Technical Report

Food Insecurity, Resilience, Stress Mindset, and Psychological Distress

Prepared by

Mohammad ali othman

Mahde hanandeh

Jad awadallah

Course Name

DATA VISUALIZATION AND EXPLORATION

University Name

jordan university of science and technology

Abstract

Food insecurity has emerged as a critical public health issue with significant implications for mental health and psychological well-being. This technical report examines the relationship between food insecurity, psychological distress, resilience, and stress mindset using cross-sectional survey data. A structured preprocessing pipeline was applied, including data cleaning, handling missing values, encoding survey responses, and constructing validated psychological scales. Food insecurity was assessed using the Food Insecurity Experience Scale (FIES), while psychological distress was measured using a six-item version of the Kessler scale (K6). Due to non-normal data distributions, non-parametric statistical methods were employed. The results indicate that higher levels of food insecurity are associated with increased psychological distress, while resilience and a positive stress mindset demonstrate protective effects. These findings emphasize the importance of psychosocial factors in mitigating the mental health consequences of food insecurity.

Introduction

Food insecurity extends beyond inadequate access to food and is increasingly associated with adverse psychological outcomes, including stress, anxiety, and emotional distress. Individuals experiencing food insecurity often face chronic uncertainty, which can negatively impact mental well-being and overall quality of life. Understanding the psychological correlates of food insecurity is therefore essential for informing public health strategies and targeted interventions.

This technical report presents the analytical framework used to investigate the association between food insecurity and psychological distress, while considering the roles of resilience and stress mindset. The report focuses on outlining the methodological approach, statistical procedures, and key analytical findings in alignment with the objectives defined in the Terms of Reference.

Methodology

A cross-sectional survey design was employed to collect self-reported data on demographic characteristics, dietary habits, food insecurity, resilience, stress mindset, and psychological distress. Data preprocessing included standardizing variable names, removing irrelevant fields, handling missing values through imputation strategies, and encoding categorical responses into numerical formats suitable for analysis.

Food insecurity was measured using the eight-item Food Insecurity Experience Scale (FIES). Resilience was assessed using a six-item scale with reverse-coded items, while stress mindset was measured using an eight-item Stress Mindset Measure. Psychological distress was measured using a six-item version of the Kessler Psychological Distress Scale (K6).

Normality of scale scores was assessed using the Shapiro–Wilk test. Due to non-normal distributions, non-parametric statistical methods were applied, including Spearman correlation for association analysis, Mann–Whitney U test for gender-based comparisons, and Kruskal–Wallis test for regional comparisons. All analyses were conducted using Python.

Table 1: Summary of Measurement Scales Used in the Analysis

Scale	**Number of Items**	**Score Range**
Food Insecurity Experience Scale (FIES)	8	0–8
Resilience Scale	6	6–30
Stress Mindset Measure (SMM)	8	0–32
Kessler Psychological Distress Scale (K6)	6	6–30

Results

The analysis revealed a significant positive association between food insecurity and psychological distress, indicating that individuals with higher food insecurity scores tended to report greater levels of distress. In contrast, resilience demonstrated a significant negative association with psychological distress, suggesting a protective effect. Similarly, a more positive stress mindset was associated with lower psychological distress scores.

Gender-based analysis identified differences in psychological distress levels between male and female participants. Additionally, regional analysis revealed variability in food insecurity levels across regions, suggesting that food insecurity may be influenced by geographic and contextual factors. These findings directly address the analytical objectives outlined in the Terms of Reference.

Appendix

Distribution of Psychological Distress Scores (K6)

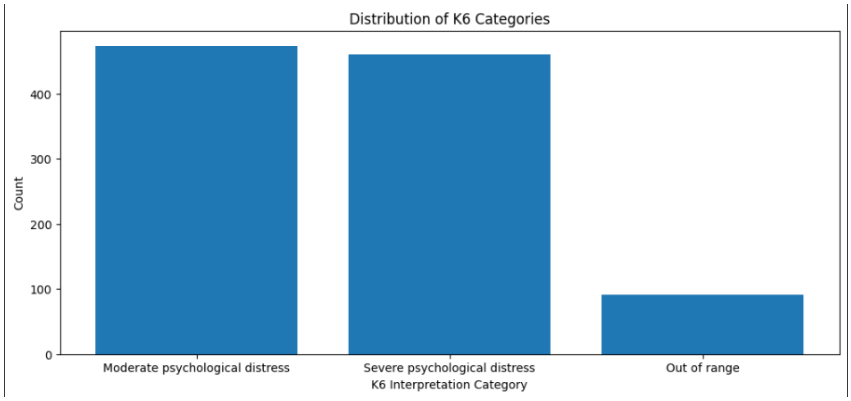

Figure 1: Distribution of K6 psychological distress scores among participants.

Psychological Distress by Gender

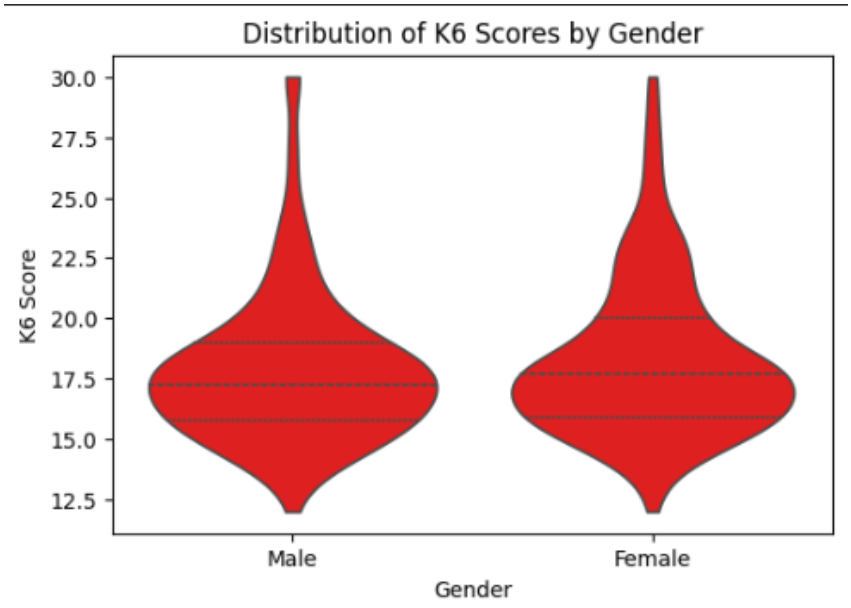

Figure 2: Boxplot showing differences in K6 scores between male and female participants.

Food Insecurity and Psychological Distress

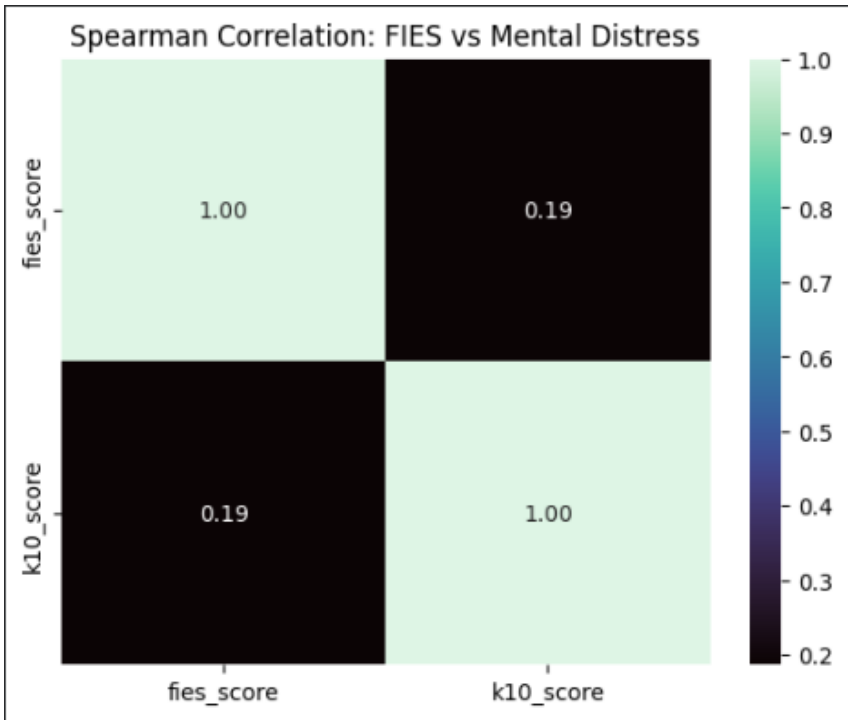

Figure 3: Association between food insecurity scores and psychological distress (K6).

Food Insecurity Across Regions

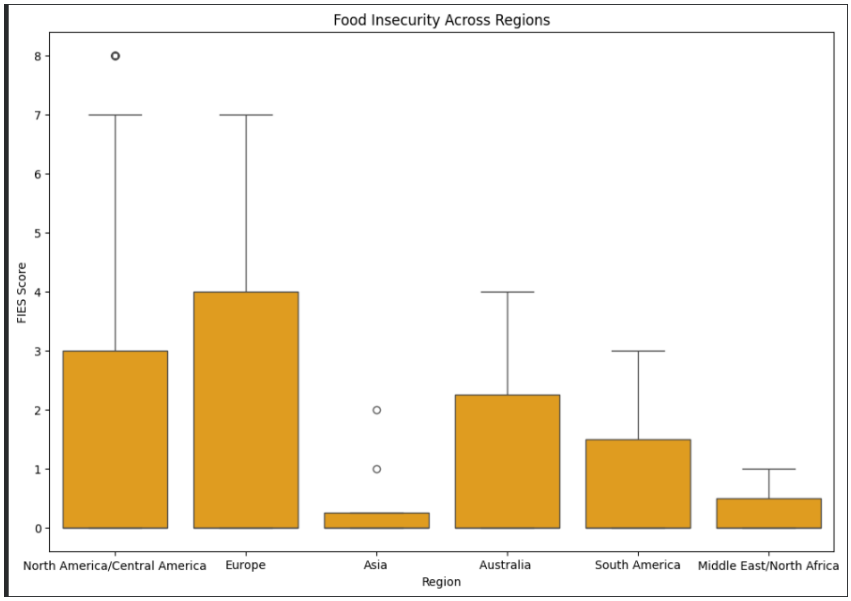

Figure 4: Distribution of Food Insecurity Experience Scale (FIES) scores across geographic regions. The boxplot illustrates median values, interquartile ranges, and outliers, highlighting regional variability in food insecurity levels.