Bias Detection Report

Detection and Analysis Summary:

1. Bias Type: Distribution

2. Relevant Feature(s): Education Level

3. Bias Level: Significant bias detected in education level distribution.

Detailed Findings:

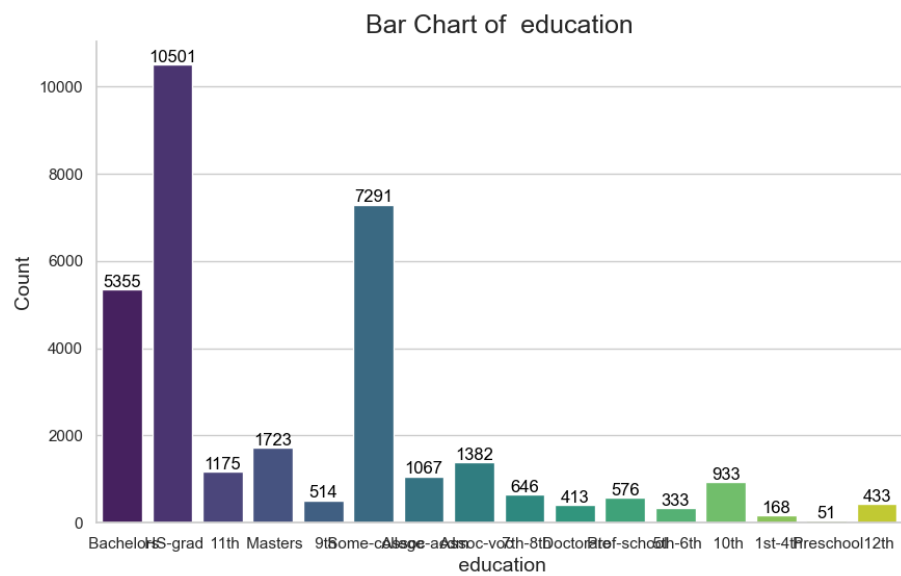- **Shannon Entropy & Balance Metric**:

  - Shannon Entropy: 2.931

  - Balance Metric: 0.733

  - The balance metric indicates a moderate bias, as it falls within the range of Level 3 bias.

- **Max/Min Ratio**:

  - Max/Min Ratio: 205.902

  - This high ratio suggests extreme bias, indicating certain education levels dominate the dataset.

- **Gini Index**:

  - Adjusted Gini Index: 0.864

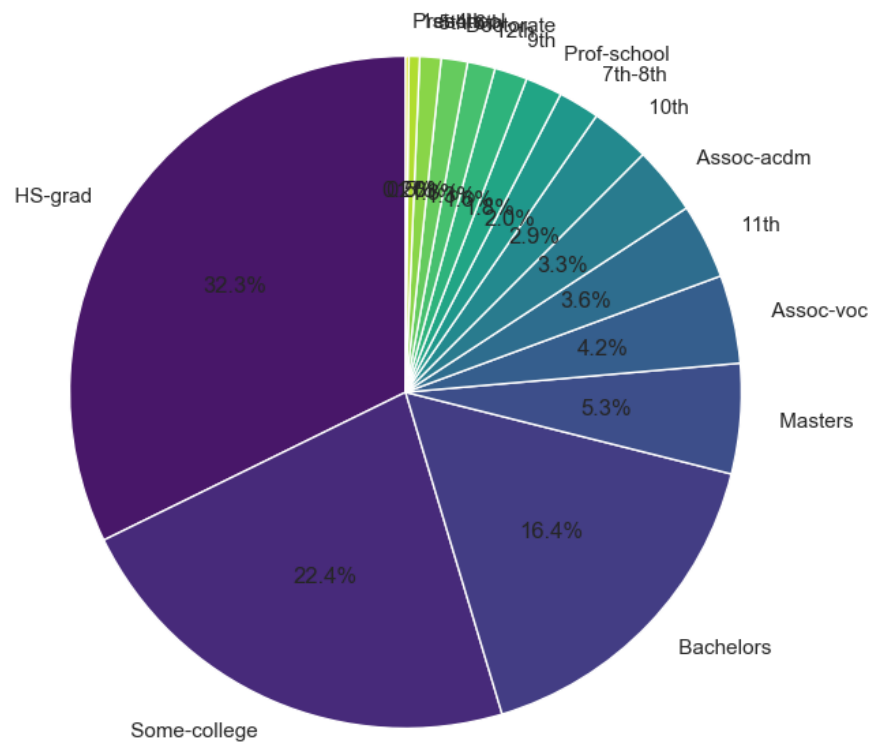 - The Gini Index suggests minimal bias in terms of inequality.

- **Relative Risk**:

  - Normalized Bias Score: 205.902

  - This score indicates extreme bias, consistent with max/min ratio findings.

Visualizations:

- Bar Chart and Pie Chart illustrating the distribution of education levels are provided.

Bar Chart of education

Pie Chart of education

Recommendations:

- The education levels in this dataset display significant bias. The results from multiple tools indicate that the bias is more prominent. For instance, the max/min ratio measured 205.902, balance metric was 0.733, and the adjusted Gini Index was 0.864. This level of bias could impact the accuracy of your analysis in certain contexts. I would advise a cautious assessment of the potential effects before using this dataset.

Conclusion:

While the dataset is usable, you may need to address the significant bias in education levels for precise analyses, particularly if your applications are sensitive to distribution imbalances. Adjustments or additional data collection may be necessary to mitigate this bias.