FUDMA Journal of Sciences (FJS)
ISSN online: 2616-1370
ISSN print: 2645 - 2944
Vol. 9 No. 7, July, 2025, pp 89 – 95
DOI: https://doi.org/10.33003/fjs-2025-0907-3624

APPLICATION OF ARTIFICIAL INTELLIGENCE IN MOBILE HEALTH CARE APPLICATIONS: A SCOPING REVIEW

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ABSTRACT
The integration of artificial intelligence (AI) with mobile health (mHealth) applications has transformed the healthcare landscape by offering early disease detection, accessible, real-time, and personalized medical support. This review examines the current state and trends of AI-powered mobile health applications, examining their implementation across various medical domains such as mental health, chronic disease management, visual impairment, stroke rehabilitation, and fitness. A comprehensive analysis of peer-reviewed literature from 2015 to 2025 was conducted, focusing on the types of AI algorithms used, their target applications, and overall effectiveness. The findings reveal an increasing trend in scholarly interest, particularly in journal publications, reflecting the demand for validated and reliable AI health solutions. Neural networks and deep learning models dominate the algorithmic landscape due to their effectiveness in handling complex and unstructured health data. This study highlights the growing reception and potential of AI-integrated mHealth apps to revolutionize personal healthcare and surface the way for more intelligent, user-centric solutions.

Keywords: Mobile App, Android, Health, Artificial Intelligence

INTRODUCTION
For a variety of computational functions, including word processing, spreadsheet creation and editing, email access, Internet browsing, and creating and editing presentations, smartphones are gradually replacing laptops and desktop computers (Salihu, I.A., et al., 2019). The landscape of computing has changed dramatically as a result of this transition (Usman, A., Ibrahim, N., and Salihu, I.A. 2020). The creation of mobile applications (apps) to meet the computational demands of their users has increased due to the popularity of these devices (Salihu, I.A., Ibrahim, R., and Usman, A. 2018). The development of mobile apps has a big impact on society and the economy. People's daily lives now involve mobile phone technology (Usman, A., et al. 2024, Salihu, I.A., et al. 2023). This technology's use in a variety of industries, including healthcare, has been made easier by advancements (Usman, A., Ibrahim, N., and Salihu, I.A. 2018). Globally, there is an urgent demand for access to high-quality healthcare because of health problems. Healthcare apps are expected to be downloaded by 1.7 billion smartphone users in 2018 (Patrick, K., et al., 2016). AI is revolutionising this quickly expanding field by assisting in risk assessment, individualised treatment, and enhancing our comprehension of a range of medical conditions. Self-care is becoming possible thanks to advancements in health science and the creation of new smartphone and sensor-based technologies. In locations where data connection through postal or road infrastructure is often delayed or inappropriate, for example, mobile phones are proving to be more useful (Pascoe, L. and J.W. Mwangoka, 2016). AI-powered mobile apps have the potential to improve health outcomes. From remote monitoring and personal health assistants to mental health support and diagnostic help, AI is expanding the potential of mobile apps to enhance users' health and well-being. AI integration into healthcare apps is anticipated to increase as technology develops, providing even more complex and significant solutions.
Personal health assistants for monitoring symptoms and reminding people to take their medications, chronic disease management for anticipating and offering advice on how to manage conditions like diabetes and tuberculosis (Cedeno-Moreno, D. and M. Vargas-Lombardo 2020, Hendrick, H., et al. 2019, Wijekoon, W.D.H. and S. Harshanath 2023), mental health for monitoring mood and offering mental support, fitness and wellness for offering work schedules and dietary recommendations, and lifestyle and preventive health for controlling stress levels are some significant areas where AI is used in mobile health applications.

Related Work
Li, Y., et al., (2023) presents review on the combination of AI and smartphones presents an examination of SARS-CoV-2. They talk about the idea and future growth of virus detection, as well as the drawbacks of identifying SARS-CoV-2 using smartphone research. They come to the conclusion that smartphone and AI-based SARS-CoV-2 detection methods show promise and can be a helpful addition to conventional analytical methods. An overview of the function and difficulties of smartphone applications for precision oncology is provided by (Srivastava, R. 2023). The following subjects were discussed in relation to the creation and evaluation of the (AI/ML) algorithms of these applications: the algorithms' objective, an explanation of the methods used, the suitability and reliability of the datasets, the algorithms' design, evaluation, implementation, and post-treatment monitoring.
Usman, A., et al., (2024) presents an in-depth analysis of comprehensive overview of studies covering the generation of test cases for Android applications (apps) that use machine

learning (ML) methods, to provide an overview of the advances and challenges in test case generation techniques for Android apps using ML.

Gamble, A., (2019), presents a review on how to observe AI chatbots, specifically as they are received through mobile applications for mental health treatment (MHapps). The social ramifications of these technologies are discussed. They come to the conclusion that AI tools in mental healthcare need human control, thus rather than taking the role of physicians, AI technologies should be developed to improve mental healthcare.

Usman, A., et al. (2023) present a review of current research studies that use reinforcement learning (RL) to test Android applications. The main aim of the study is to simplify future research by collecting and investigating the current state of Android app testing approaches using the RL technique.

In order to identify areas that require more investigation (Milne-Ives, M., et al., 2022) presents an overview of mobile health apps that use AI to offer mental health help. In order to find out how and to what degree people are open to using AI-based mobile apps for the diagnosis of skin cancer (Haggenmüller, S., et al., 2021) presents an online poll. The authors evaluated the relative importance of worries and preferences, with an emphasis on younger age groups.

MATERIALS AND METHODS

In this section we discussed the approach used in conducting the search process in accordance with the software engineering review writing guidelines. It then goes into depth regarding the criteria utilised for the review. We identified four criteria that are important and compare the articles, this are publication trend, venue, used AI algorithm and finally the metrics used in validation.

Search Process

The databases and indexing systems of Google Scholar and Scopus were used for the main search. Given that Google Scholar and Scopus cover all major publishers, including Elsevier, Springer, ACM, and IEEE articles, these two were deemed adequate. Using the years 2015–2025, the search was conducted using the abstract, keywords, and title of the papers. hence, we observed that relevant results only show up on the first few search pages. To reduce the possibility of missing related research, the references of chosen papers were also thoroughly searched.

Inclusion and Exclusion Criteria

The inclusion and exclusion criteria were used to filter all of the papers that were selected after the database search using the identified keywords and search strings. This made it possible to exclude articles that weren't relevant and to choose only those that were. Table 1 lists the criteria used during the screening process to evaluate each paper and decide whether or not to include it in the scoping review,

Table 1: Inclusion and Exclusion Criteria

Inclusion Criteria	1. Only English-Language Articles
	2. Articles, book chapters, conference proceedings, and journal papers.
	3. Research on the use of AI in healthcare mobile applications
	4. From 2015 until 2025, publications
Exclusion Criteria	1. Articles unrelated to the field of artificial intelligence in healthcare mobile apps
	2. Five-page papers, tutorials, seminars, or posters
	3. Articles that are repeated
	4. Research that has been written in languages other than English

Data Extraction

Following the proper classification of the research to be included in the scoping review, we extracted and compiled the data in order to look at and contrast the relevant studies. A range of readily available tools and applications, such as Google Sheets, REDCap, and Microsoft Excel, are typically used to extract and compile the data. Microsoft Excel was used to record data from the selected articles and accomplish the study's objectives. All the selected articles had the following data extracted: title, year of publication, kind of publishing (journal, conference, or symposium), AI algorithm, and assessment metric

Selected Articles

In order to enable early intervention, Jiménez-Serrano, S., S. et al. 2015, provide a classification model to identify the risk of postpartum depression within the first week following childbirth. For the Android platform, a mobile application is being developed so that the model may be used by both new mothers and medical professionals who want to monitor their patients' testing. Awad, M., et al, (2018), presents an Android mobile application with an intelligent eye. Among the useful features the application offers to visually challenged people are banknote recognition, item identification, colour detection, and light detection. In light of the distinct clinical context of women's health, particularly infertility (Siristatidis, C., et al., 2019), suggests partnering with mobile applications and AI/ANNs to develop the most effective customised approaches.

Pearce, G., et al. 2015, presents a study on the use of an artificial neural network (ANN) for the diagnosis and detection of stroke. The technology makes use of a neural network (NN) that can be taught to identify patients' normal limb movements and a physical grid mattress that the patient can use at home. A smartphone app was notified of any alterations in the patient's gait that would point to a stroke.

Theilig, M.-M., et al., (2019), introduced a ML-based mobile application that helps users avoid depressive moods before hospitalisation and investigates the motivation of digital mental health users who use an intelligent mobile app to complete self-assessment questions in their daily lives. Talab, E., et al. (2019), developed a mobile application to detect abnormal heart activity using either a digital stethoscope measurement as input or a mobile recording of the heartbeat using the mobile phone's microphone. The signal is denoised using wavelet transform, and CNN is then used to classify the stored heart sounds.

Hendrick, H., et al. (2019) presents an iOS mobile application that uses a bespoke AI algorithm and sputum smear photos to detect tuberculosis based on chest x-ray images. Mdhaffar, A., et al. (2019) introduce DL4DED, a deep learning method for detecting depressive episodes on mobile devices. The method recognises a patient's voice during spontaneous phone calls by combining convolutional neural networks (CNNs) with long short-term memory (LSTM) networks.

A mobile application that provides an evolving organised model of medical care for the self-management of diabetic patients is presented by (Cedeno-Moreno, D. and M. Vargas-Lombardo 2020). Using a consistent dataset of Panamanian patients, machine learning models can be used to determine the extent to which we can help Panamanian physicians. Khaled et al. 2020, propose an approach that uses CNN, speech recognition, and smartphone camera calibration to help visually impaired people navigate indoors. The CNN model is used for object identification, the phone's camera acts as the user's eyes, and speech recognition acts as a communication channel between the visually impaired person and the smartphone.

Using object recognition and text-to-speech technology, (Caballero, A.R., K.E.I. Catli, and A.G.F. Babierra, 2020), creates a comprehensive mobile application that addresses the demands of the visually challenged community. The CNN algorithm is used to analyse photos and identify information that are described to the user via text-to-speech in order to accomplish the goal. Afrah, I.A. and U. Kose (2021) presents a mHealth application with AI help that is built on an expert system. The application was assessed using survey and diagnosis-based assessment tasks and offers dynamic support for common health issues encountered in daily life. An intelligent healthcare application was created by (Tharushika, G.A., et al., 2021) to predict heart diseases and classify and treat skin conditions. KNeighborsClassifier is an application that takes pictures of skin conditions.

Gamble, A., (2020) highlight the societal ramifications of deploying AI in mobile applications for mental health care. A smartphone application using ML based on facial recognition technology and location using Google Maps is proposed by (Aljojo, N., et al., 2020). The program aims to improve everyday communication and the ability to finish daily tasks by incorporating a notification feature. According to the results, the app suggested ways for persons with Alzheimer's disease symptoms and indicators to support their everyday lives.

An offline mobile application for antibiogram analysis based on artificial intelligence is presented by (Pascucci, M., et al., 2021). The program uses the phone's camera to take pictures while a user-friendly graphical user interface walks the user through the inspection on the same device. When compared to a hospital standard automated system, the application's automated reading system for the measurement process achieves an overall agreement of 90% for weakness classification, while manual measurement yields a 98% agreement. The application's functionality showed that it is possible to view antibiotic resistance test results automatically on a smartphone.

AI-enabled mHealth applications are software programs that use AI techniques to give users data and other relevant services to patients via mobile platforms like smartphones, watches, and tablets, according to (Amugongo, L.M., et al. Amugongo, L.M., et al., 2023). These applications utilise machine learning algorithms to recognise and respond to user input, preserve health data, provide updated health recommendations, and suggest remote monitoring and analysis. Labeeshan, A., et al (2021), introduces iRetina, a smartphone software that helps the blind and visually challenged navigate. The camera on their phone acts as their eyes for people who are blind or visually impaired. The YOLOv4 object recognition algorithm is employed.

In order to analyse a user's energy balance and estimate the anticipated caloric intake needed to meet daily caloric needs for managing obesity (Sefa-Yeboah, S.M., et al., 2021) presents an AI-based application driven by a genetic algorithm (GA). By utilising the user's input data on preferred foods selected from a database and retrieved statistics on the user's level of physical activity, diabetes, and cholesterol, the algorithm forecasts possible meals required to meet the user's needs. The micro- and macronutrients of the food are used to calculate and anticipate the potential foods required to meet daily caloric needs.

A mobile machine learning application for post-stroke rehabilitation exercises is presented by Das et al. (2023). Elbow flexion, elbow extension, shoulder extension, shoulder internal and external rotation, and wrist and finger exercises are among the several movement types that physiotherapists and neurologists recommend for post-stroke treatment. The upper limb is the authors' primary emphasis. 100% classification accuracy is achieved by the CNN-based machine learning smartphone application. Wijekoon, W.D.H. and S. Harshanath (2023) suggests U-HEALTH, an Android app for creating nutritious meal planning for diabetic patients. The program considers the patient's appearance, medical information, and food allergy patterns. The dish is prepared according to Sri Lankan cuisine.

Elbagoury, B.M., et al. (2021) suggests a hybrid (DL and NN) intelligent remote diagnosis method for stroke detection and prediction in mobile health applications. The methods use datasets of electromyography (EMG) signals to give a significant amount of information for identifying both normal and pathological stroke motions. Wichmann, R.M., et al., 2022, creates the smartphone application RandomIA. It is anticipated to be expanded to additional diseases in the future and uses AI algorithms to provide prognostic and diagnostic predictions for COVID-19. A method for choosing NN models that best fit the Health Mobile App is put out by (Triana, Y.S., et al. 2023). With patient input, the software can forecast potential medical issues. In environments with limited resources, it also promotes positive management and patient involvement in their own health.

Yong, M. T. T., Ho, S. B., & Tan, C. H. (2025) develop a mobile WebApp application that combine medical knowledge with machine learning. WebApp can therefore use information from patients or experts to get better answers. Additionally, the app can give patients prompt answers and recommendations. When patients receive incorrect answers based on previously absorbed data, it also learns from its errors and responds to them more effectively. Additionally, if the WebApp is loaded on the phone, the patient can request one at any time and in any manner. The patient should be aware of what to do in the event that they require migraine guidance or a solution when an attack happens and they lack the means to travel to a clinic or hospital for professional advice.

RESULTS AND DISCUSSION

The results of the review are presented in this section. First, we provide an overview of the selection method's findings; in addition, each research question's outcomes are provided in depth.

To identify the year with the greatest number of publications on the use of AI in mobile health applications, the research was grouped by the year of publication.

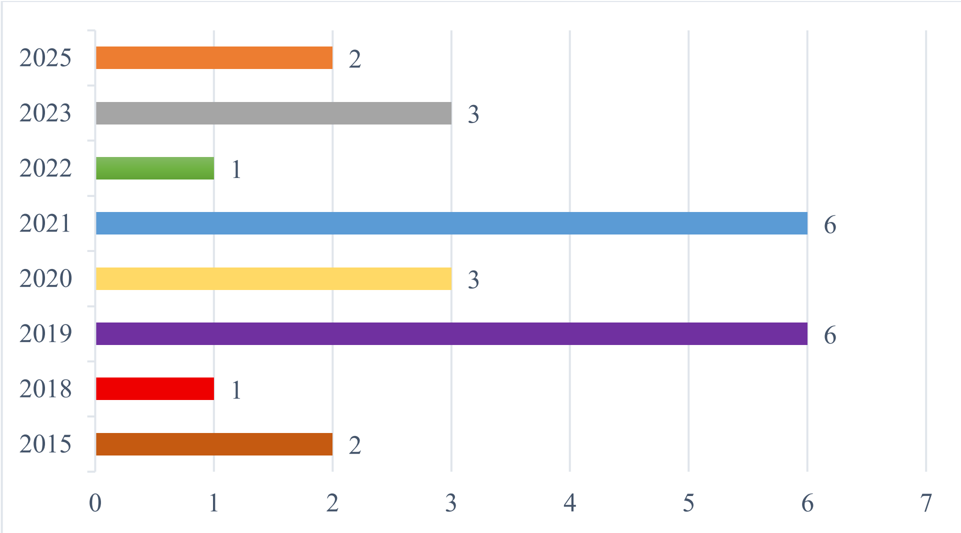

Figure 1: Publication Trend

The publication trend from 2015 to 2025 demonstrates the evolution of research interest in AI for mobile health applications. This suggests that the potential of AI in mobile health apps is becoming more widely acknowledged. If noticeable, a topmost in a given year may signify a spike brought on by financial opportunities, technological improvements, or increased healthcare demands.

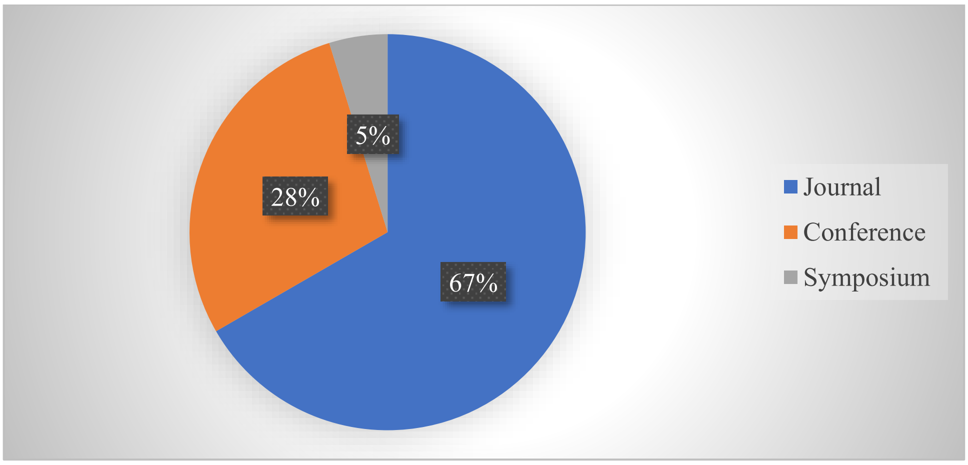

Figure 2: Selected Studies on Publication Categories

Figure 2 shows that most of the articles are published in journal.
The preponderance of journal publications emphasises the desire for robust, peer-reviewed research dissemination in this field. Given how important accuracy and dependability are in AI-driven healthcare solutions, this trend might be a reflection of the need for validation and legitimacy.

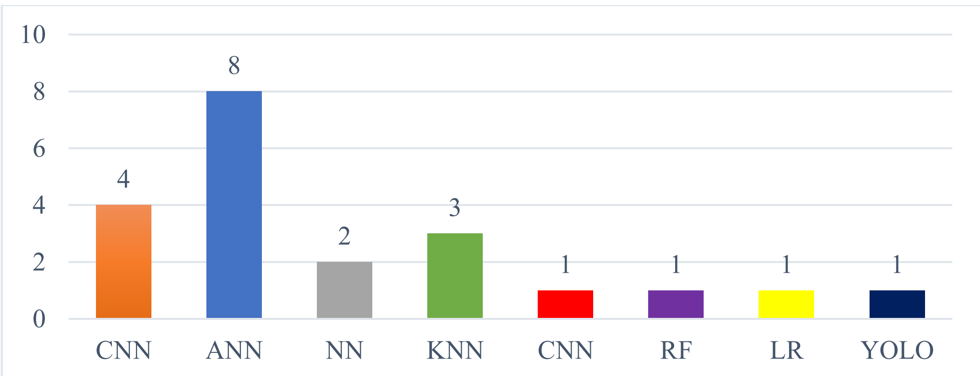

Figure 3: Algorithm Used

Figure 3 show the most widely used algorithms Common approaches in AI for mobile health are revealed by the most popular algorithms (e.g., neural networks, decision trees). The popularity of particular algorithms may be a sign of their efficiency, usability, or fit for processing structured versus unstructured data in the healthcare industry

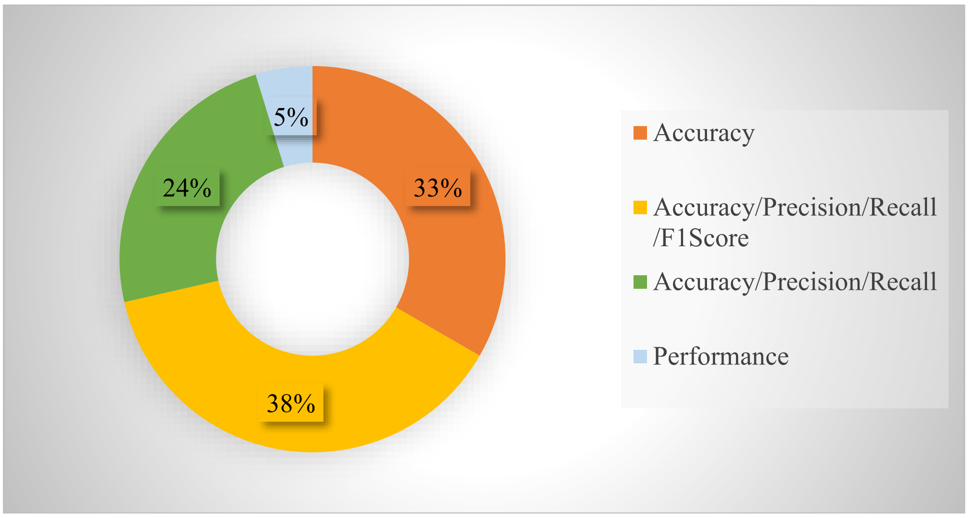

Figure 4: Metrics for Evaluation

In figure 4 the metrics used for evaluation were identified, the measures that have been identified, such as accuracy, sensitivity, and F1-score, demonstrate how AI models are evaluated in mobile health settings. The selection of metrics guarantees that models satisfy computational and medical requirements by highlighting the harmony between technical performance and clinical relevance.

Discussion

The scoping review indicates a distinct growth trajectory and interest in AI with applications related to mobile healthcare (mHealth). The growing demand for individualised digital health solutions and the technological developments that make these integrations possible are both reflected in this trend, which is demonstrated by the rise in scholarly publications between 2015 and 2025.

One important finding from the review is that deep learning and neural networks are the most popular AI techniques. For a variety of applications, such as stroke prediction, heart disease categorisation, and mental health monitoring, their capacity to interpret complex and unstructured health-related data—from speech and physiological signals to images—makes them perfect. In addition to demonstrating excellent sensitivity and accuracy, these AI models also adjust well to the limitations of mobile devices.

The focus on journal articles emphasises the need for credibility, rigour, and peer review in this sector. Both academics and developers place a high value on proven and reproducible procedures because of the clinical consequences of AI-driven decisions, particularly in the areas of diagnostics and the management of chronic diseases. The use of measurements such as sensitivity, F1-score, and accuracy in assessing these applications emphasises how important both clinical relevance and technical performance are.

Furthermore, the broad spectrum of AI applications—from stroke rehabilitation and visual impairment help to mental health support and diabetes dietary planning—showcases the technology's adaptability in tackling a variety of health issues. These advantages are extended to underprivileged groups, such as those living in remote or resource-constrained areas, through the usage of mobile platforms, which provide scalable and instant access to medical assistance.

However, a number of significant obstacles still exist in spite of these developments. Usability, data privacy, and algorithmic transparency continue to be major concerns. Contextual needs must be taken into consideration when designing and implementing AI applications, especially in low-resource settings where data sparsity or user literacy issues may arise. Furthermore, strong governance and human oversight are necessary for the ethical application of AI, particularly in diagnostic and mental health applications, in order to reduce potential bias and harm.

In summary, the combination of AI and mHealth marks a innovative stage in the provision of healthcare, with promising prospects for further growth. Future research must address the socio-technical challenges involved in order to fully realise this potential, making sure that AI-powered mobile health applications are inclusive, equitable, and explainable in addition to being intelligent and efficient.

CONCLUSION

The significant developments in AI-powered mobile health apps and their growing popularity in a variety of healthcare areas are highlighted in this review. The use of advanced AI algorithms, especially neural networks and deep learning, to provide individualised, easily accessible, and intelligent healthcare support is on the rise, according to a study of published research from 2015 to 2025. The field's emphasis on credibility and scientific rigour is demonstrated by the concentration of articles in peer-reviewed publications. Applications cover everything from mental health and the management of chronic diseases to diagnostic tools and therapy assistance, demonstrating a wide and significant application spectrum. AI integration in mHealth is anticipated to expand as technology advances, providing ever more all-encompassing and flexible healthcare solutions.

To guarantee fair access to high-quality healthcare, future studies should concentrate on improving algorithmic transparency, data protection, and the usability of these applications, especially in low-resource environments. By overwhelming these challenges, AI-powered mHealth applications can achieve wider acceptance and deliver more impactful, patient-centred care.

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