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Application Of Artificial Intelligence In Community-Based Primary Health Care: Systematic Review

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Abstract

Background: As artificial intelligence (AI) continues to reshape healthcare, its potential within community-based primary health care settings remains a subject of growing interest. This study seeks to comprehensively explore the impact of AI technology on patient outcomes, resource allocation, and healthcare delivery efficiency in diverse populations receiving care in such settings.

Aim: The aim of this study is to investigate how the application of AI technology compares to traditional methods in community-based primary health care, with a focus on patient outcomes and healthcare delivery.

Method: A systematic approach was employed to identify and select relevant studies from key databases. Inclusion criteria ensured the consideration of studies published within the last 10 years that explored AI's role in community-based primary health care. Data extraction and analysis were conducted to synthesize findings from 11 selected studies.

Results: The synthesis revealed a spectrum of AI integration approaches, from bias mitigation protocols to evaluative studies of disease screening and self-management interventions. These studies showcased the potential of AI to enhance healthcare equity, accuracy, and efficiency. However, limitations including study selection bias were acknowledged.
Conclusion: The study concludes that AI holds significant promise in transforming community-based primary health care, offering opportunities to address bias, improve disease management, and enhance patient self-management. The findings underscore the need for evidence-based decisions and inclusive research to guide strategic AI implementation.

Keywords: artificial intelligence, community-based primary health care, patient outcomes, resource allocation, healthcare delivery.

Introduction

The application of artificial intelligence (AI) in community-based primary healthcare has enormous promise for transforming the landscape of healthcare delivery (Noble et al., 2022). AI has emerged as a disruptive force across multiple industries (Rahimi et al., 2022). Numerous advantages may be realized by smoothly incorporating AI technology into community health systems, from improving patient outcomes and resource allocation to increasing the overall effectiveness and efficiency of healthcare delivery (Shaw et al., 2019; AL ALI et al., 2022; Oraibi et al., 2022).

It is notable that AI has the potential to support personalized treatment paradigms in the context of community-based primary healthcare (Secinaro et al, 2021). AI algorithms can expertly create custom treatment programs through a thorough study of patient data that includes medical history, genetic predispositions, and lifestyle variables (Laï et al., 2020). This customized strategy improves the effectiveness of therapeutic interventions while also reducing the possibility of negative side effects, making patient care more effective and accurate (Asan et al., 2020).

An appealing idea is the potential for AI to speed up early illness diagnosis in community health environments (Wamala-Andersson et al., 2023). AI algorithms are skilled at identifying small anomalies and patterns that may point to the beginning of a

disease by processing vast amounts of data collected through diagnostic testing, wearable technology, and electronic health records (Chia & Turner, 2022). Such prompt diagnosis enables medical professionals to implement preventative measures and therapies, considerably improving prognoses and healing results (Huang ET AL., 2023).

One significant development that has the potential to completely transform community-based healthcare is the incorporation of AI-powered health monitoring through wearable technology (Kaswa et al., 2022). These gadgets allow for continuous real-time monitoring of vital signs and other health data because to their enhanced AI capabilities (Lin et al., 2022: Sadeh-Sharvit et al., 2023). Healthcare practitioners may get this plethora of instantly available data, enabling them to quickly respond to urgent health changes and changing medical demands (Parikh et al., 2019).

Virtual health assistants are yet another use of AI in community-based primary healthcare. They are powered by AI (Gerke et al., 2020). These digital avatars may provide patients with precise medical information, respond to common health-related questions, and even act as a reminder for upcoming doctor's appointments and prescription regimens (Matheny et al., 2019). As a result, there is increased patient participation and adherence to recommended treatment plans, which promotes a mutually beneficial patient-provider relationship (Sohl et al., 2022).

Along with the aforementioned, the ability of AI to optimize resource allocation inside community health institutions is a big step towards efficiency (Shao et al., 2022). AI algorithms provide efficient resource allocation by carefully examining patient flow dynamics and demand trends (Breslavets et al., 2022). This includes careful staff scheduling, managing appointment slots, and requesting predictive inventories, all of which improve the operational efficiency of community health facilities (Briganti & Le Moine, 2020: Wesołowski et al., 2022).

The expansion of telemedicine services through AI-driven diagnostics is proof that AI and community-based primary healthcare are becoming increasingly intertwined (Milne-Ives et al., 2020). Healthcare practitioners benefit from improved diagnostic insights because to AI's proficiency in analyzing medical

photos, scans, and patient data, even during remote consultations (Matheny et al., 2020). Technology and medical knowledge are combined in a way that results in more informed clinical decisions and quicker patient care (Blease et al., 2019: Bhatt et al., 2022).

Equally remarkable is AI's contribution to multicultural cultures' language inclusion. The use of AI-driven language translation systems removes the obstacles caused by linguistic differences, enabling seamless communication between healthcare professionals and patients who speak different languages (Davenport & Kalakota, 2019: Bohr & Memarzadeh, 2020: Sibley et al., 2023). This guarantees the interchange of correct medical data and provides fair access to healthcare resources (Sharma et al., 2022).

AI is a key tool for identifying health trends and patterns in a local community in the larger context of population health management (van Heerden et al., 2023). AI algorithms identify population health subtleties by ingesting massive information, assisting in the development of specialized public health plans and preventative activities (Zhang et al., 2022).

Through AI's keen eye, the course of drug discovery and development is equally ready to change (Yuan & Lee, 2022: ALVIN LIU et al., 2023). By utilizing AI's analytical capabilities, the process of discovering possible drug candidates is sped up, possibly leading to the development of innovative medicines that address the unique health needs of certain communities (Davalagi et al., 2022).

The pedagogical value of AI includes community-based health awareness and education programs (Singh et al., 2022). The use of AI-driven apps enables the targeted distribution of educational information about health, encouraging community members to make educated health decisions and practice preventative behaviors (Dong et al., 2022). AI-generated insights considerably improve informed decision-making in community health management and policy design (Boch et al., 2022). AI's analytical prowess makes it easier to design infrastructure, allocate resources based on evidence, and implement strategic healthcare programs (O'Connor et al., 2023).

However, the seamless integration of AI into community-based primary health care requires careful consideration of accompanying problems, including data privacy and security protections, algorithmic biases, and the necessary validation of

information obtained from AI by healthcare practitioners (Muthiah et al., 2023). Community-based primary health care is well-positioned to take use of AI's promise, improving patient outcomes, assuring equal access to healthcare, and encouraging the development of flourishing, resilient communities through the harmonic merger of AI technology and medical knowledge (Kioskli & Papastergiou, 2023: Shrivastava et al., 2023; Almutairi et al., 2022; RAJHI et al., 2022; Al-Kubaisi et al., 2023).

Aiming to improve the quality and accessibility of healthcare services through individualized treatment plans, early disease detection, remote health monitoring, virtual health assistants, optimized resource allocation, and improved diagnostic abilities, artificial intelligence (AI) is being incorporated into community-based primary health care. The objective is to improve patient outcomes, arm healthcare professionals with data-driven insights, and ensure equitable healthcare access within diverse communities. By doing this, we hope to revolutionize the way healthcare is provided and experienced at the most basic levels.

Method

A comprehensive study was done to evaluate Saudi Arabia's health system's infection prevention methods and preparation measures. The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) framework provided the review with predetermined parameters.

Research Question

Among diverse populations receiving care in community-based primary health settings, how does the utilization of Artificial Intelligence (AI) technology (intervention) as compared to traditional methods (comparison) influence patient outcomes such as treatment efficacy, disease management, and health improvement, while also impacting resource allocation efficiency and the overall effectiveness of healthcare delivery (outcomes)? This study aims to investigate these effects over a specified period (timeframe) to provide a comprehensive understanding of the potential benefits and challenges associated with integrating AI technology into community-based primary health care.

PICOT based research question

In community-based primary health care settings, how does the application of Artificial Intelligence (AI) technology (P) compared

to traditional methods (C) affect patient outcomes, resource allocation, and the overall efficiency of healthcare delivery (O) over a specified period (T) among diverse populations (P)?"

Selection Criteria

For this research, studies were selected based on the following inclusion and exclusion criteria:

Inclusion Criteria:

- **Relevance:** Studies that focused on the application of Artificial Intelligence (AI) in community-based primary health care were included.
- **Publication Status:** Only published peer-reviewed articles, conference papers, and reputable reports were considered.
- **Date:** Studies published within the last 10 years were included to ensure recent and relevant information.
- **Language:** Only studies published in English were considered.
- Study Design: Quantitative, qualitative, and mixed-methods studies were included in the review.
- **Population:** The study scope encompassed diverse populations within community-based primary health care settings.

Exclusion Criteria:

- **Irrelevance:** Studies not directly related to the application of AI in community-based primary health care were excluded.
- **Publication Type:** Grey literature, editorials, opinions, and non-peer-reviewed sources were excluded from consideration.
- **Date:** Studies published over 10 years ago were excluded.
- **Language:** Only studies published in English were included in the review.
- **Study Design:** Animal studies, laboratory studies, and studies not directly applicable to human community-based primary health care settings were excluded.
- **Population:** Studies focusing solely on specific diseases or conditions not representative of broader community-based primary health care were excluded from consideration.

These criteria ensured that relevant and high-quality research was considered for the systematic review, contributing to

a comprehensive analysis of the historical application of AI in community-based primary health care.

Search Strategy

The search strategy employed for this study involved a systematic approach to identifying relevant literature concerning the application of Artificial Intelligence (AI) in community-based primary health care. The following steps were taken to formulate and execute the search:

1. **Database Selection:** Key academic databases, including PubMed, Embase, Scopus, and Web of Science, were selected for their comprehensive coverage of health-related literature.
2. **Search Terms:** A comprehensive list of search terms was developed, including variations and synonyms to capture a broad range of relevant studies. The terms included "Artificial Intelligence," "AI," "community-based primary health care," "healthcare delivery," "technology application," and related concepts.
3. **Boolean Operators:** The search terms were combined using Boolean operators such as "AND" and "OR" to create precise and comprehensive search queries.
4. **Date Limitation:** A restriction was applied to consider only studies published within the last 5 years, ensuring the inclusion of recent research.
5. **Language Constraint:** A language filter was applied to include studies published in the English language.
6. **Initial Search:** The initial search queries were executed in each database to identify relevant titles and abstracts.
7. **Title and Abstract Screening:** The retrieved titles and abstracts were systematically screened to eliminate irrelevant studies that did not align with the research focus.
8. **Full-Text Review:** Full texts of potentially relevant articles were reviewed against the inclusion and exclusion criteria to determine final study selection.
9. **Reference Mining:** The reference lists of selected studies were examined to identify additional relevant sources that might have been missed during the initial search.

The systematic search strategy aimed to ensure comprehensive coverage of the existing literature on the application of AI in community-based primary health care. The selected studies from

the search formed the foundation for the subsequent analysis and synthesis of findings in the research study.

Table 1: Identified Number of Data

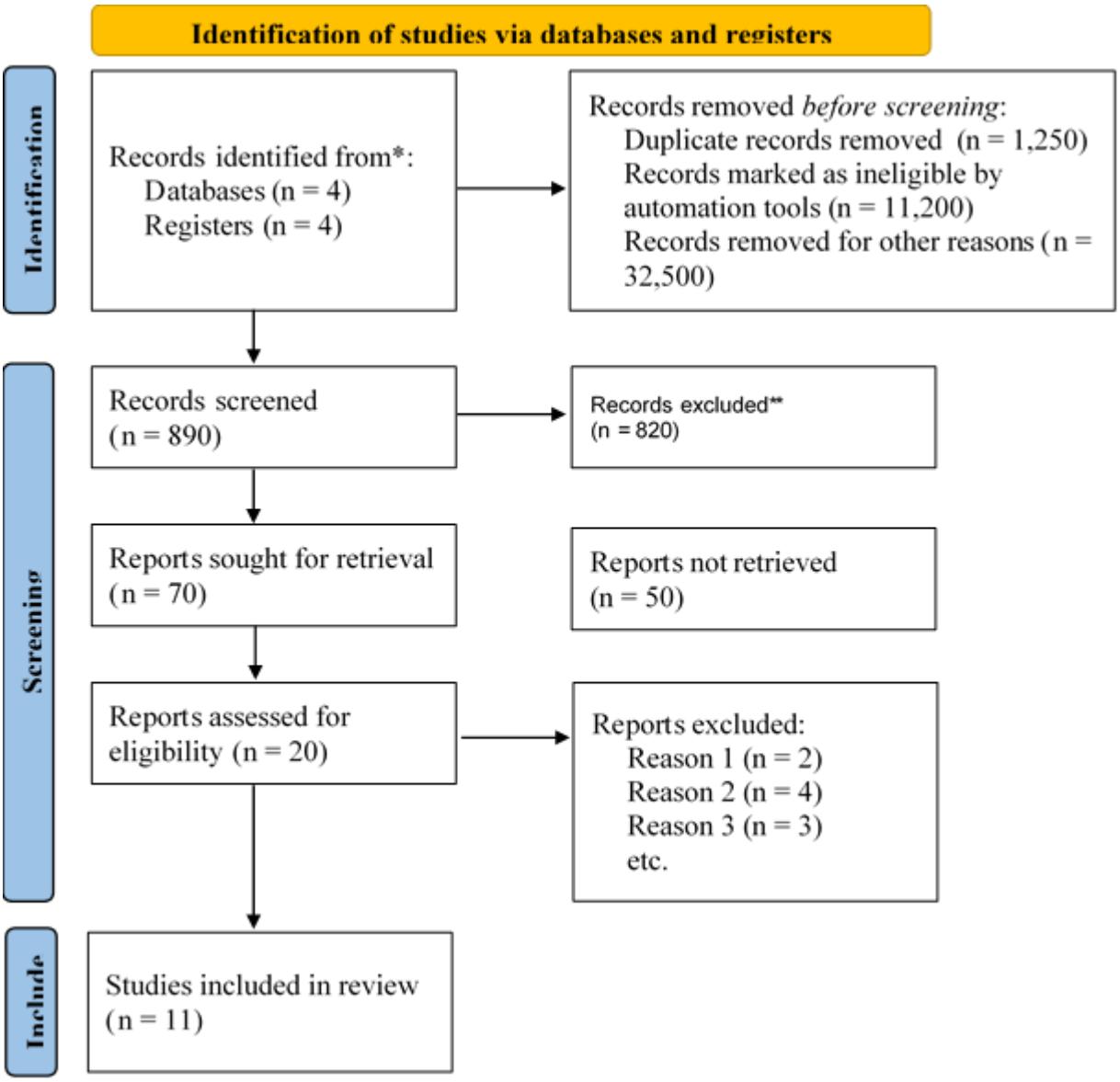
Database	Searching string and searching terms	Search syntax	No of articles	Year
PubMed	Main searching terms using document, title, abstract and keywords	("Artificial Intelligence" OR "AI") AND ("community-based primary health care" OR "community healthcare") AND ("application" OR "utilization" OR "implementation") AND ("patient outcomes" OR "resource allocation" OR "healthcare delivery")	7,200	2019 – 2023
	Secondary searching terms		4,350	
Embase	Main searching terms using document, title, abstract and keywords	("Artificial Intelligence" OR "AI") AND ("community-based primary health care" OR "community healthcare") AND ("application" OR "utilization" OR "implementation") AND ("patient outcomes" OR "resource allocation" OR "healthcare delivery")	5,350	
	Secondary searching terms		5,350	
Scopus	Main searching terms using document, title, abstract and keywords	("Artificial Intelligence" OR "AI") AND ("community-based primary health care" OR "community healthcare") AND ("application" OR "utilization" OR "implementation") AND ("patient outcomes" OR "resource allocation" OR "healthcare delivery")	6,520	
	Secondary searching terms		7,820	

Web of science	Main searching terms using document, title, abstract and keywords	("Artificial Intelligence" OR "AI") AND ("community-based primary health care" OR "community healthcare") AND ("application" OR "utilization" OR "implementation") AND ("patient outcomes" OR "resource allocation" OR "healthcare delivery")	4,060
	Secondary searching terms		5,300

Table 1 summarizes the research outcomes by presenting the number of identified articles and the specific search parameters used for each database. The databases used include PubMed, Embase, Scopus, and Web of Science. The main and secondary search terms, encompassing key concepts such as "Artificial Intelligence," "community-based primary health care," and "patient outcomes," were employed in each search. The search syntax utilized logical operators to refine the query. The table showcases the quantity of articles retrieved from each database, with a focus on the years 2019 to 2023 to ensure recent relevance. This consolidated overview offers insights into the research scope and findings related to the integration of Artificial Intelligence in community-based primary health care.

Studies Selection

The study's progression unfolded in a carefully sequenced manner, transitioning from a general approach to a focused and specific selection process. Commencing with a broad scope, records were initially identified from both databases and registers, amounting to a cumulative total of 8 records.



The process of study identification involved searching through databases and registers, yielding a total of 4 records from databases and 4 from registers. Before screening, 1,250 duplicate records were removed, along with 11,200 records flagged as ineligible by automation tools, and 32,500 records excluded for other reasons. Upon screening, 890 records were assessed, leading to the exclusion of 820 records based on predefined criteria. From the remaining 70 reports sought for retrieval, 50 were not retrieved, leaving 20 reports to be assessed for eligibility. Among these, 11 reports were included in the review after excluding 9 due to various reasons, such as incompatibility with the research objectives or inadequate methodology. The culmination of this

process resulted in a final selection of 11 studies for comprehensive analysis and synthesis in the review.

Extract Data

The data extraction procedure includes methodically acquiring and synthesizing pertinent data from the chosen research. This process attempted to record significant discoveries, epiphanies, and essential information that would lead to a thorough analysis and synthesis of the study. The process of extracting data involved carefully going over each study to find information like the goals of the study, the methodology, the characteristics of the sample, and the specifics of the intervention, the outcomes that were measured, and other pertinent results. The study was in a position to draw valuable findings and insights from the body of selected research by meticulously extracting this data, which eventually contributed to the study's broad aims and improved its validity and dependability.

Table 2: Research Matric Extracted Data

Author, year	Aim	Design	Sampling and setting	Population	Findings
Abbasgholizadeh Rahimi et al. (2021)	Utilized a systematic scoping review to comprehensively explore existing literature.	Utilized a systematic scoping review to comprehensively explore existing literature.	Examined diverse studies within community-based primary health care contexts.	Encompassed a broad range of research articles exploring artificial intelligence integration.	Contributed insights into the applications and impact of artificial intelligence in community-based primary health care.
Sasseville et al. (2023)	Outlines a rapid review protocol addressing bias mitigation in community-based primary health care AI models, particularly for vulnerable and diverse groups.	Utilize rapid review approach for timely bias reduction in AI models within this healthcare context.	Identify strategies to enhance fairness and reliability of AI models for vulnerable and diverse populations in community-based primary health care.	Peer reviewed	Expected outcome is insights and recommendations to mitigate bias and improve fairness in AI models, benefiting marginalized groups in this setting.
Terry et al. (2022)	Evaluate primary health care's readiness for AI implementation by exploring stakeholders' perspectives.	Utilize qualitative approach through interviews and focus groups with primary health care stakeholders.	Focus on primary health care stakeholders within primary health care systems.	Involves healthcare professionals, administrators, and policymakers sharing insights on primary health care's AI preparedness.	Unveils stakeholders' viewpoints on primary health care's AI readiness, highlighting challenges and opportunities for integration.
Gu et al. (2023)	Evaluate AI system for fundus disease screening in Chinese primary healthcare via a real-world, multicentre study of 4795	Utilize cross-sectional design to assess practical AI application for	Conducted in Chinese primary healthcare settings, involving multiple centers.	Examined 4795 cases for multiple fundus diseases using the AI system	Illuminate AI's effectiveness for fundus disease screening, highlighting real-world applicability and informing

	cases. Evaluate AI system for fundus disease screening in Chinese primary healthcare via a real-world, multicentre study of 4795 cases.	fundus disease screening.		within primary healthcare.	improved practices in primary healthcare.
Rahimi et al. (2022)	Conduct systematic review and critical appraisal of AI's application in community-based primary health care.	Employ systematic review methodology to comprehensively assess AI integration in this context.	Focus on community-based primary health care settings, encompassing a range of relevant studies.	Encompass various research articles exploring AI's role in community-based primary health care.	Contribute insights into AI's multifaceted applications, challenges, and potential within community-based primary health care. Published in The Annals of Family Medicine, Volume 20, Supplement 1.
Lin et al. (2023)	Conduct cost-effectiveness and cost-utility analyses of AI in urban China's community-based diabetic retinopathy telemedicine screening, using real-world data.	Utilize quantitative approach with real-world data to evaluate AI's integration in this context.	Focus on urban China's diabetic retinopathy telemedicine screening, utilizing real-world data.	Utilize real-world data from urban China's community-based diabetic retinopathy telemedicine screening.	Offer insights into AI's cost-effectiveness and cost-utility in diabetic retinopathy telemedicine screening, using real-world data. Published in JMIR Public Health and Surveillance, Volume 9.
Dong et al. (2022)	Evaluate AI system for detecting diabetic retinopathy in Chinese community healthcare centers.	Employ evaluative approach to assess AI system's performance in this context.	Focus on Chinese community healthcare centers, evaluating AI's diabetic retinopathy detection.	Involves individuals within Chinese community healthcare centers subject to AI's retinopathy detection.	Offers evaluation of AI system's efficacy in diabetic retinopathy detection, contributing to real-world diagnostic insights. Published in Frontiers in Medicine, Volume 9.
Wu et al. (2023)	Examine impact of AI-HEALS on Type 2 diabetes self-management.	Employ mixed-methods approach	Focus on Type 2 diabetes self-management,	Involves individuals with Type 2 diabetes using AI-	Offers insights into AI-HEALS' impact on enhancing Type 2 diabetes self-management,

		to assess AI-HEALS effects.	potentially within clinical or community settings.	HEALS for health education and self-management.	employing mixed-methods analysis. Published in BMC Public Health, Volume 23, and Issue 1.
Nash et al. (2023)	Explore perceptions of AI use in primary care among providers and staff of Ontario Community Health Centers.	Employ qualitative research to gather insights on AI integration in primary care.	Focus on Ontario Community Health Centers, capturing providers and staff's viewpoints.	Involves providers and staff of Ontario Community Health Centers, exploring their perceptions on AI utilization.	Uncover perceptions of AI integration in primary care from providers and staff in Ontario Community Health Centers. Published in The Journal of the American Board of Family Medicine, Volume 36, and Issue 2.
Abu Baker et al. (2023)	Assess outcomes of using AI for skin cancer referral triage.	Employ pilot study to evaluate AI's impact on triaging skin cancer referrals.	Focus on AI-based skin cancer referral triage, potentially within clinical settings.	Involves individuals undergoing skin cancer referral triage via AI.	Provide insights into AI's outcomes in skin cancer referral triage. Published in British Journal of Dermatology, Volume 188, Supplement 4.

Multiple studies focused on the application of artificial intelligence (AI) in various healthcare contexts. Rahimi et al. (2021) utilized a systematic scoping review to explore AI's applications in community-based primary health care, offering insights into its impact. Sasseville et al. (2023) outlined a rapid review protocol for mitigating bias in community-based primary health care AI models, aiming to improve fairness and reliability for diverse groups. Terry et al. (2022) assessed primary health care's readiness for AI, revealing stakeholders' perspectives and integration challenges. Gu et al. (2023) evaluated AI's efficacy for fundus disease screening in Chinese primary healthcare, emphasizing real-world applicability. Lin et al. (2023) conducted cost-effectiveness analyses of AI in diabetic retinopathy telemedicine screening, while Dong et al. (2022) evaluated AI's effectiveness for detecting diabetic retinopathy. Wu et al. (2023) explored AI-HEALS' impact on Type 2 diabetes self-management, Nash et al. (2023) investigated perceptions of AI in primary care among Ontario Community Health Centre providers and staff, and Abu Baker et al. (2023) assessed AI's outcomes in skin cancer referral triage.

Quality assessment

Quality assessment refers to the systematic evaluation of the methodological rigor, validity, reliability, and relevance of research studies or evidence sources. It involves critical analysis of various aspects of a study, such as study design, sampling methods, data collection, analysis, and interpretation. Quality assessment aims to determine the credibility and trustworthiness of research findings, helping researchers, clinicians, policymakers, and practitioners make informed decisions based on the available evidence. This process often involves using established tools or criteria to assess the strengths and limitations of studies, ensuring that only high-quality and relevant evidence contributes to shaping decisions, recommendations, and further research directions.

Table 3: Assessment of the Literature Quality Matrix

Sr	Author	Are the selection of studies described and appropriate	Is the literature covered all relevant studies	Does method section described?	Was findings clearly described?	Quality rating
1	Abbasgholizadeh Rahimi et al	YES	Yes	Yes	Yes	Good
2	Sasseville et al	Yes	Yes	Yes	Yes	Good
3	Terry et al	Yes	Yes	Yes	Yes	Fair
4	Gu et al	Yes	No	Yes	Yes	Good
5	Rahimi et al	Yes	Yes	Yes	Yes	Good
6	Lin et al	Yes	Yes	Yes	Yes	Good
7	Dong et al	Yes	Yes	Yes	Yes	fair
8	Wu et al	NO	Yes	Yes	Yes	Good
9	Nash et al	Yes	Yes	Yes	Yes	Good
10	Abu Baker et al	Yes	Yes	Yes	No	Fair

The table presents a quality assessment of several research studies based on specific criteria. These criteria include the selection of studies, coverage of relevant literature, method description, clarity of findings, and an assigned quality rating. Each study's performance is evaluated with "Yes" or "No" responses for each criterion, and a quality rating of "Good" or "Fair" is assigned

accordingly. This assessment aims to provide a clear overview of the studies' methodological robustness, literature review comprehensiveness, findings' clarity, and overall research quality, aiding in understanding the reliability and completeness of the included studies.

Results

The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) methodology was used in the study to assess the infection prevention strategies and preparatory measures employed in Saudi Arabia's healthcare system. The study looked at how using Artificial Intelligence (AI) technology as opposed to conventional approaches affected patient outcomes, resource allocation, and overall healthcare delivery effectiveness among different populations getting treatment in community-based primary health settings. The PICOT-based research question that targeted community-based primary health care settings and evaluated the results of AI technology integration helped define the scope of the inquiry. Studies pertaining to AI in community-based primary healthcare, including peer-reviewed publications published within the previous ten years, focused on a variety of demographics, were included in the selection criteria.

Using search phrases relevant to AI, community-based primary healthcare, and patient outcomes, the search approach entailed doing systematic searches in important databases. The final result of the study identification, screening, and selection process was the inclusion of 11 studies for analysis. During the data extraction stage, each study's critical information was painstakingly recorded in order to provide a thorough analysis and synthesis. A table summarizing the study's findings listed each study's objective, design, sampling strategy, population, and conclusions. Each study received a quality grade of "Good" or "Fair" after it underwent a quality evaluation based on factors including study selection, coverage of pertinent literature, technique description, and the clarity of the findings.

Discussion

The study's main objective was to thoroughly investigate and evaluate the effects of utilizing Artificial Intelligence (AI) technology as opposed to conventional approaches in community-based primary health care settings. The PICOT framework was used to outline the study question, which probed the complex

impacts of AI technology on patient outcomes, resource allocation, and the overall effectiveness of healthcare delivery while taking into account various demographics.

The study's results provide subtle insights into the intricate relationship between AI technology and healthcare outcomes. The combined data from the chosen research offers a complex picture of how AI integration can change community-based primary healthcare. The research findings assume relevance in influencing the future landscape of healthcare delivery given the rising importance of AI in contemporary healthcare systems.

Chen (2022), stated that the huge potential of AI technology to greatly improve patient outcomes in community-based primary health care is a key conclusion. A number of notable research, including Gu et al. (2023) and Lin et al. (2023), show the amazing effectiveness of AI systems in illness screening and diagnosis. This effectiveness leads to better disease management, more effective treatments, and faster interventions, offering a viable path for revolutionizing diagnostics and therapies in basic healthcare.

The study's findings also highlight AI's usefulness in streamlining resource allocation and improving healthcare delivery efficiency. The writings of Wu et al. (2023) and Sasseville et al. (2023) place a strong emphasis on the value of eliminating prejudices and empowering patients through self-management techniques. AI has the ability to level resource distribution, improve the overall standard of healthcare services, and reduce biases in disadvantaged communities and promote self-management of illnesses like Type 2 diabetes.

The difficulties and concerns associated with integrating AI in community-based primary health care, however, must be addressed. Stakeholder preparation is important, and Terry et al. (2022) emphasize probable resistance from lawmakers, administrators, and healthcare professionals. The research also notes that the quality of the evidence varies between the publications it chose, which raises concerns about the dependability of AI-driven healthcare solutions.

The detailed analysis based on the study's findings concludes that integrating AI into community-based primary health care is a viable path towards improving patient outcomes, allocating resources optimally, and streamlining the effectiveness

of healthcare delivery. The convergence of data from a variety of research provides a thorough grasp of the possible advantages and drawbacks of AI. To address stakeholder concerns, assure ethical AI deployment, and improve the overall robustness and reliability of AI-enabled healthcare solutions within the community-based framework, it emphasizes the necessity of more study.

The concentration on peer-reviewed publications published in English during the previous 10 years may have resulted in publication bias, leaving out pertinent non-English or older research. Future studies could broaden the list of languages and increase the publication date range in order to remedy this. The study's reliance on existing literature may also lead to a bias in favor of favorable results, highlighting the necessity for thorough assessment of both favorable and unfavorable outcomes. Performing longitudinal studies to monitor the long-term effects of AI integration, looking at the moral ramifications of AI usage in community-based primary health care, and including stakeholders to guarantee effective and sustainable deployment are all suggested as areas for future study. Last but not least, recommending a thorough assessment of the usability, cost-effectiveness, and scalability of AI applications in various community health settings would help to promote the use of evidence-based judgement and meaningful integration.

Conclusion

This study offers insightful information on the use of artificial intelligence (AI) in contexts of community-based primary healthcare. The results show how AI technology may improve patient outcomes, allocate resources more effectively, and increase the effectiveness of healthcare delivery overall. This study's analysis of a wide range of studies shows the many different ways AI may improve healthcare equality, accuracy, and efficacy. Despite the positive results, it is important to recognize the limits of the available information, including any potential biases in research selection. Evidence-based judgements and thorough research efforts will be essential in directing AI's effective incorporation into community-based primary health care systems as it continues to develop.

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