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**Final Report:**

**Prevalence of Gender in Mental Disorder**

**Problem Statement**

In an era where mental health awareness is paramount, this project seeks to explore and address global mental health disparities through a gender-based lens. By analyzing a comprehensive dataset from 2019, the project aims to uncover variations in the prevalence of mental health disorders, with a focus on eating disorders and bipolar disorder. The dataset includes population estimates for each country or region, providing a holistic view of mental health on a global scale.

In the next 8 months, this project will utilize a 2019 dataset to quantitatively analyze gender-based mental health disparities globally, focusing on eating disorders and bipolar disorder. By applying statistical methods, the project aims to provide measurable insights into prevalence rates, regional variations, and access to mental health care resources, with the goal of proposing actionable strategies for improvement.

**Data Wrangling**

The dataset on the prevalence of gender-specific mental disorders comprised five distinct tables, each detailing country-specific data on anxiety disorder, bipolar disorder, depression, eating disorder, and schizophrenia. These tables contained information on country names, codes, years of observation, gender distribution, and population estimates for each respective mental disorder.

During preprocessing, I eliminated all entries with missing values and standardized the entity column as "country" across all tables. Additionally, I opted to exclude the "code" column from the dataset to streamline the analysis process and focus solely on relevant variables related to mental disorder prevalence across different countries.

**EDA**

This marks the exploratory data analysis (EDA) stage of my capstone project, where I embark on a detailed examination of a dataset brimming with invaluable information regarding the prevalence of mental health disorders worldwide. This dataset encapsulates insightful data sourced from countries across the globe, providing a holistic perspective on various disorders including schizophrenia, bipolar disorder, eating disorders, anxiety disorders, drug use disorders, depression, and alcohol use disorders.

Our objective in this analysis is to present this rich dataset in a visually accessible format, facilitating a profound comprehension of the profound impacts these disorders have on individuals and communities alike.

A blue and orange pie chart

Description automatically generated

Initially, I opt to investigate global gender-based disparities in mental health, focusing particularly on eating disorders and bipolar disorders. To visually represent the prevalence rates of these disorders across genders, I experiment with both bar and pie charts. Upon comparison, the pie chart offers a clearer and more concise depiction of the data.

The pie chart highlights notable variations in prevalence rates of eating disorders and bipolar disorder among different genders across various countries and regions. It is evident that both disorders exhibit differing prevalence rates between males and females. Specifically, in the case of eating disorders, approximately 69.1% are observed in women, while 30% are reported in men. Conversely, the prevalence of bipolar disorder displays a closer distribution, with women accounting for 52.5% and men for 47.5% of cases.

A comparison of a graph

Description automatically generated with medium confidence

The juxtaposed box plots, comparing prevalence rate distributions between genders for each disorder, serve as indicators of potential gender-based disparities in mental health care. Recognizing and comprehending these disparities are imperative steps toward formulating targeted interventions and policies aimed at ensuring equitable access to mental health services for individuals of all genders. However, drawing definitive conclusions from this graph is challenging due to the absence of comprehensive background information on mental health care across various countries.

This analysis underscores the pressing need for further investigation into the underlying factors contributing to gender-based mental health disparities on a global scale. Moreover, it emphasizes the necessity for evidence-based interventions and policies geared towards enhancing mental health care accessibility, mitigating stigma, and addressing socio-economic determinants that influence mental well-being.

In essence, addressing gender-based mental health disparities demand a comprehensive approach that takes into account regional disparities, access to care, socio-economic considerations, and gender-specific requirements. Effective strategies to promote mental health equity globally necessitate collaboration among diverse stakeholders, including governments, healthcare entities, advocacy organizations, and communities, to develop and implement holistic interventions that cater to the diverse needs of individuals worldwide.

**Conclusions and Future Research**

After conducting thorough experimentation with various modeling techniques, I determined that logistic regression and Support Vector Machines (SVM) are the most suitable options for my analysis. Several other models I assessed did not align well with the structure of my dataset.

Logistic regression emerges as a valuable tool for predicting the likelihood of individuals experiencing eating disorders or bipolar disorder, with a primary emphasis on gender as a significant predictor. It allows for the quantification of the relationship between predictor variables and the probability of mental health disorder occurrence. To enhance the clarity of the analysis, I removed columns pertaining to country, code, or year, as they are extraneous to the problem statement.

The results reveal that bipolar disorder prevalence tends to be lower among males compared to females. However, there remains a notable presence of high-prevalence cases among individuals of all genders. This finding, when combined with previously gathered information, underscores a global trend of higher prevalence among women.

Conversely, SVM demonstrates proficiency in effectively categorizing individuals based on their susceptibility to mental health disorders. Its ability to manage nonlinear relationships between predictors and the target variable enables more precise discrimination between gender groups, thereby aiding in the identification of any existing disparities.

A blue and white graph

Description automatically generated

Logistic Regression

A diagram of a confused matrix

Description automatically generated with medium confidenceSupport Vector Machine (SVM)

A graph with numbers and a blue square

Description automatically generatedA graph of a number of labels

Description automatically generated with medium confidenceThe results for eating disorders were quite like the one for bipolar disorder.

Logistic Regression Support Vector Machines (SVM)

For future research, I propose that this study would yield more insightful findings if it were segmented into individual country-based analyses. While both eating disorders and bipolar disorders are observed in women, the prevalence and manifestation of these disorders can significantly vary based on cultural influences, socioeconomic status, and access to mental health resources. Therefore, conducting separate investigations for each country could provide a more nuanced understanding of these conditions.

Initiatives aimed at addressing mental health issues, particularly targeting women, should be prioritized globally. This includes increasing accessibility to mental health services and fostering open dialogue about mental health issues. Additionally, there is a pressing need for the establishment of more youth-oriented clinics and the incorporation of mental health education into school curricula to promote early intervention and awareness.

Furthermore, to enhance future research endeavors and refine intervention strategies, it is imperative for each country to conduct studies tailored to its specific societal context. Cultural norms and stigmas surrounding mental health can profoundly influence perceptions and attitudes, particularly among men. By conducting localized studies, countries can better understand and address the unique challenges and barriers to mental health care within their respective populations.