

Artificial Intelligence In Mental Health Nursing: Applications, Opportunities, Ethical Challenges, And Future Directions

Dr. Payal Sharma¹, Mr. Milan Agravat², Ms Pranali Mackwan³, Dr. Prateek Kothari⁴, Dr. Amit Vyas⁵, Moirangthem Rebati Devi⁶, Dr. Sumit Padihar⁷

¹Professor Mental Health/Psychiatric Nursing) Index Nursing College Indore

²Associate professor cum PHD SCHOLAR (Mental Health/Psychiatric Nursing), Shree Anand institute of nursing, RAJKOT (Gujarat)

³Assistant professor cum PhD scholar (Obstetrical and Gynecological Nursing) R.h. patel institute of nursing education and research centre borsad, anand Gujarat

⁴Professor Cum Vice Principal (Mental Health/Psychiatric Nursing), Aarihant Institute of Nursing Swarnim University Gandhinagar

⁵Professor Cum Principal (Community Health Nursing) Aarihant Institute of Nursing Swarnim University Gandhinagar

⁶Associate Professor (Child Health Nursing), Renaissance University School of Nursing, Indore

⁷Professor, Department of Child Health Nursing, Sri Aurobindo institute of medical science, College of nursing, Sri Aurobindo University, Indore, M.P.

Abstract

Artificial Intelligence (AI) is rapidly transforming healthcare by supporting clinical decision-making, patient monitoring, documentation, education, research, and personalized care. Mental health nursing is an important area in which AI has the potential to improve early identification of mental health problems, continuous monitoring, therapeutic support, risk assessment, and access to care. Recent advances in machine learning, natural language processing, predictive analytics, conversational agents, and generative AI have expanded the possibilities for supporting individuals experiencing depression, anxiety, psychosis, substance-use disorders, and other mental health conditions. Evidence suggests that AI-based systems can assist in detecting symptoms, predicting clinical risks, monitoring changes in behaviour and mood, and providing accessible digital interventions. However, the use of AI in mental health also creates significant ethical and professional concerns, particularly regarding privacy, confidentiality, informed consent, algorithmic bias, transparency, accountability, patient safety, therapeutic relationships, and the risk of over-reliance on automated systems. Mental health nurses are uniquely positioned to ensure that AI remains person-centred and clinically appropriate because they combine continuous patient observation with therapeutic communication and holistic assessment. This article reviews the major applications and opportunities of AI in mental health nursing, discusses ethical and professional challenges, and proposes future directions for education, research, clinical practice, and policy. AI should be regarded as a supportive technology rather than a replacement for professional nursing judgment or human therapeutic relationships.

Keywords: Artificial Intelligence, Mental Health Nursing, Psychiatric Nursing, Machine Learning, Generative AI, Chatbots, Digital Mental Health, Ethics, Patient Safety, Nursing Practice.

1. Introduction

Mental health disorders represent a major public health challenge, while access to appropriate mental health services remains unequal across populations. Mental health professionals frequently face high workloads, shortages of trained personnel, increasing documentation requirements, and the need for continuous monitoring of patients. These challenges have stimulated interest in digital technologies and Artificial Intelligence (AI) as potential tools for improving the accessibility, efficiency, and quality of mental health services.

AI refers broadly to computational systems capable of performing tasks that normally require human cognitive abilities, including pattern recognition, prediction, language processing, classification, and decision support. In healthcare, AI includes machine learning, deep learning, natural language processing, predictive analytics, computer vision, and generative AI. Recent systematic reviews indicate that AI applications in mental health are increasingly being investigated for diagnosis, monitoring, intervention, and clinical support. A systematic review of 85 studies found that machine-learning approaches have been used for diagnosis and prediction, while chatbots have been investigated for intervention and ongoing support.

For mental health nursing, AI is particularly relevant because nursing care involves continuous assessment of behaviour, mood, communication, cognition, sleep, medication adherence, social functioning, and safety risks. AI may assist nurses in identifying patterns that are difficult to recognize through conventional observation alone. However, mental health care is fundamentally relational and requires empathy, trust, communication, professional judgment, and respect for individual autonomy. Therefore, AI should complement rather than replace mental health nurses.

2. Artificial Intelligence in Mental Health Nursing

AI in mental health nursing can be understood as the use of intelligent digital technologies to support assessment, clinical decision-making, patient monitoring, therapeutic interventions, education, documentation, research, and service management.

A 2024 scope review specifically examining AI applications in psychiatric nursing identified growing opportunities for AI to support psychiatric nursing practice. The increasing availability of generative AI and conversational systems has further expanded the potential applications of AI in mental healthcare.

AI technologies relevant to mental health nursing include:

- Machine learning
- Deep learning
- Natural language processing
- Predictive analytics
- AI-enabled clinical decision-support systems
- Conversational AI and chatbots
- Generative AI
- Wearable and sensor-based monitoring
- Speech and behavioural analysis
- Digital therapeutic technologies
- Intelligent electronic health record systems

3. Applications of AI in Mental Health Nursing

3.1 Early Identification and Screening

AI can assist nurses in identifying individuals who may be at increased risk of depression, anxiety, suicide, substance-use disorders, or other mental health problems. Machine-learning models can analyse information from clinical records, questionnaires, speech, text, behavioural patterns, or other digital data.

For example, natural language processing can examine linguistic characteristics associated with depression or psychological distress. Such technologies may help nurses identify patients who require more detailed assessment.

However, AI-generated risk scores should be considered screening or decision-support information rather than definitive diagnoses. Final clinical assessment should remain the responsibility of qualified healthcare professionals.

3.2 Suicide and Self-Harm Risk Assessment

Suicide prevention is one of the most sensitive areas in mental health nursing. AI may help identify patterns associated with increased suicide or self-harm risk by analysing clinical histories, documentation, patient-reported symptoms, communication patterns, and other relevant data.

Predictive models may help nurses prioritize assessment and observation of high-risk patients. Nevertheless, false-positive and false-negative predictions can have serious consequences. Therefore, AI-based suicide-risk systems must be carefully validated and integrated with comprehensive clinical assessment.

3.3 Monitoring of Mood and Behaviour

Mental health nurses routinely monitor changes in mood, behaviour, sleep, appetite, social interaction, cognition, and activity. AI-enabled wearable devices and digital platforms can potentially support continuous monitoring of selected behavioural indicators.

For example, changes in sleep patterns, physical activity, communication, or social behaviour may provide additional information about changes in mental health status.

Such monitoring could support early intervention and help nurses recognize deterioration before it becomes clinically severe.

3.4 AI Chatbots and Conversational Support

Conversational AI systems can provide users with immediate access to information, psychoeducation, emotional support, and structured self-management activities. Research has identified potential benefits of AI chatbots for stress, anxiety, and depressive symptoms, although the evidence base remains heterogeneous.

In nursing practice, conversational AI may support:

- Psychoeducation
- Medication information

- Relaxation and breathing exercises
- Sleep-hygiene education
- Basic emotional support
- Appointment reminders
- Self-management education
- Reinforcement of therapeutic plans

However, AI chatbots should not be presented as substitutes for professional psychotherapy or crisis intervention. Generative AI can produce inaccurate or inappropriate responses, making human oversight essential.

3.5 Supporting Clinical Decision-Making

AI-based decision-support systems can analyse large amounts of clinical information and provide nurses with alerts, predictions, or recommendations.

Potential applications include:

- Identifying patients at risk of deterioration
- Supporting risk stratification
- Recognizing patterns in symptoms
- Supporting treatment monitoring
- Identifying potential medication-related concerns
- Summarizing patient records
- Supporting individualized care planning

The nurse remains responsible for interpreting AI-generated information in the context of the patient's complete clinical condition.

3.6 Documentation and Administrative Support

Mental health nurses spend considerable time documenting assessments, progress notes, care plans, risk assessments, and patient education. Generative AI and natural language processing systems may assist with documentation and summarization.

Potential benefits include:

- Faster documentation
- Structured clinical summaries
- Reduction of repetitive administrative work
- Improved organization of patient information
- Assistance with standardized documentation

Reducing administrative workload may allow nurses to devote more time to direct patient interaction and therapeutic communication. However, AI-generated documentation must always be reviewed by the nurse for accuracy, completeness, confidentiality, and clinical appropriateness.

3.7 Personalized Mental Health Care

AI can analyse individual patient characteristics and clinical histories to support personalized interventions. Instead of applying identical interventions to every patient, AI systems may help identify patterns that indicate which interventions are more likely to be useful for particular individuals.

In mental health nursing, this may contribute to individualized:

- Psychoeducation
- Behavioural interventions
- Self-management strategies
- Monitoring plans
- Follow-up schedules
- Health education

Personalization should always incorporate patient preferences, culture, values, family context, and clinical judgment.

3.8 Patient and Family Education

AI can support the development of educational materials on mental health conditions, medication adherence, coping strategies, stress management, relapse prevention, and healthy lifestyles.

Mental health nurses can use AI-assisted educational resources while ensuring that information is evidence-based, culturally appropriate, understandable, and clinically accurate.

3.9 Nursing Education and Simulation

AI can support mental health nursing education through virtual patients, simulated therapeutic conversations, case-based learning, clinical scenarios, and adaptive learning systems.

Students may use AI-supported simulations to practise:

- Mental status examination
- Therapeutic communication
- De-escalation techniques
- Suicide-risk assessment
- Psychiatric history taking
- Patient education
- Crisis-management scenarios

AI can therefore become an educational supplement while preserving supervised clinical learning with real patients.

4. Opportunities for Mental Health Nursing

4.1 Improved Accessibility

AI-enabled digital interventions may provide mental health information and basic support outside traditional healthcare settings. This may be particularly valuable for individuals who experience geographical, financial, social, or stigma-related barriers to accessing mental healthcare.

WHO has noted that AI has potential to improve access to healthcare, including in resource-constrained and rural settings, while emphasizing the need to avoid exacerbating inequities.

4.2 Early Intervention

AI-supported screening and monitoring may allow mental health nurses to identify changes earlier and initiate appropriate assessment or referral.

Early identification can potentially reduce delays in treatment and support prevention of clinical deterioration.

4.3 Reduction of Workload

Automation of selected administrative and repetitive tasks may reduce the workload of nurses. AI could assist with documentation, information retrieval, scheduling, data analysis, and routine educational activities.

This may create more time for direct patient care, therapeutic communication, and professional development.

4.4 Improved Clinical Efficiency

AI can process large amounts of information quickly. When appropriately validated, this may help nurses recognize clinically important patterns and prioritize care.

AI should therefore be considered an additional source of information rather than an independent clinical authority.

4.5 Strengthening Continuity of Care

Digital monitoring and AI-supported communication may help maintain contact between patients and healthcare services after discharge.

Potential applications include:

- Follow-up reminders
- Medication adherence support
- Symptom monitoring
- Relapse warning signals
- Patient education
- Communication with healthcare teams

4.6 Supporting Rural and Underserved Populations

In regions where mental health professionals are limited, AI-supported digital tools may help extend basic mental health information and screening services. However, technological solutions must not replace investments in trained mental health professionals and healthcare infrastructure.

WHO specifically cautions that AI should complement rather than displace the fundamental health-system investments required for universal health coverage.

5. Ethical Challenges of AI in Mental Health Nursing

The use of AI in mental health raises particularly significant ethical concerns because mental health information is highly personal and may involve sensitive information about behaviour, relationships, trauma, suicide risk, substance use, and family circumstances.

5.1 Privacy and Confidentiality

Mental health records contain sensitive personal information. AI systems may require large quantities of patient data for development or operation.

Potential risks include:

- Unauthorized access
- Data breaches
- Secondary use of information
- Inappropriate data sharing
- Commercial exploitation
- Re-identification of supposedly anonymized data

Nurses must ensure that patient information is handled according to applicable professional, institutional, and legal requirements.

5.2 Informed Consent

Patients should understand when AI is being used in their care, what information is collected, how it is processed, and what role AI plays in decision-making.

Consent becomes especially important when AI systems analyse behavioural or communication data.

5.3 Algorithmic Bias

AI systems learn from data. If training datasets do not adequately represent different populations, AI may perform less accurately for certain groups.

WHO has highlighted concerns that AI trained primarily on data from high-income countries may not perform adequately in low- and middle-income settings.

For mental health nursing, culturally diverse populations require particular attention because expressions of distress, communication styles, help-seeking behaviours, and social norms can vary considerably.

5.4 Transparency and Explainability

Many advanced AI models operate in ways that are difficult for users to understand. Nurses may receive a prediction without knowing why the system reached that conclusion.

Clinical AI systems should therefore provide meaningful explanations that enable nurses to critically evaluate recommendations.

WHO identifies transparency, explainability, and intelligibility as fundamental principles for ethical AI in healthcare?

5.5 Accountability

When an AI system provides an incorrect recommendation, responsibility must be clearly defined.

Questions include:

- Who is responsible for the decision?
- Who validates the AI system?
- Who monitors errors?
- Who is responsible for patient harm?
- How can patients challenge an AI-assisted decision?

AI cannot independently accept professional or legal responsibility. Appropriate human accountability must remain in place.

5.6 Patient Safety

Mental health patients may use AI systems during periods of severe distress, psychosis, suicidal thinking, or emotional crisis. An inappropriate response from an AI system may potentially delay professional intervention. Recent literature has raised concerns about the use of generative AI and mental health applications when systems are not adequately regulated or designed for crisis situations.

Therefore, AI systems intended for mental health should include appropriate escalation pathways and safety mechanisms.

5.7 Risk of Replacing Human Relationships

Therapeutic communication is a central component of mental health nursing. Empathy, presence, active listening, trust, and interpersonal understanding cannot be completely replaced by algorithms.

Excessive reliance on AI may reduce opportunities for meaningful nurse-patient interaction.

The appropriate model is therefore:

AI-supported care + professional nursing judgment + human therapeutic relationship.

5.8 Digital Inequality

Not all patients have equal access to smartphones, internet connectivity, digital literacy, or AI-based services. Older adults, economically disadvantaged populations, people living in rural areas, and individuals with limited digital literacy may be excluded if mental healthcare becomes overly dependent on technology.

AI implementation must therefore promote equity rather than create another healthcare barrier.

5.9 Misinformation and Hallucination

Generative AI systems may produce plausible but incorrect information. This is particularly concerning in mental healthcare because patients may interpret AI-generated information as professional advice.

WHO has warned about the potential for large language models to generate convincing misinformation and has emphasized the importance of evidence of benefit, patient safety, and appropriate governance before widespread implementation.

6. Role of the Mental Health Nurse in AI-Enabled Care

Mental health nurses should not be passive users of AI. They should become active participants in the evaluation, implementation, monitoring, and governance of AI technologies.

Major responsibilities include:

1. **Clinical assessment:** Validate AI-generated information against comprehensive clinical assessment.
2. **Patient advocacy:** Protect patient rights, privacy, dignity, and autonomy.
3. **Therapeutic communication:** Maintain meaningful human interaction despite technological integration.
4. **Risk management:** Identify inappropriate AI recommendations and patient-safety concerns.
5. **Patient education:** Explain the role and limitations of AI in understandable language.
6. **Data protection:** Follow institutional and legal requirements for handling patient information.
7. **Critical evaluation:** Assess the reliability and relevance of AI-generated information.
8. **Professional accountability:** Maintain responsibility for nursing decisions.
9. **AI literacy:** Develop knowledge of AI concepts, limitations, bias, and ethical issues.
10. **Research participation:** Contribute nursing perspectives to AI development and evaluation.

Recent nursing literature emphasizes the importance of trustworthy AI, education, professional involvement, and active nurse participation in the development and integration of AI into healthcare.

7. AI Competencies Required for Mental Health Nurses

Future mental health nurses will require a combination of clinical, digital, ethical, and analytical competencies.

Essential competencies include:

- Basic understanding of AI and machine learning
- Digital health literacy
- Data privacy and cybersecurity awareness
- Critical appraisal of AI outputs
- Understanding of algorithmic bias
- Knowledge of ethical principles
- Ability to communicate AI-related information to patients
- Recognition of AI limitations
- Clinical decision-making
- Human-centered care
- Evidence-based practice

Nursing education programs should progressively incorporate AI literacy into undergraduate and postgraduate curricula.

8. Future Directions

8.1 Human-Centred AI

Future AI systems should be designed around patient needs rather than technology alone. Patients, nurses, psychiatrists, psychologists, caregivers, and other stakeholders should participate in system development.

8.2 Explainable AI

Future systems should provide understandable reasons for predictions and recommendations. Explainability can increase clinician confidence and enable nurses to challenge inappropriate outputs.

8.3 Integration with Electronic Health Records

AI may increasingly become integrated with electronic health records to identify clinically relevant patterns and support individualized care.

However, integration must be accompanied by strict privacy, security, validation, and governance measures.

8.4 Multimodal AI

Emerging systems can process multiple types of information, including text, audio, images, and other data. WHO's guidance on large multimodal models highlights their expanding potential in healthcare while emphasizing the need for ethical governance and appropriate safeguards.

In mental health, multimodal AI could potentially support analysis of speech, written communication, behavioural indicators, and clinical information.

8.5 AI for Suicide Prevention

Future research may focus on developing safer and more clinically validated AI tools for suicide-risk detection and early intervention.

Such systems should always function within established clinical pathways rather than independently determining treatment or emergency responses.

8.6 Culturally Sensitive AI

AI systems should be trained and validated using diverse datasets representing different languages, cultures, socioeconomic groups, ages, and healthcare environments.

This is particularly important for countries such as India, where linguistic and cultural diversity is substantial.

8.7 AI Governance in Nursing

Healthcare institutions should establish clear policies covering:

- Approved AI applications
- Data protection
- Patient consent
- Documentation
- Clinical accountability
- AI validation
- Monitoring of errors
- Cybersecurity
- Professional responsibility
- Reporting of adverse events

WHO's AI guidance emphasizes human autonomy, safety, transparency, accountability, equity, and sustainability as key principles for responsible AI use in health.

8.8 Research Priorities

Future research should move beyond technical accuracy and examine real-world clinical outcomes.

Priority areas include:

- Randomized controlled trials of AI-supported mental health nursing interventions
- Long-term safety studies
- AI-assisted suicide-risk assessment
- Patient acceptability and trust
- Nurse acceptance and competency
- Cost-effectiveness
- Cultural adaptation
- Rural and low-resource implementation
- Bias and fairness
- Human-AI interaction
- Impact on therapeutic relationships
- Professional and legal accountability

Recent systematic evidence indicates promising applications of generative AI in mental health assessment, therapeutic support, and clinician assistance, but also highlights the limited real-world deployment and need for stronger safety evidence.

9. Conceptual Framework for AI-Enabled Mental Health Nursing

A useful model for integrating AI into mental health nursing can be described as:

Patient Data → AI Analysis → Clinical Insight → Nurse Validation → Individualized Intervention → Patient Response → Continuous Monitoring

The nurse remains at the centre of this cycle.

AI can process data and generate insights, but the mental health nurse interprets these findings within the patient's psychological, physical, social, cultural, and environmental context.

10. Advantages and Limitations of AI in Mental Health Nursing

Advantages	Limitations
Early identification of mental health risks	Possibility of inaccurate predictions
Continuous monitoring	Privacy and confidentiality concerns
Personalized support	Algorithmic bias
Reduced administrative workload	Lack of transparency
Improved accessibility	Digital inequality
Support for clinical decisions	Risk of over-reliance
Psychoeducation	Misinformation
Support for nursing education	Limited evidence for some applications
Potentially improved efficiency	Cybersecurity risks
Data-driven care	Possible reduction in human interaction

11. Ethical Principles for AI-Enabled Mental Health Nursing

A responsible approach can be summarized through six principles identified by WHO:

1. **Protection of human autonomy**
2. **Promotion of human well-being and safety**
3. **Transparency and explainability**
4. **Responsibility and accountability**
5. **Inclusiveness and equity**
6. **Responsiveness and sustainability**

These principles provide an important foundation for integrating AI while protecting patient rights and maintaining professional responsibility.

12. Conclusion

Artificial Intelligence has considerable potential to transform mental health nursing by supporting early identification, risk assessment, patient monitoring, psychoeducation, clinical decision-making, documentation, personalized care, and nursing education. Emerging evidence demonstrates promising applications of machine learning, natural language processing, chatbots, and generative AI in mental healthcare.

Nevertheless, AI should not be viewed as a replacement for mental health nurses. Mental health care depends heavily on therapeutic relationships, empathy, communication, clinical reasoning, ethical judgment, and individualized understanding. Concerns regarding privacy, confidentiality, algorithmic bias, misinformation, patient safety, accountability, digital inequality, and loss of human interaction must be addressed before AI becomes widely embedded in routine mental health nursing.

The future of mental health nursing is therefore unlikely to be “nurse versus AI.” Instead, it should be “nurse with AI.” The most valuable model will combine the analytical capabilities of AI with the compassion, clinical judgment, advocacy, and therapeutic presence of the mental health nurse. Nursing education, research, institutional policy, and professional regulation must prepare nurses to participate actively in the responsible development and implementation of AI. Ethical, evidence-based, culturally sensitive, and human-centred AI has the potential to strengthen—not diminish—the quality of mental health nursing care.

References

1. Alruwaili, M. M., Abuadas, F. H., Alsadi, M., Alruwaili, A. N., Ramadan, O. M. E., Shaban, M., Al Thobaity, A. A., Alkahtani, S. M., & El Arab, R. A. (2024). Exploring nurses' awareness and attitudes toward artificial intelligence: Implications for nursing practice. *DIGITAL HEALTH*, 10, 20552076241271803. <https://doi.org/10.1177/20552076241271803>
2. Bohn, B., & Anselmann, V. (2024). Artificial intelligence in nursing practice—A Delphi study with ChatGPT. *Applied Nursing Research*, 80, 151867. <https://doi.org/10.1016/j.apnr.2024.151867>
3. Gallegos, C., Kausler, R., Alderden, J., Davis, M., & Wang, L. (2024). Can artificial intelligence chatbots improve mental health? A scoping review. *Computers, Informatics, Nursing*, 42(10), 731–736. <https://doi.org/10.1097/CIN.0000000000001155>
4. Higgins, O., Chalup, S. K., & Wilson, R. L. (2024). Artificial intelligence in nursing: Trustworthy or reliable? *Nursing Inquiry*, 29(2), 143–153. <https://doi.org/10.1177/17449871231215696>
5. Kolding, S., et al. (2024). Use of generative artificial intelligence (AI) in psychiatry and mental health care: A systematic review. *Acta Neuropsychiatrica*. <https://doi.org/10.1017/neu.2024.50>
6. Li, H., Zhu, G., Zhong, Y., Zhang, Z., Li, S., & Liu, J. (2024). Applications of artificial intelligence in psychiatric nursing: A scope review. *Studies in Health Technology and Informatics*, 315, 74–80. <https://doi.org/10.3233/SHTI240109>
7. Luo, X., Zhang, A., Li, Y., Zhang, Z., Ying, F., Lin, R., Yang, Q., Wang, J., & Huang, G. (2024). Emergence of artificial intelligence art therapies (AIATs) in mental health care: A systematic review. *International Journal of Mental Health Nursing*, 33(6), 1743–1760. <https://doi.org/10.1111/inm.13384>
8. Solaiman, B. (2024). Generative artificial intelligence (GenAI) and decision-making: Legal & ethical hurdles for implementation in mental health. *International Journal of Law and Psychiatry*, 97, 102028. <https://doi.org/10.1016/j.ijlp.2024.102028>
9. Thakkar, A., Gupta, A., & De Sousa, A. (2024). Artificial intelligence in positive mental health: A narrative review. *Frontiers in Digital Health*, 6, 1280235. <https://doi.org/10.3389/fdgth.2024.1280235>
10. Torous, J., & Blease, C. (2024). Generative artificial intelligence in mental health care: Potential benefits and current challenges. *World Psychiatry*, 23(1), 1–2. <https://doi.org/10.1002/wps.21148>
11. Villarreal-Zegarra, D., Mahony Reategui-Rivera, C., García-Serna, J., Quispe-Callo, G., Lázaro-Cruz, G., Centeno-Terrazas, G., Galvez-Arevalo, R., Escobar-Agreda, S., Dominguez-Rodriguez, A., & Finkelstein, J. (2024). Self-administered interventions based on natural language processing models for reducing depressive and anxiety symptoms: Systematic review and meta-analysis. *JMIR Mental Health*. <https://doi.org/10.2196/xxxxx>
12. World Health Organization. (2021). Ethics and governance of artificial intelligence for health: WHO guidance. World Health Organization. <https://doi.org/10.1002/wps.21148>
13. World Health Organization. (2024). Ethics and governance of artificial intelligence for health: Guidance on large multi-modal models. World Health Organization.
14. Yakusheva, O., Bouvier, M. J., & Hagopian, C. O. P. (2025). How artificial intelligence is altering the nursing workforce. *Nursing Outlook*, 73(1), 102300. <https://doi.org/10.1016/j.outlook.2024.102300>