workers who conduct clinical trials is increasingly reliant on digital interactions. This includes safeguarding confidentiality and communications through digital platforms [6]. Cooperation can be effective when a consolidated information area is built within a medical organization. It is done when workers are equipped with workstations integrated into a single network, shared network resources for exchanging data and messages, communication tools, information security, and other components that can be easily found in any modern organization. This is how continuous access to data, data safety and integrity is ensured [7].

Specialists must know how to use digital tools for automated workplaces, be skilled enough to search and maintain electronic medical records, work with medical information systems (MIS), inventory accounting systems (IAS) and other specialized services. At the same time, problems of interaction may arise due to diverse digital proficiency [8]. Both technical, and ethical aspects of dealing with digital technologies should be noted [6]. One of the aspects of digital ethics includes the right for digital literacy, which emphasizes development of information technology skills [9].

The goal of the research was to study digital literacy of healthcare professionals who interact during clinical trials.

MATERIALS AND METHODS

Applicable laws and scientific publications regulating the conduct of clinical trials during healthcare digitalization were analyzed. Circulation of the studied drugs was examined through consolidated reports of medical organizations for 2022–2024 and inventory accounting systems. A sociological study was conducted among medical professionals of the

Yaroslavl region using Google Forms. The research uses information from databases [10, 11]. The first section included information about the respondents (gender, age, position, length of service, etc.). The second section informed of workplace equipment, computer competence level, and need to improve computer skills. The level of computer competence was determined through self-assessment when it was necessary to choose among the proposed levels of computer competence (Table 1).

The proposed levels of computer competence allow respondents to assess their knowledge objectively and decide whether they need additional skills to solve and perform their professional duties.

The sample included 76 medical workers and 34 pharmaceutical workers from medical organizations with 96.5% of respondents being women, 58.6% of respondents aged 40 and over, and 65.8% of respondents having higher medical or pharmaceutical education. The results were processed with descriptive statistics methods.

RESEARCH AND DISCUSSION RESULTS

It is claimed that the investigational medicinal product is supplied to the medical organization by the sponsor of clinical trials in accordance with a contract. As per GCP (good pharmacy practice), it is a pharmaceutical (pharmacy) worker who is responsible for investigational product accounting in a medical organization [3]. Therefore, such a drug enters the structural unit where clinical trials are conducted through a pharmacy or a warehouse of a medical organization. In a pharmacy, pharmaceutical workers are engaged in acceptance, storage and release of the investigational medicinal product in accordance with GPP.

Then the investigational medicinal product goes from the pharmacy/warehouse to the structural unit, with the fact being confirmed through electronic documents. They are part of the documentary trail that can be used to reconstruct what happened during the clinical trials [3]. Information-based interaction between specialists from various structural divisions is carried out in local systems (MIS/IAS), designed, in particular, to support the conduction of clinical trials (Figure).

According to figure, digital communication between medical and pharmaceutical workers during circulation of drugs is done through electronic document flow (EDF). According to the legislation of the Russian Federation, information regarding the movement of all medicines should be entered into the MIS/IAS using EDI [12].

It has been established that digital literacy influences effectiveness of digital peer interaction. In a narrow sense, digital literacy relates to computer and information processing skills. In a broad sense, it is a set of knowledge, skills and

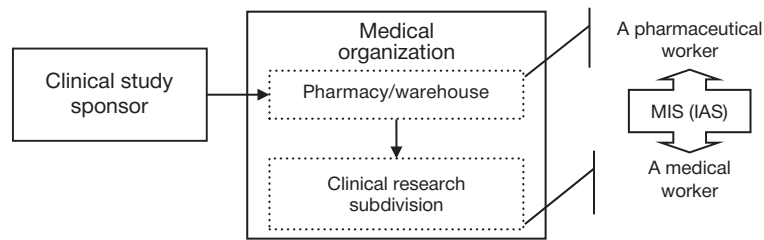


Fig. Peer relationships during circulation of medicinal products in clinical studies

Table 2. Analysis of healthcare professional workplace equipment

Equipment (if any)	Healthcare professionals, $n=76$		Pharmaceutical professionals, $n=34$	
	Number, persons	Share, %	Number, persons	Share, %
Desktop	74	97.4	31	91.2
PC	69	90.8	33	97.1

Table 3. Results of computer proficiency self-assessment by medical and pharmaceutical professionals

Computer proficiency level	Healthcare professionals, $n=76$		Pharmaceutical professionals, $n=34$	
	Number, persons	Share, %	Number, persons	Share, %
Initial (basic)	28	36.8	5	14.7
Average	35	46.1	18	52.9
Confident	13	17.1	10	29.4
Advanced	–	–	1	3.0
Total	76	100	34	100

Table 4. Analysis of the need to improve computer literacy

Reply	Healthcare professionals, $n=76$		Pharmaceutical professionals, $n=34$	
	Number, persons	Share, %	Number, persons	Share, %
yes	51	67,1	23	67,6
no	14	18,4	7	20,6
undecided	11	14,5	4	11,8
Total	76	100	34	100

abilities that allow a worker to solve problems within a digital environment effectively and safely [13]. It is mentioned in scientific publications that computer-equipped workplaces, computer literacy, and desire for self-education are essential [8].

In a sociological study, healthcare professional workplace equipment within a medical organization was analyzed (Table 2).

According to table 2, workplaces of medical and pharmaceutical professionals in medical organizations are not fully equipped. At the same time, a complex use of all functions of information systems is possible only if a workplace is well equipped [14].

It is established that all healthcare professionals use information systems and technologies in daily practice [15]. Results of computer proficiency self-assessment by medical and pharmaceutical professionals are provided below (table 3).

According to table 3, medical and pharmaceutical workers have different self-assessment results. One third of medical

workers assess their computer proficiency as basic, with the value being 2.5 times lower among pharmaceutical workers. An equal number of the respondents rate their computer proficiency as average. One in five medical professionals and every third pharmaceutical professional are confident users. Only one respondent is classified as an advanced user. The problems of healthcare digitalization in Russia, and insufficient level of digital literacy of medical personnel, in particular, are discussed in scientific publications [8].

Due to the increasing role of information in medical science and practice, constant development of digital skills among specialists is required [14]. We have analyzed the need of medical and pharmaceutical workers in computer literacy improvement (Table 4).

It has been established that two-thirds of the interviewed professionals wanted to improve their digital literacy. Other respondents provided a negative reply or failed to provide an answer at all.

CONCLUSIONS

A comprehensive analysis of regulatory documents and practical activities of medical organizations has allowed to detect a need in competent specialists when clinical trials are conducted. It is especially important for professionals to interact in the course of healthcare digitalization. However, a wide range of specialists have developed diverse digital skills and abilities. Thus, it is

necessary to improve the level of computer literacy of medical and pharmaceutical workers to ensure proper conduct of clinical trials, strengthen their motivation for self-development, and improve equipment in workplaces with personal computers. It is possible to make optimal organizational decisions to unify digital literacy requirements, develop and implement targeted educational programs, and improve technical infrastructure of medical organizations using the results.

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