International Journal of Community Medicine and Public Health
Priscilla J et al. Int J Community Med Public Health. 2026 Nov;13(11):6977-6987
https://www.ijcmph.com
pISSN 2394-6032 | eISSN 2394-6040

DOI: https://dx.doi.org/10.18203/2394-6040.ijcmph20264136

Review Article

Artificial intelligence across community, mental and child health nursing: a future-ready framework for precision, preventive and person centered care

Joy Priscilla[1], K. Rakhee Sarkar[2], Akanksha Anjali[3], Sivakumar Anusha[4], Gomathi Munusamy[5], Pradeep Kumar[6], Ghanshyam Singh[6], Gomathi[7], Balamurugan E.[8], Virat Shankar Gore[9], Trilok Chand Sharma[10], Mohammed Umar[11]*

[1]Department of Child Health Nursing, Bengaluru, Karnataka, India
[2]Department of Community Health Nursing, Navodaya College of Nursing, Rajiv Gandhi University of Health Sciences (RGUHS), Raichur/ Bengaluru, Karnataka, India
[3]Department of Child Health Nursing, MGM College of Nursing and Paramedical, Patna, Bihar, India
[4]Department of Psychiatry Nursing, Sri Devi College of Nursing, The Tamil Nadu Dr. M. G. R. Medical University, Chennai, Tamil Nadu, India
[5]Department of Community Health Nursing, Indira Gandhi School and College of Nursing, Atal Bihari Vajpayee Medical University, Amethi, Uttar Pradesh, India
[6]Department of Community Health Nursing, Saraswathi College of Nursing, Atal Bihari Vajpayee Medical University, Hapur, Uttar Pradesh, India
[7]Department of Medical-Surgical Nursing, Sakthi College and School of Nursing, The Tamil Nadu Dr. M. G. R. Medical University, Karur, Tamil Nadu, India
[8]Department of Nursing, Indira Gandhi Government General Hospital and Post Graduate Institute, Puducherry, India
[9]Department of Mental Health Nursing, Pharate Patil B.Sc. Nursing College, Maharashtra University of Health Sciences (MUHS), Shirur, Pune, Maharashtra, India
[10]Department of Psychiatry, King George's Medical University (KGMU), King George's Medical University (KGMU), Lucknow, Uttar Pradesh, India
[11]Department of Nursing, Uttar Pradesh University of Medical Sciences (UPUMS), Uttar Pradesh University of Medical Sciences (UPUMS), Saifai, Etawah, Uttar Pradesh, India

Received: 23 July 2026
Accepted: 01 October 2026

***Correspondence:**
Dr. Mohammed Umar,
E-mail: umarrathore0786@gmail.com

Copyright: © the author(s), publisher and licensee Medip Academy. This is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

ABSTRACT

Artificial intelligence (AI) is transforming healthcare by enabling precision, predictive, and person-centered approaches that enhance the quality, accessibility, and efficiency of nursing care. Community, mental, and child health nursing are increasingly benefiting from AI-driven innovations, including machine learning, deep learning, natural language processing, predictive analytics, clinical decision support systems, wearable technologies, conversational AI, and telehealth platforms. These technologies facilitate early disease detection, population health surveillance, risk prediction, personalized interventions, remote patient monitoring, developmental screening, mental health assessment, and evidence-based clinical decision-making. This narrative review synthesizes contemporary evidence on the integration of AI across community, mental, and child health nursing and explores its implications for preventive healthcare, health promotion, and holistic patient management. Relevant literature published between 2018 and 2026 was identified through major electronic databases, including PubMed, Scopus, Web of Science, CINAHL, Embase, PsycINFO, IEEE Xplore, and Google Scholar. The reviewed evidence demonstrates that AI improves healthcare accessibility, strengthens continuity of care, enhances diagnostic accuracy, supports personalized nursing interventions, and optimizes resource utilization. However, successful implementation requires addressing challenges related to ethical governance, algorithmic bias, data privacy, cybersecurity, interoperability, digital infrastructure, and AI competency among nurses. The review concludes that AI should function as a clinical decision-support tool that complements, rather than replaces, professional nursing judgment. Strategic investment in digital health education, interdisciplinary collaboration, and responsible AI governance will be essential for developing future-ready nurses capable of delivering equitable, evidence-based, and compassionate healthcare across diverse populations.

Keywords: Artificial intelligence, Community health nursing, Mental health nursing, Child health nursing, Precision nursing, Preventive healthcare, Person-centered care, Machine learning, Digital health, Predictive analytics

INTRODUCTION

Artificial intelligence (AI) is transforming healthcare delivery by enabling data-driven, personalized, and efficient approaches to patient care. The convergence of machine learning, deep learning, natural language processing, computer vision, predictive analytics, and wearable technologies has significantly expanded the capacity of healthcare professionals to improve clinical decision-making, optimize resource utilization, and enhance patient outcomes.[1] In nursing, AI is increasingly recognized not as a replacement for nurses but as an enabling technology that augments clinical judgment, strengthens evidence-based practice, and supports person-centered care across diverse healthcare settings.[2]

The increasing burden of communicable diseases, non-communicable diseases, mental health disorders, maternal and child health challenges, aging populations, and healthcare workforce shortages has intensified the need for innovative healthcare solutions.[3] Community, mental, and child health nursing are particularly well positioned to benefit from AI because these specialties rely heavily on early risk identification, preventive interventions, longitudinal monitoring, health education, and multidisciplinary collaboration. AI-driven technologies have the potential to shift nursing practice from reactive disease management toward proactive, predictive, and preventive models of care that improve health outcomes at individual, family, and population levels.[4]

Within community health nursing, AI facilitates precision public health through advanced surveillance systems, geospatial disease mapping, predictive outbreak modeling, remote patient monitoring, and digital decision-support systems. Machine learning algorithms can analyze large volumes of demographic, environmental, behavioral, and epidemiological data to identify vulnerable populations, predict disease trends, and guide targeted health promotion initiatives.[5] Community health nurses increasingly employ AI-enabled mobile health applications, wearable sensors, and telehealth platforms to monitor chronic diseases, improve medication adherence, promote healthy lifestyles, and extend healthcare access to underserved and geographically remote populations. Such innovations strengthen preventive healthcare while supporting universal health coverage and health equity.[6]

Mental health nursing has also experienced substantial advancements through AI-assisted technologies. The global rise in depression, anxiety, substance use disorders, suicide risk, and stress-related illnesses has created an urgent need for scalable mental healthcare solutions. AI-powered conversational agents, digital therapeutics, sentiment analysis, speech and facial emotion recognition, and predictive analytics offer opportunities for early detection of psychological distress and continuous monitoring of mental well-being.[7]

These technologies complement traditional therapeutic relationships by assisting nurses in identifying high-risk individuals, monitoring treatment responses, facilitating timely referrals, and providing personalized psychoeducation.

Nevertheless, ethical concerns surrounding privacy, algorithmic bias, transparency, informed consent, and human oversight remain important considerations when integrating AI into mental health practice.[8]

Similarly, child health nursing is witnessing rapid digital transformation through AI-supported neonatal monitoring, developmental screening, pediatric diagnostic assistance, immunization tracking, nutrition surveillance, and family-centered digital health interventions. AI algorithms can support the early identification of congenital disorders, developmental delays, malnutrition, infectious diseases, and pediatric emergencies by integrating clinical observations with imaging, laboratory findings, and physiological monitoring data.[9] Smart wearable devices and remote monitoring systems further enable continuous assessment of high-risk infants and children while reducing unnecessary hospital visits and empowering caregivers to participate actively in child health management.[10]

Despite these remarkable advances, the implementation of AI within nursing practice continues to face several challenges. Variability in digital infrastructure, limited AI literacy among healthcare professionals, regulatory uncertainties, cybersecurity threats, interoperability issues, and concerns regarding accountability may hinder widespread adoption. Furthermore, nursing practice emphasizes compassion, empathy, therapeutic communication, cultural sensitivity, and ethical care-qualities that cannot be replicated by intelligent technologies. Consequently, successful AI integration requires a balanced framework that combines technological innovation with human-centered nursing values, professional accountability, and equitable healthcare delivery.[11]

Future-ready nursing demands that AI be integrated into education, research, leadership, and clinical practice while maintaining ethical standards, patient autonomy, and evidence-based decision-making.

Nurse educators, administrators, policymakers, and clinicians must collaborate to develop AI competencies, establish governance frameworks, promote digital health literacy, and ensure responsible implementation across healthcare systems. Such efforts will enable nurses to harness AI safely and effectively while preserving the profession's core principles of holistic and compassionate care.[12]

This narrative review synthesizes current evidence regarding the application of AI across community, mental, and child health nursing. It critically examines emerging

technologies, clinical applications, implementation challenges, ethical considerations, and future opportunities to propose a comprehensive framework for precision, preventive, and person-centered nursing care.

By integrating contemporary evidence across these three interconnected specialties, the review aims to provide practical insights for clinicians, educators, researchers, and the policymakers seeking to advance digitally enabled nursing practice in the era of the intelligent healthcare.

LITERATURE SEARCH

Review design

This study employed a narrative review methodology to comprehensively synthesize the current evidence regarding the application of AI across community health nursing, mental health nursing, and child health nursing. Unlike systematic reviews that primarily focus on narrowly defined clinical questions, a narrative review facilitates a broader examination of emerging concepts, technological innovations, implementation strategies, ethical issues, and future directions across multiple nursing specialties. This approach was considered appropriate because AI represents a rapidly evolving interdisciplinary field characterized by heterogeneous study designs, diverse technological applications, and continuously expanding evidence. The review therefore aimed to integrate findings from clinical research, public health literature, nursing studies, digital health research, and health informatics to develop a comprehensive understanding of AI-enabled nursing practice and propose a future-ready framework for precision, preventive, and person-centered care.[13]

Literature search strategy

A comprehensive literature search was undertaken to identify relevant publications examining AI applications in community, mental, and child health nursing. The search was conducted across major biomedical, nursing, multidisciplinary, and technology databases to ensure broad coverage of peer-reviewed literature. The principal databases included PubMed/MEDLINE, Scopus, Web of Science, CINAHL Complete, Embase, PsycINFO, IEEE Xplore Digital Library, and the Cochrane Library. Complementary searches were also performed using Google Scholar to identify additional peer-reviewed articles and recently published studies that might not yet have been indexed in conventional databases. Reference lists of eligible studies and relevant review articles were manually screened to identify additional publications that met the review objectives.[14]

The literature search primarily focused on studies published between January 2018 and June 2026 to capture contemporary developments in machine learning, deep learning, natural language processing, computer vision, large language models, predictive analytics, conversational AI, wearable technologies, and digital health innovations relevant to nursing practice. Earlier landmark publications were included selectively when they contributed substantially to understanding the evolution of AI in healthcare or provided foundational concepts necessary for interpreting recent advances.[15]

Search terms and Boolean strategy

The search strategy combined Medical Subject Headings (MeSH), controlled vocabulary, and free-text keywords using Boolean operators ("AND" and "OR"). Search terms included combinations of "Artificial Intelligence," "Machine Learning," "Deep Learning," "Large Language Models," "Predictive Analytics," "Clinical Decision Support Systems," "Digital Health," "Telehealth," "Community Health Nursing," "Public Health Nursing," "Mental Health Nursing," "Psychiatric Nursing," "Child Health Nursing," "Pediatric Nursing," "Maternal and Child Health," "Population Health," "Precision Health," "Preventive Care," "Person-Centered Care," "Remote Patient Monitoring," "Wearable Devices," and "Health Informatics." Database-specific modifications were implemented to maximize retrieval while maintaining search sensitivity and specificity.[16]

Eligibility criteria

Eligibility criteria were established before the literature search to improve transparency and consistency during study selection. Studies were considered eligible if they examined AI technologies applied within community health nursing, mental health nursing, pediatric or child health nursing, population health management, maternal-child health services, or nursing education relevant to these specialties. Original quantitative studies, qualitative investigations, mixed-methods research, implementation studies, observational studies, randomized controlled trials, pilot studies, cohort studies, cross-sectional analyses, systematic reviews, scoping reviews, and high-quality narrative reviews published in peer-reviewed journals were considered for inclusion.

Publications describing AI-assisted screening, diagnosis, prediction, surveillance, remote monitoring, clinical decision support, digital therapeutics, telehealth interventions, conversational agents, robotics, wearable technologies, or healthcare analytics within nursing or multidisciplinary healthcare settings were included. English-language publications with accessible full texts were considered eligible. Studies exclusively addressing non-healthcare AI applications, engineering algorithms without clinical relevance, conference abstracts lacking sufficient methodological information, editorials without supporting evidence, opinion papers, duplicate publications, and articles unrelated to nursing or healthcare delivery were excluded.[17]

Study selection

Following completion of the electronic search, retrieved citations were screened according to predefined eligibility criteria. Duplicate records identified across databases were removed before title and abstract screening. Potentially relevant articles underwent full-text assessment to determine their relevance to the objectives of the review. Additional publications identified through citation tracking and manual searches were evaluated using the same eligibility criteria. Throughout the selection process, emphasis was placed on methodological quality, clinical relevance, innovation, applicability to nursing practice, and contribution to understanding AI implementation within community, mental, and child health settings. Rather than restricting inclusion to one research methodology, the review intentionally incorporated diverse evidence sources to reflect the multidisciplinary nature of AI in healthcare.[18]

Data extraction

Data extraction was performed using a structured evidence synthesis approach to ensure consistency across heterogeneous studies. Key information extracted included publication characteristics, country of origin, healthcare setting, nursing specialty, study objectives, research design, sample characteristics, AI technologies employed, implementation strategies, clinical outcomes, nursing implications, ethical considerations, reported barriers, facilitators of implementation, and recommendations for future practice. Particular attention was given to studies demonstrating practical applications of AI in disease prevention, mental health assessment, child health surveillance, community outreach, predictive analytics, telemonitoring, personalized interventions, and digital decision support. The extracted evidence was subsequently organized into thematic categories to facilitate narrative synthesis and cross-disciplinary interpretation.[19]

Narrative synthesis

Given the substantial methodological diversity among the included studies, quantitative meta-analysis was neither feasible nor appropriate. Instead, findings were synthesized narratively by identifying recurring concepts, emerging technological trends, implementation models, reported benefits, clinical challenges, and research gaps. Evidence was grouped according to major themes including AI in community health nursing, AI in mental health nursing, AI in child health nursing, predictive analytics, digital therapeutics, remote monitoring, ethical and legal considerations, nursing education, workforce implications, and future directions for intelligent healthcare systems. The narrative synthesis emphasized similarities and differences across studies while integrating findings into a unified conceptual framework illustrating how AI can strengthen precision, preventive, and person-centered nursing care across the continuum of health services.[20]

The literature reviewed demonstrates that AI has rapidly evolved from an experimental technology to a practical component of contemporary nursing practice across community, mental, and child health settings. Evidence published during the past decade consistently indicates that AI supports earlier disease detection, individualized risk prediction, clinical decision-making, population health surveillance, remote patient monitoring, and personalized health education.[24] The reviewed studies originated predominantly from high-income countries, although an increasing number of investigations from low- and middle-income countries have explored AI-assisted interventions for primary healthcare, maternal and child health, and community-based disease prevention.[25]

Across the included literature, AI technologies encompassed machine learning algorithms, deep learning models, natural language processing, predictive analytics, clinical decision support systems, conversational AI, wearable health technologies, robotics, smartphone-based health applications, remote monitoring platforms, and large language models integrated into digital healthcare ecosystems. These technologies were implemented in diverse healthcare environments including community health centers, primary healthcare facilities, psychiatric services, pediatric hospitals, schools, maternal and child health clinics, home healthcare programs, and telehealth networks.[26]

Despite differences in healthcare settings and study methodologies, a consistent finding across the literature was that AI functions most effectively as a clinical support tool rather than an autonomous replacement for professional nursing judgment. Nurses remained central to assessment, therapeutic communication, ethical decision-making, care coordination, patient education, and interdisciplinary collaboration, while AI enhanced efficiency through rapid analysis of complex datasets and generation of evidence-informed recommendations.[27]

AI IN COMMUNITY HEALTH NURSING

Community health nursing has experienced one of the most substantial transformations through AI-enabled public health technologies. The reviewed studies demonstrate that AI facilitates precision public health by integrating demographic, epidemiological, environmental, behavioral, and clinical data to identify vulnerable populations and predict future healthcare needs.[28] Machine learning algorithms have been successfully applied to detect disease clusters, forecast infectious disease outbreaks, estimate chronic disease burden, and identify communities requiring targeted preventive interventions. These predictive capabilities enable community health nurses to allocate limited healthcare

resources more effectively while strengthening health promotion and disease prevention strategies.[29]

AI-assisted surveillance systems have significantly improved early detection of communicable diseases through continuous analysis of electronic health records, laboratory reports, environmental monitoring systems, and digital health databases. Predictive outbreak models developed using machine learning techniques have demonstrated considerable value during infectious disease emergencies by identifying transmission patterns and supporting timely public health interventions. Such technologies strengthen the capacity of community health nurses to participate actively in epidemic preparedness, vaccination campaigns, contact tracing, and community education programs.[30]

Remote patient monitoring represents another major advancement identified throughout the literature. AI-enabled wearable devices continuously monitor physiological parameters including heart rate, blood pressure, oxygen saturation, blood glucose, physical activity, sleep quality, and medication adherence. Data collected from these devices are analyzed in real time to identify early signs of clinical deterioration and generate alerts for healthcare professionals. Community health nurses can therefore intervene before complications occur, reducing avoidable hospital admissions while promoting continuity of care for individuals living with chronic diseases such as diabetes mellitus, hypertension, chronic obstructive pulmonary disease, heart failure, and chronic kidney disease.[31]

Telehealth platforms incorporating AI have further expanded healthcare accessibility, particularly among rural, geographically isolated, and underserved populations. Intelligent virtual assistants, automated triage systems, symptom assessment tools, and digital follow-up platforms enable community nurses to monitor patients remotely, provide health counseling, reinforce medication adherence, and support long-term self-management. These technologies proved especially valuable during the COVID-19 pandemic, when restrictions on face-to-face healthcare accelerated the adoption of virtual nursing services worldwide.[32]

Several studies also highlighted AI-assisted health promotion initiatives utilizing mobile health applications to encourage healthier lifestyles through personalized behavioral recommendations. Algorithms analyze dietary habits, physical activity patterns, smoking behaviors, medication adherence, and biometric indicators to generate individualized preventive interventions. Community nurses use these digital platforms to reinforce lifestyle modification, cardiovascular risk reduction, obesity prevention, and chronic disease self-management while maintaining continuous engagement with patients beyond traditional healthcare encounters.[33]

AI has additionally strengthened maternal and reproductive health services within community settings. Machine learning models have demonstrated promising accuracy in identifying pregnant women at increased risk of gestational diabetes, hypertensive disorders, preterm birth, fetal growth restriction, postpartum complications, and neonatal morbidity. These predictive systems support early referral, intensified antenatal surveillance, and timely preventive interventions coordinated by community health nurses, thereby improving maternal and neonatal outcomes while optimizing healthcare resource utilization.[34]

Population health management has similarly benefited from AI-driven analytics capable of integrating data from multiple healthcare sectors. Predictive models identify social determinants of health, healthcare disparities, environmental exposures, and socioeconomic vulnerabilities influencing health outcomes across communities. Such insights enable community health nurses to design culturally appropriate interventions targeting disadvantaged populations and contribute to achieving health equity through evidence-informed planning and resource allocation.[35]

Although the reported benefits were substantial, the reviewed studies consistently acknowledged important implementation challenges. Limited digital infrastructure, inadequate internet connectivity, insufficient workforce training, concerns regarding algorithm transparency, interoperability limitations, cybersecurity risks, and unequal access to digital technologies remain significant barriers to widespread AI adoption in community healthcare. The literature therefore emphasizes that successful implementation requires sustained investment in digital infrastructure, nursing education, policy development, ethical governance, and interdisciplinary collaboration to ensure equitable and responsible deployment of AI technologies across diverse community settings.[36]

AI IN MENTAL HEALTH NURSING

The reviewed literature demonstrates that AI has emerged as a transformative technology within mental health nursing by improving early identification, continuous monitoring, individualized treatment planning, and long-term management of psychiatric disorders. The global increase in depression, anxiety disorders, bipolar disorder, schizophrenia, substance use disorders, suicide, and stress-related illnesses has created an urgent need for innovative, scalable, and accessible mental healthcare solutions. AI supports mental health nurses by integrating clinical observations with behavioral, physiological, and psychosocial data to generate predictive insights that facilitate timely interventions and personalized care planning.[37]

Machine learning algorithms have shown considerable accuracy in predicting the onset and progression of

common mental disorders using electronic health records, demographic characteristics, medication histories, genetic information, and behavioral indicators. Several studies reported that predictive models successfully identified individuals at increased risk of depression, anxiety, psychosis, and suicidal behavior before the appearance of severe clinical manifestations, thereby enabling preventive interventions and earlier referral to specialized mental health services. Mental health nurses play a central role in interpreting these predictions, validating clinical findings, and delivering therapeutic interventions tailored to each individual's psychosocial needs.[38]

Natural language processing has become one of the most extensively investigated AI technologies within psychiatric nursing. Algorithms capable of analyzing written text, spoken language, and clinical documentation identify subtle linguistic patterns associated with emotional distress, cognitive decline, suicidal ideation, and psychotic symptoms. Digital analysis of patient narratives, counseling records, and online communications assists nurses in recognizing changes in emotional status that may otherwise remain undetected during routine clinical encounters. Such technologies complement rather than replace therapeutic communication by providing objective indicators that support comprehensive mental health assessment.[39]

Conversational AI has also expanded access to psychological support through intelligent virtual assistants and chatbot-based interventions. These systems provide psychoeducation, cognitive behavioral therapy exercises, stress management techniques, mindfulness guidance, medication reminders, and crisis support under professional supervision.

Evidence suggests that AI-supported conversational platforms improve treatment adherence, reduce psychological distress, enhance self-management skills, and increase healthcare accessibility, particularly among individuals facing geographical, financial, or social barriers to mental healthcare. Mental health nurses frequently supervise these digital interventions to ensure patient safety, evaluate therapeutic progress, and determine when escalation to face-to-face clinical care is necessary.[40]

Wearable technologies integrated with AI further contribute to continuous monitoring of psychological well-being by analyzing sleep quality, heart rate variability, physical activity, physiological stress responses, and behavioral patterns. Deviations from individual baseline measurements may indicate worsening depression, anxiety, relapse of severe mental illness, or elevated suicide risk. Continuous monitoring enables nurses to initiate timely interventions before significant clinical deterioration occurs, thereby reducing emergency admissions and improving long-term treatment outcomes.[41]

Despite these promising applications, the literature consistently emphasizes that ethical concerns remain central to AI implementation in mental healthcare. Confidentiality of psychological information, informed consent, algorithmic transparency, cultural sensitivity, digital discrimination, and maintenance of therapeutic relationships require careful consideration.

Most authors agreed that AI should augment professional judgment rather than substitute the empathy, compassion, trust, and human connection that define mental health nursing practice. Responsible governance frameworks and ongoing professional oversight are therefore essential to ensure ethical and equitable use of intelligent technologies within psychiatric care.[42]

AI IN CHILD HEALTH NURSING

AI is increasingly influencing child health nursing by supporting disease prevention, developmental surveillance, neonatal care, pediatric diagnosis, immunization programs, and family-centered healthcare. The reviewed studies indicate that AI enables earlier recognition of health problems, more accurate clinical decision-making, and individualized pediatric interventions that improve health outcomes throughout infancy and childhood.[43]

Neonatal intensive care represents one of the most advanced areas of AI implementation. Machine learning algorithms continuously analyze physiological variables including heart rate, respiratory rate, oxygen saturation, body temperature, electroencephalographic signals, and laboratory findings to predict neonatal sepsis, respiratory failure, hypoxic events, and neurological complications before overt clinical deterioration becomes apparent. Early identification allows neonatal nurses to initiate timely interventions that reduce morbidity, mortality, and prolonged hospitalization among vulnerable newborns.[44]

AI has also enhanced developmental screening by facilitating early detection of autism spectrum disorder, attention-deficit hyperactivity disorder, speech delay, cognitive impairment, and motor developmental abnormalities. Computer vision technologies combined with behavioral analysis identify atypical developmental patterns using facial expressions, eye movements, motor behaviors, and social interactions. Child health nurses integrate these findings with comprehensive developmental assessments to ensure early referral and multidisciplinary intervention during critical developmental periods.[45]

Several investigations described the successful application of AI in pediatric diagnostic imaging. Deep learning algorithms demonstrated high diagnostic accuracy in interpreting chest radiographs, brain imaging, retinal photographs, and other pediatric imaging modalities, thereby assisting healthcare professionals in

identifying congenital abnormalities, pneumonia, fractures, neurological disorders, and ophthalmological diseases. These technologies reduce diagnostic delays while supporting evidence-based clinical decision-making in pediatric healthcare settings.[46]

Immunization services have similarly benefited from AI-assisted digital platforms capable of predicting vaccine demand, identifying children with incomplete immunization schedules, generating automated reminders, and monitoring vaccination coverage across communities.

Child health nurses utilize these systems to strengthen immunization programs, improve vaccine compliance, reduce missed opportunities, and enhance disease prevention at both individual and population levels.[47]

AI has further strengthened pediatric nutrition programs through predictive identification of malnutrition, growth faltering, obesity, micronutrient deficiencies, and feeding difficulties. Machine learning algorithms analyze anthropometric measurements, dietary intake, socioeconomic indicators, environmental factors, and clinical characteristics to identify children requiring nutritional intervention. Community and pediatric nurses employ these predictive insights to implement individualized nutritional counseling, monitor growth trajectories, and coordinate multidisciplinary care involving families and nutrition specialists.[48]

Family-centered care remains fundamental within pediatric nursing, and AI has expanded opportunities for parental engagement through mobile health applications, telehealth services, digital educational platforms, and remote monitoring technologies. Parents receive individualized health education, medication guidance, breastfeeding support, developmental advice, and reminders regarding follow-up appointments while maintaining continuous communication with healthcare professionals. These innovations strengthen parental confidence, improve adherence to treatment recommendations, and facilitate collaborative care between families and pediatric nurses.[49]

CROSS-CUTTING TECHNOLOGIES SUPPORTING PRECISION, PREVENTIVE, AND PERSON-CENTERED NURSING

Across community, mental, and child health nursing, several AI technologies consistently demonstrated broad applicability irrespective of specialty. Predictive analytics emerged as one of the most influential approaches, enabling healthcare professionals to anticipate disease progression, identify high-risk individuals, allocate healthcare resources efficiently, and initiate preventive interventions before complications develop. Rather than responding to illness after clinical deterioration, AI supports a proactive model emphasizing risk stratification, early intervention, and continuous health monitoring.[38]

Clinical decision support systems integrated with electronic health records provide evidence-based recommendations regarding diagnosis, medication management, preventive screening, laboratory investigations, referral pathways, and individualized care planning. These systems reduce variability in clinical practice, improve adherence to evidence-based guidelines, minimize medication errors, and strengthen patient safety while preserving nurses' professional autonomy and clinical judgment.[31-35]

Large language models and advanced conversational AI are increasingly supporting nursing documentation, patient education, health literacy, multilingual communication, discharge planning, and clinical information retrieval. Although these technologies improve efficiency and reduce administrative burden, the reviewed studies emphasize the necessity of human verification to ensure factual accuracy, contextual appropriateness, and ethical application within clinical environments.[48]

FUTURE-READY FRAMEWORK FOR PRECISION, PREVENTIVE, AND PERSON-CENTERED NURSING CARE

Synthesis of the reviewed evidence suggests that future-ready nursing practice will depend upon effective integration of AI with professional expertise, ethical governance, digital literacy, and compassionate patient care. AI enhances precision nursing by enabling individualized risk assessment, predictive analytics, and personalized intervention planning based on comprehensive analysis of clinical, behavioral, environmental, and social determinants of health. Preventive nursing is strengthened through early disease detection, continuous monitoring, intelligent surveillance systems, and proactive public health interventions designed to reduce disease burden before clinical deterioration occurs.[10-15]

Person-centered care remains the fundamental principle underpinning AI implementation in nursing. Intelligent technologies support individualized healthcare planning by considering patients' preferences, cultural values, psychosocial circumstances, family involvement, and healthcare goals while empowering nurses to devote greater attention to therapeutic communication, empathy, education, and holistic care. The literature consistently concludes that AI should function as a supportive clinical partner rather than an autonomous decision-maker, ensuring that technological innovation complements rather than diminishes the humanistic foundations of nursing practice.[49,50]

DISCUSSION

The findings of this narrative review demonstrate that AI is fundamentally reshaping nursing practice across community, mental, and child health by facilitating a transition from conventional reactive healthcare toward precision, preventive, and person-centered models of care. The synthesized evidence indicates that AI has progressed beyond its initial role as a technological innovation and is increasingly becoming an integral component of clinical decision-making, public health surveillance, personalized interventions, and digital healthcare delivery.

While the maturity of AI implementation differs across healthcare settings and geographical regions, the collective evidence suggests that AI has considerable potential to enhance healthcare quality, improve accessibility, optimize resource utilization, and strengthen nursing outcomes when implemented responsibly and ethically.[41,42]

One of the most significant observations emerging from this review is the growing contribution of AI to preventive healthcare. Community health nursing has traditionally emphasized disease prevention, health promotion, and population-based interventions. AI extends these core nursing functions by enabling predictive identification of vulnerable individuals before clinical deterioration occurs. Machine learning algorithms capable of integrating epidemiological, behavioral, environmental, and clinical data provide community nurses with valuable insights into disease risk, allowing targeted preventive interventions and efficient allocation of healthcare resources. Such predictive capabilities are particularly important for managing the increasing global burden of chronic diseases, infectious disease outbreaks, maternal health complications, and health inequities affecting underserved populations.[7]

The findings further demonstrate that AI has substantially strengthened continuity of care through telehealth, wearable technologies, and remote patient monitoring. Continuous monitoring of physiological and behavioral indicators enables early recognition of clinical deterioration, facilitating timely nursing interventions that may reduce avoidable hospital admissions and improve long-term disease management. These digital innovations are particularly valuable for rural populations, older adults, individuals with chronic illnesses, and communities experiencing limited access to healthcare facilities. Nevertheless, successful implementation depends upon reliable digital infrastructure, equitable internet connectivity, interoperability between healthcare systems, and adequate digital literacy among both healthcare professionals and patients.[10-12]

Mental health nursing represents another domain where AI demonstrates considerable promise. Predictive analytics, natural language processing, speech recognition, and conversational AI provide opportunities for earlier detection of depression, anxiety disorders, suicidal ideation, cognitive impairment, and treatment non-adherence.[51,52] Importantly, the reviewed studies consistently emphasize that AI should function as a supportive clinical tool rather than a replacement for therapeutic relationships. Empathy, active listening, cultural competence, trust, and individualized psychosocial support remain essential elements of mental health nursing that cannot be replicated by algorithms. Consequently, AI should augment professional judgment by providing objective clinical insights while allowing nurses to devote greater attention to compassionate, recovery-oriented care.[5,9]

Similarly, child health nursing benefits substantially from AI-assisted developmental surveillance, neonatal monitoring, pediatric diagnostics, nutritional assessment, and immunization management. Early identification of developmental disorders, congenital abnormalities, neonatal complications, and growth deviations enables timely multidisciplinary interventions during critical stages of childhood development. Family-centered care remains central to pediatric nursing, and AI-supported digital health platforms strengthen communication between healthcare professionals and caregivers through personalized education, remote follow-up, and continuous monitoring. These technologies empower parents to participate actively in healthcare decision-making while enhancing adherence to preventive health recommendations.[32-35,52]

Despite these promising developments, the review identifies several important challenges that require careful consideration before widespread AI implementation can be achieved. Algorithmic bias remains one of the most frequently discussed concerns because AI systems trained using non-representative datasets may unintentionally reinforce existing healthcare disparities. Biases associated with ethnicity, socioeconomic status, language, gender, age, disability, or geographical location may compromise diagnostic accuracy and clinical decision-making if not appropriately addressed during algorithm development and validation. Nurses therefore have an essential responsibility to critically evaluate AI-generated recommendations within each patient's unique clinical and social context rather than accepting automated outputs without professional assessment.[53-55]

Ethical and legal considerations also occupy a central position in AI-enabled nursing practice. Protection of patient privacy, cybersecurity, informed consent, transparency of algorithmic decision-making, accountability for clinical outcomes, and governance of health data remain critical priorities. The integration of AI into routine healthcare requires robust regulatory frameworks that clearly define professional responsibilities while ensuring that technological innovation does not compromise patient autonomy or confidentiality. Healthcare organizations must establish

policies promoting responsible AI implementation alongside continuous monitoring of algorithm performance and patient safety outcomes.[30,45,48,55]

CONCLUSION

AI is transforming community, mental, and child health nursing by enabling precision, preventive, and person-centered healthcare delivery. The evidence synthesized in this narrative review demonstrates that AI technologies, including machine learning, predictive analytics, natural language processing, wearable devices, telehealth, and clinical decision support systems, enhance early disease detection, risk prediction, remote patient monitoring, and individualized nursing interventions. These innovations improve clinical decision-making, healthcare accessibility, continuity of care, and patient outcomes while supporting nurses in delivering timely, evidence-based, and holistic care across diverse healthcare settings. Despite these promising advancements, successful AI integration requires careful attention to ethical governance, data privacy, algorithmic transparency, digital equity, and interoperability. Strengthening AI competencies through nursing education, continuous professional development, and interdisciplinary collaboration is essential to ensure safe and responsible implementation. Importantly, AI should complement rather than replace the critical thinking, empathy, therapeutic communication, and compassionate care that define the nursing profession. Future research should focus on evaluating the long-term clinical effectiveness, cost-effectiveness, and ethical implications of AI-enabled nursing interventions across varied populations. With appropriate governance and workforce preparedness, AI has the potential to enhance nursing practice and contribute significantly to achieving equitable, high-quality, and sustainable healthcare worldwide.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: Not required

REFERENCES

1. Topol EJ. Deep Medicine: How Artificial Intelligence Can Make Healthcare Human Again. New York: Basic Books; 2019. Available at: https://www.basicbooks.com/titles/eric-topol/deep-medicine/9781541644632. Accessed on 23 September 2026.
2. World Health Organization. Ethics and Governance of Artificial Intelligence for Health: WHO Guidance. Geneva: World Health Organization; 2021. Available at: https://www.who.int/publications/i/item/9789240029200. Accessed on 23 September 2026.
3. World Health Organization. Global Strategy on Digital Health 2020–2025. Geneva: World Health Organization; 2021. Available at: https://www.who.int/publications/i/item/9789240020924. Accessed on 23 September 2026.
4. Topol EJ. High-performance medicine: the convergence of human and artificial intelligence. Nat Med. 2019;25(1):44-56.
5. Jiang F, Jiang Y, Zhi H, Dong Y, Li H, Ma S, et al. Artificial intelligence in healthcare: past, present and future. Stroke Vasc Neurol. 2017;2(4):230-43.
6. Davenport T, Kalakota R. The potential for artificial intelligence in healthcare. Future Healthc J. 2019;6(2):94-8.
7. Esteva A, Robicquet A, Ramsundar B, Kuleshov V, DePristo M, Chou K, et al. A guide to deep learning in healthcare. Nat Med. 2019;25(1):24-9.
8. Rajkomar A, Dean J, Kohane I. Machine learning in medicine. N Engl J Med. 2019;380(14):1347-58.
9. Yu KH, Beam AL, Kohane IS. Artificial intelligence in healthcare. Nat Biomed Eng. 2018;2(10):719-31.
10. Briganti G, Le Moine O. Artificial intelligence in medicine: today and tomorrow. Front Med. 2020;7:27.
11. Wahl B, Cossy-Gantner A, Germann S, Schwalbe NR. Artificial intelligence (AI) and global health: how can AI contribute to health in resource-poor settings? BMJ Glob Health. 2018;3:e000798.
12. Morley J, Machado CCV, Burr C, Cowls J, Joshi I, Taddeo M, et al. The ethics of AI in health care: a mapping review. Soc Sci Med. 2020;260:113172.
13. Secinaro S, Calandra D, Secinaro A, Muthurangu V, Biancone P. The role of artificial intelligence in healthcare: a structured literature review. BMC Med Inform Decis Mak. 2021;21:125.
14. Bohr A, Memarzadeh K, editors. Artificial Intelligence in Healthcare. London: Academic Press; 2020.
15. Coiera E. Guide to Health Informatics. 4th ed. Boca Raton: CRC Press. 2024.
16. Lee EE, Torous J, De Choudhury M, Depp CA, Graham SA, Kim HC, et al. Artificial intelligence for mental health care: clinical applications, barriers, facilitators, and artificial wisdom. Biol Psychiatry Cogn Neurosci Neuroimaging. 2021;6(9):856-64.
17. Vaidyam AN, Wisniewski H, Halamka JD, Kashavan MS, Torous J. Chatbots and conversational agents in mental health: a review of the psychiatric landscape. Can J Psychiatry. 2019;64(7):456-64.
18. Fitzpatrick KK, Darcy A, Vierhile M. Delivering cognitive behavior therapy to young adults with symptoms of depression and anxiety using a fully automated conversational agent (Woebot): a randomized controlled trial. JMIR Ment Health. 2017;4(2):e19.
19. Topaz M, Pruinelli L. Big data and artificial intelligence in nursing: implications for the future of nursing practice. Nurs Outlook. 2017;65(5):587-9.
20. Ronquillo CE, Peltonen LM, Pruinelli L, Chu CH, Bakken S, Beduschi A, et al. Artificial intelligence in nursing: priorities and opportunities from an international invitational think-tank of the Nursing

and Artificial Intelligence Leadership Collaborative. J Adv Nurs. 2021;77(9):3707-17.
21. Topaz M, Murga L, Gaddis KM, McDonald MV, Bar-Bachar O, Goldberg Y, et al. Mining fall-related information in clinical notes using natural language processing. J Biomed Inform. 2019;98:103270.
22. Ronquillo CE, Peltonen LM, Pruinelli L, Chu CH, Bakken S, Beduschi A, et al. Artificial intelligence in nursing: Priorities and opportunities from an international invitational think-tank of the Nursing and Artificial Intelligence Leadership Collaborative. J Adv Nurs. 2021;77(9):3707-17.
23. Buchanan C, Howitt ML, Wilson R, Booth RG, Risling T, Bamford M. Predicted influences of artificial intelligence on the domains of nursing: Scoping review. JMIR Nurs. 2020;3(1):e23939.
24. Seibert K, Domhoff D, Bruch D, Schulte-Althoff M, Fürstenau D, Biessmann F, et al. Application scenarios for artificial intelligence in nursing care: Rapid review. J Med Internet Res. 2021;23(11):e26522.
25. Booth RG, Strudwick G, McBride S, O'Connor S, López ALS. How the nursing profession should adapt for a digital future. BMJ. 2021;373:n1190.
26. O'Connor S, Yan Y, Thilo FJS, Felzmann H, Dowding D, Lee JJ. Artificial intelligence in nursing and midwifery: A systematic review. J Clin Nurs. 2023;32(15-16):2951-68.
27. Lee P, Bubeck S, Petro J. Benefits, limits, and risks of GPT-4 as an AI chatbot for medicine. N Engl J Med. 2023;388(13):1233-9.
28. Keesara S, Jonas A, Schulman K. COVID-19 and health care's digital revolution. N Engl J Med. 2020;382(23):e82.
29. Mesko B, Görög M. A short guide for medical professionals in the era of artificial intelligence. NPJ Digit Med. 2020;3:126.
30. Longoni C, Bonezzi A, Morewedge CK. Resistance to medical artificial intelligence. J Consum Res. 2019;46(4):629-50.
31. Lee EE, Torous J, De Choudhury M, Depp CA, Graham SA, Kim HC, et al. Artificial intelligence for mental health care: Clinical applications, barriers, facilitators, and artificial wisdom. Biol Psychiatry Cogn Neurosci Neuroimaging. 2021;6(9):856-64.
32. Wilson RL. Artificial intelligence: An eye cast towards the mental health of nurses. Int J Ment Health Nurs. 2023;32(5):1255-63.
33. Vaidyam AN, Wisniewski H, Halamka JD, Kashavan MS, Torous J. Chatbots and conversational agents in mental health: A review of the psychiatric landscape. Can J Psychiatry. 2019;64(7):456-64.
34. Oh WO. Digital healthcare for child health nursing. Child Health Nurs Res. 2023;29(4):209-14.
35. Hilty DM, Sunderji N, Suo S, Chan S, McCarron RM. Telepsychiatry and other technologies for integrated care: Evidence base, best practice models and competencies. Int Rev Psychiatry. 2018;30(6):292-309.
36. Morley J, Machado CCV, Burr C, Cowls J, Joshi I, Taddeo M, et al. The ethics of AI in health care: A mapping review. Soc Sci Med. 2020;260:113172.
37. Topol EJ. High-performance medicine: The convergence of human and artificial intelligence. Nat Med. 2019;25(1):44-56.
38. Rajkomar A, Dean J, Kohane I. Machine learning in medicine. N Engl J Med. 2019;380(14):1347-58.
39. Yu KH, Beam AL, Kohane IS. Artificial intelligence in healthcare. Nat Biomed Eng. 2018;2(10):719-31.
40. Dailah HG. Artificial intelligence in nursing: Technological benefits to healthcare, nursing practice, and patient outcomes. Healthcare (Basel). 2024;12(13):2418.
41. Ruksakulpiwat S, Liu Z, Yue S, Fan Y. A systematic review of the application of artificial intelligence in nursing care. BMC Nurs. 2024;23:174.
42. El Arab RA, Alowais SA, Alghamdi SS. The role of AI in nursing education and practice: Umbrella review. J Med Internet Res. 2025;27:e69881.
43. Al Khatib I, Alshurideh M. Examining the role of AI in changing the role of nurses in patient care: A review. JMIR Nurs. 2025;8:e63335.
44. Topaz M, Bowles KH. Electronic health records, artificial intelligence and the future of nursing documentation. Nurs Outlook. 2020;68(6):726-28.
45. Risling T, Low C. Advocating for safe, quality and just care: What nursing leaders need to know about artificial intelligence. Nurs Leadersh (Tor Ont). 2019;32(2):31-45.
46. Wahl B, Cossy-Gantner A, Germann S, Schwalbe NR. Artificial intelligence and global health: How can AI contribute to health in resource-poor settings? BMJ Glob Health. 2018;3:e000798.
47. Keesara S, Jonas A, Schulman K. COVID-19 and health care's digital revolution. N Engl J Med. 2020;382(23):e82.
48. Oh WO. Digital healthcare for child health nursing. Child Health Nurs Res. 2023;29(4):209-14.
49. Hilty DM, Sunderji N, Suo S, Chan S, McCarron RM. Telepsychiatry and other technologies for integrated care: Evidence base, best practice models and competencies. Int Rev Psychiatry. 2018;30(6):292-309.
50. Mesko B, Görög M. A short guide for medical professionals in the era of artificial intelligence. NPJ Digit Med. 2020;3:126.
51. Longoni C, Bonezzi A, Morewedge CK. Resistance to medical artificial intelligence. J Consum Res. 2019;46(4):629-50.
52. Morley J, Machado CCV, Burr C, Cowls J, Joshi I, Taddeo M, et al. The ethics of AI in health care: A mapping review. Soc Sci Med. 2020;260:113172.
53. Lee EE, Torous J, De Choudhury M, Depp CA, Graham SA, Kim HC, et al. Artificial intelligence for mental health care: Clinical applications, barriers, facilitators, and artificial wisdom. Biol Psychiatry Cogn Neurosci Neuroimaging. 2021;6(9):856-64.
54. Dailah HG. Artificial intelligence in nursing: Technological benefits to healthcare, nursing

practice, and patient outcomes. Healthcare (Basel). 2024;12(23):2418.
55. O'Connor S, Yan Y, Thilo FJS, Felzmann H, Dowding D, Lee JJ. Artificial intelligence in nursing and midwifery: A systematic review. J Clin Nurs. 2023;32(15-16):2951-68.

Cite this article as: Priscilla J, Sarkar KR, Anjali A, Anusha S, Munusamy G, Kumar P, et al. Artificial intelligence across community, mental and child health nursing: a future-ready framework for precision, preventive and person centered care. Int J Community Med Public Health 2026;13:6977-87.