

Unleashing the Potential: Artificial Intelligence's Transformative Impact on Healthcare and Nursing

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ABSTRACT

The convergence of artificial intelligence (AI) with the healthcare landscape signifies a pivotal juncture, poised to catalyze transformative shifts in both the medical and nursing spheres. Artificial intelligence's capacity to replicate human cognitive functions holds vast potential across medical diagnosis, treatment strategies, patient management, and nursing practice. Concurrently, integrating AI into nursing practice brings forth an array of opportunities, from clinical decision support systems to remote patient monitoring, fostering heightened patient care, and operational efficiency. Despite the attendant challenges and ethical considerations, the synergistic relationship between AI and healthcare professionals promises to redefine patient outcomes and reshape the essence of healthcare provision. With ongoing advancements in AI, medical professionals and nurses alike are positioned to leverage its potential, steering healthcare into an era characterized by tailored, effective, and compassionate medical services.

Keywords: Artificial intelligence, Collaboration, Healthcare professionals, Nursing practices, Remote monitoring.

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INTRODUCTION

In simple terms, artificial intelligence (AI) involves creating smart machines using algorithms or rules that guide them to imitate human thinking processes like learning and problem-solving. These AI systems have the potential to predict problems and handle challenges in a smart, intentional, and flexible way. One of AI's key strengths lies in its capacity to learn and identify patterns from vast and complex datasets, such as translating a patient's complete medical history into a single value representing a probable diagnosis. Additionally, AI systems are self-adjusting and independent, continuously learning and evolving with new data.¹

The intersection of AI with both medical and nursing domains stands at the precipice of transformative change within the healthcare landscape. With its ability to replicate human cognitive functions, AI has garnered substantial attention, traversing the realms of medical diagnosis, treatment strategies, and patient management. Simultaneously, the integration of AI into nursing practice offers an array of possibilities, from clinical decision support systems (CDSS) to remote patient monitoring. This article embarks on a comprehensive exploration of AI's integration into medical and nursing practices, unraveling its multifaceted applications that hold the promise to reshape patient care and streamline nursing workflows. As indispensable facets of healthcare delivery, both medical professionals and nurses stand poised to harness the potential of AI, fostering a synergy that could revolutionize patient outcomes and redefine the very essence of healthcare provision.

ARTIFICIAL INTELLIGENCE APPLICATIONS IN NURSING

Clinical decision support systems represent a pivotal facet of healthcare informatics, harnessing AI algorithms to furnish healthcare professionals with evidence-based insights at the point of care. By amalgamating patient-specific data, clinical guidelines, and medical literature, CDSS offer personalized, timely guidance.

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The overarching aim is to amplify patient care quality, bolster safety, and optimize clinical outcomes. Leveraging AI capabilities, CDSS proficiently analyze diverse patient data, from medical histories to lab results, to discern risks, propose diagnostics, and advocate treatments. Clinical decision support systems efficacy spans disease diagnosis, medication management, and treatment planning, effectively mitigating errors through drug interaction alerts, and expediting disease detection via tailored screenings. In essence, CDSS epitomizes a transformative synergy of AI and healthcare, equipping clinicians with insights that catalyze accurate and informed decisions.²

An exploratory cross-sectional survey delves into the perspectives of nurses within health organizations regarding the integration of AI into nursing practice. The study, conducted in health organizations within the United Arab Emirates, aimed to assess nurses' knowledge, perceptions, organizational readiness, and challenges associated with AI implementation. A survey link was disseminated via email, yielding a response rate of 85%, with 553 of 650 invited nurses participating. The survey revealed that while 51% of respondents acquired AI knowledge through

self-teaching, 20% gained insights from various courses. Merely 8% reported postgraduate education as their source of AI knowledge, and 9% admitted a lack of AI understanding. An overwhelming 75% of participants endorsed the integration of basic AI knowledge into the nursing curriculum. These findings underscore a notable deficit in AI comprehension within the nursing profession. The study highlights the necessity for focused educational initiatives to bridge this knowledge gap and ensure the seamless and safe assimilation of AI into nursing practice.³

BENEFITS OF AI INTEGRATION

The burgeoning field of robotic engineering is ushering in new capabilities for robots, including emotionally responsive behaviors, leading to the emergence of socially interactive robots or companions. These robots are gradually infiltrating healthcare, domestic, and professional settings, designed to mimic human interactions. Although they are not poised to replace human roles, they stand to enhance healthcare by performing tasks such as ambulation support and vital sign measurement, potentially reclaiming nurses' time for more direct patient care. Nursing-focused robotics projects, funded by various bodies, illustrate the growing interest in integrating robots into nursing activities. This trend does not signal the obsolescence of nurses; rather, it involves their active engagement in developing and using robots specialized for patient care and elderly support. These robots are envisioned as collaborative partners that work alongside nurses to enhance care quality. Notable projects include the development of the tele-robotic intelligent nursing assistant and nurse-led telehealth robot initiatives. These endeavors reflect the potential for robots to support healthcare workers in tasks with infection risks, promote wellness, and manage chronic illnesses. Although robots can augment care delivery, the distinct human elements of touch, connection, and relationship-building will continue to characterize nursing's essential role at the forefront of patient care.⁴

As healthcare's complexity evolves, nursing education must also adapt to keep pace. The integration of AI technology into higher education represents a transformative shift, potentially enhancing learning experiences for students through personalization and efficiency. However, typical of new technologies, concerns accompany AI's adoption in higher education, including nursing programs. This article aims to offer an overview of AI in nursing education, exploring its historical origins, present applications, and future trajectories. By examining AI's opportunities and limitations within nursing education, the article encourages nurse educators to deliberate on the optimal integration of AI technology into teaching methods, thereby enriching student learning and contributing to the cultivation of skilled and empathetic nurses.⁵

CHALLENGES AND CONSIDERATIONS

Swedish healthcare leaders conducted an exploratory qualitative approach in a regional setting regarding AI implementation. Semi-structured interviews were conducted with 26 healthcare leaders from October 2020 to May 2021. Qualitative content analysis was used, yielding three categories that represent challenges associated with AI implementation: (1) external healthcare system conditions, (2) strategic change management capability, and (3) transformation of healthcare professions and practices. In conclusion, healthcare leaders identified a spectrum of implementation challenges concerning AI, encompassing both external healthcare system

conditions and internal strategic change management capacities, intertwined with transformations within healthcare professions and practices. The findings underscore the necessity for comprehensive implementation strategies spanning healthcare organizations to address AI-specific capacity enhancement. Regulatory frameworks and policies are imperative to govern effective AI implementation strategies, necessitating investments in time and resources in collaboration across healthcare, county councils, and industry partnerships.⁶

FUTURE DIRECTIONS

The future of AI in nursing holds transformative potential across various aspects of healthcare. Personalized patient care can be revolutionized through AI's ability to analyze patient data and offer tailored treatment plans. Enhanced diagnostics and early disease detection will be enabled by AI-powered tools. Telehealth and remote monitoring will expand, with wearable devices and real-time guidance becoming prevalent. Artificial intelligence-driven CDSS will provide nurses with instant evidence-based insights. Education will incorporate AI tools for immersive learning experiences. Robotics and automation will streamline routine tasks, freeing nurses for more critical care. Ethical considerations and privacy protection will be integral. Artificial intelligence will foster interdisciplinary collaboration and continuous learning. Embracing these advancements, nurses will lead healthcare's evolution, maintaining compassionate care while embracing the benefits of AI progress.

The scoping review on predicted influences of AI on nursing education aims to comprehensively summarize the present and anticipated impacts of AI in health technologies (AIHTs) on nursing education within the next decade and beyond. Employing a methodology outlined in a pre-established protocol, this review encompassed diverse databases and gray literature sources. A total of 27 articles were analyzed, encompassing various AIHTs like virtual avatar apps, predictive analytics, smart homes, virtual/augmented reality, and robots. The review highlights two primary categories: AI's effects on nursing education in (1) academic institutions and (2) clinical practice. The findings underscore the pressing need for curricular enhancements in nursing education, both in academic and clinical settings, to equip nurses and students to adeptly navigate the AI landscape. This includes integrating evolving pedagogies, nurturing requisite competencies, and ensuring the judicious integration of AIHTs for compassionate patient-centered care.⁷

CONCLUSION

In conclusion, the intersection of AI with healthcare holds the potential for transformative change in both medical and nursing domains. Artificial intelligence's capabilities to replicate human cognitive functions are poised to reshape medical diagnosis, treatment strategies, patient management, and nursing practice. The integration of AI into nursing practice offers a wide range of possibilities, from CDSS to remote patient monitoring, contributing to enhancing patient care and streamlined workflows. Although challenges and concerns exist, including the need for education and ethical considerations, the symbiotic relationship between AI and healthcare professionals stands to revolutionize patient outcomes and redefine healthcare provision. As AI continues to advance, nurses and medical professionals must harness its potential,

ushering in an era of personalized, efficient, and compassionate healthcare.

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