Exploratory Data Analysis

Mental Health

Anxiety Levels: Percentage Distribution

Severe 6%
Moderate 16%
Minimal 38%
Mild 40%
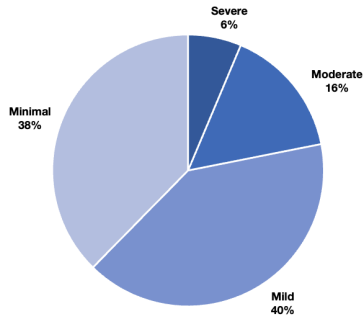
Depression Levels: Percentage Distribution

Severe 4%
Moderately Severe 3%
Moderate 4%
Mild 29%
Minimal 60%
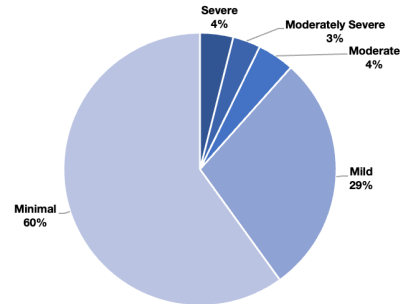
- The pie charts illustrate the distribution of **anxiety and depression levels** among the surveyed population of widows. The anxiety chart reveals that a significant proportion **(approximately 62%) experience moderate to severe anxiety**, while a smaller percentage **(around 38%) report minimal anxiety.**

- The depression chart shows that **60% reported minimal depression**, which may also indicate an **underestimation of depressive symptoms**.

Suicidal Thoughts Level Distribution

|	Number of Widows
Nearly every day	12
Several days	17
More than half the days	3
Not at all	425
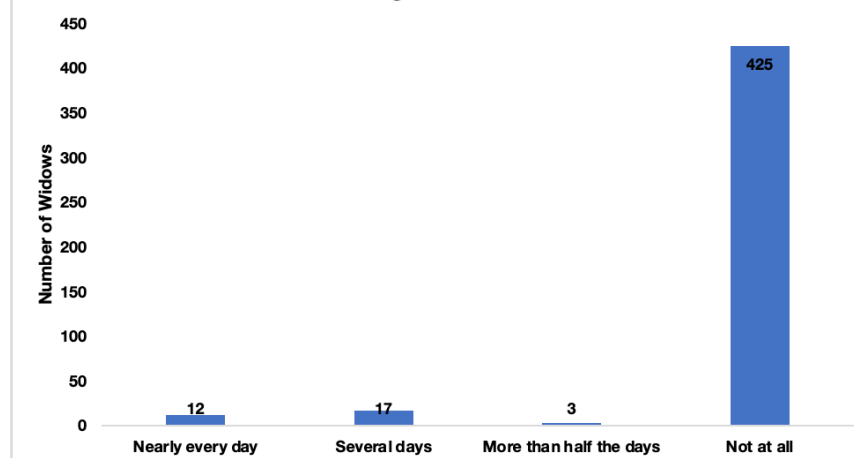
- The bar chart on Suicidal Thoughts Level Distribution shows that most of the surveyed population **(425 individuals) reported "Not at all"** when asked about the **frequency of suicidal thoughts.**

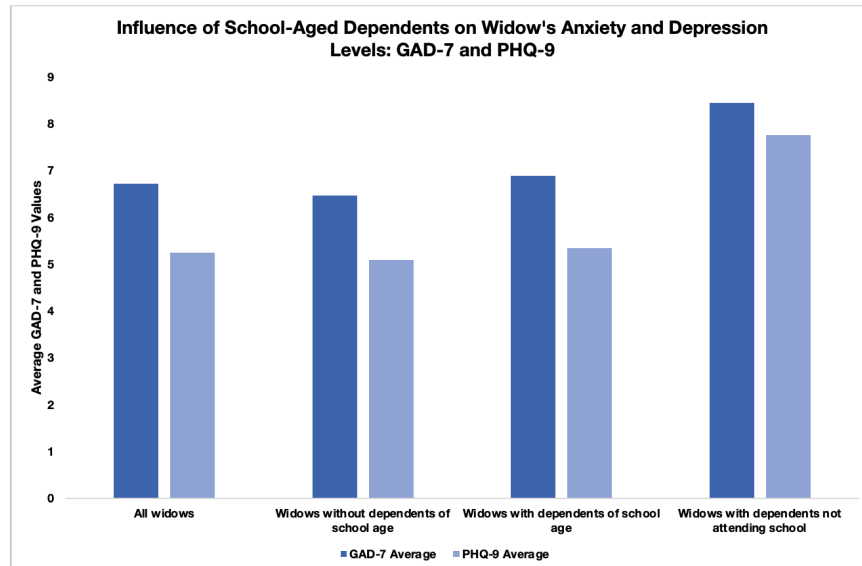**Relation Between Anxiety and Depression Scores**
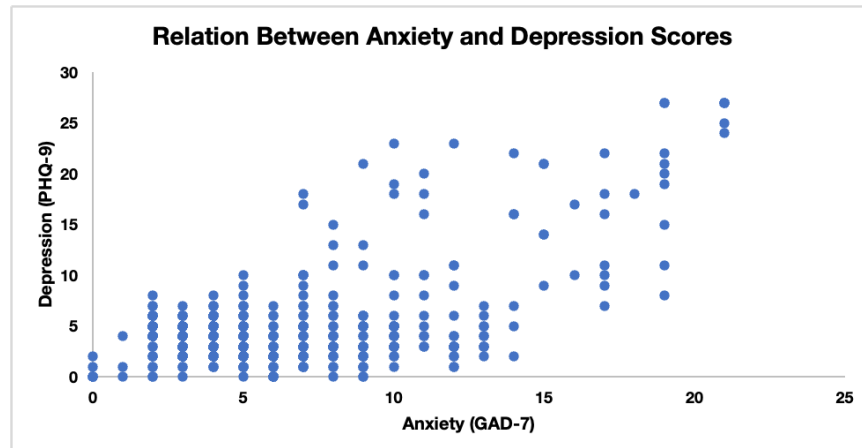
- This scatter plot illustrates the **relationship between PHQ-9 scores (indicating depression severity) and GAD-7 scores (indicating anxiety severity)** in a population.

- The data points show a general trend of **increasing PHQ-9 scores (depression) as GAD-7 scores (anxiety) increase**. This suggests a **moderate positive correlation (0.61)** between anxiety and depression levels in this population, indicating that individuals with **higher anxiety levels** also tend to have **higher levels of depression**.

Number of Dependents and Anxiety/Depression Levels

Number of Dependents (Average) by Anxiety Level
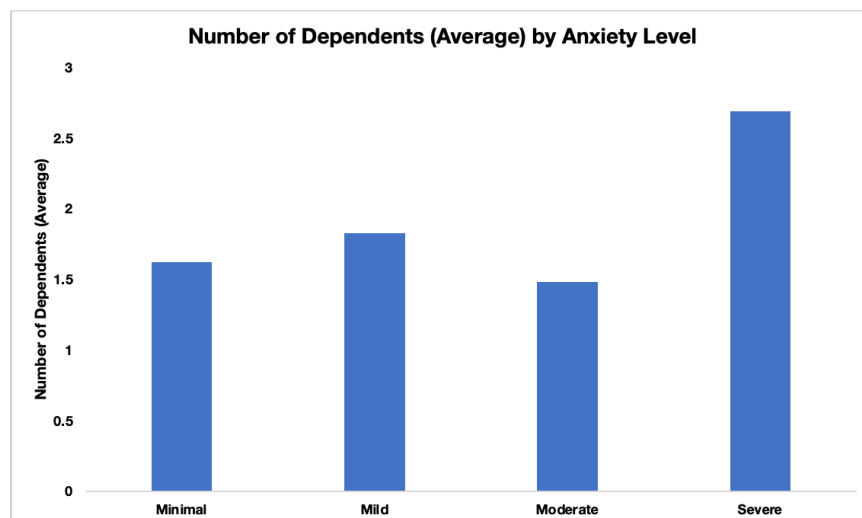
- The bar chart illustrates a **potential relationship between anxiety levels and the average number of dependents.** The chart shows that as the **level of anxiety increases, so does the average number of dependents.**

- This suggests that individuals experiencing **higher levels of anxiety** may be more likely to have a **greater number of people relying on them for support**. This could be due to various factors such as family responsibilities, caregiving roles, or financial obligations.

Influence of School-Aged Dependents on Widow's Anxiety and Depression Levels: GAD-7 and PHQ-9
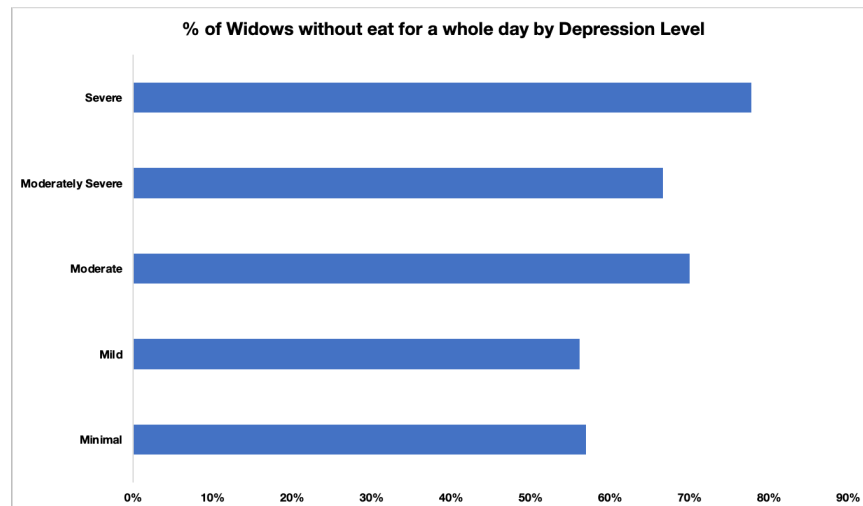
Average GAD-7 and PHQ-9 Values

(Categories: All widows; Widows without dependents of school age; Widows with dependents of school age; Widows with dependents not attending school)

■ GAD-7 Average   ■ PHQ-9 Average

- **Widows with school-aged dependents have significantly higher average GAD-7 and PHQ-9 scores**, indicating increased anxiety and depression **compared to widows without school-aged dependents.**

- **Widows with dependents not attending school exhibit the highest levels of anxiety and depression**, suggesting additional stressors associated with caring for dependents outside of a structured school environment.

Violence and Anxiety

Percentage of Widows Experiencing Violence Across Different Anxiety Levels
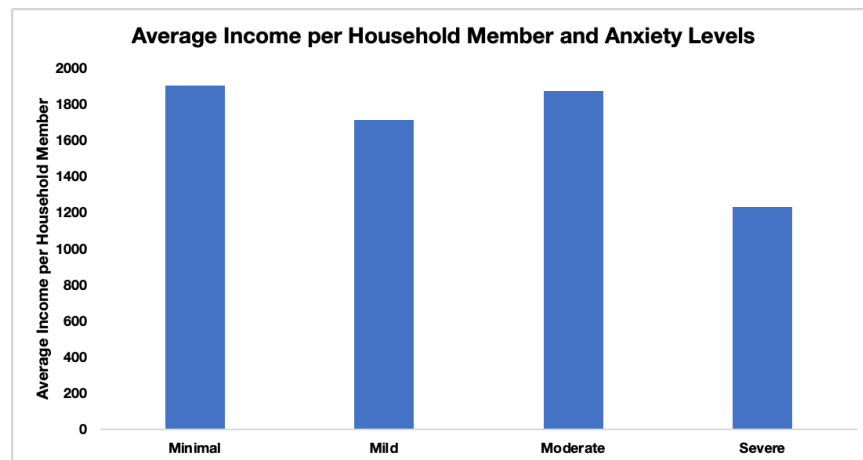
(Categories: Minimal; Mild; Moderate; Severe)
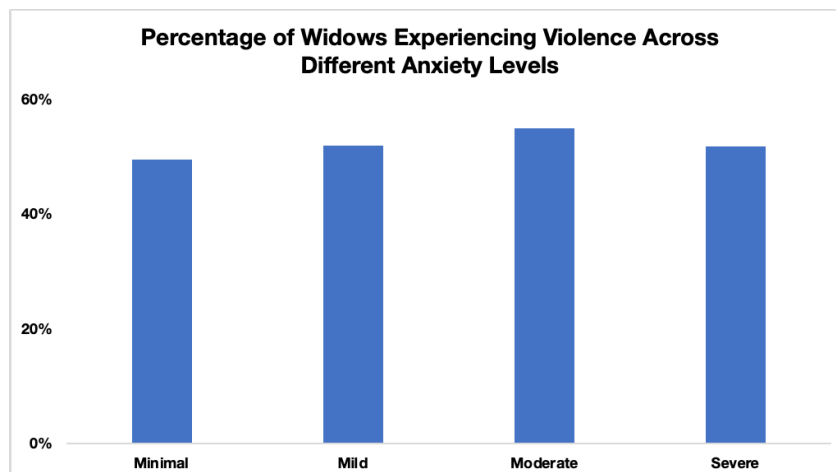
- The bar chart initially **appears to show an increasing trend in the percentage of violence in widows from Minimal to Moderate anxiety levels**. However, **this trend does not continue with Severe anxiety,** suggesting that the **relationship between anxiety level and violence experience is not linear.**

- This unexpected pattern could be due to several factors. For example, **severe anxiety might lead to increased isolation and reduced social interaction**, potentially limiting exposure to situations of violence.

- Approximately **51% of the widows reported experiencing violence** related to widowhood.

Nutrition and Depression

% of Widows without eat for a whole day by Depression Level

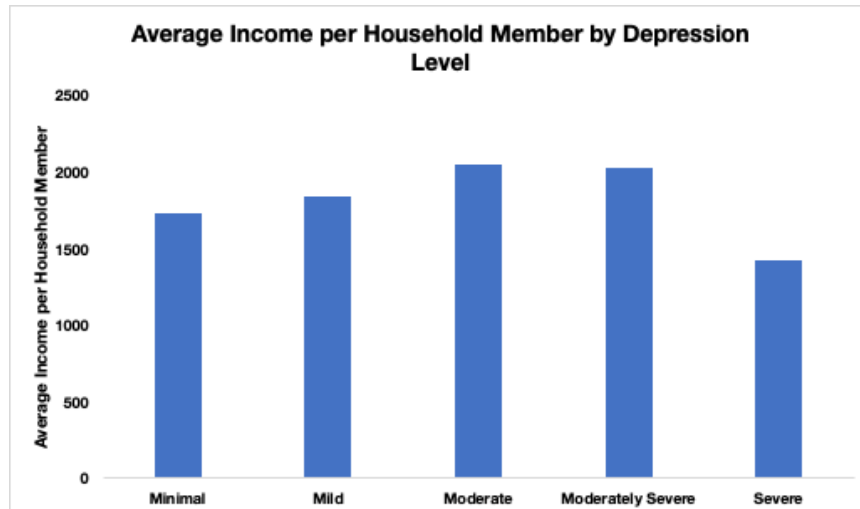| Depression Level	
Severe	(bar ≈ 78%)
Moderately Severe	(bar ≈ 67%)
Moderate	(bar ≈ 70%)
Mild	(bar ≈ 56%)
Minimal	(bar ≈ 57%)

(x-axis: 0% 10% 20% 30% 40% 50% 60% 70% 80% 90%)

- The chart shows a **clear trend where the percentage of widows going without food for a whole day increases as the severity of depression increases.** This suggests a **strong association between the severity of depressive symptoms and the likelihood of experiencing food insecurity.**

- The percentage of **widows experiencing a full day without food is significantly higher in the "Severe Depression"** group compared to the "Minimal Depression" group, highlighting the **potential impact of severe depressive symptoms on basic needs** like food access.

Income and Anxiety/Depression Levels

Average Income per Household Member and Anxiety Levels

(y-axis: Average Income per Household Member, 0 to 2000)

Anxiety Level	Average Income
Minimal	≈ 1900
Mild	≈ 1700
Moderate	≈ 1870
Severe	≈ 1230

- The chart suggests a **potential relationship between anxiety levels and average income per household member**. Individuals with **minimal and moderate anxiety levels appear to have higher average incomes** per household member **compared to those with mild and severe anxiety**.

- The **"Average Income per Household Member"** in this chart was calculated by **dividing the total household income by the number of dependents plus the widow herself**.

Average Income per Household Member by Depression Level

- The chart indicates a **potential negative relationship between depression levels and average income per household member**. Individuals with **severe depression tend to have lower average incomes** compared to other levels of depression.

Income per Household Member and Depression (PHQ-9)
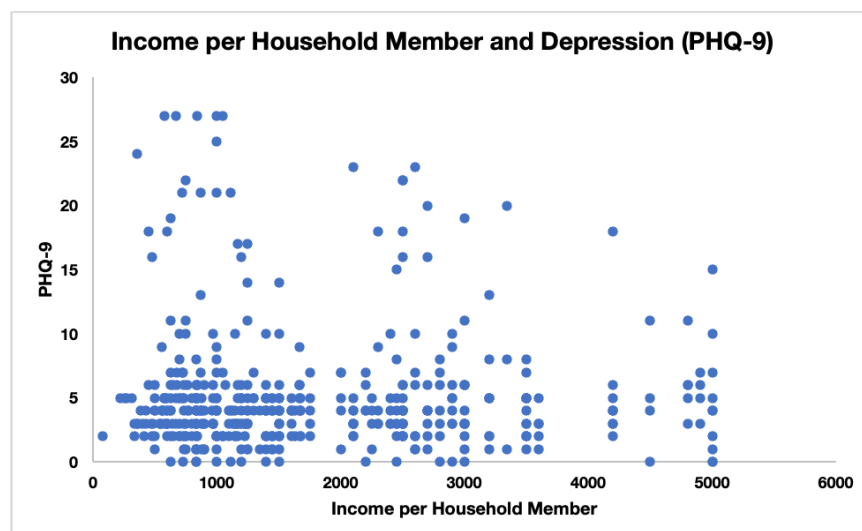
- There is **no significant overall correlation between income per household member and PHQ-9 scores.**

- However, the **correlation becomes stronger (-0.28 for moderate to severe depression and -0.41 for severe depression)** when the analysis is restricted to widows with **moderate to severe depression and severe depression**, suggesting a **moderate negative correlation between low income and higher depression** severity within this subgroup.

Conclusions

- The analysis of the mental health and socio-economic factors affecting widows highlights critical relationships and insights. **Anxiety and depression levels** exhibit a **moderate positive correlation (0.61)**, suggesting that individuals with high anxiety are also more likely to experience depression. **Socio-economic stressors**, such as food insecurity and the number of dependents, **strongly influence mental health outcomes**. For example, **widows with severe depression**

report significantly higher instances of going without food for an entire day, and those with **severe anxiety tend to support a greater number of dependents**.

- An important discovery is the **relationship between income per household member and PHQ-9 scores**, particularly among **widows with moderate to severe depression**. While no significant overall correlation exists, a **stronger negative correlation (-0.28 to -0.41)** emerges within this subgroup. This finding indicates that **lower income per household member is moderately associated with higher depression severity**, emphasizing the **compounded effects of financial stress on mental health.**

- The analysis suggests that **correlations between socio-economic factors and mental health outcomes become stronger at higher levels of anxiety and depression.** This trend highlights the escalating **impact of financial and social stressors as mental health challenges intensify**, further underscoring the **importance of targeted, multi-faceted interventions**.

- **Widows with school-aged dependents** exhibit significantly **elevated GAD-7 and PHQ-9 scores**, indicating **higher levels of anxiety and depression compared to widows without such dependents**. This disparity is **particularly pronounced for widows with dependents not attending school**, suggesting that the **absence of a structured school environment may add further strain and contribute to increased mental health challenges.**