

BRIEF REPORT

Reducing Social Media Use Improves Appearance and Weight Esteem in Youth With Emotional Distress

Helen Thai¹, Christopher G. Davis², Wardah Mahboob^{2, 3}, Sabrina Perry^{2, 3}, Alex Adams^{2, 3},
and Gary S. Goldfield^{2, 3, 4}

¹ Department of Psychology, McGill University

² Department of Psychology, Carleton University

³ Healthy Active Living and Obesity (HALO) Research Group, Children's Hospital of Eastern Ontario

⁴ Department of Pediatrics, University of Ottawa

Adolescence and young adulthood are vulnerable periods in which mental health challenges often emerge. Cross-sectional research has shown that high social media use (SMU) is associated with poor body image in youth, a known predictor of eating disorders; however, high-quality experimental evidence is scarce, limiting the ability to make causal inferences. The present study experimentally examined the effects of *reducing* smartphone SMU on appearances and weight esteem in youth with emotional distress. A randomized controlled trial was conducted where 220 participants (17–25 years; 76% female, 23% male, and 1% other) were assigned to either an intervention (SMU limited to 1 hr/day) or control (unrestricted access to SMU) group. SMU was monitored via screen time trackers and submitted daily during 1-week baseline and 3-week intervention periods. Baseline and post-intervention measurements were taken to assess changes in appearance and weight esteem. Compared to the controls, the intervention group yielded significant increases in both appearance ($p < .022$) and weight esteem ($p < .026$). The intervention group significantly increased in appearance esteem (from $M = 2.95$ to 3.15 , $p < .001$, $d_z = 0.33$) and weight esteem (from $M = 3.16$ to 3.32 , $p < .001$, $d_z = 0.27$), whereas the control group did not significantly change (appearance: $M = 2.72$ to 2.76 , $p = .992$, $d_z = 0.13$; weight: $M = 3.01$ to 3.02 , $p = .654$, $d_z = 0.06$) from baseline to post-intervention. No effects of gender were detected. Findings suggest that reducing SMU on smartphones may be a feasible and effective method of improving body image in a vulnerable population of youth.

Public Policy Relevance Statement

A brief 4-week intervention using screen time trackers showed that reducing social media use (SMU, experimental group) yielded significant improvements in appearance and weight esteem in distressed youth with heavy SMU, whereas unrestricted access to social media (control group) did not. Reducing SMU is a feasible method of producing a short-term positive effect on body image among a vulnerable population of users and should be evaluated as a potential component in the treatment of body image-related disturbances.

This article was published Online First February 27, 2023.

Gary S. Goldfield  <https://orcid.org/0000-0001-6216-7824>

No competing interests, personal financial interests, funding, employment, or other competing interests were reported by the authors of this paper.

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

This research received approval from Carleton University's research ethics board (Protocol 111107).

The data that support the findings of this study are available from the corresponding author upon reasonable request. The data are not publicly available due to ethics constraints and the potential for breaching participant privacy and confidentiality.

All participants provided were informed, orally and in writing, about the purpose of the study, its requirements, and potential risks involved as per the informed consent process. Participants who met the eligibility criteria provided informed consent.

As this research involved a brief social media reduction intervention that is still in the proof-of-concept stage, we did not deem this study as a clinical

trial, therefore no registration was obtained. However, this research, involving human participants, conforms to the recognized standards of the Declaration of Helsinki and CONSORT Guidelines.

Helen Thai served as lead for data curation, formal analysis, visualization, writing—original draft, writing—review and editing and contributed equally to methodology. Christopher G. Davis served as lead for conceptualization, supervision. Wardah Mahboob served in a supporting role for project administration, writing—review and editing. Sabrina Perry served in a supporting role for project administration, writing—review and editing. Alex Adams served in a supporting role for project administration, writing—review and editing. Gary S. Goldfield served as lead for conceptualization, supervision. Helen Thai, Christopher G. Davis, and Gary S. Goldfield contributed equally to investigation. Christopher G. Davis and Gary S. Goldfield contributed equally to writing—review and editing.

Correspondence concerning this article should be addressed to Gary S. Goldfield, Healthy Active Living and Obesity Research Group, Children's Hospital of Eastern Ontario, Research Institute, 401 Smyth Road, Ottawa, ON K1H 8L1, Canada. Email: ggoldfield@cheo.on.ca

Keywords: social media, body image, appearance esteem, weight esteem, intervention

The rising popularity of social media use (SMU) has garnered attention over the last several years, with many concerned about the effects it may have on mental health, particularly in adolescents and young adults (Karim et al., 2020). Adolescence and young adulthood, spanning from ages 17 to 25 years, are critical stages of life during which numerous psychological, physical, neurobiological, behavioral, and social changes take place (Paus et al., 2008; Wood et al., 2018). These changes occur in concert with exposure to numerous sociocultural factors (e.g., appearance comparisons, teasing, social exclusion) that commonly perpetuate body dissatisfaction, a consistent predictor of eating disorders and other mental illnesses (Prnjak et al., 2021; Tremblay & Limbos, 2009). Paralleling this perpetuation of body dissatisfaction is the ubiquitous growth of SMU, which has undeniably become an integrated part of many young people's lives.

Although social media may indeed be an accessible medium for greater connectivity, resources, and creativity, many studies have documented that youth who are heavy or frequent users of social media tend to have more body image concerns (for meta-analysis, see Ryding & Kuss, 2020). However, evidence for the negative effect of SMU on body image is constrained by several limitations. To date, this literature is dominated by correlational studies that preclude or limit causal inferences and rely on self-reports to quantify SMU. Concerning self-reported time on social media, a recent meta-analytic review indicated that self-reported SMU correlates only weakly with device-based measures, suggesting that self-reported SMU does not adequately reflect actual use (Parry et al., 2021); device-based measures provide a more accurate assessment of SMU.¹ Moreover, few studies in the literature utilize an experimental design to assess the effects of SMU on body image (or, indeed, other aspects of mental health). Most experimental social media research on body image has involved implementing social media literacy programs among adolescent girls (Bell et al., 2022; McLean et al., 2017), or have focused on exposure to only certain social media platforms (e.g., Facebook; for review, see Fardouly & Vartanian, 2016).

In addition to these methodological criticisms, meta-analytic reviews of cross-sectional research on SMU and body image concerns have concluded that although statistically significant, the association is rather weak ($r = .169$; Saiphoo & Vahedi, 2019). This weaker-than-expected association between SMU and body image may be due to the possibility that some individuals are more vulnerable to the harmful effects of social media than others. For example, Seabrook et al. (2016) showed that youth with certain cognitive styles (e.g., ruminative, brooding) are more susceptible to the negative effects of SMU than those without those cognitive styles. Similarly, Twenge and colleagues have indicated that those lacking in-person interaction (Twenge, Joiner, et al., 2018) and/or those with preexisting mental health difficulties (Twenge, Martin, & Campbell, 2018) appear to be more susceptible to the negative effects of SMU than others. These studies suggest that distressed youth may be particularly vulnerable to the negative effects of frequent SMU; however, what has yet to be explored is whether reducing SMU would also reduce its potential harms.

To better understand the effect that reducing SMU has on body image, we conducted a pilot randomized controlled trial (RCT) wherein a sample of distressed, frequent (adolescent) users of social media were asked to limit their SMU to 60 min/day for 3 weeks (Thai et al., 2021). Compared to controls who self-monitoring controls who had unrestricted access to SMU, those asked to reduce their SMU showed improvements in appearance esteem but not weight esteem. However, due to the small sample size, we were unable to conduct meaningful gender analyses. The objective of this study is to replicate these results in a larger sample and to address these limitations to better understand the effects of reducing SMU on body image.

In this paper, we examine whether a brief intervention that targets SMU reduction (1 hr/day for 3 weeks) leads to improvements in facets of body esteem (i.e., appearance and weight esteem) in youth who experience emotional distress. Following our pilot study (Thai et al., 2021), we targeted a clinically relevant population as youth with distress are at greater risk of experiencing the negative effects of heavy SMU and are susceptible to significant body image concerns (Collison & Harrison, 2020). Accordingly, we hypothesized that participants in the intervention group, who were asked to reduce SMU to 1 hr/day, would exhibit greater improvements in both appearance and weight esteem at 4-week post-intervention compared to controls who had no restrictions on SMU. Given that females tend to experience greater body image concerns (He et al., 2020) and use social media more often than males (Keles et al., 2020), we also examined, as a secondary objective, the extent to which gender moderates the effect of SMU reduction on our outcome variables.

Method

Participants

Undergraduate students enrolled in an introductory psychology course at a Canadian university were recruited through an online participant pool to participate in a 4-week study entitled, *Limiting Social Media Screen-time on iPhones and Androids*. Participant recruitment took place over three academic semesters from January 2021 to December 2021. Eligibility requirements included individuals aged 17–25 years who were regular social media users (at least 2 hr/day on average) on their smartphones and have symptoms of depression or anxiety as assessed with two items from the Center for Epidemiological Studies Depression Scale (Bradley et al., 2010) and two items from the Generalized Anxiety Disorder Scale (Spitzer et al., 2006). The purpose of the study (i.e., examining the effects of limiting SMU on mental health-related outcomes) was not disclosed to participants during the recruitment, enrollment, and study period. All participants provided informed consent. This study received approval from the university's research

¹ Among the dearth of research using device-based measures of SMU is a recent prospective study by Sewall et al. (2022), which found that fluctuations in SMU over time did not affect psychological distress (depression, anxiety, social isolation) in young adults. This study, however, did not examine facets of body image, thus it is unknown whether changes in device-based measures of SMU would yield similar results for body image.

ethics board. Participants received grade-raising credit for their participation.

Study Design

The present study employed a parallel group, RCT design that was developed in compliance with CONSORT guidelines for non-pharmacological trials (Boutron et al., 2017). The 4-week study comprised a 1-week baseline period followed by a 3-week intervention period. Participants were randomly assigned to one of two groups, control or intervention, using a computer-generated randomization scheme on Excel by a member of the research team who was uninvolved in participant recruitment. Participants assigned to the intervention group were instructed to reduce their daily SMU to a maximum of 1 hr, whereas participants assigned to the control group were instructed to use their SMU as per usual (i.e., no restriction). Measurements were collected during pre- and post-intervention to detect changes in outcome variables.

Procedure

All study procedures were conducted virtually. Participant recruitment involved a rolling admission process, where the individual could enroll in the study and complete it in a given semester. After signing up to participate in the study, participants attended an online session (via Zoom) where they were informed, orally and in writing, about the purpose of the study, its requirements, and potential risks involved as per the informed consent process. Participants who met the eligibility criteria and provided informed consent were then instructed how to access and take a screenshot of their smartphone's daily screen time tracker to send to the study's secure email inbox daily over the 4-week study duration. Participants were then instructed to complete an online baseline questionnaire via Qualtrics, which contained demographic characteristics, mental health outcomes, and typical weekday and weekend SMU over the past week. During the baseline period (Days 1–7), all participants were instructed to use their SMU as per usual and received a daily email reminder each evening to send their SMU screenshot the next morning to capture the full 24 hr of the day. On Day 7, participants randomly assigned to the intervention condition received a daily email with instructions to reduce their SMU to a maximum of 1 hr/day starting the next day for the remaining three weeks (intervention period) and to send their SMU screenshot, while those in the control group received the same daily email sent during the baseline period reminding them to send their SMU screenshot (i.e., controls were not instructed to limit SMU). In the case that a participant in the intervention group did not reduce their SMU to a maximum of 1 hr/day, an email was sent to remind them of the study procedure. On Day 28, all participants received the post-intervention questionnaire to complete via Qualtrics. Upon study completion, an electronic debrief form was provided to inform participants of the purpose of the study (i.e., to evaluate the effects of reducing SMU on mental health).

Measures

Basic demographic information was collected at baseline via online questionnaires, which included age (in years) and gender categories (female, male, and other). Although the focus of this paper is

on the effect of SMU on body esteem variables, data on other mental health outcomes (i.e., depression, anxiety) were also collected but have been reported elsewhere as they were the primary outcomes of this study (Davis et al., n.d.).

Social Media Use

Daily SMU was tracked objectively using screenshots of integrated smartphone screen time tracking reports that were submitted to the study's secured inbox over the study period.² The integrated screen time reports allow for tracking time spent on individual platforms. Social media platforms tracked in this study included Facebook, Instagram, Tik Tok, Snapchat, Twitter, Pinterest, and Tumblr. Messaging, video-calling, and -streaming platforms, such as Facebook Messenger, WhatsApp, FaceTime, YouTube, and Netflix, were not tracked or targeted for reduction. Using device-based measures of SMU increases reliability and eliminates the risk of recall bias common in self-reports of behavioral activity (Parry et al., 2021).

Appearance and Weight Esteem

Levels of appearance and weight esteem were measured using an abbreviated version of the Body Esteem Scale for Adults and Adolescents (BESAA; Mendelson et al., 2001). The original BESAA is divided into appearance, weight, and attribution subscales. We assessed appearance and weight esteem using the five of the highest loading items based on Cragun et al.'s (2013) factor analysis for appearance (e.g., "I'm pretty happy about the way I look") and weight (e.g., "I am satisfied with my weight") esteem subscales. An a priori decision was made to exclude the attribution subscale as items pertaining to this subscale focused on evaluation attributed to *others* about one's appearance and body (e.g., "People my own age like my looks"). Responses to appearance and weight esteem subscale items were made on a 5-point Likert scale ranging from 1 (*never*) to 5 (*always*). After reverse scoring 6 out of the 10 items, a mean item score was calculated for each subscale, with higher scores indicating higher esteem. In the present study, Cronbach's α s at baseline were 0.90 and 0.88, and at post-intervention were 0.90 and 0.90 for appearance and weight esteem, respectively.

Analytic Plan

Data for outcome variables were approximately normally distributed in accordance with skewness and kurtosis standards indicated by Byrne (2013) and Hair et al. (2010). Descriptive statistics were used to characterize the sample at baseline. Group differences were evaluated by independent *t* tests for continuous data and

² We also asked participants in the initial survey and follow-up survey to self-report using a slider (range: 0–10+ hr) their average daily SMU on other devices (e.g., laptop, tablet) in the past week. However, these questions had a great deal of missing data, perhaps because the slider was initially set to zero and participants may have assumed that leaving it at zero indicated 0 hr on other devices. If they did not move the slider, the program registered it as a skipped question. Given that we cannot determine whether a non-response should be coded as "0 hr" or "missing data/skipped question," we do not report these data.

chi-square tests for categorical data. To ensure the intervention was successful in limiting participants' SMU, a 2 (condition) \times 4 (week) mixed analysis of variance (ANOVA) was conducted as a manipulation check to compare daily SMU among participants in each condition during the 4-week study period. To test whether the intervention had effects on appearance and weight esteem, and if intervention effects were moderated by gender, separate 2 (condition) \times 2 (pre, post) \times 2 (gender: male/female) mixed ANOVA models were conducted for each outcome. Significant interactions were explored via simple effects. Statistical power was calculated using GLIMMSE Version 3 software (Kreidler et al., 2013). Power was estimated based on a hypothesized condition \times time interaction using a repeated ANOVA to determine the requisite sample size to detect an expected 1/3 *SD* change in our outcome variables in the intervention group, whereas no change was expected in the control group, and anticipating a test-retest correlation in dependent variables of $r = .6$. For power of 0.80, 200 participants were required. For all analyses, an α value was set at 0.05 to determine significance. Cohen's *d* was used as a measure of effect size where 0.2, 0.5, and 0.8 are considered small, medium, and large effect sizes, respectively (Cohen, 2013). Data were analyzed using SPSS Version 28.

Results

Descriptive Statistics

A total of 279 participants (76% female, 23% male, and 1% other) were recruited and met the eligibility criteria. Sixty-seven percent were aged 17–19 years, 20% were 20–22 years, and 13% were 23–25 years. Of the 279 participants, 59 were excluded from the analyses. A summary of participants included in the analyses is outlined in the CONSORT diagram (Figure 1). The baseline characteristics of the remaining sample are described in Table 1. Participants demonstrated strong compliance in providing screenshots of their daily SMU over the baseline and intervention periods and did not differ by group ($p \geq .71$). During the baseline period, 94.5% provided screenshots on all 7 days and 93.2% provided screenshots on at least 20 days during the intervention.

Manipulation Check

Results of the mixed ANOVA revealed that the intervention was successful at reducing participants' daily SMU, $F(3, 648) = 94.05$, $p < .001$, $d = 1.31$. Simple effects showed no difference between groups during the baseline period, $p = .197$, however, significant differences were detected between groups during the 3-week intervention period, $p < .001$. Participants in the intervention condition reduced their daily SMU by approximately 50%, to an average of 78.25 min/day (relative to 168.04 min/day during baseline), whereas those in the control group averaged 180.81 min/day and 188.76 min/day during the baseline and intervention period, respectively.

Main Analyses

For appearance esteem, results of the mixed ANOVA indicated a nonsignificant main effect of condition, $F(1, 213) = 1.03$, $p = .311$, $d = 0.02$, a significant main effect of time, $F(1, 213) = 5.40$, $p = .021$, $d = 0.29$, and a significant condition by time interaction,

$F(1, 213) = 5.33$, $p = .022$, $d = 0.28$. Simple effects revealed that the intervention group significantly increased in levels of appearance esteem (from $M = 2.95$ to 3.15 , $p < .001$, $d_z = 0.33$),³ whereas the control group did not significantly increase (from $M = 2.72$ to 2.76 , $p = .992$, $d_z = 0.13$) from baseline to post-intervention (see Figure 2). When gender (male/female) was added as an independent factor to the model, a significant main effect of gender was detected, $F(1, 213) = 8.42$, $p = .004$, $d = 0.37$, however, gender did not significantly moderate the two-way interaction, $F(1, 213) = 3.50$, $p = .063$, $d = 0.21$.

For weight esteem, mixed ANOVA results indicated a significant main effect of condition, $F(1, 213) = 8.34$, $p = .004$, $d = 0.37$, significant main effect of time, $F(1, 213) = 8.35$, $p = .004$, $d = 0.37$, and a significant condition by time interaction, $F(1, 213) = 5.04$, $p = .026$, $d = 0.27$. Simple effects revealed that the intervention group significantly increased in levels of weight esteem (from $M = 3.16$ to 3.32 , $p < .001$, $d_z = 0.27$), whereas the control group did not increase significantly (from $M = 3.01$ to 3.02 , $p = .654$, $d_z = 0.06$; see Figure 3). The main effect of gender (male/female) was not significant, $F(1, 213) = 1.16$, $p = .282$, $d = 0.06$, nor did gender moderate the two-way interaction described above, $F(1, 213) = 1.91$, $p = .168$, $d = 0.13$. See Table 2 for a summary of ANOVA main and interaction effects on outcome variables.

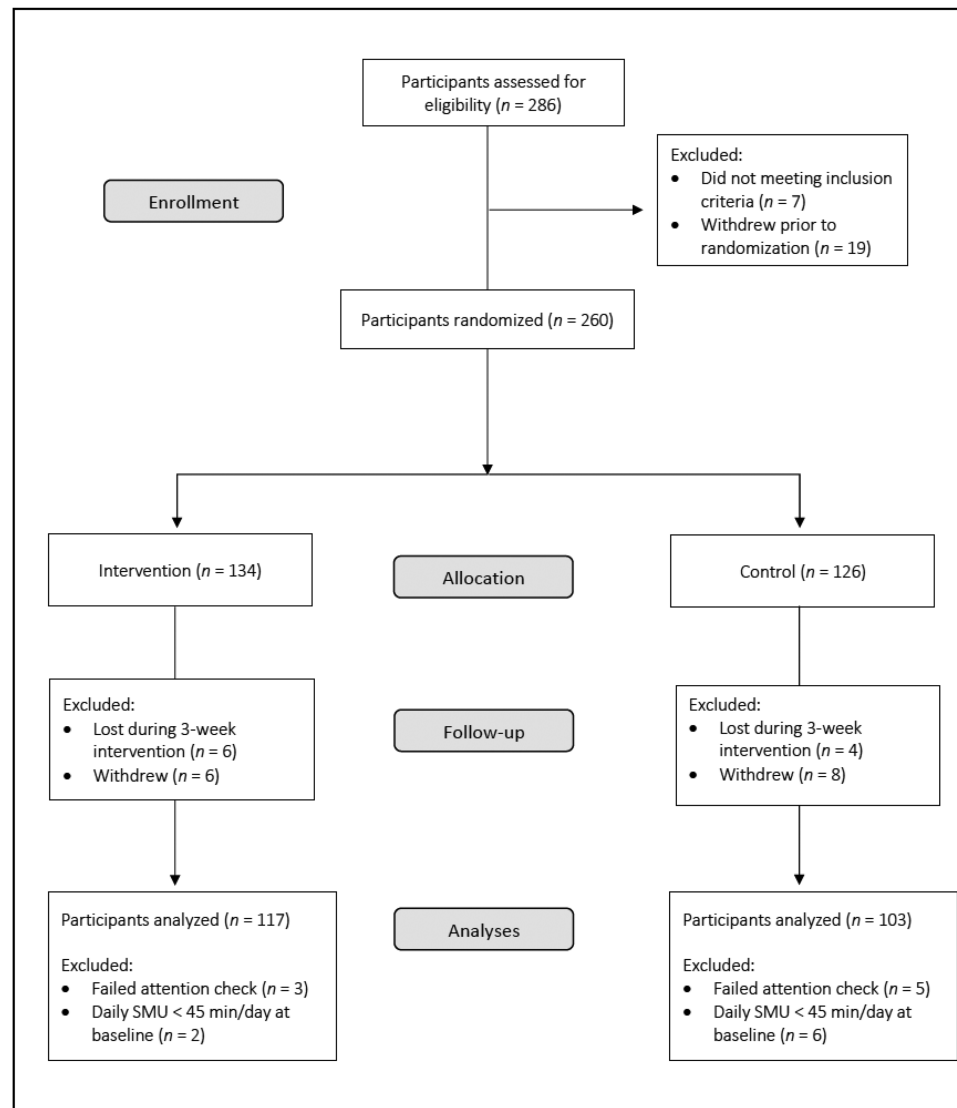
Discussion

The present study examined the effect of reducing SMU on appearance and weight esteem in youth with emotional distress. Results supported our hypothesis that reducing daily SMU led to discernible improvements in both appearance and weight esteem relative to self-monitoring controls who had unrestricted access to SMU. Notably, the intervention group exhibited significant improvements in appearance and weight esteem, with small to medium effect sizes. Moreover, exploratory moderation analyses showed that, within our sample, reducing SMU may have a positive effect on body image that is comparable for both male and female youth with emotional distress. By utilizing an experimental design and assessing SMU through an integrated device-based measure, these findings overcome the most significant limitations of prior studies and advance knowledge on whether reducing SMU facilitates improvements in body image among youth with emotional distress.

Although potential mechanisms driving this effect were not investigated in the present study, researchers have proposed that limiting SMU may reduce users' engagement in unfavorable social comparisons and ideal body internalization, thereby facilitating improvements in appearance and weight-related esteem (Fardouly et al., 2015; Hogue & Mills, 2019; Jarman et al., 2021; Marengo et al., 2018; Tiggemann et al., 2018). For example, one recent study found that upward social comparison with social media influencers fully mediated the relation between Instagram use and body dissatisfaction among female youth (Pedalino & Camerini, 2022). However, a large proportion of such studies are based on cross-sectional data, self-reported SMU, and do not consider individual

³ The effect size estimate Cohen's d_z was calculated directly from the t value and number of participants using the formula provided by Lakens (2013).

Figure 1
Participant CONSORT Flow Diagram



differences that make some youth more susceptible than others. As such, there is a need for more experimental research to better understand *how reducing* SMU confers improvements in body esteem in vulnerable populations, such as youth with emotional distress who are heavy users of SMU.

Limitations

Although the present study adds experimental evidence to the extant literature on the effect of modifying SMU on body image, there are limitations to consider. First, the intervention was brief (3 weeks long) and may not be effective if extended for a longer duration for youth who are heavy SMU users. Nonetheless, both participant compliance and retention to the intervention were high and provide support as a proof-of-concept study. Second, it remains unknown the extent to which those in the intervention

condition would be able to maintain the reduced SMU beyond the study period and if long-term reduction in SMU would yield stronger improvements. Third, although not all participants in the intervention group met the 1 hr/day SMU limit, SMU was reduced by approximately 50% during the 3-week intervention period (~78.25 min/day) from baseline (~168.04 min/day). This suggests that, for some heavy users, reducing SMU to 1 hr/day may not be overly ambitious. That the intervention group reduced SMU by 50% and still showed improvement in body image suggests that it is the reduction in time spent on social media that is important.

Although we were able to objectively monitor SMU on smartphone devices, we had no control over SMU that may have occurred on other devices (e.g., computers, tablets, and laptops). It is unlikely that those participants assigned to the intervention condition disproportionately shifted their use to other devices since if they had

Table 1
Baseline Characteristics of Study Sample

Variables	Total, N = 220	Intervention, n = 117	Control, n = 103	p
Gender (n)				.55
Male	50	25	25	
Female	168	92	76	
Other	2	0	2	
Age group (n)				.39
17–19 years old	161	84	77	
20–22 years old	37	22	15	
23–25 years old	11	4	7	
Baseline variables <i>M</i> (<i>SD</i>)				
Appearance esteem	2.85 (0.88)	2.95 (0.85)	2.72 (0.90)	.06
Weight esteem	3.09 (1.07)	3.16 (1.08)	3.01 (1.06)	.28
Daily social media use (Days 1–7)	174.02 (76.32)	168.04 (73.01)	180.81 (79.74)	.11

Note. $p < .05$ to indicate differences between intervention and control.

done so, we would not have observed the improvements in body image.⁴

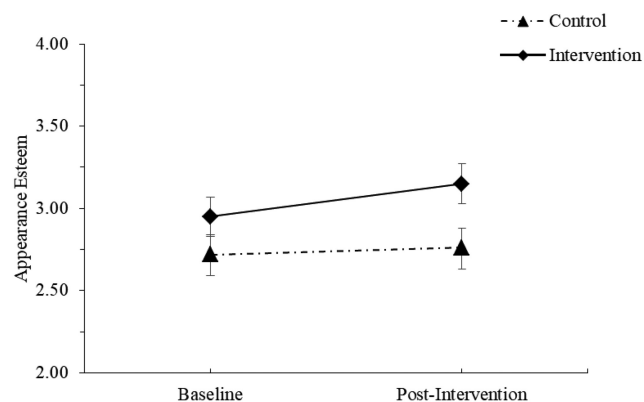
Whereas one of our goals was to assess gender differences in the extent to which reducing social media improves body image, our sample was still disproportionately female (3:1). Although this is to be expected given (a) that psychology students are more likely to be female than male, and (b) that females were more likely than males to meet eligibility criteria (i.e., report symptoms of depression or anxiety and be heavy users of social media), it nevertheless means that our analyses involving gender were somewhat underpowered.

Finally, it must be acknowledged that our sample comprised university students who volunteered to enroll in a study where they had a 50/50 chance of being asked to reduce their SMU, and as such, the results may not generalize to youth less motivated to limit their SMU.

Future Directions

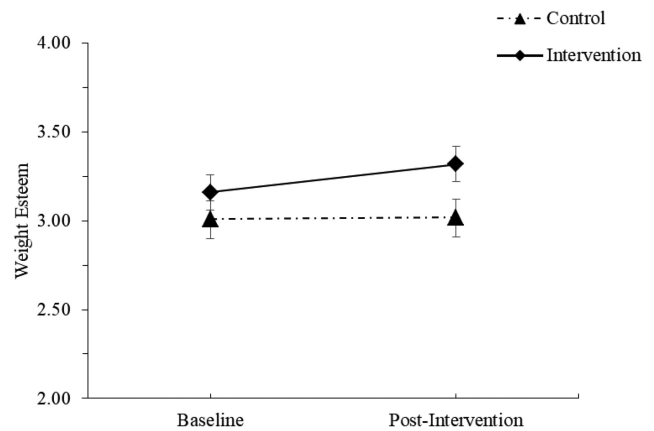
The present study targeted a vulnerable population (i.e., youth with emotional distress who use social media frequently) that may be at greater risk of body image concerns, thus providing greater

Figure 2
Effect of Reducing Social Media Use on Levels of Appearance Esteem by Condition



Note. Error bars represent standard errors.

Figure 3
Effect of Reducing Social Media Use on Levels of Weight Esteem by Condition



Note. Error bars represent standard errors.

clinical relevance and utility of the intervention. Although there is good evidence that high SMU may perpetuate body image concerns, an important avenue for future research is to clarify not just *who* is at risk of social media harms, but also *what* kind of use is likely to lead to harm if users are engaging with certain content. Most social media platforms are developed in such a way that users' daily social media feed is generated by the algorithms based on their engagement with specific content and/or sources (e.g., models, peers, businesses, memes). In other words, the content to which users are exposed may influence facets of body image differently. For instance, SMU on visual-based platforms such as Instagram was found to predict users' visual attention to high-anxiety body regions to a greater extent than platforms that often display both visual and word-based posts, such as Facebook (Couture Bue, 2020). Future research may benefit from investigating other aspects of SMU in addition to time spent on these platforms.

Conclusion

The present study makes a novel contribution to the limited experimental literature on SMU and body image. To the best of our knowledge, this is the first adequately powered study to demonstrate that a brief intervention involving smartphone-based SMU reduction of approximately 50% from baseline may be a feasible and effective method of improving appearance and weight esteem among youth with emotional distress. Our findings show that reducing SMU reaps comparable benefits in body esteem for both males and females. Although more research is warranted to assess maintenance effects, our findings show that reducing SMU has a short-term positive effect on body image among a vulnerable population of youth with emotional distress, and thus should be evaluated as an important component in the treatment and prevention of body image-related disturbances.

⁴ As noted earlier, at our 4-week follow-up assessment, we did ask participants in both conditions the extent to which they used other devices in the past week. Although there were data quality issues, we found no significant difference between those in the intervention and those in the control conditions.

Table 2

ANOVA Main Effects and Interaction Effects on Appearance and Weight Esteem

Source	<i>MS</i>	<i>F</i>	<i>p</i>	<i>d</i>
Appearance esteem				
Condition	2.18	1.03	.311	0.02
Time	0.81	5.40	.021	0.29
Gender	17.78	8.42	.004	0.37
Condition × Time	0.80	5.33	.022	0.28
Condition × Gender	1.33	0.63	.43	0.00
Time × Gender	0.00	0.03	.868	0.00
Condition × Time × Gender	0.52	3.50	.063	0.22
Error (within)	0.15			
Error (between groups)	2.11			
Weight esteem				
Condition	12.11	8.34	.004	0.37
Time	1.18	8.35	.004	0.37
Gender	2.66	1.83	.178	0.12
Condition × Time	0.71	5.04	.026	0.27
Condition × Gender	1.69	1.16	.282	0.06
Time × Gender	0.03	0.18	.676	0.00
Condition × Time × Gender	0.27	1.91	.168	0.13
Error (within)	0.14			
Error (between groups)	1.45			

Note. Boldface indicates statistical significance ($p < .05$); $N = 218$.

References

- Bell, B. T., Taylor, C., Paddock, D., & Bates, A. (2022). Digital bodies: A controlled evaluation of a brief classroom-based intervention for reducing negative body image among adolescents in the digital age. *British Journal of Educational Psychology*, 92(1), 280–298. <https://doi.org/10.1111/bjep.12449>
- Boutron, I., Altman, D. G., Moher, D., Schulz, K. F., & Ravaud, P. (2017). CONSORT Statement for randomized trials of nonpharmacologic treatments: A 2017 update and a CONSORT extension for nonpharmacologic trial abstracts. *Annals of Internal Medicine*, 167(1), 40–47. <https://doi.org/10.7326/m17-0046>
- Bradley, K. L., Bagnell, A. L., & Brannen, C. L. (2010). Factorial validity of the center for epidemiological studies depression 10 in adolescents. *Issues in Mental Health Nursing*, 31(6), 408–412. <https://doi.org/10.3109/01612840903484105>
- Byrne, B. M. (2013). *Structural equation modeling with Mplus: Basic concepts, applications, and programming*. Routledge.
- Cohen, J. (2013). *Statistical power analysis for the behavioral sciences*. Routledge.
- Collison, J., & Harrison, L. (2020). Prevalence of body dysmorphic disorder and predictors of body image disturbance in adolescence. *Adolescent Psychiatry*, 10(3), 206–218. <https://doi.org/10.2174/2210676610999200420112129>
- Couture Bue, A. C. (2020). The looking glass selfie: Instagram use frequency predicts visual attention to high-anxiety body regions in young women. *Computers in Human Behavior*, 108, Article 106329. <https://doi.org/10.1016/j.chb.2020.106329>
- Cragun, D., Debate, R. D., Ata, R. N., & Thompson, J. K. (2013). Psychometric properties of the body esteem scale for adolescents and adults in an early adolescent sample. *Eating and Weight Disorders-Studies on Anorexia, Bulimia and Obesity*, 18(3), 275–282. <https://doi.org/10.1007/s40519-013-0031-1>
- Davis, C. G., Mahboob, W., Abdessemed, M., Perry, S., Adams, A., & Goldfield, G. S. (n.d.). Limiting social media decreases depression, anxiety and FoMO in youth with emotional distress: A randomized controlled trial. [Manuscript under review]
- Fardouly, J., Diedrichs, P. C., Vartanian, L. R., & Halliwell, E. (2015). Social comparisons on social media: The impact of Facebook on young women's body image concerns and mood. *Body Image*, 13, 38–45. <https://doi.org/10.1016/j.bodyim.2014.12.002>
- Fardouly, J., & Vartanian, L. R. (2016). Social media and body image concerns: Current research and future directions. *Current Opinion in Psychology*, 9, 1–5. <https://doi.org/10.1016/j.copsyc.2015.09.005>
- Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2010). *Multivariate data analysis*. Pearson Educational International.
- He, J., Sun, S., Zickgraf, H. F., Lin, Z., & Fan, X. (2020). Meta-Prevalence of body dysmorphic disorder and predictors of body image disturbance in adolescence. *Body Image*, 33, 90–10. <https://doi.org/10.1016/j.bodyim.2020.02.011>
- Hogue, J. V., & Mills, J. S. (2019). The effects of active social media engagement with peers on body image in young women. *Body Image*, 28, 1–5. <https://doi.org/10.1016/j.bodyim.2018.11.002>
- Jarman, H. K., McLean, S. A., Slater, A., Marques, M. D., & Paxton, S. J. (2021). Direct and indirect relationships between social media use and body satisfaction A prospective study among adolescent boys and girls. *New Media & Society*. <https://doi.org/https://doi.org/10.1177/14614448211058468>
- Karim, F., Oyewande, A. A., Abdalla, L. F., Chaudhry Ehsanullah, R., & Khan, S. (2020). Social media use and its connection to mental health: A systematic review. *Cureus*, 12(6), Article e8627. <https://doi.org/10.7759/cureus.8627>
- Keles, B., McCrae, N., & Grealish, A. (2020). A systematic review: The influence of social media on depression, anxiety and psychological distress in adolescents. *International Journal of Adolescence and Youth*, 25(1), 79–93. <https://doi.org/10.1080/02673843.2019.1590851>
- Kreidler, S. M., Muller, K. E., Grunwald, G. K., Ringham, B. M., Coker-Dukowitz, Z. T., Sakhadeo, U. R., Barón, A. E., & Glueck, D. H. (2013). GLIMMPS: Online power computation for linear models with and without a baseline covariate. *Journal of Statistical Software*, 54(10), 1–26. <https://doi.org/10.18637/jss.v054.i10>
- Lakens, D. (2013). Calculating and reporting effect sizes to facilitate cumulative science: A practical primer for *t*-tests and ANOVAs [Review]. *Frontiers in Psychology*, 4. <https://doi.org/10.3389/fpsyg.2013.00863>
- Marengo, D., Longobardi, C., Fabris, M., & Settanni, M. (2018). Highly-visual social media and internalizing symptoms in adolescence: The mediating role of body image concerns. *Computers in Human Behavior*, 82, 63–69. <https://doi.org/10.1016/j.chb.2018.01.003>
- McLean, S. A., Wertheim, E. H., Masters, J., & Paxton, S. J. (2017). A pilot evaluation of a social media literacy intervention to reduce risk factors for eating disorders. *International Journal of Eating Disorders*, 50(7), 847–851. <https://doi.org/10.1002/eat.22708>
- Mendelson, B. K., Mendelson, M. J., & White, D. R. (2001). Body-esteem scale for adolescents and adults. *Journal of Personality Assessment*, 76(1), 90–106. https://doi.org/10.1207/S15327752JPA7601_6
- Parry, D. A., Davidson, B. I., Sewall, C. J., Fisher, J. T., Mieczkowski, H., & Quintana, D. S. (2021). A systematic review and meta-analysis of discrepancies between logged and self-reported digital media use. *Nature Human Behaviour*, 5(11), 1535–1547. <https://doi.org/10.1038/s41562-021-01117-5>
- Paus, T., Keshavan, M., & Giedd, J. N. (2008). Why do many psychiatric disorders emerge during adolescence? *Nature Reviews Neuroscience*, 9(12), 947–957. <https://doi.org/10.1038/nrn2513>
- Pedalino, F., & Camerini, A. L. (2022). Instagram Use and body dissatisfaction: The mediating role of upward social comparison with peers and influencers among young females. *International Journal of Environmental Research and Public Health*, 19(3). <https://doi.org/10.3390/ijerph19031543>
- Prnjak, K., Hay, P., Mond, J., Bussey, K., Trompeter, N., Lonergan, A., & Mitchison, D. (2021). The distinct role of body image aspects in predicting

- eating disorder onset in adolescents after one year. *Journal of Abnormal Psychology*, 130(3), 236–247. <https://doi.org/10.1037/abn0000537>
- Ryding, F. C., & Kuss, D. J. (2020). The use of social networking sites, body image dissatisfaction, and body dysmorphic disorder: A systematic review of psychological research. *Psychology of Popular Media*, 9(4), 412–435. <https://doi.org/10.1037/ppm0000264>
- Saiphoo, A. N., & Vahedi, Z. (2019). A meta-analytic review of the relationship between social media use and body image disturbance. *Computers in Human Behavior*, 101, 259–275. <https://doi.org/10.1016/j.chb.2019.07.028>
- Seabrook, E. M., Kern, M. L., & Rickard, N. S. (2016). Social networking sites, depression, and anxiety: A systematic review. *JMIR Mental Health*, 3(4). <https://doi.org/10.2196/mental.5842>
- Sewall, C. J. R., Goldstein, T. R., Wright, A. G. C., & Rosen, D. (2022). Does objectively measured social-media or smartphone use predict depression, anxiety, or social isolation among young adults? *Clinical Psychological Science*, 10(5), 997–1014. <https://doi.org/10.1177/21677026221078309>
- Spitzer, R. L., Kroenke, K., Williams, J. B., & Löwe, B. (2006). A brief measure for assessing generalized anxiety disorder: The GAD-7. *Archives of Internal Medicine*, 166(10), 1092–1097. <https://doi.org/10.1001/archinte.166.10.1092>
- Thai, H., Davis, C. G., Stewart, N., Gunnell, K. E., & Goldfield, G. S. (2021). The effects of reducing social media use on body esteem among transitional-aged youth. *Journal of Social and Clinical Psychology*, 40(6), 481–507. <https://doi.org/10.1521/jscp.2021.40.6.481>
- Tiggemann, M., Hayden, S., Brown, Z., & Veldhuis, J. (2018). The effect of Instagram “likes” on women’s social comparison and body dissatisfaction. *Body Image*, 26, 90–97. <https://doi.org/10.1016/j.bodyim.2018.07.002>
- Tremblay, L., & Limbos, M. (2009). Body image disturbance and psychopathology in children: Research evidence and implications for prevention and treatment. *Current Psychiatry Reviews*, 5(1), 62–72. <https://doi.org/10.2174/157340009787315307>
- Twenge, J. M., Joiner, T. E., Rogers, M. L., & Martin, G. N. (2018). Increases in depressive symptoms, suicide-related outcomes, and suicide rates among US adolescents after 2010 and links to increased new media screen time. *Clinical Psychological Science*, 6(1), 3–17. <https://doi.org/10.1177/2167702617723376>
- Twenge, J. M., Martin, G. N., & Campbell, W. K. (2018). Decreases in psychological well-being among American adolescents after 2012 and links to screen time during the rise of smartphone technology. *Emotion*, 18(6), 765–780. <https://doi.org/10.1037/emo0000403>
- Wood, D. L., Crapnell, T., Lau, L., Bennett, A. G., Lotstein, D. S., Ferris, M., & Kuo, A. A. (2018). Emerging adulthood as a critical stage in the life course. In M. Halfon, C. Forrest, & E. Faustman (Eds.), *Handbook of life course health development*. Springer. https://doi.org/10.1007/978-3-319-47143-3_7

Received July 13, 2022

Revision received December 23, 2022

Accepted January 4, 2023 ■