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DIGITAL HEALTH CARE IN PAEDIATRICS THE PIVOTAL ROLE OF A NURSE TO ENHANCE NURSING CARE DIGITALLY

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ABSTRACT

Digital healthcare involves the amalgamation of electronic technologies and inventive approaches within healthcare services. It encompasses utilizing digital tools, software systems, and communication platforms to enhance medical procedures, patient care, diagnosis, treatment, and the management of health records. Nursing, focused on preserving and improving the well-being of individuals, groups, families, and communities, converges with mHealth nursing within the broader landscape of digital healthcare. Breakthroughs such as Molly, a milestone in telenursing created by Sensely, represent notable progress in the field of digital healthcare. Digital innovations in pediatric healthcare and nursing herald a transformative era, significantly elevating the standards of care while fostering unparalleled advancements in accessibility and patient engagement. These technological advancements serve as catalysts, not just improving the quality of healthcare delivery but also revolutionizing the overall health outcomes for children and their families. Through telemedicine and healthcare mobile applications, families, especially those in remote areas, can access specialized care, reducing geographical barriers and minimizing the need for extensive travel. The integration of electronic health records (EHRs) ensures seamless coordination among healthcare providers, promoting personalized and efficient treatments. Wearable health devices empower parents and caregivers to monitor a child's health in real-time, facilitating timely interventions and proactive health management. Moreover, gamification and interactive elements in healthcare apps enhance children's participation in their treatment, promoting better adherence and engagement. These technological strides not only enhance the efficacy of pediatric care but also create a more inclusive and patient-centered healthcare landscape for children and their families, ultimately improving their overall well-being.

Keywords: Artificial Intelligence, Digitalization, Health, Paediatrics, Nursing Care.

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INTRODUCTION

The impressive evolution of artificial intelligence (AI) has sparked profound transformations across every facet of our lives. Specifically, the recent launch of ChatGPT has garnered worldwide attention as a pivotal moment, bringing us closer to a future that was once only a distant vision. Progress in diverse digital technologies, AI included, is fundamentally reshaping the landscape of healthcare, paving the way for what we now term as smart healthcare. The onset of the COVID-19 pandemic acted as a catalyst, propelling the integration of digital healthcare solutions. Prior to the pandemic in 2019, telemedicine—a key representation of digital healthcare—was only adopted at a rate of 9%. Yet, just three years later in 2022, this adoption rate surged to 41%. Consequently, numerous digital technologies are under development to provide virtual services to the intended demographic. Initially concentrating on prescriptions and interventions, digital healthcare now encompasses predictive capabilities. This expansion has led to the implementation of diverse methods in child health nursing, spanning education, research, and practical applications. Digital healthcare refers to the utilization of digital technologies, such as electronic devices, software solutions, and communication platforms, to enhance the delivery and management of healthcare services. It encompasses the integration of technology into various aspects of healthcare, including medical diagnosis, treatment, monitoring, record-keeping, and patient communication. numerous digital technologies are being developed to offer virtual services to a wide range of users. Initially focused on prescriptions and interventions, digital healthcare has evolved to include predictive capabilities, allowing for more proactive approaches to healthcare. This expansion has led to the integration of various methods in child health nursing, encompassing education, research, and practical applications. Digital healthcare, broadly defined, involves the use of electronic devices, software solutions, and communication platforms to enhance the delivery and management of healthcare services. It encompasses the integration of technology into various aspects of healthcare, such as medical diagnosis, treatment, monitoring, record-keeping, and patient communication.

DIGITALIZATION IN HEALTHCARE

Digital healthcare encompasses the integration of electronic technologies and innovative solutions within the realm of healthcare services. It involves the application of digital tools, software systems, and communication platforms to optimize medical procedures, patient care,

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diagnosis, treatment, and health record management.

Digital health encompasses various elements such as mobile health (mHealth), e-healthcare, health information technology (IT), wearable devices, telehealth, and personalized medicine, representing an emerging sector within healthcare. This field combines advancements in digital technology with medical innovations to transform healthcare delivery, aiming to improve the treatment, care, and overall well-being of individuals. Terminologies like mHealth apps, e-health, and smart healthcare are often used interchangeably with digital healthcare, which is a subset within the broader healthcare framework. However, its specific position within this framework remains somewhat uncertain. Mobile healthcare, a pivotal aspect in nursing with tailored applications, falls under the broader scope of digital healthcare. It involves leveraging smartphones, internet connectivity, and digital tools to provide healthcare services. Recognizing the distinctions between digital healthcare and traditional healthcare is common, acknowledging areas of overlap such as remote medicine and digital therapeutics (DTx). Nursing shares a comparable situation, where specialized nursing aimed at maintaining and enhancing the health of individuals, groups, families, and local communities intersects with mHealth nursing, embedded within the extensive domain of digital healthcare. Milestones like Molly, an achievement in telenursing developed by Sensely, exemplify significant advancements within the realm of digital healthcare.

DIGITAL INNOVATIONS IN PEDIATRIC HEALTHCARE AND NURSING

Mobile healthcare has emerged as a significant area of focus in both the exploration of nursing practices and their practical implementation. It involves a diverse array of applications designed to serve various purposes within pediatric care, ranging from ensuring the safety of hospitalized children to offering vital support and wellness aid for youngsters grappling with chronic conditions such as pediatric cancer or moyamoya disease. An increasing trend in research involves integrating AI technology into chatbots specifically tailored for interventions and educational endeavors. Within child health nursing, chatbots have proven highly promising, evidenced by their contributions to vaccination consultations for children and their involvement in programs aiding children and caregivers managing chronic conditions through community-based chatbot initiatives.

Digital technology holds a unique allure for children and adolescents, particularly as adolescents, considered digital natives, exhibit widespread smartphone ownership, with over 95% reported as smartphone users. This trend is notably pronounced in South Korea, where

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digital healthcare accessibility is exceptionally high, with a staggering 99.8% of teenagers owning smartphones. Given that children and adolescents are well-versed in engaging through virtual avatars, researchers are actively exploring the use of avatars within virtual environments to proactively prevent accidents and tackle health-related concerns. Furthermore, digital gaming platforms have emerged as potential catalysts for piquing children's curiosity, positioning game-based digital interventions as potential tools for managing children's health. Another noteworthy digital technology embraced in a child-friendly manner is humanoid robots, designed to interact with individuals in a manner akin to pets. Research endeavors utilizing humanoid robots to alleviate pain and distress during children's vaccination procedures underscore their potential efficacy. Their practical interaction capabilities suggest that humanoid robots could particularly benefit children navigating developmental challenges.

Digital innovations in pediatric healthcare and nursing have significantly transformed the way healthcare providers deliver services and care for children. These innovations leverage technology to improve diagnosis, treatment, communication, and overall patient outcomes in pediatric healthcare settings. Some notable advancements include: Telemedicine and Telehealth: These platforms allow pediatricians and nurses to remotely assess and diagnose children, offer consultations, and provide ongoing care. Virtual visits minimize travel burdens for families, especially those in rural areas, and enable continuous monitoring of chronic conditions. Healthcare Mobile Applications: There's been a surge in mobile apps tailored for pediatric health, facilitating parents to track their child's growth, developmental milestones, vaccination schedules, and manage chronic illnesses more effectively. Some apps even offer symptom checkers and basic health guidance. Electronic Health Records (EHRs): Digital documentation systems enhance efficiency in tracking a child's medical history, prescriptions, allergies, and lab results. This ensures better coordination among healthcare providers, leading to more personalized and effective treatments. Wearable Health Devices: Wearables like smartwatches and health trackers can monitor a child's vital signs, sleep patterns, physical activity, and even detect early signs of illness. These devices assist healthcare providers in understanding a child's health trends and intervening when necessary. Virtual Reality (VR) and Augmented Reality (AR): These technologies are increasingly used in pediatric healthcare for pain management, distraction during procedures, and providing educational experiences to children about their conditions or treatments in a more engaging manner. Robotics in Surgery and Rehabilitation: Pediatric surgeons use robotic-assisted procedures for greater precision and minimal invasiveness. Additionally, robotic devices aid in pediatric rehabilitation, assisting

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children with disabilities to improve mobility and motor skills. Genomic Medicine: Advances in genetic testing and analysis help identify genetic disorders and predispositions in children, enabling early interventions and personalized treatments based on an individual's genetic makeup. Artificial Intelligence (AI) in Diagnostics: AI-powered algorithms analyze medical imaging, aiding in the early detection of conditions like cancer or abnormalities in pediatric radiology. AI also assists in predicting disease progression and outcomes based on various data inputs. Gamification of Healthcare: Using game-like elements in healthcare apps or devices encourages children to adhere to treatment plans, perform rehabilitation exercises, or manage chronic conditions through interactive and enjoyable experiences. Remote Monitoring and Home Healthcare Devices: Remote monitoring devices enable continuous tracking of a child's health parameters at home, reducing hospital visits and ensuring timely interventions when needed. These digital innovations in pediatric healthcare and nursing not only improve the quality of care but also enhance accessibility, patient engagement, and overall health outcomes for children and their families.

EMERGING FRONTIERS IN PEDIATRIC HEALTHCARE AND NURSING

Nurses hold a distinct role in educating patients about how digital health apps function. Consequently, child health nurses are responsible for assessing the efficacy of digital health technologies for children and ensuring ethical data management. However, integrating digital health into child health nursing has both advantages and risks, and there's insufficient evidence regarding its usefulness and effectiveness from a child's perspective. Thus, it's critical to create assessment tools to address this gap. The realm of digital healthcare encompasses various disciplines such as computer science, engineering, economics, social science, public health, and epidemiology. Hence, educating child health nurses should encompass digital healthcare preparation within their curriculum. Innovative nursing education programs, moving beyond conventional teaching methods, should incorporate teaching and practical experiences, emphasizing collaboration across professional fields, essential for the future of child health nursing education. Researchers in child health nursing have developed analogous interventions like mHealth apps, digital health nursing care, and healthcare devices to enhance patients' psychological well-being and self-management. However, there's a lack of discourse on how nurses can manage the expenses associated with applying these interventions in various nursing settings (clinical, family, and community). Nursing-related organizations need to actively engage and deliberate on this aspect for the future. Digital healthcare has the potential to widen

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health gaps among children, especially in nations lacking robust IT infrastructure. Hence, developers of digital healthcare should always consider alternative care approaches for vulnerable children in developing countries. Nursing is traditionally seen as a blend of art and science. Despite the recent emphasis on the human touch in digital healthcare, its ability to encapsulate the artistic facets of nursing remains uncertain. In child health nursing, there's a need for human-centered development in digital healthcare to bridge virtual and real-life experiences, meeting children's practical needs. Child health nurses must remain updated on technological advancements and position themselves as specialists capable of providing valuable insights in the field. As key caregivers responsible for children's well-being in healthcare settings, nurses shouldn't blindly adopt new technologies but rather possess the acumen to discern their advantages and limitations.

In the realm of child health nursing, several challenges arise in the context of the evolving digital landscape: Evaluating Digital Health Technologies: Assessing the effectiveness, safety, and appropriateness of digital health interventions specifically tailored for children poses a challenge. There is a need to develop robust evaluation methods to determine the suitability and impact of these technologies on pediatric patients. Ethical Considerations and Data Management: Ensuring ethical use and management of children's data within digital health platforms is crucial. Child health nurses must navigate issues of privacy, consent, and data security, especially when dealing with minors' health information. Lack of Evidence-Based Practice: Limited empirical evidence exists on the efficacy and long-term outcomes of digital health interventions designed for children. Building a solid evidence base that demonstrates the effectiveness and safety of these technologies in pediatric care is essential. Integration into Nursing Education: Incorporating digital health education within child health nursing programs poses a challenge. There's a need to adapt nursing curricula to equip future nurses with the necessary skills and knowledge to effectively utilize and navigate digital health tools in pediatric care settings. Financial Barriers and Resource Allocation: Implementing digital health solutions often requires financial investment and resource allocation. Addressing disparities in access to these technologies among different populations and healthcare settings remains a challenge. Health Inequalities and Access to Care: Digital health advancements may inadvertently widen health disparities among children, particularly in regions with limited access to robust IT infrastructure. Bridging this digital divide to ensure equitable access to quality care for all children is a pressing challenge. Human-Centered Digital Healthcare: Balancing the technological aspects of digital health with the human-centric approach to nursing care is

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essential. Integrating empathy, compassion, and personalized care within digital health interventions for children poses a challenge in maintaining the holistic aspect of nursing practice. Adapting to Rapid Technological Changes: Keeping pace with the rapid advancements in digital health technologies is a perpetual challenge. Child health nurses must continually update their knowledge and skills to effectively navigate and leverage new innovations in pediatric care. Addressing these challenges requires collaboration among healthcare professionals, policymakers, educators, and technology developers. It involves developing guidelines, ethical frameworks, evidence-based practices, and inclusive strategies that prioritize children's well-being while harnessing the benefits of digital health in nursing practice.

CONCLUSION

This article illustrates the transformative impact of digital healthcare on pediatric healthcare and nursing. Digital healthcare encompasses the utilization of electronic technologies, software systems, and innovative methods to enhance various aspects of healthcare services. In this context, nursing, which is primarily concerned with improving the health of individuals, families, and communities, converges with mHealth (mobile health) nursing within the expansive realm of digital healthcare. Breakthroughs like Molly, a significant achievement in telenursing developed by Sensely, exemplify substantial progress within this field. The innovations in digital healthcare have led to a remarkable transformation in pediatric care, notably improving standards and advancing accessibility and patient engagement. These advancements serve not only to enhance the quality of healthcare delivery but also to revolutionize health outcomes for children and their families. Technologies such as telemedicine and healthcare mobile applications have made specialized care more accessible, especially for families residing in remote areas, breaking geographical barriers and reducing the need for extensive travel. Integration of electronic health records (EHRs) facilitates seamless communication among healthcare providers, enabling personalized and efficient treatments. Wearable health devices provide real-time monitoring of a child's health, empowering parents and caregivers to take timely actions and proactively manage their child's health. Furthermore, incorporating gamification and interactive elements in healthcare apps encourages children's active participation in their treatment, leading to improved adherence and engagement. These technological advancements not only enhance the effectiveness of pediatric care but also contribute to building a more inclusive and patient-centered healthcare environment for children and their families. Ultimately, these advancements aim to improve the overall well-being of pediatric patients by leveraging digital innovations in healthcare.

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