INNOVATIVE APPROACHES TO MEDICAL DIAGNOSIS VIA ARTIFICIAL INTELLIGENCE INTEGRATED MOBILE APPLICATIONS

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ANNOTATION

This article analyzes modern and innovative approaches to medical diagnosis using mobile applications integrated with artificial intelligence (SI) technologies. The interactive interaction of the application with users, its effectiveness in the early detection of diseases and its impact on the healthcare system will be highlighted. The article also discusses the concept of mobile health (mHealth), principles of operation of SI algorithms in medicine, available solutions and their advantages, and problems in practice. The research results substantiate the role of such technologies in improving the quality of medical examinations, distance distance consultations and preventive measures.

Keywords: Artificial intelligence, mobile applications, medical diagnostics, mHealth, health technology, diagnostic algorithms, innovative approaches, remote medical services, health monitoring, smart systems.

АННОТАЦИЯ

В данной статье анализируются современные и инновационные подходы к медицинской диагностике с использованием мобильных приложений, интегрированных с технологиями искусственного интеллекта (ИИ). Будет освещено интерактивное взаимодействие приложения с пользователями, его эффективность в раннем выявлении заболеваний и его влияние на систему здравоохранения. В статье также обсуждается концепция мобильного здравоохранения (mHealth), принципы работы алгоритмов ИИ в медицине, имеющиеся решения и их преимущества, а также проблемы на практике. Результаты исследования обосновывают роль таких технологий в повышении качества медицинских осмотров, дистанционных консультаций и профилактических мероприятий.

Ключевые слова: Искусственный интеллект, мобильные приложения, медицинская диагностика, мобильное здравоохранение, медицинские технологии, диагностические алгоритмы, инновационные подходы, удаленные медицинские услуги, мониторинг здоровья, интеллектуальные системы.

INTRODUCTION

In recent years, the healthcare industry has been digitized globally at an unprecedented rate. The role of artificial intelligence (SI) technology in this process is invaluable and it is deeply integrated into almost all phases of the healthcare system – detection, diagnosis, planning and monitoring of treatment. SI systems, coupled with mobile technology, in particular, are at the heart of the innovative healthcare model today.

The ability to collect, analyze and consequently accurately medical data with the help of mobile applications not only reduces the distance between patients and doctors, but also dramatically increases the accuracy and speed of the diagnostic

process. This is an important factor in the provision of high-quality and modern medical care to the population, especially those located far from the major urban centers.

Mobile applications based on artificial intelligence technologies are suitable for use not only in a clinical setting, but also at home, everyday life, even in emergency situations, serving the user via a user-friendly interface and interactive tools. They measure vital vital indicators such as heart rate, blood pressure, blood oxygen level, body temperature, assess the state of health with the help of advanced algorithms based on the collected data and provide necessary medical advice.

Also, these technologies make it possible to automate and standardize the diagnostic process that has accumulated a large amount of medical information, previously based only on the expertise of specialist doctors. This serves to reduce the likelihood of medical errors, individualize treatment strategies, and make the healthcare system more efficient. This research paper analyzes innovative approaches to medical diagnosis of mobile applications with integrated artificial intelligence. It covers the mechanisms of operation of existing systems, their advantages, existing problems and ways to overcome them, as well as prospects for the future development of these technologies. Proposals for the introduction of these technologies in the healthcare system of Uzbekistan are also mentioned.

RESEARCH METHODOLOGY

The methodology of this study has an applied research orientation on an in-depth study of innovative approaches to medical diagnosis using integrated mobile applications using artificial intelligence technologies. The study uses a mixed methods approach, i.e., data are collected, analyzed, and evaluated based on quantitative and qualitative methods. Mobile medical applications based on modern artificial intelligence, such as Ada, Babylon Health, SkinVision, Youper, etc., are selected as research objects. The subject is the efficiency and accuracy of these applications in the processes of medical diagnosis, the quality of services provided to users and the overall functioning mechanisms.

Several approaches are used in the data collection process. First, questionnaires and semi-structured interviews are organized among users, healthcare providers, and IT professionals. Through this, subjective experiences, thoughts, and needs are identified. Second, certain applications are tested in simulated medical situations and in supervised clinical settings. Thirdly, the existing scientific articles, statistical reports and official documents on medical technologies are studied and a secondary analysis is carried out.

The data obtained is processed using qualitative and quantitative analysis methods. Qualitative data is analyzed by thematic coding, that is, points formed as a result of interviews are grouped together within the main topics. Quantitative data is analyzed and graphically expressed through statistical programs such as SPSS, Python programs, or Excel. The diagnostic accuracy level, sensitivity, specificity, precise response index, and overall F1 norm score are determined.

RESULTS

According to the results of this study, it was found that mobile applications with integrated artificial intelligence technologies play an important role in automating, simplifying and accelerating diagnostic processes in modern medicine. The analysis showed that the accuracy of initial diagnosis using AI-based mobile apps is approaching and in some cases even surpassing traditional methods. Users have rated these apps highly for their user-friendly interface, quick response, and 24/7 accessibility.

However, at the same time it was emphasized that these technologies cannot fully replace a complete medical diagnosis, but should be used as a complement and support tool for the activities of doctors. Clinical tests have shown that the sensitivity and specificity levels of AI applications vary by state, requiring them to be continuously improved with specialized algorithms and databases. At the same time, the relevance of ethical and security issues was also noted during the study — in particular, it is important to protect users' personal information and prevent the possibility of misdiagnosis.

DISCUSSION

The results obtained within this study showed that artificial intelligence (SI) technologies have wide potential in the field of medical diagnosis through mobile applications. Based on the survey and experience, it was determined that such applications are becoming more and more inclusive among users, especially when they are starting to play an important role in getting initial medical advice, detecting symptoms and making health decisions. The ability of AI algorithms to self-learn (machine learning) and analyze large amounts of medical data in real time is making these applications an effective and useful tool.

Nevertheless, diagnoses made through mobile apps are intended for initial evaluation purposes only, and it may be risky to make them as an independent medical decision. During the study, in some cases, incorrect or insufficiently accurate diagnoses were observed, which implies a cautious approach to the use of these technologies in clinical practice. In addition, the quality of AI models is directly dependent on their database, algorithmic structure, and the correctness of user-generated data.

CONCLUSION

In conclusion, the integration of artificial intelligence technologies into mobile applications enters a qualitatively new stage in medical diagnosis processes. The results of the study showed that such applications make it possible for users to get convenient, fast and constant medical advice. The fact that AI algorithms can detect symptoms, make probable diagnoses, and provide necessary recommendations based on large amounts of medical data increases their practical value. Also, these technologies serve to reduce the burden in the healthcare system, serve as an adjunct to physicians and increase the responsibility of patients in relation to their own health.

However, as far as what these technologies are capable of, there are also some limitations to them. In particular, issues such as a decrease in diagnostic accuracy in some cases, recommendations based on misinformation, as well as the

security of user data require serious attention. Therefore, caution is imperative when using AI-based mobile apps and should not be a substitute for professional doctor's advice.

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