

Using Artificial Intelligence to Create Tailored Healthcare Packages for Mental Health

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Abstract

The incorporation of artificial intelligence (AI) in mental health nursing implies a paradigm shift in the attitude toward patient care. Machine learning (including natural language processing) offers the opportunity to use it to work on complex patient data, reveal patterns and recommend individual interventions. This will enable development of mental health nursing care plans that are custom-made to the needs of individual patients making decision-making at the clinical level more efficient and more accurate. By assisting nurses in the process of evaluating patient conditions, and foreseeing the risks of complications, AI can supplement human intelligence and shed off administrative load. Nonetheless, ethical concerns, data confidentiality, and the human control requirement should not be disregarded to make implementation safe and efficient. This review discusses opportunities, challenges, and practical implications of the use of AI-driven care plan generation in the mental health nursing issues, putting an emphasis on improved patient outcomes and enhanced nursing practice.

Keywords: Artificial intelligence, Mental health nursing, Nursing care plans, Machine learning, Personalized patient care, Clinical decision support, Healthcare technology, Ethical considerations.

1.Introduction

The introduction of artificial intelligence in the healthcare sector is one of the most important technological transformations of our lifetime, radically altering past notions on how to best treat patients and make clinical decisions. As far as the specific area of mental health nursing is concerned, technological revolution poses not only amazing opportunities but also a range of complex ethical questions that cannot be overlooked. New applications of automated AI involve automation of healthcare documentation, assessment and care planning possibilities, made possible by the creation of state-of-the-art AI systems, such as the language models used in AI. There are fundamental issues relating to the use of such technologies in the mental health field, however, to the nature of healing relationships, the need of human empathy in the healing process, and the dangers of depersonalizing treatment of some of the most vulnerable members of society(1).

Mental health nursing has been characterised since time immemorial by its focus on therapeutic relations, the importance given to human contact, and its individual care principle which considers the distinctive psychological, social and cultural situation of each individual person. The fundamental principles that guide the profession are based on the fact that, mental health requires human empathy, capacity to create therapeutic alliances, and the ability to traverse rugged emotional terrains in a manner that is empathetic and wise. These are key facets of mental health care that can be viewed as peculiarly human traits, which cannot be imitated or substituted by artificial intelligence functionalities no matter how advanced they are.

The recent and fast development of AI technologies places us in a scenario where these tools are adopted before our ability to comprehend the impact they have on patient safety and the quality of care. The technological lag poses a special challenge to mental care where the cost of ineffective one can be catastrophic, even resulting in failed treatment or even in heightened suicidal thinking in some cases, or even a therapeutic breakdown that can be years to restore. Compared to other areas of healthcare orientation which AI applications are likely to be tailored to the domain of diagnosing and treating the patient with utmost precision and technological effectiveness, mental health nursing is a complex interpersonal operation involving human behavior, cultural sensitivity and discernment to address an emotional emergency.

The democratization of AI tools has enabled them to be put in the hands of unsufficiently qualified and trained healthcare professionals without sufficient control and supervision, and it may happen that, as a result of such practices, patient safety is threatened by the overly enthusiastic adoption of automated solutions. Such ease of use, though helpful in other contexts, poses the question of how to ensure quality control of AI-generated content in

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clinical practice and how AI tools may have the effect of further propagating preexisting biases or stereotypes that have already influenced the delivery of mental health care.



FIGURE 1 AI in Mental Health Nursing

In addition, the existing healthcare ecosystem of mounting workloads, staffing shortages, and paperwork requirements might exert pressures that make AI tools seem like appealing solutions to overworked mental health workers. Nevertheless, the allure to deploy such technologies in an attempt to optimize the care delivery process must be offset by the basic appreciation that mental health recovery is, by definition, relational and is not reducible to standardized algorithms, or generic treatment protocols(2).

The discussion regarding the role of AI in mental health nursing can also be discussed in the context of the overall healthcare digitalization process and the question of the proper balance between technological effectiveness and human care-related operating methods. In the era of healthcare systems all over the world struggling with limitations of resources against the heightening need in mental health care, the question of how best the emerging technologies can be used is both a question of clinical efficacy and ethical responsibility and professional integrity. The Potential and the Danger of ART-Created Care Plans

The hybrid of AI-generated care plans is a unique facet of the merger of technological ability and clinical practice providing not only notable potential advantages, but also substantial risks that mental health experts will need to be cautious of. In considering the potential of existing AI systems to generate mental health nursing care plans, we face a dilemma: they may generate content that might seem to be professional competent (at first sight) and with some basic flaws that may jeopardize patient safety and therapeutic care. This dichotomy speaks to the advanced nature of the current AI systems and their capacity to produce rather realistic content that might not be deep, accurate, and individualized enough to provide effective mental health care.

The possibility that AI care plans can help solve several of the most burning issues in mental health nursing today poses the key benefit of this technology to that field. The healthcare sector across the world is under unprecedented pressure in terms of its need to provide mental health care services, combined with ongoing workforce shortages and growing administrative workloads that may come at the expense of direct patient care time. In this regard, AI-based tools have the potential to be useful to support care planning by producing initial care plans framework, recommending evidence-based interventions, and sending reminders of particular clinical factors that a busy clinician might otherwise not pay attention to(3). The speed and reliability of information processing and structured output that AI systems show could in the future also provide an opportunity to empower mental health nurses to invest more time and energy in the human aspects of their work, namely the relational and therapeutic dimensions of their practice.

In addition, AI systems have the theoretical potential to synthesize research literature and clinical guidelines in real-time, and a care plan may be based on up-to-date approaches and best practices. To novice practitioners or those who work in areas where continuing education and supervision are not readily available, the AI-generated content can be utilized as a point-of-reference and an educational tool that may allow the same novice practitioners to be prepared to incorporate the core principles of clinical practice when developing care planning procedures. Nevertheless, dangers of the AI-generated care plans in mental health nursing are enormous and complex. The most worrying is the eagerness of AI systems to make assumptions and fill the gaps in information with generalizations that may not be explored to specific patients. The very nature of mental health presentations is complex and personal, and therefore shaped by an infinite number of factors: trauma history, cultural background, socioeconomic status, family dynamics and personal strengths and resources. Though more clever, such I systems

still work on the basis of pattern recognition using training data and risk introducing statistical and clinical assumptions not present in the actual case or patient.

Another important threat is the risk of diagnostic bias, or the chance that AI models are trained to match particular symptoms, signs, or combinations of them to particular diagnoses or comorbidities due to the occurrence of statistical associations and not a complete evaluation of all aspects of the patient. Such a propensity toward algorithmic bias may be particularly complicating in mental health care, where potentially complicating historical prejudices and stereotypes have already brought an imbalance in the quality and the access to care between different populations. This danger of allowing biases already present to be reinforced by what seems like objective, evidence-based principles is another threat the use of AI systems poses to the possibility of clinical neutrality(4).

2.Methods

1. Research design and Theory Framework

The study conducted a qualitative descriptive research that leveraged expert clinical analysis approach in examining strengths and weaknesses of artificial intelligence use in mental health care planning. The study was also supported by a few theoretical frameworks such as person-centered care theory that indicates the values of an individual approach to the treatment, and therapeutic relationship theory that acknowledges the significance of human interrelation in mental health recovery. Moreover, the assessment framework has drawn the principles of evidence-based practice models and theories of clinical decision-making to offer a complete assessment system.

The scientific methodology was framed as a simulation study in real-life, where AI-generated content would be tested in environment of the real-life conditions similar to those of a clinical practice scenario. Such approach to methodology enabled authentic evaluation of the attitude AI tools may have when implemented in working routines of mental health nurses in a community. The theory base was also used to understand the interplay of technology and the healthcare givers and patient outcomes through the sociotechnical systems theory.

2. Selection and Justification of the Platform to be used

The research was carried out on the AI platform (GPT-3.5 architecture) installed through the free research preview, the last update of which is March 23 rd, 2023, provided by OpenAI. The choice was made on the basis of among others easy accessibility of the platform to medical professionals, its advanced natural language processing system, and in its ability to create intelligent clinical notes. The time of the version of the platform was important because it was indicative of available at the time AI technology that mental health nurses could potentially experience in practice.

The contrast made between free and premium AI services was not accidental, as the assumption was that many healthcare practitioners and institutions may first encounter AI tools via the free versions and then move on to the paid versions depending on their need. This strategy guaranteed that the assessment would be indicative of the experiences of average mental health nurses that may have tried the AI devices without institutional permission or training.

3. Case Development Methodology

The fictional patient case was well designed, and it represented a picture of the typical cases encountered in the community mental health nursing practice. The case development process included generation of the character of Emily, a 25-year-old woman who has severe self-harm habit and complications in interacting with the concept of the dialectical behavior therapy (DBT). The presentation was selected particularly since NHS England data has identified self-harm to be the most frequently presenting incident that required care planning to be undertaken in UK mental health services(5).

The complexity of the case was built deliberately to probe AI on various levels of performance in area of risk assessment, considerations of therapeutic relationship, evidence-based choice of interventions, and care coordination. The case of presenting self-harm together with the difficulty of engaging in DBT is a potentially real-life case that should be approached with a delicate knowledge of trauma-informed care values, alliance formation, and person-centered treatment planning.

Only minimum demographic and clinical information was fed to the AI model so as to mimic real-world scenario wherein full assessment information may not always be available. This solution also made it possible to consider the way that the AI systems deal with such lack of information and generate proper clinical assumptions or dangerous generalizations.

4.ICA Interaction Protocol

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The interaction with AI was conducted in a systematic process that is aimed at reflecting realistic clinical query that a mental health nurse would ask the system through Atlantic AI. The main command employed was: "Develop a community mental health nursing care plan to Emily who has major incidences of suicide and cannot easily engage the dialectical behaviour therapy skilling." This instruction was intentionally general to evaluate how the AI system would organize and prioritize care planning use without leaving it with too many prompts.

A secondary task was performed to test the potential of the AI to generate a specific type of therapeutic interventions/exercises i.e. dialectical behaviour therapy (DBT) exercises and the command was as follows: "Please provide me some dialectical behaviour therapy exercises to Emily living in the community and experiencing strong self-harm problems." The second concluded that the study had an opening to assess the AI knowledge on evidence-based methods of therapy and the possibility of adapting general to specific clinical presentations.

A third interaction focussed on the question of risk awareness with the following question: What are the risks of using AI to assist with mental health nursing care of self-harming behaviour? This meta-evaluation was created to evaluate whether AI system had a proper understanding of its own levels of limits and potential dangers in clinical practices (6).

5. Multi-Disciplinary Expert Assessment Scheme

The evaluation group was composed of mental health nurses with various fields of clinical practice and levels of expertise, and including both dialectical behavior therapy-specialized and dialectical behavior therapy-informed practitioners. This composition guaranteed the all-round evaluation of the wide range of professional perspectives and experience. Each evaluator contributed a certain degree of expertise in the aspects of self-harm intervention, development of a therapeutic relationship, risk assessment, and implementation of an evidence-based practice, among others.

The process of evaluation had a structured framework in which AI-generated content is evaluated on several aspects such as its clinical accuracy, therapeutic appropriate, ethical consideration and practical applicability. Each evaluator had commented individually on the AI outputs and a group discussion followed to determine common ground and disagreement in evaluation.

6. Evidence-based Evaluation Criteria

The evaluation used accepted clinical standards as its initial assessment tools, namely the National Institute for Health and Care Excellence (NICE) on the self-harm assessment, prevention and management (NICE, 2022). This gave a neutral benchmark on which AI produced suggestions could be measured. Other assessment criteria were on conformity with ideals of the dialectical behavior therapy, person-centered care, and best practices in establishing a therapeutic relationship.

The assessment framework also folded evaluation of the possible harms markers (e.g., identifying the clinical errors, improper presumptions, stigmatization, and lack of critical assessment elements). Special focus was made on the prospects that AI-based content could cause harm by subliminally destabilizing therapeutic relationships or encouraging methods that may be incompatible with trauma-informed care.

7. The methodology of the content analysis

Thematic, assumption- and recommendation-wise analysis of text was conducted as a systematic content analysis. This review entailed description of evidence-based measures, language tone and suitability evaluation, and analysis of the efficiency of the care plan construction and completeness. The analysis also discussed what the AI system would add and infer with the minimal input provided, so one can determine how much the system tends to make clinical assumptions(7).

A particular focus on the analysis of the way the AI system operated with multifaceted clinical notions of therapeutic engagement, risk, and individual care planning was given. The framework used to analyze the data involved analysis of whether the AI-generated content had shown any insights into the relational nature of mental health nursing and the criticality of collaborative care plans.

3.Results

3.1 The overall AI performance and structural competency

The overall assessment of the mental health care planning AI was notable due to the disparity between superficial professional competency and underlying clinical insufficiency comprising of serious safety implications in the mental health practice. The AI system illustrated a high capacity of producing structured professionally formatted

care plans with appropriate sections such as the nursing diagnoses, goal statements, and intervention strategies and the evaluation criteria. The generated content appeared according to the organizational structure that closely resembled the typical structure of nursing care plans, which indicated that the AI had been trained on a large amount of health care documentation and will be able to reproduce the typical pattern of healthcare professional communication.

Prompt inclusion of evidence-based therapeutic modalities in a single plan of care and integration of multiple evidence-based therapeutic modalities showed advanced information synthesis skills of the AI. It efficiently interlaced dialectical behavior therapy principles, motivational interviewing, trauma-informed, and recovery-oriented treatment approaches into a single treatment framework. Such integration implied access to the whole body of mental health literature, and the possibility of recognising complementary therapeutic methods that theoretically could be used in practice. The focus of the care plan on patient empowerment, the participation approach, and the application of the measurement of strengths proved to be consistent with this current nursing philosophy of mental health nursing and the principles of person-centered care.

Less noticeable however, there were deep structural issues underpinning this visually impressive structural offering, so significant that on a wide scale of application the potential risks involved were enormous unless closely guided by clinical control. The characteristics that made the AI produce results that looked clinically reasonable but based on a critical mistake set up a hazardous situation that falsely gave the practitioners the reassurance that they should have complete confidence in generated clinical decision-making. The artificial intelligence-based content may not be clinically sufficient, which can be detrimental since the issues of its flawed content development can be hidden behind the facade of its overall superficial competency and allow its use in areas that require delicate human work and judgment beyond the capabilities of automation.

3.2 Integration of Evidence-Based Practice and Clinical Guideline Adherence

The AI system proved to be rather competent in locating and integrating accepted clinical recommendations and evidence-based practices into the care plan system. The formulated plan was appropriate in referencing NICE guidelines on the management of self-harm and able to note that the evidence based intervention available to address self-injuries related to emotional dysregulation and self-injurious behaviors is dialectical behavior therapy. The fact that the AI addressed the main modules of DBT emotion regulation, distress tolerance, interpersonal effectiveness, and mindfulness, portrayed the knowledge of this type of therapy and its theoretical basis.

The focus on safety planning, crisis intervention plans and a collaborative approach to managing risk covered in the care plan was consistent with current best practice guidelines in this field of self-harm intervention. The AI aptly selected the growing of personal safety plans that involve coping strategies, crisis resources, and identification of support people. The support of the motivational interviewing premises in resolving therapeutic ambivalence portrayed the awareness that various modalities of treatment can intermingle in holistic mental care. Moreover, the fact that psychosocial intervention strategies instead of treatments based on medication were applied by the AI depicts proper knowledge of DBT philosophy and the principles of trauma-informed care. The skill-building, building of therapeutic relationships and patient empowerment emphasized in this plan were aligned with recovery-oriented practice models, which have a focus on collaboration of the care relationship and patient autonomy. This association implied that the AI product had access to the current literature on the topic of mental health and was able to combine the data of various professional sources.

Nevertheless, the implementation of these evidence-based strategies into the practice of the AI has shown that there is serious superficiality in perception regarding complex therapeutic processes. Although the system was able to isolate and name possible interventions, it did not have a sense of depth that could enable it to implement them clinically. The approach to treatment of the DBT skills used in the care plan was unspecific and did not indicate how these intervention approaches needed to be tailored to the specific situations and trauma histories of the patients and cultural background.

3.3 Unnecessary Usage of Critical Clinical Errors and Unfounded Assumptions

The most threatening observation during the AI assessment was that the system tended to make clinical assumptions and append the data that was not presented in the given clinical input at all. The fact that the AI did not correctly identify the presence of the past history of substance abuse in Emily and that the patient is free of any drugs or alcohol at the moment was a severe clinical error on the part of the AI. This manipulation of clinical data showed unacceptable algorithmic thinking that may give rise to inharmonious treatment planning and may even cause stigmatizing treatment ideas that may harm the therapeutic relations.

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The diagnostic assumption of the AI that Emily possesses borderline personality disorder was problematic because it showed poor clinical reasoning processes. This diagnostic jump, performed without any broad-scale assessment data or clinical reason, showed the bias of the AI to make correlational assumptions based on the displaying of symptoms instead of proceeding by established and proper diagnostic steps. This form of premature diagnostic appraisal may elicit treatment bias, improper treatment methods and failure to consider other or co-morbid conditions that may necessitate alternative intervention methods.

Also, the AI presented false assumptions about the social situation of Emily, indicating that she was socially isolated, unemployed, and alone in an apartment even though no such information was stated in the clinical input. These social assumptions may significantly affect the care planning methods and decision making about resources allocation, which may imply inappropriate interventions that do not correspond to the actual situation and the patient needs. The inclination of AI to complete informational gaps with stereotyped assumptions about people resorting to self-harm behavior showed problematic bias that may have reproduced stigma and discrimination in a mental health care environment.

The AI was also unable to identify the importance of lacking clinical information and failed to adequately mention those areas where further assessment would be required to come up with comprehensive care plans. Such denial of the nature of clinical uncertainty and the necessity of constant assessment was a severe misfortune of professionals nursing practice principles which underline the processes of clinical decision making with complete individual assessment as the cornerstone.



FIGURE 2 Analyzing AI Performance in Mental Health Care

3.4 Language and Communication Appropriateness Therapeutic

The discussion of the AI language use demonstrated the worrying tendencies, which may negatively affect therapeutic relationships and conflict with such major concepts as trauma-informed and recovery-oriented care. The AI also used problematic language including expressions of a lack of progress during treatment, as well as to describe patient ambivalence in a manner that can contribute to shame, self-blame, and de-motivation of therapy. These language decisions were a direct contradiction to DBT values that stress the need not to hold judgmental and blameful attitudes toward the patient but to keep an open mind and encourage patient willingness and active presence (8).

The language used by the AI reflected a less modernistic, paternalistic approach to medical care that placed the patient on the receiving end of the care that is already prescribed rather than a central participant in care planning where their opinions are sought. The language would always refer to what Emily will do and not about what Emily may want to do, what Emily might want to consider or to do something, the language being prescriptive rather than collaborative in its approach to therapeutic planning. This language style may even harm the formation of a good therapeutic relationship and diminish incentive of the patient to active participation in the treatment.

In addition, each of the descriptions of therapeutic issues provided by the AI employed deficit-oriented phrasing that puts an accent on the limitations of the patient instead of promoting strengths-based approaches that are the key to a successful practice in mental health nursing(9). The use of phrases depicting Emily as struggling and

having difficulties in life with no mention of what she is capable of and has already accomplished and what strengths and resources she possesses were manifestations of a problem-oriented way of thinking that may impede the path to recovery. This language approach was involved in contradicting evidenced-based practices which stress the need to assess the strengths and resiliences of the patient and leverage upon them.

The AI also did not illustrate deriving the understanding of the significance of language validation in the mental health care facilities. The created materials did not include any statements of sympathy, validation of emotional experience, and acknowledging the braveness it takes to approach mental health treatment. Lack of therapeutic validation may contribute to non-understanding, judgment, and dismissal of patients, and prospects of therapeutic violations and forfeit among the patients.

4. Conclusion

AI technology in mental health care applications is the paradoxical outcome of these findings; competency in the surface level of professionalism, but incompetency in the clinical level.

The fact that the AI makes unjustified assumptions about the diagnosis, clinical information that is fabricated, and complex therapeutic interventions oversimplified proves that AI is not the right choice to be used in making a direct clinical decision in mental health institutions. The inability of the system to understand where the bounds of given information lies and its contiguity to fill such gaps with stereotypical generalizations about mental health presentations may further reinforce the biasnesses and stigmas that already exist in the system and undermine the individualized care approaches that are the hallmark of an effective mental health nursing practice. Such results indicate that the only apparent sophistication of AI-generated content is likely to worsen clinical risks instead of mitigating them, as it allows a false sense of confidence in the automation of decision-making.

The assessment also emphasized that human clinical judgment, and skills in a therapeutic relationship as well as the ability to understand the setting, cannot be replaced. The inability of the AI to show compassion, intercultural awareness, and cooperative communication strategies highlighted the inherently humanistic aspect of mental health nursing and the centrality of people-to-people interaction to healing. The results of the study supply strong arguments that the essence of the core values of mental health nursing and pathways of treatment cannot be reproduced with the help of technological advances, no matter the sophistication of the AI system employed, or the completeness of the training data.

Legal Ethics and Rules of Regulation

The conclusion of this assessment has far-reaching consequences to the professional responsibility of nurses and the importance of developing more inclusive regulatory measures to control AI application in the mental health care environment. Since professional recommendations, organizational policies, and regulatory control of AI implementation practices in medical practice are currently lacking, a potentially unacceptable gap exists that may put patients as well as practitioners at risk of various forms of harm. Mental health nurses engaging in experimentation on AI tools in their work, being unaware of the perils, may jeopardize the safety of patients, as well as put on the hook of professional liability and ethical breaches.

Nursing professionals should immediately come up with holistic learning programs that can instill in practitioners the significance of critically assessing the AI-produced content and the weaknesses and dangers of using AI-generated clinical decisions. The benefit of these educational programs is that they should focus on the invaluable importance of human clinical judgment and offer skills of detecting the mistakes made by the AI and its improper assumptions. Professional nursing organizations must take proactive steps to codify the guidelines, which would define the AI usage and promote patient safety as a top priority and the principle of the individualized, relationship-based care maintained within the nursing profession.

The linkage of healthcare institutions to AI technology needs to focus on building effective governance mechanisms, which entail risk evaluations, quality control measures, and continuous surveillance of patient responses once they apply the AI tools in the delivery of medical services. Such governance mechanisms must require disclosure to patients about the use of AI in their care, design effective accountability regimes in the event AI-generated content is produced, and is observed by ensuring that suitable clinical oversight and supervision are in place when AI tools are introduced as adjuncts to human decision making in clinical care.

The regulatory implication does not only touch individual institutions, but it also applies to both the national and the international healthcare policy development. Regulatory agencies should develop guidelines to AI system validation within healthcare applications, the clinical evidence required to demonstrate safety and efficacy, and

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ensure a system is in place to continuously monitor AI system-related adverse events. The speed of AI technology advancement will require assertive regulatory solutions that can keep up with the changes in capability, but continue to offer high standards of patient protection.

Future Research Directions, Evidence Developments

The preliminary character of this appraisal emphasizes the importance of the systematic research, which would extend into the consequences of the integration of AI into the mental health nursing practice. Future research projects need to use stringent methodological procedures such as randomized controlled trials, long-term outcome research studies, and complete safety monitoring to ascertain the efficiency and the hazards associated with AI innovation in mental medical care practices. These studies are to be conducted not only on clinical outcomes but also on patient satisfaction, quality of therapeutic relationships, and professional advancements of the practitioner. The priorities in this research should focus on how AI tools can have an impact on the establishment and sustenance of therapeutic relationships, which is the central pillar in mental health nursing practice. Research on the attitudes of patients regarding AI use in their treatment, the role of automated mechanisms on building trusting therapeutic relationship, and the consequences of remote care on recovery rates will be crucial to evidence-based policy-making regarding the use of AI. Also, studies should consider how the AI systems can become a part of reproducing or exacerbating the current racial and other disparity in healthcare and elaborate on methods of securing equitable and equal access to high-quality, culturally relevant care.

The research topic ought to include what also needs to be investigated is the best way of training and educating mental health nurses so that they can work effectively with the AI technology. Research into the best practices in the development of critical thinking skills, sustaining clinical competency in the use of technology-present environments and retaining the relationship orientation of the mental health nurse practice will be vital in the professional development programs. Moreover, studies on the organizational and systems-related aspects which ensure successful and safe integration of AI will be used to inform policymaking and implementation practices on an institutional level.

Studies to understand the professional development consequences of using AI tools in the context of mental health nurses will be of vital essence to look into the future in terms of how this is influencing the development of skills, professional personalities, and occupational satisfaction. Such researchers ought to examine whether AI tools usage causes deskilling effects, clinical reasoning process changes, or adjustments in the professional roles conceptualizations that may affect the quality and safety of mental health care delivery processes.

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Conflicts of interest

The authors have no conflicts of interest to declare

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