

CONCEPTUAL

Artificial Intelligence Healthcare Community Awareness Initiative (AI-HCAI): A Key for AI Healthcare Sustainable Development

Professor Mahasin Shomo

Senior Fellow (SFHEA), London, UK

Khartoum University

Hull University PhD Alumna

The African American Institute Fellow (Wave B07-F86)

Center for Human Capacity Development, Global Bureau of the US

Email: drmahasin@hotmail.com

ORCID: 0000 0003 3519 4047

ABSTRACT

PURPOSE: This paper investigates how community awareness can play a key role in AI healthcare sustainable development (SD).

DESIGN: The paper is a conceptual analytical study that reviews the literature and examines the impact of community awareness regarding AI healthcare. Based on the results, an initiative is synthesised to support AI healthcare SD.

RESEARCH LIMITATIONS: The paper focuses on the impact of community awareness on AI healthcare SD based on the reviewed and analysed literature.

FINDINGS: The results explore the merits of AI healthcare, the potential, lack of quality data, and the inability to simulate humans. Several social issues were identified including technological utilisation. Subsequently, an initiative is created that can solve these issues.

ORIGINALITY: The AI Healthcare Community Awareness Initiative (AI-HCAI) has been created by the author based on her prolonged experience in community research and SD activities, both as a researcher and the director of the Community Applied Research Unit at Princess Nourah University, KSA.

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IMPLICATIONS: The initiative is synthesised to be adaptable to any community worldwide in an SD framework.

KEYWORDS: *Artificial Intelligence (AI); Community Awareness; Sustainable Development; Initiative Healthcare*

OVERVIEW

AI is currently being used for multiple purposes and in different healthcare contexts, including the management of complicated health conditions, provision of health services, and detection of disease.

Although AI has the potential to help address important health challenges, the performance might be inadequate due to the quality of available health data, and by AI's inability to display some human characteristics, treatment discovery, and prescription of medication.

The implementation of AI healthcare is associated with several ethical issues; these include:

- the potential for AI to make erroneous decisions;
- the absence of a responsible reference when AI is used to support decision-making;
- difficulties in validating the outputs of AI systems;
- biased data used to train AI systems;
- poor protection of potentially confidential and sensitive data;
- insecure AI technologies used in healthcare services;
- lack of consideration for people's privacy and sense of dignity;
- social isolation in care situations;
- influences on the roles and skill-requirements of healthcare professionals; and
- the potential for AI to be used for criminal and malicious purposes.

A key issue in the present study is ensuring that AI healthcare will be developed and used in a way that is transparent and consistent with social interests and aligned with community awareness. Nurturing community awareness for the sake of AI healthcare SD is central to AI healthcare success. Accordingly, the current paper designed an Artificial Intelligence Healthcare Community Awareness Initiative (AI-HCAI).

THEORETICAL FRAMEWORK

From the beginning of life, humans have been considered the top intelligent and smart species due to their innate ability to think, reason, employ and interact logically. Also, they comprehend complicated issues, analyse data, form theories, and detect connections among unpredictable things. Additionally, humans have the capability to build plans, develop proposals, solve problems, make reasonable decisions, and visualise the future. One remarkable output of these capacities is that humans invented computers to resolve time issues, overcome obligatory burdens, and minimise work pressure. The invention has continued to create manmade intelligence, called artificial intelligence (AI), that poses thinking capabilities (Ghosh and Thirugnanam, 2021).

Recent years have witnessed a fast growth of AI healthcare. This transformational movement reveals a tremendous surge in AI healthcare benefits such as informed patient care, improved patient safety, and innovative treatment options. Therefore, many clinicians believe that most of their decisions over the next decade will be made using AI clinical decision support tools. However, patients in the local communities face a knowledge gap and rising need for understanding AI healthcare and its impact on their life. Therefore, the mission of healthcare authorities and decision-makers is two-fold. First, the provision of quality AI healthcare services and, second, filling the knowledge gap that informs the community about this inevitable health service.

Currently, there is a great expansion of using AI in different domains of industry including healthcare, the subject of the present paper. To examine AI's existence in the machine is based on its capabilities, including learning and reasoning skills. In addition to the self-improvement associated with previous experience, there is the ability to understand language and solve problems. AI has been perceived as a symbol of human intelligence simulation that is created by humans. Indeed, AI has presently been considered as one of the most powerful means that assists humans in making their life's performance much easier, saving time and energy in their work. The most famous assistants of AI are the manual represented by the robots, and the digital one represented by Chabot that can perform troublesome, repetitive and risky tasks.

Potentially, healthcare solutions driven by AI can offer more personalised, precise treatment options and better health outcomes. However, implementing AI in clinical settings can be complex due to cultural, economic and regulatory factors. At the global community level with its great variation and complexity, the situation is getting more complicated. In this context Trappett (2023) argued that it is important not to overlook the value of human interaction in building trust and that AI can never duplicate emotional intelligence, active listening, body language, adaptability, and authentic

relationship building. The author asserts the importance of ethical considerations and potential challenges such as data privacy and bias. Also, organisations and communities must approach the use of AI in community engagement responsibly to maximise its benefits while mitigating potential risks.

Therefore, healthcare authorities, community and sustainable development leaders must unite to overcome challenges, including lack of awareness, data quality and bias, algorithmic trust and skills deficits. Also, they must put effort into focusing on patient-centricity and treatment options that focus on treating patients receiving healthcare with dignity and respect and involving them in all decisions about their health (Harvard Medical School Executive Education, 2024).

It is recognised that the AI healthcare revolution requires medical professionals and researchers to build knowledge and improve healthcare transformation and decision-making for patients. Also, it involves healthcare leaders who are deeply concerned about comprehending the implementation of AI practices for improving human healthcare. Technology innovators play a key role in AI healthcare as technologies are the tools for operating transformation systems. Additionally, healthcare consultants and policy-makers are involved in leading the adoption and developing policy of AI-based healthcare (Harvard Medical School Executive Education, 2024). Together with these subsets, the researcher of the present study perceives that patients' awareness about the AI-based healthcare transformation is certainly integral and central to its success. Patients' awareness plays a key role in exploring AI-driven healthcare processes and practice, and convinces patients about its potential.

Nevertheless, the rapid growth of AI healthcare has also brought many ethical and social implications. The current research investigated different aspects of this phenomenon, with special focus on the ethical considerations of applying AI healthcare including the effect on patient autonomy, privacy, and doctor-patient relationships. Likewise, Bhogawar *et al.* (2023) examined the potential for automation to reduce the availability of healthcare jobs and to widen existing health inequalities. The findings showed several potential benefits and drawbacks to using AI in healthcare. It was also found to be essential to consider the ethical and social implications prior to the implementation of AI healthcare services.

The study urged for more research to be conducted to understand the full implications of using AI healthcare. It recommends that ethical regulations must be central to ensure patient safety and satisfaction, enhancing the current initiative that aims to attain social AI healthcare SD. Alowais *et al.* (2023, p.1) explored the benefits of integrating AI into healthcare that maintains excellent potential for improving

disease diagnosis, treatment selection, and clinical laboratory testing. The findings revealed that AI tools can leverage large datasets and identify patterns to surpass human performance in several healthcare aspects. Moreover, it is recognised that AI healthcare offers increased accuracy and reduced costs, saving time while minimising human error. It can revolutionise personalised medicine, optimise medication dosages, and enhance the management of the population's health. Additionally, it establishes guidelines, provides virtual health assistance, supports mental health care, improves patient education, and influences patient-physician trust.

AI HEALTHCARE SOCIAL AND ETHICAL ISSUES AND DRAWBACKS

Ai (2018, p.4) reported that many ethical and social issues raised by AI overlap with those raised by data use: automation, the broad reliance on technologies, and issues that arise with the use of supportive technologies and telehealth. The AI literature reveals many challenges related to data privacy, bias, and the need for human expertise that must be addressed for the responsible and effective implementation of AI in healthcare services (Alowais *et al.*, 2023, p.1). On the other hand, ethical challenges associated with AI healthcare are classified into subsets including:

- epistemic, related to misguided, inconclusive or inscrutable evidence;
- normative, related to unfair outcomes and transformative effectiveness; or
- related to traceability (Morley *et al.*, 2020).

Due to the impact of these issues, policy-makers, regulators, and decision-makers must investigate means of solving these issues and minimising people's feelings of dissatisfaction and scepticism regarding AI healthcare sustainability. The present study suggests that one option is to elevate the awareness of the community to understand the flaws and merits of the AI healthcare process to sustain its development.

Ai (2018) explored several social issues of AI healthcare including safety, reliability, data bias, trust, transparency, data fairness and equality. Regarding reliability and safety, the issue focuses on errors that could be committed by AI. This happens when the error is difficult to identify and could have serious implications (Caruana *et al.*, 2015).

The issue of transparency and accountability is associated with ill-logical and ambiguous data produced by AI that is too complicated for humans to understand and this situation gets worse when the data are kept secret; the transparency issue raises problems of validation of AI outputs (Knight, 2017). On the other hand, AI could possibly reflect and reinforce biases in the data that are produced to train

them (Dilsizian and Siegel, 2014). This leads to potential gender, ethnicity, age, and disability discrimination (Sharkey and Sharkey, 2012). It could also affect people who are under-represented in research data and clinical tests, such as ethnic minorities (Coakley *et al.*, 2012). Therefore, public debate is growing fast on falling distrust about AI technologies, initiated by the collaboration between DeepMind and commercial companies that have been providing access to patient data (Polonski, 2018).

AI healthcare applications possess the ability to empower people to evaluate their own symptoms and care for themselves in some areas; this enhances their independence and dignity. These practices initiate social concern of family time with patients, feelings of isolation and loss of human contact. Social concern is extended to reach healthcare professionals as they may feel threatened in their jobs and autonomy. Additionally, the potential of AI to be used for malicious aspects of healthcare such as analysing someone's motor behaviour, cyber-attack, and revealing a person's information without their knowledge (Brundage *et al.*, 2018).

The literature reviewed explores the notion that AI possesses the capability to revolutionise healthcare by advancing quicker, more precise diagnoses, individualised treatments, and outcomes (Wang, 2019). Also, it may help physicians and clinicians in making better-informed judgements by evaluating massive patient data. Nonetheless, AI employment in healthcare produces ethical and societal concerns that must be tackled. One of the major ethical issues is the possibility that AI may make biased decision-making that possibly occurs when the decision-making algorithms are based on personal data or need to be more transparent and answerable. Additionally, concerns include security, data privacy and the possibility of AI replacing physicians and clinicians.

PROBLEM

The lack of community awareness about AI healthcare social issues and their influence on people constitutes a problem that must be investigated. Poor background information and concepts about AI healthcare services and practices among people in local communities is also involved and must be investigated. As healthcare is growing fast, people need to be aware of these inevitable changes brought by AI healthcare transformation. Therefore, a campaign for AI awareness is central to healthcare sustainable development. The current study provides the Artificial Intelligence Community Awareness Initiative (AI-CAI) as an option that could assist in minimising social AI healthcare concerns and hesitance regarding AI healthcare.

Objectives

The present study aims to:

- provide knowledge about AI healthcare practices to the local communities;
- empower the public to confront AI healthcare's social and ethical drawbacks;
- develop an AI healthcare awareness programme to be applied within local communities;
- develop a matrix for the initiative's implementation in global communities;
- forecast social awareness about AI healthcare for its sustainable development.

Targeted Groups

The community targeted groups include people with poor or no AI-based healthcare background, vulnerable groups, and people in remote areas.

Methodology

The study followed a descriptive method by reviewing the AI healthcare literature with a special focus on social issues. Based on the results, the study developed an initiative of AI healthcare community awareness as a key for AI healthcare SD.

Importance

The importance of the current research is that it:

- provides an overview of AI healthcare including its potential applications and its capability to implement the healthcare domain and patients;
- sheds light on the AI healthcare associated with social challenges, including lack of knowledge and expertise;
- provides an initiative for community awareness that aims for better engagement of patients and to enhance accelerating the pace of AI healthcare SD;
- discusses the implementation mechanisms and evaluation of the initiative;
- provides a matrix that summarises the initiative application mechanisms;
- enhances global community awareness about AI healthcare and sustains healthcare organisations to proceed with their work effectively.

Limitations of the Study

- The initiative is focused on developing community awareness on AI skills and practices.
- The initiative for AI healthcare community awareness about AI-based healthcare is adaptable to the global community.
- The initiative is focused on, but not limited to, community vulnerable groups.

Definition of Artificial Intelligence (AI)

The literature reveals that there is variation in AI definition according to the context of its implementation. In the field of technology, Ghosh and Thirugnanam (2021) define AI as a branch of computer science that makes computers simulate human behaviour to assist humans for better performance in the field of science and technology. Saleh (2019) defined the applications of AI in the context of healthcare as the technology that permits computers to execute activities that generally require the human brain.

To perform its tasks, AI has basic subdivisions including machine learning and deep learning that are used to solve problems using high performance algorithms and multi-layer neural networks.

Why does AI Merge in Human Life Domain?

According to technology contenders, the goals of AI's existence in human life encompass the following:

- replicating human intelligence;
- solving knowledge intensive tasks;
- building machines which can perform human intelligence-based tasks;
- creating systems which can learn by itself.

How AI Healthcare Operates

To operate its healthcare tasks AI utilises two main tools, machine learning and deep learning; these subsets of AI are used to solve problems using high performance algorithms and multilayer neural networks, respectively. With the help of the machine learning process, structured data, e.g., genetic data, electrophysical data, and imaging data, are properly investigated in medical diagnosis. AI provides advanced devices, drug designing techniques, tele-treatment, physician-patient communication using Chatbots, and intelligent machines used for analysing the cause and the chances of occurrence of any disease in the healthcare domain.

AI Healthcare Community Awareness Initiative (AI-HCAI)

The literature reveals the argument regarding AI healthcare stemmed from global concerns about the increasing cost of healthcare. This problem has been investigated and the results showed multiple causes that are examined and found hard to understand and define. Therefore, this problem must be solved in different contexts (Medifind, 2024). The argument then finished on the classic definition of AI as an umbrella term for a range of techniques that can be used to make machines complete tasks in a way that would be considered intelligent and completed by a human. It discussed the means of tackling the issue of ethical risks proactively to avoid the potential risks of ethical mistakes or misunderstandings. The dispute highlighted ethical risks and their effect on social rejection, biased legislation and policies. These issues could disrupt social acceptance and damage the advancement of AI healthcare. It was also argued that if action is not swiftly taken in this regard, a new terrifying effect related to a loss of public trust in the benefits of AI for healthcare will occur. Additionally, futuristic studies reveal that AI systems will become more advanced, develop the capability to carry out an extensive range of tasks without human control or contribution. If this happens, AI systems will then confront a complicated problem represented by ethical issues associated with the machines' need to learn to be 'ethical' and to make ethical decisions (Bostrom and Yudkowsky, 2014). Therefore, the community must be aware of AI healthcare's challenges to help to overcome ethical risks. The present article provides a community initiative to support social hesitance about AI healthcare and enhance its sustainable development (Morley *et al.*, 2020).

Components of AI-HCAI

The initiative consists of several components including: 1) the description; 2) implementation mechanisms; 3) outputs; 4) key performance indicators; 5) partners. These components are presented in detail on the initiative page and the full components are illustrated in the matrix given at the end of this paper.

The Implementation Mechanisms of the AI-HCAI

The application of the AI-HCAI as shown in the matrix involves three basic components:

1. description of the initiative and its implementation;
2. matrix of the initiative operation;
3. benefits of the initiative.

What are the Benefits of Applying the AI-HCAI?

The current suggested initiative is not just a set of procedures and requirements associated with the people of the community; it is a tool for navigating the complexity of AI healthcare services and their impacts. As the world experiences a surge in AI healthcare and technological advances, people-centred healthcare emphasises the success of AI healthcare provision. The benefits of the AI-HCAI application include:

- improving the quality of healthcare delivery;
- raising patient satisfaction and feeling of comfort;
- accelerating planning for sustainable development of AI healthcare;
- assisting AI healthcare service delivery;
- enhancing AI healthcare operations and effectiveness;
- fostering social reputation with an extended market reach.

Matrix for Implementation Mechanisms of Community Awareness about AI-based Healthcare Initiative

| Initiative | Description | Implementation Mechanisms | Outputs | Key Performance Indicators (KPIs) | Partners |
|--|--|---|--|---|---|
| AI-based Healthcare Community Awareness Initiative | <p>The initiative aims to:</p> <ul style="list-style-type: none">- Develop community awareness about AI-based healthcare- Enhancement- Foster community AI-based healthcare knowledge- Acquire expertise from community reputed advisors | <ul style="list-style-type: none">- Developing brochure for AI-based healthcare- Announcement of the initiative in the community- Development of materials to support community learning and acquisition of AI concepts and practices- Seminars on AI-based healthcare:- Brainstorm activities- Online discussion sessions- Scientific papers- Focus groups on AI-based healthcare services and best practices- AI-based healthcare forums- Evaluation of programme- Suggestions for future development- Recommendations for improvement | <p>Initiative guide</p> <p>Introductory workshop for global communities</p> <p>Number of:</p> <ul style="list-style-type: none">- participants- scientific papers on community awareness about AI-based healthcare service- mobile open discussions about the initiative- local communities that involved in the AI awareness campaign- established focus groups- forums on AI- based healthcare activities | <ul style="list-style-type: none">1. Number of participants<ul style="list-style-type: none">- Elders- Vulnerable groups- Others- Scientific papers2. Simulation activities3. Seminars4. Forums5. Meetings6. Online open discussions7. Basic AI awareness workshops8. Advisors9. Presenters10. Coaches.11. Focus groups12. Survey results on awareness evaluation13. Reports | <ul style="list-style-type: none">1. Healthcare clinics/centres2. AI simulation units/ centres3. Hospitals4. Healthcare. authorities5. Community service centres6. Community clubs |

CONCLUSIONS

The present research article investigated AI technologies that have been employed in the healthcare domain, including detection of disease, management of chronic conditions, delivery of health services, and drug prescription. The study explored the merits of AI healthcare and its potential to help address important health challenges and enhance health services such as improving disease diagnosis, treatment selection, and clinical laboratory testing. Also, AI offers increased accuracy with lower costs, and reduced time and energy. It is recognised that AI can revolutionise personalised medicine, optimise medication dosages, enhance population health management, and provide health assistance. However, AI healthcare might be limited by the quality of available health data, and by the inability of AI to simulate some human characteristics, such as empathy and kindness.

The study shed light on several ethical and social issues, many of which overlap with issues raised using data and healthcare technologies more broadly. A key challenge for AI healthcare sustainable development will be ensuring that AI is applied in a transparent and compatible manner that aligns with the public interest. Accordingly, the study created a community AI Healthcare Awareness Initiative to broadcast knowledge, and skills to solve the ethical challenges that cripple AI healthcare's sustainable development.

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BIOGRAPHY



Professor Mahasin Shomo is currently a faculty member at the Applied College, Princess Nourah University, Saudi Arabia where she has held several leadership roles. She also helped develop the Nourah Community Research Chair and the Applied Community Research and Studies Unit. Previously, Professor Mahasin chaired the Curriculum and Instruction Department and launched a graduate Family Education programme at Taibah University, Saudi Arabia. She has a PhD in Education (Curriculum Development and Teaching Strategies) from the University of Hull, UK, a Master's from the University of Nebraska–Lincoln, USA, and a Bachelor's from the University of Khartoum. She has supervised many masters' dissertations and PhD theses, and has published widely, contributed to academic journals, and engaged in international collaborations. She is affiliated with global academic and professional organisations and plays an active role in community engagement and sustainable development.