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Human-AI Collaboration in Healthcare: A Review of User Perspectives and Challenges

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Abstract:

Artificial intelligence (AI) has rapidly become a transformative force across various sectors, including healthcare, virtual support, and security. The convergence of AI and Human-Computer Interaction (HCI) has led to the development of interactive intelligent systems, fostering user engagement. This paper presents a comprehensive review of the intersection of AI and HCI, focusing on user perspectives and challenges in the context of healthcare.

Keywords: *Artificial intelligence, Human-Computer Interaction, Healthcare, User Perspectives, Challenges*

Introduction:

Artificial intelligence (AI) is an emerging technology widely accepted in fields such as virtual support, healthcare, and security. The combination of AI and Human-Computer Interaction (HCI) creates interactive intelligent systems, utilizing various algorithms and HCI to provide transparency. This paper aims to explore the intersection of AI and HCI, emphasizing the role of Explainable Artificial Intelligence (XAI) in healthcare.

Background and Context:

The evolving field of human-AI collaboration in healthcare presents opportunities to address workforce shortages and enhance care quality (Lai, 2021). Challenges include biases in decision-making, trust issues, and adoption barriers (Park, 2019). The transition from AI development to real-world implementation requires attention to end-user engagement and socio technical considerations (Andersen, 2021). The importance of trust, transparency, and human-centered perspectives in the adoption of human-AI collaboration in clinical decision-making is underscored (Hemmer, 2022).

Brief Overview of the Increasing Role of AI in Healthcare:

AI's increasing role in healthcare spans medical imaging, diagnostics, patient engagement, drug discovery, and administrative tasks (Kuwaiti, 2023). Noteworthy applications include diagnosis and treatment recommendations, patient engagement, and administrative activities (Davenport, 2019). The availability of

healthcare data and advances in analytics techniques further support AI's integration. Challenges include technical, ethical, and social issues (Kuwaiti, 2023).

Importance of Understanding the Collaboration Between Humans and AI in Healthcare Settings:

The collaboration between humans and AI in healthcare offers potential benefits but is influenced by technical, human-centered, and socio technical considerations (Hemmer, 2022; Park, 2019). Key challenges include work types, labor relations, and social impacts. Factors influencing the interaction between medical professionals and AI include training data quality, performance, explainability, adaptability, and trust (Knop, 2022).

Research Methodologies:

To comprehensively review the Human-AI Collaboration in Healthcare, a systematic approach was employed. Searches across academic databases, snowballing techniques, and consultation of specialized resources were conducted. Emphasis was placed on peer-reviewed articles and reputable sources to ensure the paper's grounding in a diverse body of literature.

Duration and Objective of the Comprehensive Literature Review:

This six-month literature review (January 2023 to June 2023) aimed to examine the Human-AI Collaboration in Healthcare The primary objectives included assessing AI's applicability, acceptance, and adoption in the healthcare industry and providing recommendations for practitioners and policymakers.

User Perspectives in Human-AI Collaboration:

Research highlights the importance of AI-to-human communication in co-creative systems (Rezwana, 2022). Transparency in AI design is crucial, as human participants tend to view human partners more positively than AI partners (Ashktorab, 2020). The challenges of collaboration in human-AI systems design are addressed through the concept of "leaky abstractions" (Subramonyam, 2022). A shift from human-human to human-AI collaboration is proposed, emphasizing mutual goal understanding and shared progress tracking (Wang, 2020).

Healthcare Professional and Patient Perspectives:

Perspectives on healthcare professionalism emphasize patient input, global curriculum alignment, and improved professionalism (Grainger, 2011; Khan, 2011; Upadhyai, 2020; Jalil, 2020). Patient perspectives on AI in healthcare reveal receptivity but concerns about privacy, trust, and transparency (Khullar, 2022; Esmaeilzadeh, 2021; Budde, 2020; Mccradden, 2020). Interdisciplinary collaboration highlights the importance of a patient-centered approach and ethical frameworks.

Applications of AI in Healthcare:

AI applications in healthcare include Clinical Decision Support Systems, Diagnostic Imaging and Pathology, and Electronic Health Records. User experiences, successful case studies, and insights into the usability and effectiveness of AI-driven technologies are explored.

Challenges in Human-AI Collaboration:

Challenges in human-AI collaboration encompass biases, trust issues, and adoption barriers (Lai, 2021; Park, 2019). Transparency, explainability, and reliability are essential for AI systems operating alongside humans (Endsley, 2022). Responsible development and implementation of AI in healthcare require interdisciplinary research and collaboration (Matheny, 2019; Endsley, 2022).

Trust and Reliability:

Trust and reliability are crucial for AI's successful implementation in healthcare (Larasati, 2020; Tucci, 2021). Factors influencing user trust include transparency, explainability, accountability, risk perception, facilitating conditions, and social influence (Wang, 2023; Asan, 2020). Reliable performance is essential for building and maintaining user trust.

Future Directions and Recommendations:

The future of AI in healthcare holds promise, with opportunities in disease diagnosis, treatment, and patient care. Real-world evaluation, regulatory systems, IoT, and AI collaboration are identified as important focus areas. Technical, ethical, and practical considerations must be addressed for the responsible development of AI in healthcare.

Conclusion:

Human-AI collaboration in healthcare offers significant potential but comes with challenges such as biases, trust issues, and adoption barriers. A human-centered approach, transparency, and interdisciplinary collaboration are crucial for successful integration. The paper provides comprehensive insights into the intersection of AI and HCI in healthcare, emphasizing the need for responsible AI development and continued research.

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