New paper examines potential power and pitfalls of harnessing artificial intelligence for sleep medicine

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In a new research commentary, the Artificial Intelligence in Sleep Medicine Committee of the American Academy of Sleep Medicine

highlights how artificial intelligence stands on the threshold of making monumental contributions to the field of sleep medicine.

Through a strategic analysis, the committee examined advancements in AI within sleep medicine and spotlighted its potential in revolutionizing care in three critical areas: clinical applications, lifestyle management, and population health. The committee also reviewed barriers and challenges associated with using AI-enabled technologies.

The study is published in the *Journal of Clinical Sleep Medicine*.

"AI is disrupting all areas of medicine, and the future of sleep medicine is poised at a transformational crossroad," said lead author Dr. Anuja Bandyopadhyay, chair of the Artificial Intelligence in Sleep Medicine Committee.

"This commentary outlines the powerful potential and challenges for sleep medicine physicians to be aware of as they begin leveraging AI to deliver precise, personalized patient care and enhance preventive health strategies on a larger scale while ensuring its ethical deployment."

According to the authors, AI has potential uses in the sleep field in three key areas:

1. Clinical applications: In the clinical realm, AI-driven technologies offer comprehensive data analysis, nuanced pattern recognition and automation in diagnosis, all while addressing chronic problems like sleep-related breathing disorders. Despite understated beginnings, the utilization of AI can offer improvements in efficiency and patient access, which can contribute to a reduction in burnout among health care professionals.
2. Lifestyle management: Incorporating AI also offers clear

benefits for lifestyle management through the use of consumer sleep technology. These devices come in various forms like fitness wristbands, smartphone apps, and smart rings, and they contribute to better sleep health through tracking, assessment and enhancement. Wearable sleep technology and data-driven lifestyle recommendations can empower patients to take an active role in managing their health, as shown in a recent AASM survey, which reported that 68% of adults who have used a sleep tracker said they have changed their behavior based on what they have learned. But, as these AI-driven applications grow ever more intuitive, the importance of ongoing dialogue between patients and clinicians about the potential and limitations of these innovations remains vital.

3. Population health: Beyond individual care, AI technology reveals a new approach to public health regarding sleep. "AI has the exciting potential to synthesize environmental, behavioral and physiological data, contributing to informed population-level interventions and bridging existing health care gaps," noted Bandyopadhyay.

The paper also offers warnings about the integration of AI into sleep medicine. Issues of data privacy, security, accuracy, and the potential for reinforcing existing biases present new challenges for health care professionals. Additionally, reliance on AI without sufficient clinical judgment could lead to complexities in patient treatment.

"While AI can significantly strengthen the evaluation and management of sleep disorders, it is intended to complement, not replace, the expertise of a sleep medicine professional," Bandyopadhyay stated.

Navigating this emerging landscape requires comprehensive validation and standardization protocols to responsibly and ethically implement AI technologies in health care. It's critical that AI tools are validated against

varied datasets to ensure their reliability and accuracy in all patient populations.

"Our commentary provides not just a vision, but a roadmap for leveraging the technology to promote better sleep health outcomes," Bandyopadhyay said. "It lays the foundation for future discussions on the ethical deployment of AI, the importance of clinician education, and the harmonization of this new technology with existing practices to optimize patient care."

More information: Anuja Bandyopadhyay et al, Strengths, weaknesses, opportunities and threats of using AI-enabled technology in sleep medicine: a commentary, *Journal of Clinical Sleep Medicine* (2024). DOI: 10.5664/jcsm.11132

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