A JAMOVI-BASED STUDY ON STRESS LEVELS AND SLEEP QUALITY AMONG WORKING ADULTS IN THE US

1. Background and Research Objective

The client—an occupational health research team affiliated with a private wellness consultancy—was conducting a study on how psychological stress affects sleep quality in adult employees. With growing interest in data-driven wellness strategies, the organization sought to **quantify how stress levels, work hours, and demographic variables contribute to changes in sleep quality**.

The aim was twofold:

- Provide empirical evidence supporting stress management programs

- Identify subgroups at higher risk of sleep disturbance

Research Questions:

1. Is there a statistically significant association between stress level and sleep quality among US working adults?

2. Do gender and work hours moderate the relationship between stress and sleep?

3. Are there significant differences in sleep quality across occupational groups?

2. Data and Variable Details

- **Dataset:** Cross-sectional survey data of 312 full-time employed adults aged 22–60 across the US.

- **Collection Tool:** Online survey using validated psychological scales.

- **Jamovi File Format:** .omv, converted from CSV with categorical encoding.

Key Variables:

Variable	Type	Scale	Description
Sleep_Quality_Score	Continuous	0–21	Pittsburgh Sleep Quality Index (lower = better sleep)
Perceived_Stress_Score	Continuous	0–40	Cohen's Perceived Stress Scale

Work_Hours	Continuous	Raw	Average weekly work hours
Occupation	Categorical	Nominal	Job sector: IT, Healthcare, Education, Retail, Other
Gender	Categorical	Nominal	Male, Female, Non-binary
Age_Group	Categorical	Ordinal	22–30, 31–40, 41–50, 51–60

3. Jamovi Analysis Workflow

3.1 Descriptive Analysis

- Imported and labeled variables using Jamovi's **Data tab**.

- Conducted summary statistics (Exploration → Descriptives):

    o Mean stress score: 21.6 (SD = 6.4)

    o Mean sleep quality score: 9.7 (SD = 3.8)

    o Work hours: Mean = 45.2 hours/week (range: 30–70)

- Plotted histograms and density curves; mild right skew in stress scores.

3.2 Bivariate Correlation Analysis

- Used **"Correlation Matrix"** to assess Pearson's r:

    o Stress ↔ Sleep Quality: **r = +0.51, p < .001** → Moderate positive correlation: higher stress is associated with worse sleep.

3.3 Regression Model in Jamovi

- Accessed via **"Regression → Linear Regression"**

- **Model:**

    $$\text{Sleep Quality} = \beta_0 + \beta_1 \cdot \text{Stress Score} + \beta_2 \cdot \text{Work Hours} + \beta_3 \cdot \text{Gender}$$

Results:

Predictor	Estimate (B)	Std. Error	t-value	p-value
Intercept	5.81	0.78	7.45	<.001
Perceived Stress Score	+0.18	0.02	9.20	<.001
Work Hours	+0.07	0.03	2.33	0.021

Gender (Female)	+0.62	0.29	2.14	0.034
Gender (Non-binary)	+1.22	0.51	2.39	0.017

- **Adjusted R² = 0.32**

- VIF scores all < 1.8 → no multicollinearity

Interpretation: For each 1-point increase in stress score, sleep quality worsens by 0.18 points, controlling for gender and hours worked. Gender differences indicate women and non-binary individuals report significantly worse sleep than men at equivalent stress levels.

4. Group Differences (ANOVA)

Test: One-Way ANOVA → Sleep Quality ~ Occupation

- **Null hypothesis:** No difference in sleep quality across occupational groups

- **Result:** $F_{(4, 307)} = 4.12$, **p = 0.003**

Post-hoc (Tukey's):

- IT vs. Healthcare: **p = 0.008**

- Retail vs. Education: **p = 0.027**

Interpretation: Healthcare workers and retail employees reported poorer sleep compared to IT and education professionals. This finding helped the client prioritize occupational health interventions for frontline sectors.

5. Visualizations Generated via Jamovi

- Scatterplot: Stress vs. Sleep with regression line

- Boxplots: Sleep quality by occupation and gender

- Interaction Plot: Sleep Quality by Gender × Stress

- Correlation matrix heatmap for all numeric variables

All visuals were exported as high-resolution PNGs for the final report.

6. Reporting and Deliverables

- PDF report (12 pages) with academic formatting

- Table of statistical outputs (APA-style)

- Full interpretations in plain language for non-statisticians

- Jamovi .omv file and editable dataset (with codebook)

- Slide deck version (optional for executive briefing)

7. Insights and Impact

- **Practical Use:** The client integrated findings into a corporate wellness pitch deck targeting healthcare firms.

- **Key Insight:** Sleep interventions should be **tailored by occupation and gender**, not implemented as one-size-fits-all.

- **Academic Utility:** Suitable for a health psychology dissertation, public health analysis, or HR research project using real-world behavioral data.