WORLD PSYCHIATRIC ASSOCIATION

Section for Conflict Management and Conflict Resolution

World Psychiatric Association WPA Conflict Management and Conflict Resolution CMCR Section Leadership Council Webinar: Technology, Psychiatry and Mental Health

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Elected Member, World Psychiatric Association, WPA Conflict
Management and Conflict Resolution Section CMCR Leadership Council

29th January 2025 3-4pm CET Online

WORLD PSYCHIATRIC ASSOCIATION

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TECH DRIVEN VISION

New horizons to see
New horizons to be
Change is Wow
Change is Now
The Future is near
The Future is here
Novel Vistas towards the Find
Novel Vistas towards the Mind
A Journey towards Innovation
A Journey towards Determination
Serendipity shall find its way
Serendipity shall find You One Day
What you seek is seeking you
What you seek is near too
Explore the Universe for that role
Explore the Universe for that goal
You will succeed One Fine Day
You will succeed towards the Way

Dr. Darpan Kaur

Mumbai

BACKGROUND

- Technology has relevant scope and applications in Psychiatry and Mental Health

AIMS AND OBJECTIVES

- The aim is to enhance awareness on Technology, Psychiatry and Mental Health

AIMS AND OBJECTIVES

- To share insights on the scope of Technology across diagnosis, prognosis and treatment in Psychiatry and Mental Health

- To gain perspectives on the applications of Technology across medical education, training, clinical care, research and service development in Psychiatry and Mental Health

AIMS AND OBJECTIVES

- To develop understanding of innovative aspects of Technology and Neurosciences, Digital Psychiatry, Tele Mental Health, Digital Clinic, Digital Psychopharmacology, Digital Assessment, Digital Psychotherapy, Machine Learning, Artificial Intelligence, Natural Language Processing, Speech Technology, Pattern Recognition, Algorithmic Diagnosis, Affective Computing, Imaging Technology, Social Media Technology, Digital Phenotyping, Ecological Momentary Assessment and Precision Psychiatry

- To highlight advances in Technology and Psychiatry across NeuroPsychiatry, Child Psychiatry, Perinatal Psychiatry, Geriatric Psychiatry and Consultation Liaison Psychiatry

AIMS AND OBJECTIVES

- To discuss relevant Ethical and Regulatory Frameworks in Technology, Psychiatry and Mental Health

- To explore opportunities for Leadership, Innovation, Networking and Collaboration in Technology, Psychiatry and Mental Health

SCOPE OF TECHNOLOGY : DIAGNOSIS, PROGNOSIS AND TREATMENT IN PSYCHIATRY AND MENTAL HEALTH

- Data acquisition and processing, feature extraction and characterization, psychiatric disorder classification, potential biomarker detection, real-time monitoring, and interventions in psychiatric disorders

- Early detection, diagnosis, prognosis, and treatment of specific psychiatric disorders, including depression, schizophrenia, autism spectrum disorder, attention-deficit/hyperactivity disorder, addiction, sleep disorders, and Alzheimer's disease

Sun J, Dong QX, Wang SW, Zheng YB, Liu XX, Lu TS, Yuan K, Shi J, Hu B, Lu L, Han Y. Artificial intelligence in psychiatry research, diagnosis, and therapy. Asian J Psychiatr. 2023 Sep;87:103705

APPLICATIONS OF TECHNOLOGY : DIAGNOSIS, PROGNOSIS AND TREATMENT IN PSYCHIATRY AND MENTAL HEALTH

- Urgent need for AI to help identify high-risk individuals and provide interventions to prevent and treat mental illnesses

- Successful examples of AI's use with electronic health records, brain imaging, sensor-based monitoring systems, and social media platforms to predict, classify, or subgroup mental illnesses as well as suicidality

Lee EE, Torous J, De Choudhury M, Depp CA, Graham SA, Kim HC, Paulus MP, Krystal JH, Jeste DV. Artificial Intelligence for Mental Health Care: Clinical Applications, Barriers, Facilitators, and Artificial Wisdom. Biol Psychiatry Cogn Neurosci Neuroimaging. 2021 Sep;6(9):856-864.

APPLICATIONS OF TECHNOLOGY ACROSS MEDICAL EDUCATION

- Psychiatric trainees receive limited or no formal education on Digital Psychiatry

- Feasibility of implementing a digital psychiatry curriculum for residents in multiple levels of training and opportunity to increase learner confidence in the appraisal and clinical use of digital mental health apps through the use of a formal curriculum

Noori S, Khasnavis S, DeCroce-Movson E, Blay-Tofey M, Vitiello E. A Curriculum on Digital Psychiatry for a US-Based Psychiatry Residency Training Program: Pilot Implementation Study. JMIR Form Res. 2024 May 13;8:e41573. doi: 10.2196/41573.

APPLICATIONS OF TECHNOLOGY ACROSS CLINICAL CARE

- Digital health technologies offer the potential of accessible and scalable interventions that can augment traditional care

- Further efforts towards strengthening implementation addressing the key issues at the patient, provider and policy levels are needed

Torous J, Bucci S, Bell IH, Kessing LV, Faurholt-Jepsen M, Whelan P, Carvalho AF, Keshavan M, Linardon J, Firth J. The growing field of digital psychiatry: current evidence and the future of apps, social media, chatbots, and virtual reality. World Psychiatry. 2021 Oct;20(3):318-335.

INNOVATIONS AND DISRUPTIVE PSYCHIATRY

- Significant promise exists via the provision of potentially more effective innovative therapeutic digital interventions

- Further advanced by individualization of the treatments using computational technology (including quantum computing, machine learning, and artificial intelligence) and genomics

Sarris J. Disruptive innovation in psychiatry. Ann N Y Acad Sci. 2022 Jun;1512(1):5-9. doi: 10.1111/nyas.14764. Epub 2022 Mar 1.

APPLICATIONS OF TECHNOLOGY ACROSS SERVICE DEVELOPMENT

- Assist and improve current care

- Develop new treatment and advance scientific and medical knowledge

Stern E, Micoulaud Franchi JA, Dumas G, Moreira J, Mouchabac S, Maruani J, Philip P, Lejoyeux M, Geoffroy PA. How Can Digital Mental Health Enhance Psychiatry? Neuroscientist. 2023 Dec;29(6):681-693.

TECHNOLOGY AND NEUROSCIENCE

- Translating artificial intelligence techniques into the realm of cognitive neuroscience

- Holds promise for significant breakthroughs in our ability to probe the intrinsic mechanisms of the brain

Chen Z, Yadollahpour A. A new era in cognitive neuroscience: the tidal wave of artificial intelligence (AI). BMC Neurosci. 2024 May 6;25(1):23.

DIGITAL PSYCHIATRY

- Digital health technologies offer the potential of accessible and scalable interventions that can augment traditional care

- Challenges and opportunities towards real-world implementation

Torous J, Bucci S, Bell IH, Kessing LV, Faurholt-Jepsen M, Whelan P, Carvalho AF, Keshavan M, Linardon J, Firth J. The growing field of digital psychiatry: current evidence and the future of apps, social media, chatbots, and virtual reality. World Psychiatry. 2021 Oct;20(3):318-335.

TELE MENTAL HEALTH

- Comprehensive clinical guidelines from mental health organizations are available

- Focus on five content themes: legal and regulatory issues, clinical considerations, standard operating procedures and protocols, technical requirements, and considerations of specific populations and settings

Sugarman DE, Busch AB. Telemental health for clinical assessment and treatment. BMJ. 2023 Jan 16;380:e072398.

DIGITAL CLINIC

- Expanding emotional-awareness, symptom tracking, and medication management, provide real-clinical examples of remote mental health care to a diverse group of people

- Digital technologies, like smartphone apps, can diversify methods of clinical engagement, assist with collecting health metrics in a safe and ethical manner, and promote person centred care

Rauseo-Ricupero N, Henson P, Agate-Mays M, Torous J. Case studies from the digital clinic: integrating digital phenotyping and clinical practice into today's world. Int Rev Psychiatry. 2021 Jun;33(4):394-403.

DIGITAL ASSESSMENT

- Digital technologies have a vital role in the future of mental health care

- Need for a comprehensive appraisal of the current state and validity (ie, screening or diagnostic accuracy) of digital mental health assessments

Martin-Key NA, Spadaro B, Funnell E, Barker EJ, Schei TS, Tomasik J, Bahn S. The Current State and Validity of Digital Assessment Tools for Psychiatry: Systematic Review. JMIR Ment Health. 2022 Mar 30;9(3):e32824.

DIGITAL PSYCHOTHERAPY

- Patients in regional, rural and remote communities experience difficulties accessing mental health treatments in a timely manner

- Development of digital psychotherapy provides an opportunity to address this healthcare gap

Weightman M. Digital psychotherapy as an effective and timely treatment option for depression and anxiety disorders: Implications for rural and remote practice. J Int Med Res. 2020 Jun;48(6):300060520928686.

MACHINE LEARNING AND PRECISION PSYCHIATRY

- Even though Machine Learning and pharmacogenomics are not part of everyday clinical practice yet

- Will gain a unique role in the next future in improving personalized treatments in Precision Psychiatry

Del Casale A, Sarli G, Bargagna P, Polidori L, Alcibiade A, Zoppi T, Borro M, Gentile G, Zocchi C, Ferracuti S, Preissner R, Simmaco M, Pompili M. Machine Learning and Pharmacogenomics at the Time of Precision Psychiatry. Curr Neuropharmacol. 2023;21(12):2395-2408.

ARTIFICIAL INTELLIGENCE IN PSYCHIATRY

- Potential of AI to enhance our understanding of psychiatric conditions, improve patient care, and drive innovation in psychiatric research

- Need for robust ethical frameworks and stringent data protection measures to ensure the responsible and effective use of AI in Psychiatry

Briganti G. Artificial Intelligence in Psychiatry. Psychiatr Danub. 2023 Oct;35(Suppl 2):15-19.

- Offer multiple perspectives in mental health research

- Considered as tools to support clinical practice

Le Glaz A, Haralambous Y, Kim-Dufor DH, Lenca P, Billot R, Ryan TC, Marsh J, DeVylder J, Walter M, Berrouiguet S, Lemey C. Machine Le

SPEECH TECHNOLOGY IN NEUROPSYCHIATRY

- Possibility of Early and simple screening for patients with MCI using prosodic and acoustic features from everyday conversations with a humanoid robot

- Same level of accuracy as the MMSE

Yoshii K, Kimura D, Kosugi A, Shinkawa K, Takase T, Kobayashi M, Yamada Y, Nemoto M, Watanabe R, Ota M, Higashi S, Nemoto K, Arai T, Nishimura M. Screening of Mild Cognitive Impairment Through Conversations With Humanoid Robots: Exploratory Pilot Study. JMIR Form Res. 2023 Jan 13;7:e42792.

PATTERN RECOGNITION

- Machine-learning (ML) techniques and pattern recognition methods applied to Neuroimaging

- Characterize disease-related alterations in brain structure and function and identify phenotypes, for example, for translation into clinical and early diagnosis.

Steardo L Jr, Carbone EA, de Filippis R, Pisanu C, Segura-Garcia C, Squassina A, De Fazio P, Steardo L. Application of Support Vector Ma

IMAGING TECHNOLOGY

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- High temporal resolution imaging particularly magnetoencephalography often in conjunction with sophisticated machine learning decoding techniques

- Promise novel insights into the spatiotemporal dynamics of cognitive phenomena, including domains relevant to psychiatric illnesses such as reward and avoidance learning, memory, and planning

McFadyen J, Dolan RJ. Spatiotemporal Precision of Neuroimaging in Psychiatry. Biol Psychiatry. 2023 Apr 15;93(8):671-680. doi: 10.1016/j.biopsych.2022.08.016.

DIGITAL PHENOTYPING

- Digital phenotyping is based on the idea of collecting real-time markers of human behaviour in order to determine the 'digital signature of a pathology'.

- Assumption that behaviours are 'quantifiable' from data extracted and analysed through connected tools (smartphone, digital sensors and wearable devices) to deduce an 'e-semiology'

Mouchabac S, Conejero I, Lakhlifi C, Msellek I, Malandain L, Adrien V, Ferreri F, Millet B, Bonnot O, Bourla A, Maatoug R. Improving clinical decision-making in psychiatry: implementation of digital phenotyping could mitigate the influence of patient's and practitioner's individual cognitive biases. Dialogues Clin Neurosci. 2022 Jun 1;23(1):52-61.

ECOLOGICAL MOMENTARY ASSESSMENT

- Repeated sampling of an individual's symptoms within their natural environment

- Potential of usage in clinical settings and drug development, emphasizes importance for regulation of applications and provides insight into future directions

Yim SJ, Lui LMW, Lee Y, Rosenblat JD, Ragguett RM, Park C, Subramaniapillai M, Cao B, Zhou A, Rong C, Lin K, Ho RC, Coles AS, Majeed A, Wong ER, Phan L, Nasri F, McIntyre RS. The utility of smartphone-based, ecological momentary assessment for depressive symptoms. J Affect Disord. 2020 Sep 1;274:602-609.

TECHNOLOGY AND PRECISION PSYCHIATRY

- Precision psychiatry is an emerging field that aims to provide individualized approaches to mental health care and reduce uncertainty about prognosis and treatment response

- Multivariate analysis and machine learning are used to create outcome prediction models based on clinical data such as demographics, symptom assessments, genetic information, and brain imaging

van Dellen E. Precision psychiatry: predicting predictability. Psychol Med. 2024 Jun;54(8):1500-1509.

TECHNOLOGY AND NEURO PSYCHIATRY

- As neuropsychiatry evolves, it necessitates an integrative approach

- Recent advancements in neuroscience, propelled by technologies like artificial intelligence and advanced neuroimaging, reshape our comprehension of brain-behavior interactions, offering potential biomarkers and comprehensive treatment approaches

Medina-Rodríguez JC. Exploring Neuropsychiatry: Contemporary Challenges, Breakthroughs, and Philosophical Perspectives. Cureus. 2023 Nov 25;15(11):e49404.

TECHNOLOGY AND CHILD PSYCHIATRY

- Digital phenotyping provides opportunities to study child and adolescent psychiatry from a novel perspective

- Diverse ways in which objective data can augment naturalistic self-report methods in child and adolescent psychiatry to allow for more objective, ecologically valid, and temporally resolved conclusions

Nisenson M, Lin V, Gansner M. Digital Phenotyping in Child and Adolescent Psychiatry: A Perspective. Harv Rev Psychiatry. 2021 Nov-Dec 01;29(6):401-408.

TECHNOLOGY AND PERINATAL PSYCHIATRY

- Wearable technology, electronic consultation, virtual and augmented reality, internet-based cognitive behavioral therapy, and predictive analytics using machine learning to support Perinatal Mental Health

- Increased use of technology has the potential to address barriers in Perinatal Psychiatry by facilitating modes of communication, data collection, and patient experience

Novick AM, Kwitowski M, Dempsey J, Cooke DL, Dempsey AG. Technology-Based Approaches for Supporting Perinatal Mental Health. Curr Psychiatry Rep. 2022 Sep;24(9):419-429.

TECHNOLOGY AND GERIATRIC PSYCHIATRY

- Digital health technologies can potentially assist in reaching the full capacity of comprehensive geriatric assessments

- Improve Communication on patients' medical and treatment plan information and health decision-making

Molinari-Ulate M, Mahmoudi A, Parra-Vidales E, Muñoz-Sánchez JL, Franco-Martín MA, van der Roest HG. Digital health technologies supporting the application of comprehensive geriatric assessments in long-term care settings or community care: A systematic review. Digit Health. 2023 Jul 28;9:20552076231191008.

TECHNOLOGY AND CONSULTATION LIAISON PSYCHIATRY

- A range of psychiatric conditions commonly encountered by consultation-liaison services were diagnosed and treated through the teleconferencing modality

- Feasibility of a centralized telepsychiatry hub to improve delivery of psychiatry consultation within a multihospital system with an overall reduction in patient wait time

Shayevitz C, Breitinger S, Lerario MP, Mroczkowski M, Osuji M, Fleischut P, Khan M, Murray J, Wilner P, Sombrotto L. Implementation of a Centralized Telepsychiatry Consult Service in a Multi-Hospital Metropolitan Health Care System: Challenges and Opportunities. J Acad Consult Liaison Psychiatry. 2021 Mar-Apr;62(2):193-200.

ETHICAL AND REGULATORY FRAMEWORKS IN TECHNOLOGY, PSYCHIATRY AND MENTAL HEALTH

- Establishing binding ethical guidelines and legal regulations, assist stakeholders in formulating effective strategies and methodologies to navigate the complex landscape

- Ensuring adherence to the highest ethical standards and promoting patient welfare, integrate the benefits of telemedicine with proactive measures to address emerging ethical challenges grounded in a well-prepared and respected ethical framework

Jedličková A. Ethical dimensions in telemedicine - balancing technology, responsible care, and patient protection. Cas Lek Cesk. 2024;16

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- Leadership: Take the Lead

- Innovation: Think Novel Think Original

- Networking: We are in it Together

- Collaboration: Together We Can

THANK YOU