Miya Estis 343478575

Carmel Mandelblit 212373096

Analysis of Demographic Factors in Schizophrenia Using EEG Data

Abstract

Schizophrenia is a complex neuropsychiatric disorder with cognitive and sensory processing deficits. The present study examines a dataset derived from EEG recordings during a basic sensory task in individuals with schizophrenia and a control group. The dataset includes 81 participants, 32 controls, and 49 individuals diagnosed with schizophrenia. The objective of this study is to analyze potential correlations between demographic factors—specifically, years of education and age—with schizophrenia status.

Introduction

Understanding the demographic differences between schizophrenia patients and healthy individuals can provide insights into disease manifestation and cognitive function. This study investigates whether educational attainment and age correlate with the presence of schizophrenia.

Methods

The dataset was obtained from an open-source repository (https://www.kaggle.com/datasets/broach/button-tone-sz/data?select=demographic.csv) and included structured demographic data such as gender, age, and years of education. The data were analyzed using Python and statistical visualization techniques.

Results

1. Education Level Distribution

- A bar plot was generated to illustrate the overall distribution of years of education among all participants.

- A second plot focused exclusively on participants diagnosed with schizophrenia.

- A third plot analyzed education levels in the control group.

- Results demonstrated no significant correlation between years of education and schizophrenia status. In fact, contrary to our initial hypothesis, individuals with schizophrenia had slightly higher education levels on average than the control group.

2. Age Distribution Analysis

- A boxplot was created to examine the age distribution across both groups.

- The interquartile range (middle 50% of data) was analyzed to assess variations in age between schizophrenia patients and controls.

- The correlation coefficient between age and schizophrenia status was computed, revealing a weak correlation, suggesting that age is not a significant predictor of the disorder.

Discussion

Our initial hypothesis suggested a negative correlation between education level and schizophrenia. However, the analysis disproved this assumption, as individuals with schizophrenia showed a comparable or slightly higher level of education than controls. Furthermore, the weak correlation between age and schizophrenia status suggests that demographic factors alone may not be strong indicators of disease presence.

Conclusion

The findings suggest that neither years of education nor age are significant predictors of schizophrenia. Future studies should consider integrating additional cognitive, genetic, and neurophysiological factors to enhance our understanding of demographic influences on schizophrenia.

References

- Broach et al., Button-Tone EEG Dataset, Kaggle. Retrieved from: https://www.kaggle.com/datasets/broach/button-tone-sz/data?select=demographic.csv