



ABSTRACTS: VOLUME 3, SPECIAL ISSUE

ABSTRACT

Quantifiable Structured Clinical Diagnosis for Psychiatry: An Integration of Machine Learning and Cloud Computing Approaches to Achieve Scalability

Laith Azzam Ayasa¹, Matthew Toegel¹, Joman Y. Natsheh^{1,2}, Mohmmad M. Herzallah^{1,3}.

¹ *Palestinian Neuroscience Initiative, Al-Quds University, Jerusalem, Palestine*

² *Children's Specialized Hospital, Mountainside, NJ, USA*

³ *Center for Molecular and Behavioral Neuroscience, Rutgers University, Newark, NJ, USA*

Published in May 2022

Background: Current diagnostic systems for psychiatric disorders suffer many limitations that hinder their applicability. The diagnosis of psychiatric disorders is exclusively conducted by clinicians using lengthy interviews that lack sensitivity and specificity. According to recent clinical trials, only a fraction of patients with psychiatric disorders respond to initial treatment with psychometric medications or psychotherapy. Unfortunately, clinicians cannot predict, a priori, who will or will not respond to treatment. If, however, a simple computer-based system utilizing multidimensional symptom expression could diagnose patients with psychiatric disorders and differentiate those who are, or are not, likely to respond to treatment, this would provide immediate clinical relevance.

Objectives: We are building a brief (~20 minutes) online structured clinical interview which will assess the severity, frequency, and morbidity of mental health symptoms and swiftly reproduce the diagnostic outputs according to the DSM/ICD.



Methods: We utilize the basic structure mini-international neuropsychiatric interview (MINI) as the reference for the online system. Based on data collected from hundreds of participants at the Palestinian Neuroscience Initiative, using machine learning, we managed to significantly reduce the number of screening questions necessary to complete the MINI profile.

Results: We created a cloud-based capacity to present questions of clinical interviews with different dependencies. Questions have a label (for searching), tags (for searching), a status, and answer groups. Answer Groups allow composite responses to the question via radio buttons and/or sliders. Answer Groups can have internal dependencies to the same question or external dependencies to other questions. Researchers and administrators can create modules from a group of questions. Modules have a label and tags for searching and a status for visibility rules.

Conclusion: Our system represents a significant step toward digitizing basic mental health services in Palestine to reduce stigma and increase access.

Research Keywords: Psychiatry diagnostics, DSM, ICD, the mini-international neuropsychiatric interview, machine learning, cloud-computing, databasing.