



Social Media Use, Social Comparison, and Mental Health Scores among Statistics Students

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ABSTRACT

Social media use and online comparison may be associated with students' psychological experiences, but these relationships require careful measurement and interpretation. This study examined the associations of social media use and social comparison with mental health scores among Diploma-IV Statistics students at Universitas Sumatera Utara. A quantitative survey included 155 students from a population of 252, with stratified random sampling reported across the 2023–2025 cohorts. Data were collected through online and offline questionnaires containing six items for each of three constructs. Multiple linear regression showed positive associations between the outcome score and social media use ($B = 0.315$, $\beta = .314$, $p < .001$) and social comparison ($B = 0.425$, $\beta = .507$, $p < .001$). The model accounted for 46.1% of the observed variance ($R^2 = .461$; adjusted $R^2 = .454$), with a residual standard error of 2.750. These coefficients describe higher outcome scores; they cannot establish improved or poorer mental health because the scoring direction was not documented. The observational design also precludes causal conclusions. The findings identify associations for further investigation and may inform the development of campus digital literacy activities, but intervention benefits remain untested. Clearer instrument documentation and longitudinal analyses are needed before stronger substantive interpretations can be made.

Keywords: social media use; social comparison; mental health; regression; university students

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INTRODUCTION

Social media provides university students with channels for communication, information exchange, and peer support. Its relationship with mental health is not uniformly beneficial or harmful: opportunities for connection coexist with risks related to distressing content and problematic engagement (Naslund et al., 2020). An umbrella review identified variation in how reviews characterize the evidence linking social media use with adolescent mental health (Valkenburg et al., 2022). A separate meta-analysis associated problematic use with symptoms of depression, anxiety, and stress (Shannon et al., 2022). Problematic use, however, is a distinct construct from the frequency or intensity of ordinary use.

Social comparison offers a theoretical basis for examining these relationships. People may evaluate their opinions and abilities by comparing themselves with others (Festinger, 1954). Online environments provide many opportunities for such evaluations, including comparisons involving appearance, achievement, and lifestyle. Experimental evidence synthesized in a meta-analysis linked exposure to upward comparison targets with less favorable self-evaluations and emotions (McComb et al., 2023). Studies of comparative social media use have also examined associations with self-esteem and depressive tendencies (Ozimek & Bierhoff, 2020). These findings motivate attention to comparison processes alongside the amount of social media use.

Evidence from Indonesia provides a relevant context. Research on university students has examined social comparison in the relationship between social networking behavior and social anxiety (Akbar & Hakim, 2024). A study conducted during the COVID-19 pandemic linked information overload, perceived intrusion into daily life, and anxiety with social media fatigue (Rahardjo et al., 2021). These outcomes are related but distinct: fatigue, anxiety, depressive symptoms, and general mental health scores should not be treated as interchangeable measures.

Studies in other settings similarly distinguish types of engagement and psychological experiences. Research on WeChat examined active and passive interactions in relation to upward comparison, depressed mood, and fear of missing out (Pang, 2021). Research on mobile social media use considered both upward comparison and cognitive overload in relation to depressive mood (Yan et al., 2024). Such work suggests that a single measure of use may not capture the range of experiences students encounter online. It also provides a rationale for including comparison as a separate predictor without assuming that a cross-sectional regression can establish a causal pathway.

This study examines whether social media use and social comparison are associated with mental health scores among Diploma-IV Statistics students at Universitas Sumatera Utara. Its specific objectives are to describe the adjusted association of each predictor with the outcome and to quantify the variance accounted for by their joint regression model. The contribution is a local analysis of students in one vocational program, rather than evidence that statistics students are more vulnerable than other groups. Potential implications for campus education are considered within the limits of the measurement and study design.

METHODS

A quantitative explanatory survey was conducted among active students in the Diploma-IV Statistics Study Program, Faculty of Vocational Studies, Universitas Sumatera Utara. The reported population comprised 252 students, and the sample included 155 students from the 2023, 2024, and 2025 cohorts. The sample planning calculation used the Slovin formula with a nominal error parameter of .05: $252/[1 + 252(.05^2)] = 154.60$, rounded up to 155. This calculation describes the reported recruitment target; it is not a power analysis for the regression coefficients.

Stratified random sampling by cohort was reported. The available study record does not specify the population and sample counts within each stratum, the random selection procedure, or the response rate. Questionnaires were administered online and offline. No repeated measurement occasions are described, so the findings are interpreted as cross-

sectional associations. Data collection dates, consent procedures, and ethics review details were not provided in the study record.

The questionnaire contained three six-item scales. Social media use (X) addressed frequency and intensity of use; social comparison (M) addressed comparisons involving appearance, achievements, and life circumstances; and mental health (Y) covered stress, mood, and efforts to maintain psychological well-being. The questionnaire used Likert-type responses, but the item wording, response anchors, reverse coding, and method of combining items into scores were not documented. In particular, it is unclear whether a higher Y score represents better well-being or greater distress.

The original account states that validity and reliability testing was completed, but it does not provide the relevant coefficients, criteria, or testing sample. Accordingly, no numerical claim about instrument reliability or validity is made here. The broad outcome description also does not establish that the scale measures a diagnosed mental health condition.

Multiple linear regression entered X and M simultaneously as predictors of Y. The results are reported as unstandardized coefficients (B), standard errors (SE), standardized coefficients (β), t statistics, and p values. Model fit is summarized by the multiple correlation R, R^2 , adjusted R^2 , and residual standard error. The fitted equation is presented with the results. Values originally displayed as $p = .000$ are expressed as $p < .001$.

The study record also mentions simple regressions, a Sobel test, and a comparison of cohort averages. These supplementary findings are described separately because their detailed output is unavailable. Cross-sectional mediation estimates do not establish temporal mediation and may differ substantially from longitudinal estimates (Maxwell & Cole, 2007; Maxwell et al., 2011). Assumption-test results, missing-data procedures, regression confidence intervals, and the software used were not supplied; model adequacy therefore cannot be independently verified from the reported summaries.

RESULT AND DISCUSSION

Table 1 presents the multiple regression coefficients. Both social media use and social comparison had positive associations with the mental health score after adjustment for the other predictor. For social media use, $B = 0.315$, $SE = 0.063$, and $p < .001$. For social comparison, $B = 0.425$, $SE = 0.053$, and $p < .001$. The coefficient signs describe the numerical direction of the outcome score, not the direction of a health benefit or harm.

Table 1. Multiple regression coefficients for the mental health score

Predictor	B	SE	β	t	p
Constant	3.841	1.330	—	2.888	.004
Social media use (X)	0.315	0.063	.314	4.969	< .001
Social comparison (M)	0.425	0.053	.507	8.035	< .001

Note. B = unstandardized coefficient; SE = standard error; β = standardized coefficient. Values are retained from the reported output; p values shown originally as .000 are expressed as < .001.

The fitted regression equation is:

$$\hat{Y} = 3.841 + 0.315X + 0.425M \quad | \quad (1)$$

In Equation (1), $\hat{Y}$ is the fitted mental health score, X is the social media use score, and M is the social comparison score. Holding M constant, a one-unit increase in X corresponds to a 0.315-unit increase in the fitted Y score. Holding X constant, a one-unit increase in M corresponds to a 0.425-unit increase. The intercept is the fitted outcome when both predictors equal zero; its substantive meaning depends on whether zero is a meaningful value on the scales.

The standardized coefficient for comparison ($\beta = .507$) exceeded that for social media use ($\beta = .314$). Within this fitted model, this indicates a larger standardized conditional association for comparison. It does not mean that comparison explains 50.7% of outcome variance, establish a larger causal effect, or demonstrate that the two coefficients differ statistically. A direct comparison would require an appropriate test and information beyond the coefficient table.

Table 2 summarizes overall model fit. The joint model had $R = .679$, $R^2 = .461$, and adjusted $R^2 = .454$. Thus, it accounted for 46.1% of the observed variation in Y within this sample. The remaining 53.9% is unexplained by this model and may reflect unmeasured variables, measurement error, random variation, or model misspecification; it cannot be assigned entirely to other causal factors.

Table 2. Model fit for the joint regression of the mental health score

Model	R	R ²	Adjusted R ²	Residual SE
X and M predicting Y	.679	.461	.454	2.750

Note. The model contains two predictors. Residual SE is expressed in outcome-score units; model fit has not been externally validated.

The multiple correlation R is nonnegative by definition and does not independently establish the direction of either predictor's association. The residual standard error of 2.750 describes residual variability in the units of the outcome scale. The proximity of adjusted R^2 to R^2 reflects the adjustment for sample size and the number of predictors; it does not demonstrate stability or rule out overfitting. No external validation or out-of-sample prediction assessment was reported.

The reported supplementary results were $R^2 = .232$ for the simple regression of Y on X and $R^2 = .110$ for the simple regression of M on X . Coefficients and uncertainty estimates for those models were not supplied. These R^2 values describe model fit but, on their own, do not establish coefficient signs or statistical significance. The supplementary analysis also reported a Sobel statistic of $z = 3.81$ with p approximately .00014. This p value is numerically consistent with a two-sided standard normal test, but the constituent path estimates, their standard errors, and the indirect-effect confidence interval are unavailable. The reported statistic therefore cannot be independently reconstructed.

The reported cohort mean outcome scores were ranked from highest to lowest as 2023, 2024, and 2025. No group means, standard deviations, sample counts, or comparison tests were provided. This remains an unquantified descriptive ranking, not evidence of statistically significant cohort differences. Nor can the ranking identify which cohort has better mental health without clarification of the scoring direction.

The association involving comparison is compatible with the wider rationale for studying online self-evaluation, but substantive comparisons with prior research require caution. A survey of graduate students found that the direction of the association between social networking site use and depression changed after negative comparison was taken into account (Chen et al., 2023). Research on distress disclosure also examined social comparison and gender in relation to depressive symptoms (Ye & Gao, 2025). These studies use more specific constructs than the broadly described outcome in the present survey. Their findings cannot determine the meaning of a higher score on the current instrument.

Related research highlights processes that the present two-predictor model does not measure. A study of adult social media users associated comparison with fatigue within a model involving fear of missing out and narcissistic processes (Jabeen et al., 2023). Another survey linked compulsive use, information overload, and fear of missing out with fatigue, which was associated with social anxiety (Qin et al., 2024). These findings support considering additional contextual and behavioral variables in future work, but they do not identify what explains the residual variance in the present sample.

Temporal direction remains an important limitation. Research on Instagram has considered a reciprocal pattern between depressive symptoms and upward comparison (Aubry et al., 2024). An experience-sampling study examined the temporal relationships among platform use, self-esteem, repetitive negative thinking, and negative affect (Faelens et al., 2021), while a longitudinal university study investigated social media addiction and depression (Luo et al., 2025). These approaches illustrate the value of repeated observations. In contrast, the current survey cannot distinguish whether online experiences precede changes in psychological state or whether existing psychological experiences shape use and comparison.

The findings may help define topics for campus digital literacy activities, such as interpreting curated content, recognizing comparison habits, and identifying supportive online interactions. A small daily-diary pilot evaluated a social comparison intervention among college students, providing a basis for further intervention research rather than a general guarantee of benefit (Andrade et al., 2023). The present study did not deliver or evaluate a community service program. Any proposed educational activity should therefore be treated as a future application, with its objectives, delivery, and outcomes evaluated separately.

Several limitations constrain the conclusions. The single-program sample limits generalization, and incomplete sampling documentation prevents assessment of representativeness. Self-reported predictors and outcomes may share response biases. Missing instrument details prevent a clear interpretation of score direction and measurement quality. The absence of residual diagnostics and full statistical output limits assessment of the linear model and supplementary analyses. Future studies should document the scales and recruitment procedures, report uncertainty and diagnostics, and use longitudinal designs to examine temporal relationships.

CONCLUSION

Among 155 Statistics students at Universitas Sumatera Utara, social media use and social comparison were positively associated with the reported mental health score in a joint regression model. The model accounted for 46.1% of the observed outcome variance, and

comparison had the larger standardized coefficient. These findings describe within-sample associations; they do not establish causal effects, validated predictive performance, or whether higher scores reflect better or poorer mental health.

The results provide a local basis for further research on online comparison and student psychological experiences. Instrument scoring, reliability evidence, sampling details, and diagnostic output need clearer documentation before stronger interpretations can be made. The supplementary mediation and cohort findings also require fuller reporting. Campus digital literacy activities may be developed and evaluated in future work, but their effectiveness was not tested in this survey.

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