

COGNITIVE SUBTYPING IN SCHIZOPHRENIA: AN ANALYSIS OF NEUROPSYCHOLOGICAL PROFILES, CLINICAL SYMPTOMATOLOGY, AND THE IMPACT OF ILLNESS DURATION USING THE COBRE DATASET**Melike Nur Altunç¹, Ali Tarık Altunç², Yusuf Çiçek³, Abdullah Ekrem Okur⁴, Halil Aziz Velioglu⁵**¹*Bakırköy Prof. Dr. Mazhar Osman Mental Health and Neurological Diseases Training and Research Hospital, Istanbul, Türkiye*²*Council of Forensic Medicine, Istanbul, Türkiye*³*Istanbul University-Cerrahpasa Cerrahpasa Faculty of Medicine, Psychiatry Department, Istanbul, Türkiye*⁴*Free Computer Engineer, Istanbul, Türkiye*⁵*Feinstein Institutes for Medical Research - Psychiatric Neuro Center, New York, USA; Istanbul Medipol University, Istanbul, Türkiye*

BACKGROUND AND AIM: Cognitive impairment, a hallmark feature of schizophrenia, is known to exhibit significant heterogeneity among patients. Classification studies often reveal three primary clusters based on deficit severity. This study aimed to categorize patients with schizophrenia using the COBRE dataset, examining the relationship between cognitive clusters, sociodemographic variables, and clinical findings.

METHODS: (Ethics Committee Approval must be obtained and the number should be specified). Data from 68 patients with schizophrenia and 67 healthy controls were analyzed. Cognitive categories were established via K-means clustering based on seven MATRICS domains. Groups were compared using independent samples t-tests and one-way ANOVA. Pearson correlation assessed the relationship between clinical parameters and the MATRICS overall composite score. Data processing and statistical analyses were facilitated by Python libraries and the Antigraity software. The COBRE dataset is a publicly accessible repository released under a Creative Commons Attribution-Non-Commercial license; written informed consent was obtained from all participants in compliance with the University of New Mexico (UNM) Institutional Review Board (IRB) protocols.

RESULTS: Three distinct cognitive clusters emerged: Relatively Preserved (n=23), Moderately Impaired (n=22), and Severely Impaired (n=19). No statistically significant differences were found between groups regarding age, gender, education, PANSS total scores, illness duration, or antipsychotic medication dosage. However, the Severely Impaired group exhibited significantly higher scores on PANSS “Disorientation” (p=0.021) and “Lack of Judgment and Insight” (p=0.043). While the Severely Impaired group showed a 4.6-point IQ decrease compared to estimated premorbid levels, no significant decline was detected in other groups. A very strong positive correlation was identified between age of onset and overall cognitive performance (r=0.77, p<0.001).

CONCLUSIONS: These findings indicate that cognitive impairment in schizophrenia does not depend on illness chronicity, aligning with existing literature that deficits emerge early and stabilize over time. Additionally, the ‘Severely Impaired’ cluster appears to follow a unique trajectory defined by an earlier onset of illness, impaired insight, and severe neurocognitive deficits.

Keywords: Cognitive impairment, k-means clustering, schizophrenia,