

Social Comparison Orientation as a Mediator between Social Media Integration and Body Shape Concern, Anxiety, and Depressive Symptoms in Adolescents and Young Adults in India: A Cross-Sectional Study

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Abstract

Background. Social media use has been linked with poorer mental health in young people, but the associations are small and the mechanisms are unclear. We tested whether social comparison orientation accounts for the associations between social media integration and body shape concern, anxiety, and depressive symptoms in adolescents and young adults in India.

Methods. In this cross-sectional survey, 450 participants aged 13 to 25 years who used social media for at least two hours daily were enrolled at 12 sites between January and December 2025; 410 were analysed after excluding 40 entries with identical responses across every item of a scale. Measures were the Social Media Use Integration Scale (SMUIS), the Iowa-Netherlands Comparison Orientation Measure (INCOM), the Body Shape Questionnaire (BSQ-8C), the GAD-7, and the PHQ-9. Analyses used Pearson correlation, multiple regression, and bootstrapped mediation (5,000 resamples).

Results. Mean age was 18.27 years ($SD = 2.75$); 48.3% were female. SMUIS correlated with BSQ-8C ($r = .19$), GAD-7 ($r = .18$), and PHQ-9 ($r = .14$), and remained a significant predictor after adjustment for age, gender, socioeconomic status, and daily hours of use. Daily hours were unrelated to body shape concern ($r = .00$). INCOM mediated all three associations: the indirect effect accounted for 62% of the SMUIS and body shape concern association (full mediation), 29% for anxiety, and 22% for depressive symptoms (partial mediation). Men and women did not differ on any study variable.

Conclusions. In this sample, how deeply social media was integrated into daily life, rather than the time spent on it, was associated with distress, and social comparison orientation statistically accounted for much of the link with body shape concern. The cross-sectional design cannot establish temporal order, and longitudinal studies are needed.

Keywords: social media; social comparison; body image; anxiety; depression; adolescents; young adults; mediation; India

Introduction

Social media is now a routine part of daily life for adolescents and young adults, and whether it harms their mental health has produced a large but inconsistent literature. A systematic review of 13 studies in adolescents found that time spent, activity, investment, and addictive use of social media were all correlated with depression, anxiety, and psychological distress, although 12 of the 13 studies were cross-sectional (Keles et al., 2020). A meta-analysis of 12 studies of adolescents aged 11 to 18 years reported a small positive correlation between social media use and depressive symptoms ($r = .11$) with very high heterogeneity ($I^2 = 95\%$), which the authors took to indicate that other factors moderate the association (Ivie et al., 2020).

Time spent is a coarse indicator of exposure. In a preregistered analysis of a representative sample of 120,115 English adolescents, the association between digital screen time and mental well-being followed a quadratic function, and moderate use was not intrinsically harmful (Przybylski & Weinstein, 2017). A systematic review of social networking sites, depression, and anxiety reported that positive interactions, social support, and social connectedness were related to lower symptom levels, whereas negative interactions and social comparison were related to higher levels (Seabrook et al., 2016). These findings suggest that the psychological processes set in motion by use, rather than its duration, may be the more informative target.

Social comparison theory holds that people evaluate themselves by comparing themselves with others (Festinger, 1954), and social media supplies a continuous stream of comparison targets. Among 227 female university students, the association between Facebook use and body image concerns was mediated by appearance comparisons (Fardouly & Vartanian, 2015). In an experiment, women who browsed Facebook reported a more negative mood than those who browsed a control website, and women high in appearance-comparison tendency reported more appearance discrepancies after Facebook exposure (Fardouly et al., 2015). A review concluded that correlational studies consistently link social media use with body image concerns in young women and men and that appearance comparisons play a role in this relationship (Fardouly & Vartanian, 2016).

Evidence from India is more limited. Among 200 undergraduate medical students in Kolkata, use of social networking sites was pervasive, and the study examined its relation to anxiety and depression (Barman et al., 2018). In a study of Indian young adults, media influence and body mass index predicted body dissatisfaction and disordered eating, with body dissatisfaction measured by the Body Shape Questionnaire (Singh & Gadiraju, 2020). The present study examined, in a single sample of adolescents and young adults, whether social comparison orientation accounts for the associations between social media integration and three outcomes: body shape concern, anxiety, and depressive symptoms.

We hypothesised that (H1) greater social media integration would be associated with higher body shape concern, anxiety, and depressive symptoms; and (H2) social comparison orientation would mediate each of these associations, producing a positive indirect effect.

Method

Design and reporting

This was a cross-sectional survey. It is reported in line with the STROBE statement for cross-sectional studies (von Elm et al., 2007).

Participants and setting

Eligible participants were aged 13 to 25 years, used social media for at least two hours a day, had no current psychiatric diagnosis or treatment, no severe mental illness (for example, schizophrenia or bipolar disorder) or cognitive impairment, and gave informed consent. Data were collected between 5 January and 10 December 2025 at 12 sites. Indore contributed 199 of the 450 entries (44.2%), and the remainder came from 11 other sites identified by site code in the dataset. Every entry was recorded as eligible. The target sample size was 400, based on Cochran's formula for a proportion ($P = .50$, precision = .05, which gives 384) plus a buffer (Cochran, 1977). In total, 450 entries were recorded, of which 410 were analysed.

Ethics

The study was approved by the combined Institutional Ethics Committee and Institutional Scientific Committee of Index Medical College, Hospital & Research Centre, Indore (approval number IMCHRC/IEC/2026/22) and followed the National Ethical Guidelines for Biomedical and Health Research Involving Human Participants (Indian Council of Medical Research, 2017). Written informed consent was obtained, and the consent type (adult consent, or parental consent with participant assent) was recorded for every participant. Participants were identified only by a numeric code. Responses to PHQ-9 item 9, which asks about thoughts of death or self-harm, were flagged automatically in the data-entry workbook for immediate clinical review.

Measures

Social media integration. The Social Media Use Integration Scale (SMUIS) has 10 items rated from 1 (strongly disagree) to 6 (strongly agree), giving totals from 10 to 60, with higher scores indicating greater integration of social media into daily life (Jenkins-Guarnieri et al., 2013). Item 8 is reverse-keyed. Daily hours of social media use were also self-reported.

Social comparison orientation. The Iowa-Netherlands Comparison Orientation Measure (INCOM) has 11 items rated from 1 (strongly disagree) to 5 (strongly agree), giving totals from 11 to 55, with higher scores indicating a stronger tendency to compare oneself with others (Gibbons & Buunk, 1999). Items 4 and 9 are reverse-keyed.

Body shape concern. The eight-item Body Shape Questionnaire (BSQ-8C) is a short form of the Body Shape Questionnaire (Cooper et al., 1987; Evans & Dolan, 1993). Items are rated from 1 (never) to 6 (always), giving totals from 8 to 48, with higher scores indicating greater concern. The original questionnaire was developed for women, and the short forms were derived in a sample of women (Evans & Dolan, 1993). One item in the version administered here referred to other "women/men". The BSQ-8C has been used in Indian young adults of both genders (Singh & Gadiraju, 2020).

Anxiety and depressive symptoms. The Generalized Anxiety Disorder-7 (GAD-7) has seven items scored from 0 to 3 (total 0 to 21; cut-points of 5, 10, and 15 for mild, moderate, and severe anxiety; Spitzer et al., 2006). The Patient Health Questionnaire-9 (PHQ-9) has nine items scored from 0 to 3 (total 0 to 27; cut-points of 5, 10, 15, and 20 for mild, moderate, moderately severe, and severe

depression; Kroenke et al., 2001). The psychometric properties of both scales were comparable to those in Western settings in a rural Indian population aged 30 to 60 years (De Man et al., 2021).

Sociodemographic variables. Age, gender, residence (urban, semi-urban, rural), education, family type, primary platform, and socioeconomic status (Modified Kuppaswamy classes I to V) were recorded.

Data screening

Scale totals were recomputed from item-level responses. Entries in which a participant gave identical responses to every item of at least one scale were treated as careless responding and excluded ($n = 40$, 8.9%). In the analytic sample ($n = 410$) no item response was missing. Two entries carried socioeconomic labels outside the five Kuppaswamy classes ("Upper" and "Lower-Middle") and were assigned to Class I and Class III, respectively.

Statistical analysis

Internal consistency was estimated with Cronbach's alpha. Associations among study variables were estimated with Pearson correlations with 95% confidence intervals. For each outcome, multiple linear regression estimated the association with SMUIS after adjustment for daily hours of use, age, gender, and socioeconomic status. Mediation was tested with a single-mediator model equivalent to Model 4 of the PROCESS framework (Hayes, 2018), with SMUIS as the predictor, INCOM as the mediator, and each outcome in a separate model. The indirect effect (ab) was tested with 5,000 percentile bootstrap resamples (Preacher & Hayes, 2008); an indirect effect was considered significant when its 95% confidence interval excluded zero. Models were also re-estimated with age, gender, and socioeconomic status as covariates. Group differences were examined with Welch t tests and one-way analysis of variance, with Bonferroni-adjusted pairwise comparisons. Effect sizes were interpreted against conventional benchmarks (Cohen, 1988). Tests were two-tailed with $\alpha = .05$. Analyses were run in Python 3 (NumPy, SciPy, and statsmodels), and the analysis script is available from the authors.

Results

Participants

The analytic sample comprised 410 participants aged 13 to 25 years ($M = 18.27$, $SD = 2.75$); 204 (49.8%) were adolescents (13 to 17 years) and 206 (50.2%) were young adults (18 to 25 years). There were 212 men (51.7%) and 198 women (48.3%). Participants reported a mean of 4.51 hours ($SD = 0.95$) of daily social media use. Indore contributed 178 participants (43.4%). Table 1 gives the sample characteristics.

Descriptive statistics and reliability

Internal consistency was good for all scales (Cronbach's $\alpha = .85$ for PHQ-9, .84 for GAD-7, .84 for BSQ-8C, .89 for INCOM, and .86 for SMUIS; Table 2). Skewness and kurtosis values were all within ± 1 . Using the published cut-points, 160 participants (39.0%) scored 10 or above on the GAD-7 and 188 (45.9%) scored 10 or above on the PHQ-9. PHQ-9 item 9 was endorsed above zero by 292 participants (71.2%).

Associations among study variables

SMUIS was positively correlated with body shape concern ($r = .19$, 95% CI [.09, .28], $p < .001$), anxiety ($r = .18$, 95% CI [.09, .27], $p < .001$), and depressive symptoms ($r = .14$, 95% CI [.04, .23], $p = .005$),

supporting H1 (Table 2). Spearman correlations gave the same pattern ($\rho = .18, .17$, and $.13$, all $p < .01$). After Holm adjustment across the 15 correlations in Table 2, all three SMUIS correlations remained significant (adjusted $p \leq .030$). Daily hours of use were unrelated to body shape concern ($r = .00$, 95% CI $[-.10, .10]$, $p > .99$), weakly related to anxiety ($r = .10$, 95% CI $[-.01, .20]$, $p = .036$), and weakly related to depressive symptoms ($r = .15$, 95% CI $[-.05, .24]$, $p = .003$). INCOM showed its strongest association with body shape concern ($r = .43$, 95% CI $[-.34, .50]$, $p < .001$), and smaller associations with anxiety ($r = .22$, 95% CI $[-.13, .31]$, $p < .001$) and depressive symptoms ($r = .14$, 95% CI $[-.04, .23]$, $p = .005$).

Regression analyses

SMUIS was a significant independent predictor of every outcome after adjustment for daily hours, age, gender, and socioeconomic status (Table 3). The models explained 3.8% (body shape concern), 4.5% (anxiety), and 5.0% (depressive symptoms) of the variance. Daily hours predicted depressive symptoms ($B = 0.85$, $p = .005$) but not body shape concern ($p = .868$) or anxiety ($p = .067$). Age, gender, and socioeconomic status were not significant predictors in any model.

Mediation by social comparison orientation

SMUIS was positively associated with INCOM ($a = 0.281$, $p < .001$). INCOM mediated the association between SMUIS and each outcome, supporting H2 (Table 4; Figure 1). For body shape concern, the indirect effect was 0.092 (95% CI $[0.057, 0.131]$) and the direct effect was not significant ($c' = 0.057$, $p = .125$), indicating full mediation, with 61.7% of the total effect transmitted through INCOM. For anxiety, the indirect effect was 0.030 (95% CI $[0.012, 0.050]$) and the direct effect remained significant ($c' = 0.073$, $p = .011$), indicating partial mediation (28.8% mediated). For depressive symptoms, the indirect effect was 0.020 (95% CI $[0.002, 0.042]$) and the direct effect remained significant ($c' = 0.071$, $p = .037$), indicating partial mediation (22.3% mediated). Adjustment for age, gender, and socioeconomic status did not change the conclusions (indirect effects 0.094, 0.031, and 0.022; all 95% confidence intervals excluded zero).

Differences by gender, age group, and residence

Men and women did not differ significantly on any study variable (all $p \geq .24$; all $|d| \leq 0.12$; Table 5). Adolescents reported higher PHQ-9 scores than young adults ($M = 9.99$ vs. 8.86 ; $t(402.6) = 1.99$, $p = .047$, $d = 0.20$), but this difference did not survive Bonferroni correction across the five comparisons (adjusted $p = .24$) and the groups did not differ on the other variables. Residence was associated with anxiety, $F(2, 407) = 5.72$, $p = .004$: urban participants ($M = 8.97$, $SD = 5.04$) scored higher than semi-urban participants ($M = 6.86$, $SD = 4.45$; Bonferroni-adjusted $p = .002$), and neither group differed significantly from rural participants ($M = 8.01$). Residence was unrelated to body shape concern or depressive symptoms (both $p > .50$).

Discussion

In this sample of adolescents and young adults, greater integration of social media into daily life was associated with higher body shape concern, anxiety, and depressive symptoms, and social comparison orientation statistically accounted for a large share of the association with body shape concern and a

smaller share for anxiety and depressive symptoms. Daily hours of use, by contrast, were unrelated to body shape concern and only weakly related to the other two outcomes.

The correlations between SMUIS and the three outcomes were small ($r = .14$ to $.19$), which is in line with the small pooled correlation reported for adolescents in a meta-analysis ($r = .11$; Ivie et al., 2020). The contrast between integration and duration fits the view that time spent is a coarse indicator of exposure (Przybylski & Weinstein, 2017) and that the quality of engagement matters (Keles et al., 2020; Seabrook et al., 2016). It should be noted that SMUIS and daily hours were essentially uncorrelated in this sample ($r = .05$), so the two indices captured different aspects of use.

The mediation results are consistent with the proposition that comparison with others is one route from social media to distress. The pattern of full mediation for body shape concern parallels earlier work in which appearance comparisons mediated the association between Facebook use and body image concerns among young women (Fardouly & Vartanian, 2015) and with the review conclusion that comparison plays a role in this relationship (Fardouly & Vartanian, 2016). The smaller mediated shares for anxiety and depressive symptoms, together with significant direct effects, indicate that comparison orientation is one of several pathways for these outcomes, in line with the observation that positive interactions and social support are related to lower symptoms whereas negative interactions and social comparison are related to higher symptoms (Seabrook et al., 2016). Other pathways were not measured here.

The absence of gender differences is worth comment because the appearance literature has long concentrated on women. Fardouly and Vartanian (2016) concluded that social media use is associated with body image concerns in both young women and young men, and in an Indian sample, men and women did not differ on body dissatisfaction or disordered eating (Singh & Gadiraju, 2020). Our finding is consistent with both, but the BSQ was developed for women (Evans & Dolan, 1993), and the adapted wording used here has not, to our knowledge, been validated for men in this population, so measurement non-equivalence cannot be excluded. The higher anxiety scores among urban than semi-urban participants and the higher depressive symptom scores among adolescents were not hypothesised, the latter did not survive correction for multiple comparisons, and both should be treated as exploratory.

These findings have modest practical implications. If the aim is to identify young people at risk, asking how central social media is to their social and emotional life, and how often they compare themselves with others, may be more informative than asking how many hours they spend online. Interventions that target comparison processes, for example by building awareness of how curated content invites comparison, are a plausible focus, but the present data cannot show that changing comparison orientation would change symptoms.

Limitations

The design was cross-sectional, so the associations cannot establish temporal order, and the mediation results describe statistical rather than causal pathways. Reverse and reciprocal associations are plausible, for example if young people who feel anxious or dissatisfied with their bodies compare themselves more or integrate social media more deeply. INCOM measures a general tendency to compare, not comparison on social media, and SMUIS measures integration rather than content or activity, so we could not test active versus passive use or appearance-focused content. All measures were self-reported. We did not test measurement invariance across gender, age group, or language, and the psychometric evidence cited for the GAD-7 and PHQ-9 in India comes from a rural adult sample (De Man et al., 2021). Participants

were recruited at 12 sites by a team of data collectors, and the sample is not probability-based, so prevalence figures should not be generalised. Entries with identical responses were excluded, which may have removed some genuine responders. PHQ-9 item 9 was endorsed above zero by 71.2% of participants, a high proportion for a non-clinical sample that may reflect characteristics of the sample or of its recording, and findings involving PHQ-9 totals should be read with this in mind. Subgroup comparisons were not adjusted for multiplicity beyond the corrections reported. Effect sizes were small, and the models explained 4 to 5% of the variance in each outcome.

Conclusion

Among adolescents and young adults in this sample, how deeply social media was integrated into daily life, rather than how long it was used, was associated with body shape concern, anxiety, and depressive symptoms, and social comparison orientation statistically accounted for most of the link with body shape concern. Longitudinal and experimental studies, and measures that separate active from passive use and appearance-focused content, are needed to test whether comparison is a modifiable pathway.

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