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To the Editor

Pediatric healthcare poses distinctive challenges due to the vulnerability and specific medical requirements of children [1]. Errors in nursing within such contexts can result in grave consequences, underscoring the critical importance of preventing such occurrences [2]. On the other hand, machine learning offers promising avenues for addressing these challenges by automating decision-making processes, improving diagnostic precision, and issuing real-time alerts to avert potential errors [3]. The objective of this paper is to furnish an exhaustive examination of the application of machine learning in ameliorating nursing errors in pediatric care, elucidating the technologies utilized, their practical applications, and the attained outcomes thus far.

The utilization of machine learning in pediatric nursing to forestall errors is becoming increasingly prevalent through various applications. In this regard, one notable application involves the creation of predictive models that sift through extensive health data to identify potential risks and complications before they escalate [4]. For instance, machine learning algorithms are deployed to monitor vital signs and forecast severe conditions such as sepsis or respiratory failure, which pose heightened risks in neonatal intensive care units [5]. These algorithms can forewarn nurses and physicians about the onset of such condition's hours prior to the manifestation of traditional symptoms, enabling timely intervention.

Another significant application lies in medication management, where machine learning aids in computing precise dosages tailored to the unique requirements of pediatric patients, thereby

significantly diminishing the likelihood of dosing errors [6]. Furthermore, machine learning-based systems are being integrated into electronic health records to highlight discrepancies or oversights in patient data, such as allergies or prior adverse reactions to medications, thereby assisting nurses in upholding comprehensive and precise care records [7].

Despite the benefits, the integration of machine learning in pediatric nursing encounters several challenges. Foremost among these are concerns regarding data privacy, as the management of sensitive health information pertaining to children necessitates strict adherence to legal standards such as "Health Insurance Portability and Accountability Act" in the United States [8]. Additionally, the integration of sophisticated machine learning systems with prevailing healthcare information technology infrastructure poses technical and financial hurdles [9]. There is also the challenge of overcoming resistance from healthcare practitioners who may harbor skepticism towards substituting conventional care methodologies with algorithm-based tools. Moreover, the accuracy of machine learning models is contingent upon the quality and quantity of available data, which in pediatric care may be restricted due to ethical considerations surrounding clinical trials involving children, thereby impeding the development and training of robust machine learning systems [10].

In this context, in light of these challenges, to surmount current impediments and augment the effectiveness of machine learning applications in pediatric nursing, future research endeavors should concentrate on devising adaptable and scalable machine learning solutions that seamlessly integrate with diverse

hospital systems. It is imperative to foster collaboration among computer scientists, healthcare providers, and policymakers to ensure that these tools address practical requirements while adhering to ethical and legal standards. Subsequent studies should strive to expand the datasets available for training machine learning models while upholding rigorous standards of privacy and consent.

In sum, machine learning holds the potential to transform pediatric nursing by averting errors and refining care delivery. As technological advancements unfold, the adoption of machine learning tools in pediatric care settings can yield significant enhancements in safety and patient outcomes, ultimately reducing the incidence of nursing errors.

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Authors' contributions

Substantial contributions to the conception or design of the work; or the acquisition, analysis, or interpretation of data for the work: AS, YS; Drafting the work or revising it critically for important intellectual content: AS, YS; Final approval of the version to be published: AS, YS; Agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved: AS, YS.

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Availability of data and materials

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Using artificial intelligent chatbots

None.

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