Exploring the Relation Between Social Media Experience and Psychological Distress: A Study on Bangladeshi Adults

Data Science Major Capstone - Jennifer Yu 24'

Background and Research Question

Social media is deeply embedded in daily routines globally, influencing how people communicate, access information, and engage socially. However, questions have emerged about the effects of excessive use on mental health. This explores the connection between social media habits and psychological distress among Bangladeshi adults. This study aim to answer:

(1) How does the individuals' social networking sites (SNS) experience correlate with dimensions of psychological distress among young Bangladeshi adults?

(2) What variables are most relevant to predicting the psychological distress level for Bangladeshi adults?

Data

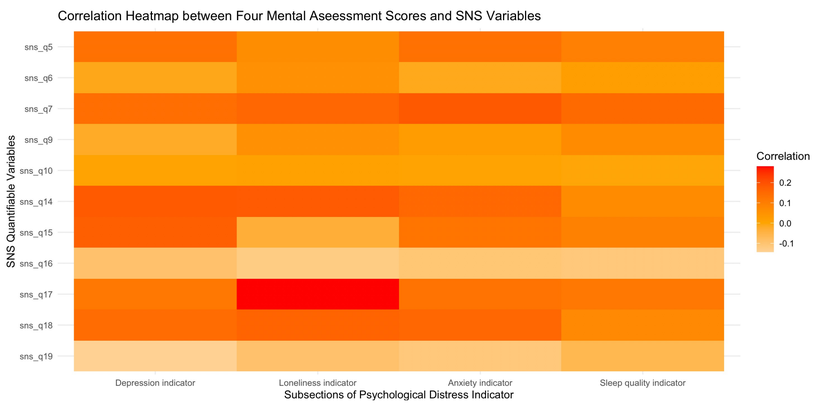
Description

The dataset used in this study was collected through a cross-sectional survey conducted in Bangladesh using Google survey tools. 791 adults participated in the study through convenience sampling methods. [1]

Structure

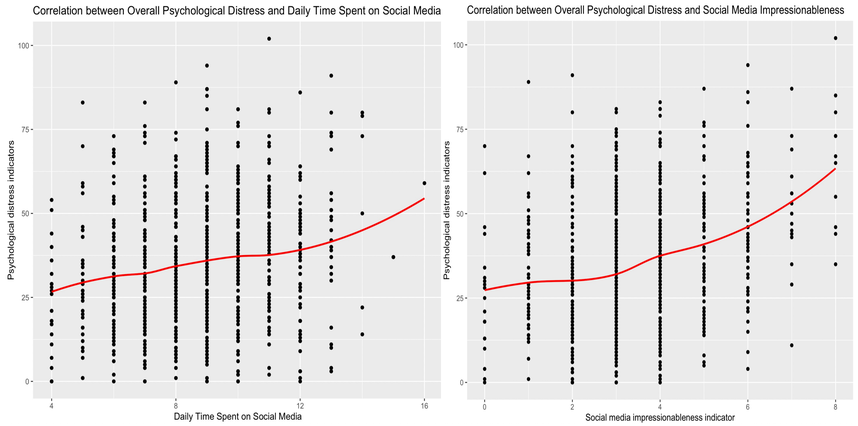
Variables categories	Number of variables	Description	Data Structure
SNS Usage Pattern	20	Social media habits and experiences	Split into two sections: one delves into actual social media usage, while the other extracts subjects' perspectives on social media based on the intension of survey questions.
Psychological Distress Indicator	43	Measures individual's mental distress	Contains 4 mental health assessment including UCLA-8 for loneliness [2] , PHQ-9 for depression [3], GAD-7 for anxiety [4], PSQI for sleep quality. [5]
Background	12	Demographic information	NA

Due to the complexity of the data, the study want to explore how SNS variables are correlated to the 4 dimensions of the psychological distress indicator and to find critical predictors to optimize the following analyses.



Data Modeling for RQ1

Loess Regression



Although Loess regression lack of interpretable coefficients and traditional hypothesis tests, its visual interpretation can help with early stage of relationship exploration between variables. Loess regression was ran for **overall psychological distress** and **daily time pent on social media** (left graph) & **overall psychological distress** and **social media impressionableness** (right graph) . Both analysis revealed a linear positive relationship.

Linear Regression

To further investigate in the linear correlations observed in the Loess Regression the study ran Simple linear regressions for both relationships.

Overall psychological distress vs. Daily time spent on social media

Result: The model revealed a statistically significant linear relationship between daily social media usage and psychological distress indicator($\beta = 3.8265$, $p < 0.001$).Higher psychological distress indicators correspond to poorer mental health, highlighting the negative correlation of social media usage on mental well-being in this population.

Limitation: The explanatory power of the model is modest (R-squared = 0.03858)

Overall psychological distress vs. Social media impressionableness

Result: The model also showed a statistically significant association between social media impressionableness and overall psychological distress ($\beta = 3.6438$, $p < 0.001$). The coefficient is smaller than the previous model suggesting that change in same units of social media impressionableness is associated with smaller change in overall psychological distress scores compare to daily time spent on social media

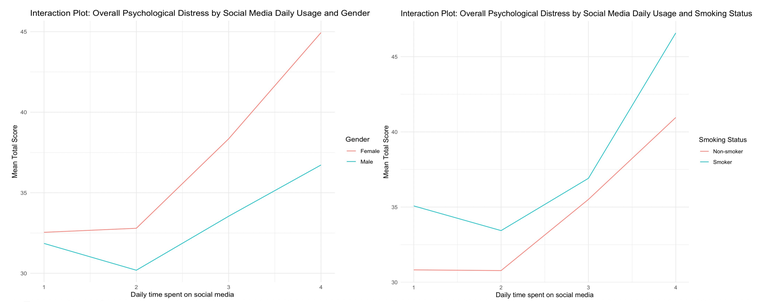
Limitation: The model has a stronger explanatory power comparing to the previous one, however, it is still modest (R-squared = 0.0888)

Data Modeling for RQ2: Multiple Linear Regression

Multiple linear regression (MLM) model was employed to identify significant predictors that contribute to variations in psychological distress. The pool for predictors are all the variables in the "SNS Usage Pattern" and "Background" categories. Then, predictors showing statistical significance, larger coefficients, and practical relevance were prioritized.

The model has the following form: $$\textbf{\textit{Psychological Distress}} = 17.47 + 4.81\times\textit{sns\_q5}_2 + 6.99\times\textit{sns\_q5}_3 + 6.11\times\textit{sns\_q5}_4 - 1.46\times\textit{sns\_q7}_2 + 2.03\times\textit{sns\_q7}_3 + 6.12\times\textit{sns\_q7}_4 - 3.43\times\textit{sns\_q16}_2 + 5.38\times\textit{sns\_q14}_2 + 4.78\times\textit{sns\_q17}_1 + 7.79\times\textit{sns\_q17}_2 + 4.61\times\textit{sns\_q18}_1 + 5.1\times\textit{sns\_q18}_2 - 2.02\times\textit{sns\_q19}_2 - 7.75\times\textit{demo\_q2Male} + 0.12\times\textit{demo\_q10} + 6.54\times\textit{demo\_q12Smoker}$$

- "sns_q" + # variables represent different aspects of social media usage patterns.
- "demo_q2" represents gender
- "demo_q10" represents weight
- "demo_q12" represents the smoking status



Examples of psychological distress levels across some demographic predictors concerning social media usage

Results and Discussion

The use of three models reveals a significant relationship between social media experience and mental health, considering demographic factors. While the study's generalizability is limited, these insights underscore the complex dynamics between social media use, demographics, and psychological well-being. Individuals can utilize these preliminary results as a reference to mitigate mental distress stemming from social media use, whether through lifestyle changes, mindset adjustments, or modifications in online browsing habits.

The questionnaire design generates numerous categorical variables, which could improve the model if gathered as continuous variables through more precise data collection methods. Moreover, its self-reported nature may introduce response biases. Moving ahead, the study aims to overcome these limitations by employing more rigorous sampling methods and including diverse populations from various geographical locations. Furthermore, future research could explore causal relationships between social media use and mental well-being. Addressing these limitations and building on the findings can contribute to the development of targeted interventions to enhance mental health in the digital age.

[1] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8627992/ [2] UCLA-8 [3] PHQ-9 [4] GAD-7 [5]PSQI