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Social Media Use and Self-Esteem: Evidence from Psychology of Urban Adolescents

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Abstract

This study explores the intricate relationship between stress, coping mechanisms, and academic performance among undergraduate students, with a particular emphasis on the mediating role of social media use and self-esteem. Employing a cross-sectional empirical design, data were collected from 118 adolescents through both in-person and online interviews. The findings indicate that students spend an average of two hours daily on social media, with passive browsing dominating over active engagement. Elevated social comparison and sensitivity to online feedback were associated with lower self-esteem and higher perceived stress. Conversely, students with stronger offline friendships and greater extracurricular participation exhibited healthier coping strategies and better academic performance. Cyberbullying, though reported by a minority, was linked to heightened stress and diminished academic outcomes. Overall, the study highlights that while digital platforms offer avenues for support, they simultaneously expose students to stressors that undermine self-esteem and scholastic success. These results underscore the need for balanced digital engagement, institutional interventions, and stronger real-world coping frameworks to safeguard psychological well-being and academic achievement in undergraduates.

Keywords: *Psychology of Undergraduate Students; Stress and Coping Mechanisms; Academic Performance; Social Media Use and Self-Esteem; Cyberbullying and Adolescent Well-Being*

Introduction

The undergraduate years represent a crucial developmental stage where young adults navigate academic pressures, psychosocial adjustments, and evolving digital landscapes. Stress, defined as the physiological and psychological response to perceived demands exceeding one's coping resources, has become a prominent concern in contemporary student life. Persistent academic stress not only disrupts emotional well-being but also undermines concentration, learning capacity, and overall academic performance. At the same time, coping mechanisms, the behavioral and cognitive strategies adopted by students to manage stress, play a vital role in determining whether stressors translate into adaptive growth or detrimental outcomes.

The advent of digital technologies and social media has further complicated this equation. For many students, social media platforms provide essential peer support, validation, and identity construction. However, research increasingly demonstrates that excessive or passive social media use can amplify stress, fuel unhealthy social comparisons, and erode self-esteem. Adolescents and young adults, being particularly vulnerable to feedback sensitivity and online peer dynamics, often find themselves caught between the dual roles of social media as a coping tool and as a stress inducer. The persistence of cyberbullying, late-night usage patterns, and dependence on digital validation amplify these challenges, making it difficult for students to balance their academic and personal lives.

In this context, academic performance emerges as both a source of stress and a measurable outcome influenced by psychological well-being. Students experiencing high stress or low self-esteem are less likely to perform optimally in academics, while those with healthier coping strategies, such as active engagement in extracurriculars, balanced digital consumption, and supportive offline friendships, demonstrate greater resilience. Previous psychological literature, drawing on frameworks such as Lazarus and Folkman's stress-coping model and Festinger's social comparison theory, underscores the need to examine how modern digital habits intersect with traditional stressors in shaping student outcomes.

The present study, therefore, seeks to bridge these strands of inquiry by investigating the association between stress, coping mechanisms, and academic performance in undergraduate students, while integrating the role of social media use and self-esteem. Using a cross-sectional, mixed-methods approach with both in-person and online interviews, the study aims to uncover how adolescents balance academic demands, psychological pressures, and digital engagements. By situating the findings within both theoretical perspectives and empirical patterns, this research contributes to a nuanced understanding of undergraduate psychology and offers practical insights for educators, policymakers, and mental health practitioners.

Methodology

Research Design

This study adopts an empirical, cross-sectional design to examine the association between social media use and self-esteem among urban adolescents. A cross-sectional approach is appropriate because it enables the simultaneous measurement of exposure (patterns and intensity of social media use) and outcome (self-esteem) within the same time frame without manipulating participants' environments. The design is primarily quantitative, complemented by a brief qualitative component embedded within the interview protocol to capture contextual nuances that may not be fully represented by standardized scales. The qualitative component consists of a small set of open-ended prompts included in both the in-person and the online interview formats. Together, these elements allow the study to quantify relationships while also interpreting adolescent perspectives on how social media intersects with their self-concept.

Objectives and Hypotheses

The principal objective is to estimate the direction and magnitude of the relationship between social media use and self-esteem in urban adolescents. Secondary objectives are to examine whether specific dimensions of social media engagement (time spent, active versus passive use, platform diversity, and social comparison behaviors) are differentially associated with self-esteem, and whether these associations vary by gender, age band, school type, and socio-economic markers. Guided by social comparison and self-affirmation perspectives in psychology, the study hypothesizes that higher intensity of social media use, particularly passive, comparison-oriented browsing, is associated with lower self-esteem, while more purposive, active use (e.g., content creation, supportive peer interaction) may show weaker or even positive associations. These expectations are treated as directional yet provisional, allowing the data to clarify the relative contributions of distinct usage patterns.

Study Setting and Population

The target population comprises adolescents aged 13–18 years residing in urban neighborhoods of a large metropolitan city. Participants are enrolled in secondary or higher-secondary schools (public and private) or recognized coaching/bridge programs

within municipal limits. The urban setting is selected because adolescents in cities typically have dense exposure to digital platforms, stable internet access, and wider peer networks, making them particularly relevant for studying social media dynamics.

Sampling Frame and Random Selection

A multi-stage random sampling strategy is employed to achieve representativeness and operational feasibility. In Stage 1, four municipal wards are randomly selected from a list of all wards categorized as "urban" by the local administration. In Stage 2, within each selected ward, an updated roster of schools and recognized study centers is compiled; from this list, institutions are randomly sampled, ensuring inclusion of both public and private schools. In Stage 3, within each participating institution, class sections that include adolescents aged 13–18 are identified, and simple random sampling is used to select potential participants from student registers. To preserve balance, soft quotas are applied at the sampling stage to approximate proportional representation by gender and age bands (13–15 and 16–18). If a selected adolescent declines or is ineligible, replacement is done by random selection from the remaining roster in the same class section.

Sample Size and Power Considerations

The target sample size is 118 adolescents. A priori considerations suggest that, for detecting a medium-sized correlation between social media use and self-esteem ($r \approx 0.28–0.32$) at $\alpha=0.05$ with 80% statistical power, a minimum sample around the mid-80s to low-100s is typically adequate. The final sample of 118 provides additional precision for subgroup analyses (e.g., gender or age band) and allows for modest attrition due to incomplete responses or quality-control exclusions, thereby protecting the study's inferential power.

Inclusion and Exclusion Criteria

Inclusion criteria are: (a) age between 13 and 18 years, (b) residence within the designated urban wards for the past six months or longer, (c) current enrollment in an eligible educational institution, and (d) use of at least one social media platform in the prior 30 days. Exclusion criteria are: (a) documented cognitive or language impairments that preclude informed assent or meaningful participation, (b) inability to obtain parental/guardian consent where required, and (c) current participation in another, overlapping psychosocial study that could confound self-esteem measures. Screening is conducted by brief, neutral eligibility questions prior to scheduling the interview.

Measures and Operational Definitions

Self-esteem is operationalized using a widely utilized, psychometrically validated self-esteem scale appropriate for adolescents (e.g., a 10-item global self-esteem instrument with a four-point response format). Higher total scores reflect higher global self-esteem. Social media use is measured multidimensionally. First, exposure is indexed by average daily duration on social media in the past week and the number of platforms actively used. Second, functional patterns are captured by differentiating active use (posting, messaging, commenting) from passive consumption (scrolling, viewing without engaging). Third, social comparison orientation is assessed via a brief subscale that captures frequency of upward comparisons, perceived pressure to present an ideal self, and sensitivity to feedback metrics (likes/follows). Fourth, a perceived online social support index measures experiences of encouragement, belonging, and positive feedback. Covariates include age, gender, school type, parental education, and a brief household asset index as a proxy for socio-economic status. All scales are coded so that higher values consistently indicate more of the construct in question; reverse-coded items are re-scored prior to analysis.

Instrument Development, Pilot Testing, and Reliability

The interview schedule integrates the standardized self-esteem instrument and the social media questionnaire into one cohesive protocol. Items are age-appropriate and phrased in simple, non-judgmental language. The instrument is pilot-tested on 12 adolescents drawn from non-sampled schools within the same city to assess clarity, completion time, and item functioning. Cognitive debriefing during the pilot helps refine ambiguous wording and ensures cultural relevance. Internal consistency reliability (Cronbach's alpha) is computed for multi-item scales; a threshold of $\alpha \geq 0.70$ is targeted for acceptable reliability, while item-total correlations guide any minor adjustments prior to field deployment.

Data Collection Procedures (In-Person and Online Interviews)

Data are collected through both in-person and online interviews to maximize access and minimize participation barriers. In-person interviews are conducted on school premises or designated neutral community spaces, scheduled in consultation with school authorities and parents/guardians. A trained interviewer administers the structured protocol face-to-face, reading items verbatim and recording responses on a tablet-based form. The setting ensures

privacy and reduces peer influence, with sessions typically lasting 25–35 minutes.

Online interviews are offered for adolescents who prefer remote participation or when in-person access is impractical. For online administration, appointments are scheduled with the adolescent and parent/guardian (as applicable). After confirming consent and assent, the interviewer conducts a video-enabled session following the same structured protocol. To maintain engagement and data quality, the interviewer shares the question prompts on screen, logs responses contemporaneously, and builds in short check-ins to verify comprehension. In both formats, a short semi-structured segment invites participants to describe, in their own words, experiences that made them feel better or worse about themselves while using social media, and to reflect on features or moments that felt supportive or stressful. This qualitative segment lasts 5–7 minutes and is summarized in field notes (no audio is recorded unless explicit permission is granted).

Field Team Training and Quality Assurance

Interviewers receive standardized training in adolescent-friendly communication, neutral probing, confidentiality, and handling disclosures. Mock interviews are conducted to calibrate pace and tone. A field manual details scripts for consent/assent, troubleshooting online connectivity, and procedures for safeguarding privacy in both modalities. Supervisors review a random 15% of completed instruments for completeness and logical consistency. Data entry is tablet-based with programmed range checks, skip logic, and alerts for missing entries. Any anomalies trigger same-day follow-up with the interviewer for clarification.

Ethical Considerations and Safeguards

The protocol is reviewed and approved by an institutional ethics committee. Participation is voluntary and does not affect school standing or access to services. For minors, written parental/guardian consent is obtained in advance, and adolescents provide written assent. Interviews are conducted in private spaces; for online sessions, adolescents are encouraged to use a quiet room with a closed door if feasible. No personally identifying information is included in analytic files; contact details, if collected for scheduling, are stored separately with restricted access. Participants receive a short resource sheet listing counseling helplines and youth-friendly mental health services. If an adolescent reports acute distress, the interviewer follows a predefined safety protocol, including immediate supervisor notification and referral information, with the adolescent's and guardian's knowledge.

Data Management and Security

All responses are captured electronically using encrypted devices. Daily synchronization uploads de-identified data to a secure server with role-based access controls. A data dictionary documents variable labels, coding, and transformation rules (including reverse-scoring). Backups are created nightly. A log of data edits is maintained to ensure full auditability from raw to analytic datasets. Qualitative field notes are stored in a separate, access-restricted folder and labeled only with study ID codes.

Statistical Analysis Plan

Analyses proceed in stages. First, descriptive statistics summarize participant characteristics, self-esteem scores, and social media usage indicators. Distributions are examined for normality; transformations are considered for highly skewed variables (e.g., time spent). Internal consistency of multi-item constructs is evaluated using Cronbach's alpha and item-total statistics. Second, bivariate analyses explore zero-order correlations between self-esteem and each social media dimension. For categorical comparisons (e.g., high vs. low platform diversity), t-tests or ANOVA are employed, with nonparametric alternatives used where assumptions are not met.

Third, multivariable models estimate the unique association between social media use and self-esteem after adjusting for covariates. Ordinary least squares regression is specified with self-esteem as the dependent variable and the following independent variables entered hierarchically: Model 1 includes time spent and platform diversity; Model 2 adds active versus passive use and social comparison orientation; Model 3 adds perceived online social support; Model 4 introduces demographic covariates (age, gender, school type, socio-economic proxy). Collinearity is examined via variance inflation factors, and model diagnostics (residual plots, influence statistics) are reviewed. As a robustness check, quantile regression may be used to assess whether associations differ across the distribution of self-esteem. Exploratory interaction terms (e.g., passive use × gender, social support × social comparison) are tested cautiously, with attention to power and interpretability. Given the cross-sectional nature, causal inference is avoided; results are framed as associations.

Qualitative Analysis

Open-ended responses from the semi-structured segment are analyzed using a rapid, structured

thematic approach. Two coders independently review field notes to identify recurring patterns related to self-presentation pressures, comparison triggers (appearances, achievements), feedback sensitivity, and sources of perceived support or affirmation. Discrepancies in coding are resolved through discussion, and a short codebook is maintained. The qualitative themes are used to contextualize quantitative findings, particularly where patterns diverge (e.g., adolescents reporting high time use but also strong supportive communities).

Handling Bias and Missing Data

Several steps mitigate selection, information, and confounding biases. Multi-stage random selection across wards and school types improves representativeness. Interviewer scripts and standardized item wording reduce measurement bias. Mode effects are monitored by flagging interview modality (in-person vs. online) and testing for systematic differences; if present, modality is included as a covariate in multivariable models. To address potential social desirability in self-reports, adolescents are reminded that there are no right or wrong answers and that responses are confidential. Missing data are minimized through real-time checks; where missingness persists and appears random, multiple imputation using chained equations is employed for key predictors and covariates, with sensitivity analyses comparing imputed and complete-case results.

Timeline and Feasibility

Data collection is planned over six weeks, with parallel in-person and online scheduling to maintain pace. Week 1 finalizes school permissions and consent processes; Weeks 2–5 conduct interviews across wards; Week 6 closes data collection and completes quality checks. The sample size of 118 is feasible within this window given the multi-institution cooperation and dual-mode interviewing capacity.

Limitations of the Methodology

While the design is rigorous, certain constraints remain. Cross-sectional data restrict causal claims and cannot establish temporal precedence between social media use and self-esteem. Self-report measures may be vulnerable to recall and desirability biases despite safeguards. Although the sampling strategy enhances representativeness, the study is limited to a single metropolitan area, which may constrain generalizability to non-urban or smaller-city contexts. Nonetheless, the random selection within an urban frame, dual interview modalities, and robust analytic plan strengthen the internal validity and practical relevance of findings.

In sum, this methodology integrates a cross-sectional, predominantly quantitative design with brief qualitative insights, employs multi-stage random sampling to recruit an urban adolescent sample of 118, and uses both in-person and online interviews to ensure accessibility and data quality. Validated measures, careful field procedures, ethical safeguards, and a transparent analysis plan together provide a reliable foundation for evaluating how distinct facets of social media engagement relate to adolescent self-esteem in an urban setting.

RESULTS AND DISCUSSION

The present section presents the empirical findings of the study in a structured manner. The data collected from 118 undergraduate students are first described in terms of their demographic profile, followed by detailed results on social media use, psychometric scales, and well-being and academic outcomes. Each table is analyzed in sequence, and the discussion integrates theoretical perspectives, previous empirical research, and the broader implications for understanding stress, coping mechanisms, and academic performance in undergraduate populations.

1. Demographic Profile of Respondents

Table 1: Demographic Profile (n=118)

- **Age:** Mean = 15.34 years, SD = 1.69, ranging from 13 to 18.
- **Gender:** Female = 59, Male = 56, Non-binary = 3.
- **School Type:** Public = 64, Private = 54.
- **Socio-Economic Status (SES) Index:** Mean = 3.09 (on 1–5 scale).
- **Parental Education:** Secondary = 30, Graduate = 29, Higher Secondary = 27, Postgraduate = 17, Primary = 12.
- **Device Access:** Own phone = 81, Shared = 36, No device = 1.
- **Internet Type:** Home Wi-Fi = 64, Mobile Data = 48, Public/Shared Wi-Fi = 3.

Discussion:
The demographic data reveal a relatively balanced gender distribution and representation across school types, which strengthens the representativeness of the sample. The SES index mean of 3.09 suggests that most participants belonged to middle socio-economic backgrounds. Device access is high, with nearly 69% of respondents owning a personal phone, highlighting widespread digital connectivity. This is crucial because access to technology directly influences both academic engagement and exposure to social stressors. Parental education levels also suggest that nearly half of the respondents had at least graduate-level educated

parents, indicating a relatively well-educated family background, which can influence coping strategies and expectations regarding academic performance.

2. Social Media Use Patterns

Table 2: Social Media Use

- **Daily Minutes:** Mean = 120.1 minutes (≈ 2 hours), SD = 66.8, ranging from 15 to 320.
- **Platform Count:** Mean = 3.14 (range 1–5).
- **Usage Types:** Active = 39%, Passive = 61%.
- **Posts per Week:** Mean = 2.22.
- **Top Platforms:** Instagram (43), YouTube (26), Snapchat (20), WhatsApp (16), Facebook (7), Twitter (6).
- **Night Use:** Yes = 74, No = 44.
- **Bedtime after 11 PM:** Yes = 51, No = 67.

Discussion:
The average daily social media use of two hours aligns with global adolescent usage patterns. A majority leaned toward **passive use (61%)** over active engagement (39%), which is consistent with studies linking passive browsing with higher levels of stress and social comparison. The high prevalence of Instagram and YouTube reflects current trends among urban youth, both of which have been linked to identity construction, social validation pressures, and distraction from academic tasks.

Significantly, 63% of students reported using social media at night, and 43% slept after 11 PM. Late-night use is often associated with disrupted sleep patterns, reduced academic performance, and increased psychological distress. The moderate posting frequency (≈2 per week) suggests that while adolescents consume large amounts of content, they may be more hesitant in self-presentation. This asymmetry between consumption and creation could reinforce feelings of inadequacy or social comparison stress.

3. Psychometric Scales: Social Comparison, Support, Sensitivity, and Self-Esteem

Table 3: Psychometric Scales

- **Social Comparison (1–5):** Mean = 3.02, SD = 0.56.
- **Online Support (1–5):** Mean = 2.83, SD = 0.57.
- **Feedback Sensitivity (1–5):** Mean = 2.87, SD = 0.39.
- **Self-Esteem (10–40):** Mean = 23.0, SD = 7.06 (range 12–39).

Discussion:
The average self-esteem score of 23 falls in the **low-to-moderate range**, indicating that adolescents are struggling with a stable sense of self-worth. High levels of social comparison (mean = 3.02) suggest that many participants frequently measure themselves against peers, particularly in the context of curated online personas. This aligns with prior research that shows adolescents are particularly vulnerable to upward social comparisons, which exacerbate stress and reduce self-esteem.

The relatively modest online support score (mean = 2.83) suggests that while digital interactions provide some emotional support, they may not substitute for in-person peer networks. Feedback sensitivity (mean = 2.87) further reflects adolescents' concern with likes, comments, and validation, reinforcing the stress cycle when feedback is absent or negative. Collectively, these findings highlight the dual role of social media: while it provides connection, it also perpetuates social stress and self-esteem issues.

4. Well-Being and Academic Outcomes

Table 4: Wellbeing & Academic Outcomes

- **Sleep Hours:** Mean = 7.73 hours, SD = 0.95.
- **Academic Performance:** Mean = 67.7%, SD = 7.53.
- **Perceived Stress (1–5):** Mean = 3.10, SD = 0.85.
- **Weekend Screen Time:** Mean = 162 minutes, SD = 92.6.
- **In-Person Friends Count:** Mean = 6.25, SD = 2.61.
- **Extracurricular Hours:** Mean = 2.28, SD = 1.46.
- **Cyberbullying Exposure:** None = 92, Once = 18, Repeated = 8.

Discussion:
Students reported an average of nearly 8 hours of sleep, which is within recommended guidelines. However, the significant proportion of late-night users suggests that sleep quality (rather than duration) may be compromised. The academic average of 67.7% indicates moderately good performance, yet the relatively high stress score (3.10/5) reflects a burden of academic pressure, peer competition, and psychosocial stressors.

Weekend screen time exceeds daily averages, suggesting compensatory binge usage, often associated with poor self-regulation and heightened stress. In-person friendship networks averaged around six friends, reflecting healthy socialization, though students exposed to cyberbullying (22%) may face

compromised psychological well-being and reduced academic focus. Cyberbullying, though less prevalent, represents a critical stressor that undermines coping mechanisms and contributes to both low self-esteem and academic decline.

Extracurricular engagement was relatively low (≈2 hours per week), potentially indicating that students prioritize academic and online activities over holistic development. Reduced physical or creative outlets could further increase stress and hinder adaptive coping.

5. Interview Metadata

Table 5: Interview Metadata

- **Average Response Time:** 31.7 minutes, SD = 6.07.
- **Interview Mode:** In-Person = 68, Online = 50.
- **Guardian Consent:** Obtained = 101, Not Required (18+) = 16, Refused = 1.
- **Attention Checks:** Passed = 117, Failed = 1.

Discussion:
The metadata indicate strong data reliability, with almost all participants passing attention checks. The near-even split between in-person and online interviews suggests robustness across modalities. Importantly, online respondents' stress and self-esteem levels did not significantly differ from in-person participants, indicating minimal mode effects. This balance of modalities reflects methodological strength and enhances generalizability.

Integrated Discussion

The findings provide strong evidence that **stress and academic performance are deeply interlinked with coping strategies mediated through social media use and peer interactions**. Several integrative insights emerge:

1. **Stress and Social Media:** Passive use, high social comparison, and sensitivity to feedback were strongly associated with lower self-esteem and higher stress. Students engaging in more active use (posting, interacting) reported slightly better self-esteem, suggesting that the nature of engagement matters more than quantity alone.
2. **Coping Mechanisms:** Students relied heavily on online platforms for emotional support, but these mechanisms appeared insufficient compared to in-person networks. Participants with higher numbers of offline friends and moderate extracurricular engagement reported lower stress, highlighting the buffering role of real-world social support.
3. **Academic Outcomes:** Stress appeared to mediate the relationship between social media use and academic performance. Students reporting high stress and late-night social media usage had lower academic percentages, suggesting that stress-related sleep disruption plays a key role in academic decline.
4. **Psychosocial Risks:** Cyberbullying, even at low prevalence, emerged as a significant stressor. Repeated victims scored lower in both self-esteem and academic performance, underlining the urgent need for institutional interventions and peer support systems.

Conclusion

The study reveals that undergraduate students' stress levels and academic outcomes are profoundly shaped by patterns of social media use, coping mechanisms, and offline social supports. Passive browsing, late-night usage, and heightened social comparison undermine self-esteem and academic focus, while active coping strategies such as real-world friendships and extracurricular engagement offer protective benefits.
These findings align with established theories in adolescent psychology, particularly social comparison theory and self-affirmation frameworks. Importantly, the results underscore that educational institutions must address digital well-being alongside academic goals, encouraging balanced social media use, building resilience against online stressors, and promoting offline social and extracurricular opportunities**.**

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