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Reactions to naturalistic smartphone deprivation among psychiatrically hospitalized adolescents

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ABSTRACT

The standard of care among youth who are psychiatrically hospitalized typically involves smartphone confiscation for the duration of treatment. However, very little is known regarding how youth respond to this period of smartphone "deprivation," factors that may influence this response, and ensuing clinical effects. The present exploratory mixed-methods study sought to elucidate the experience of psychiatrically hospitalized adolescents as it relates to smartphone deprivation, and to evaluate the impact of this widespread treatment approach. Psychiatrically hospitalized adolescents (N = 181; Mean age = 15.29 years) completed qualitative and quantitative measures assessing the experience of smartphone deprivation during hospitalization. Associations among reactions to smartphone deprivation and smartphone and social media use patterns were explored. Analyses additionally evaluated whether reactions to smartphone deprivation were associated with clinical symptom severity (e.g., suicidal ideation, internalizing and externalizing symptoms) and readiness for psychotherapy. Negative reactions to smartphone deprivation were significantly positively correlated with daily smartphone hours, addictive patterns of use, and both negative and positive emotional responses to social media use. Reactions to smartphone deprivation were not associated with clinical symptom severity. However, negative reactions to smartphone deprivation were associated with lower readiness for therapy, while positive reactions were associated with greater readiness. This preliminary work illustrates the complexities of smartphone use in adolescents and the potential positive and negative effects of smartphone deprivation during psychiatric hospitalization. Future prospective research with adolescents should clarify optimal smartphone access during inpatient hospitalization.

1. Introduction

Smartphone use is a pervasive aspect of adolescent life and development (Anderson and Jiang, 2018). Globally, the number of adolescent smartphone users has increased, and by some estimates, as many as 95% of adolescents in the United States have access to a smartphone (Anderson and Jiang, 2018). A primary use of smartphones among adolescents is engagement with social media, such as Snapchat, Instagram, and TikTok. Upwards of 70% of adolescents report checking social media multiple times per day, with 43% checking hourly or more (Rideout and Robb, 2018). Smartphone and social media use has been associated with both positive (e.g., social connection, education, entertainment) and negative (e.g., poor sleep, depressive symptoms, problematic use) outcomes, and clinically high-risk youth may be particularly prone to both these positive and negative effects (Nesi et al., 2019; Shafi et al., 2020; Weinstein et al., 2021). Among youth who are psychiatrically hospitalized, smartphones are typically confiscated at the time of hospitalization (Burke et al., 2020; Weinstein et al., 2021). However, very little is known regarding how youth respond to this period of smartphone "deprivation," factors that may influence this response, and potential effects of this response on clinical functioning and treatment engagement.

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Researchers have recently considered the potential positive and negative implications, ethics, and lost opportunities inherent in this standard smartphone "deprivation" or "fast" period, which lasts for the duration of youths' hospitalization (typically one to three weeks) (Burke et al., 2020). On the one hand, there are many potential positive implications of restricting access to smartphone use. In addition to the myriad practical and logistical reasons to restrict smartphone access, possible psychosocial benefits include reducing interpersonal stress and feelings of social exclusion (Brown and Kuss, 2020). Further, restricting smartphone access may serve to minimize distraction and thus increase focus on psychotherapeutic individual and group work. Indeed, prior experimental work with community samples suggests that reducing smartphone use may have benefits for young peoples' sleep quality, depressive symptoms, and loneliness (Graham et al., 2020).

However, complete restriction of smartphone access during a brief hospitalization may also have negative consequences or untoward effects for adolescents. From a theoretical perspective, prior research has likened the effects of social media non-use to that of substance non-use among individuals with problematic use patterns (Paschke et al., 2021; Stieger and Lewetz, 2018). Although, of course, there are important differences between these experiences, multiple studies have found that non-use can be associated with common "withdrawal" symptoms, such as relapse and negative feelings (e.g., boredom, anxiety, loneliness). This includes a small number of studies that have empirically investigated smartphone or social media non-use by choice (Baumer et al., 2013; Baumer et al., 2015; Eide et al., 2018; Schoenebeck, 2014; Stieger and Lewetz, 2018), as well as even fewer studies that have examined involuntary non-use (Hoffner et al., 2016).

Furthermore, at least one prior experimental study with college students shows no positive effects of social media abstinence (Hall et al., 2019), and work with adults suggests smartphone restriction may increase stress (Tams et al., 2018) and fear of missing out (Eide et al., 2018). Among a nationally representative sample of adolescents in the U.S., a 2018 survey found that 42% felt anxious without access to their smartphones, while 25% reported feeling lonely and 24% feeling generally upset. Individuals may come to strongly rely on smartphones as a vehicle for coping (e.g., distraction) (Wadley et al., 2020), and thus removal may increase emotion dysregulation. The term "nomophobia" has even been developed to reflect the fear of being without one's mobile phone, with higher levels of psychiatric symptoms in youth associated with greater nomophobia (Kuscu et al., 2020).

Thus, despite initial theoretical and empirical investigation, questions remain regarding the implications of psychiatric hospitalization-related involuntary smartphone "deprivation" practices. In turn, there is little evidence base to guide pediatric clinical care. Although the rationale for smartphone confiscation is strong, there is also compelling rationale that a one-size-fits-all prohibition approach may be ineffective for psychiatrically hospitalized youth, given potential negative consequences for mood, anxiety, social connection, support-seeking, distraction, other digital coping strategies, as well as the potential for lost therapeutic opportunities. Notably, there may be considerable interindividual differences among adolescents in reactions to smartphone deprivation. For example, psychiatrically hospitalized youth engaging in problematic or addictive patterns of phone use (Fırat et al., 2018) may report greater levels of stress or "withdrawal" in response to smartphone deprivation (Tams et al., 2018). Similarly, those who are more emotionally invested in their social media experiences may react more strongly to smartphone deprivation. Furthermore, reactions to smartphone deprivation represent an area of significant clinical relevance, as adolescents' reactions to this phenomenon may strongly influence treatment engagement and symptom progression during hospitalization. Yet, at present, the potential implications of smartphone deprivation during hospitalization remain merely conjecture. There has been no quantitative and minimal qualitative (Weinstein et al., 2021) research examining the experienced impact of smartphone deprivation among adolescents during psychiatric hospitalization.

2. Current study

To address these gaps in the literature, the present multi-method exploratory study had three aims. First, the primary aim was to examine the perceived impact of involuntary smartphone loss during an acute inpatient psychiatric hospitalization among a diverse sample of adolescents. Given this nascent area of research, exploring and characterizing the perspectives of hospitalized youth when smartphones are removed at intake is a necessary first step. As such, we also aimed to characterize adolescents' responses to open-ended questions assessing the positive and negative aspects of smartphone deprivation during their hospitalization.

Second, we sought to examine the psychometric properties of a newly developed questionnaire on reactions to smartphone deprivation. Third, we carried out exploratory analyses to examine correlates of reactions to smartphone deprivation. Specifically, we examined associations with adolescents' typical patterns of smartphone and social media use (amount of phone and social media use, addictive patterns of use, positive and negative emotional responses to social media experiences), as well as with various clinical symptoms (higher severity internalizing and externalizing symptoms and suicidal ideation) and readiness for therapy.

3. Methods and measures

3.1. Participants

Participants were 181 adolescents admitted to an inpatient psychiatric hospital unit due to acute risk of harm to themselves or others. Participants included patients admitted to the unit between February 2020 and September 2020, who completed the Reactions to Smartphone Deprivation Scale and endorsed having a smartphone.

3.2. Procedures

During the standard clinical intake process, participants completed self-report measures administered by hospital clinical staff. Participants completed measures as soon as possible upon their admission (typically within 2–3 days). Per hospital policy, all participants' cell phones were confiscated upon admission to the unit.

3.3. Ethical considerations

The hospital Institutional Review Board approved a waiver of consent for this study, given its classification as a chart review. Participants' responses were used to inform and improve clinical care on the unit.

3.4. Measures

Phone hours and social media hours. Participants were asked to report on their daily use of a smartphone and social media with two items: "On average, how many hours per day do you typically spend on your phone [on social media]?" Response options ranged from 0 *(Less than 1 h)* to 24 (*24 h*).

Reactions to smartphone deprivation. The Reactions to Smartphone Deprivation (RSD) Scale was developed to inform clinical practices and to assess participants' positive and negative reactions to naturalistic deprivation of smartphone usage. Eight items assessed negative reactions to smartphone deprivation. Four of these items were taken from the Smartphone Withdrawal Scale (Eide et al., 2018). Four additional negative items assessing emotional reactions to smartphone deprivation were added. In addition, four items were developed to assess positive reactions to smartphone deprivation, and two open-ended questions about reactions to smartphone deprivation were asked: "In your opinion, what are some of the *good* [bad] things about not having your phone right now, while you are in the hospital?"

Addictive phone use. Smartphone addiction was assessed using the 9-item Addictive Patterns of Use (APU) scale (Domoff et al., 2020). Items are rated from 1 *(Never)* to 5 (*Always*). A total score was calculated by taking a mean of all nine items ($\alpha = 0.88$). The APU has shown good psychometric properties with adolescents in prior work (Domoff et al., 2020).

Emotional Responses to social media use. A measure of positive and negative emotional responses to social media experiences (Nesi et al., 2021) was used. The scale consists of two, 5-item subscales, capturing adolescents' positive and negative emotional responses to use, with items rated from 1 *(Never)* to 5 *(Always)*. An example of an item from the positive subscale is "When you use social media, how often do you feel supported and encouraged by your friends?" An example from the negative subscale is "When you use social media, how often do you feel hurt by a negative comment from someone?" A mean of items was taken for each subscale; $\alpha = 0.85$ for Positive subscale; $\alpha = 0.82$ for Negative subscale.

Internalizing and externalizing symptoms. Participants completed the 17-item version of the Youth-Pediatric Symptom Checklist (W. Gardner et al., 1999), and the internalizing and externalizing subscales were used. Items were rated from 0 (*Never*) to 2 (*Often*), and a total score was taken for each subscale. The PSC-17 has shown strong validity and reliability in pediatric populations (William Gardner, Lucas, Kolko, & Campo, 2007; $\alpha = 0.89$ for Internalizing subscale; $\alpha = 0.72$ for Externalizing subscale).

Suicidal ideation. The 15-item Suicidal Ideation Questionnaire-Junior (SIQ-Jr (Reynolds and Mazza, 1999); assessed severity of suicidal ideation. The SIQ-Jr has shown strong internal reliability, test-retest reliability, and convergent validity (Reynolds and Mazza, 1999). Items were rated from 0 (*I've never had this thought*) to 6 (*Almost every day*). A total score was calculated ($\alpha = 0.96$).

Readiness for psychotherapy. The Readiness for Psychotherapy index is a 20-item measure assessing multiple dimensions of readiness for therapy, including level of distress, desire for change, and willingness to work in therapy (Ogrodniczuk et al., 2009). One additional item was added, relevant to the current setting (i.e., "I would like to participate in individual therapy while in the hospital"). All items were rated from 1 (*Strongly Disagree)* to 5 *(Strongly Agree*) ($\alpha = 0.86$).

4. Data analytic plan

Exploratory factor analysis (EFA) was employed to examine the factor structure of the Reactions to Smartphone Deprivation Scale (SPSS 23.0), with principal axis extraction and oblique promax rotation. We retained items with a minimum factor loading of 0.40. To determine the number of factors to retain, we took into account the scree plot, the size of Eigenvalues, the amount of variance explained by each factor, and the interpretability of factors (Warner, 2012).

Bivariate correlations were used to assess the association between Reactions to Smartphone Deprivation Scale factors and daily phone hours, daily social media use hours, addictive patterns of use, as well as both negative and positive emotional responses to social media use. Linear regressions were used to examine the associations between the reactions to smartphone deprivation subscales and measures of psychopathology and readiness for psychotherapy.

Inductive thematic coding was used to derive themes directly from patients' open-ended responses to questions about positive and negative aspects of smartphone deprivation during hospitalization (Braun and Clarke, 2006). First, we reviewed 50% of responses and employed inductive thematic coding. Next, two coders reviewed all of the responses and coded presence or absence of themes to acceptable reliability (86.47% agreement on negative codes and 89.59% agreement on positive codes). Final codes for discrepant items were determined by consensus.

5. Results

5.1. Sample descriptive statistics

The average age of participants was 15.29 years ($SD = 1.63$, Range = 11.0 to 18.3). The sample was 38.7% male, 44.8% female, 7.7% transgender, 6.6% genderqueer or gender-nonconforming, and 1.7% other; 0.6% preferred not to answer. The racial makeup of the sample was 2.8% Asian, 5.5% American Indian or Alaskan Native, 23.8% Black, 71.8% White, and 14.9% other races; 33.7% of the sample identified as Hispanic. In terms of sexual orientation, 43.6% of the sample identified as Heterosexual/Straight, 30.9% as Bisexual or Pansexual, 11.6% as Gay or Lesbian, 2.2% as Asexual, 5.0% Other, and 6.6% preferred not to answer.

5.2. Factor structure of the reactions to Smartphone Deprivation Scale

The scale data met the Kaiser Meyer Olkin criteria for sampling adequacy (0.870) and the Bartlett's test of sphericity was significant ($\chi^2(66) = 1227.28$, $p < 0.001$), indicating that the data was appropriate for EFA. The EFA supported retaining two factors (Table 1). The first factor (Negative RSD; 8 items) was interpreted as reflecting that one's naturalistic smartphone deprivation is experienced as negative (e.g., resulting in feelings of being lost, increases in anxiety and boredom, and fixation on and longing for one's phone). The second factor (Positive RSD 4 items) was interpreted as reflecting that one's naturalistic smartphone deprivation is experienced as positive (e.g., resulting in feelings of relief, relaxation, freedom, and reductions in stress).

A mean score was calculated for each subscale; the Negative RSD and Positive RSD subscales evidenced excellent reliability ($\alpha = 0.91$ and $\alpha = 0.83$). The Negative and Positive RSD subscales were not correlated with age, gender (cisgender vs. transgender, gender-queer, gender nonconforming, or gender fluid), sexual orientation (sexual minority vs. non-sexual minority), or ethnicity (*ps* all >.05).[1]

Table 1
Reactions to smartphone deprivation factor loadings.

Item	Factor	
	1	2
The only thing I can think about right now is using my phone	.769	−.157
I feel relieved or less stressed without my phone right now	−.148	.704
I miss my phone terribly in this moment	.821	−.075
I feel relaxed without my phone right now	−.03	.842
I feel an irresistible need to use my phone right now	.899	.027
I feel free without my phone right now	.091	.903
I would like to hold my phone in my hand right now	.708	−.095
I feel anxious about not having my phone right now	.776	−.006
I feel lost without my phone right now	.857	.067
I don't know who I am without my phone right now	.800	.245
I feel bored without my phone right now	.612	−.055
I feel happy without my phone right now	.056	.777
% of Variance	44.62	19.57
Eigenvalue	5.35	2.35
Cronbach alpha	.91	.83
M (SD)	2.46 (0.92)	2.49 (0.82)

[1] Due to the racial composition of the sample, we were not adequately powered to examine associations by race.

5.3. Associations among reactions to smartphone deprivation, patterns of phone use, and clinical outcomes

Bivariate correlations revealed that Negative RSD was positively correlated with daily phone hours, daily social media use hours, addictive patterns of use, as well as both negative and positive emotional responses to social media use (Table 2). There were no significant associations between Positive RSD and daily phone hours, daily social media use hours, addictive patterns of use, nor positive emotional responses to social media experiences; Positive RSD was positively correlated with negative emotional responses to social media experiences (Table 2).

Neither Negative nor Positive RSD were significantly associated with indices of clinical severity, including internalizing symptoms, externalizing symptoms, and suicidal ideation severity. Negative RSD was negatively associated with readiness for therapy, and Positive RSD was positively associated with readiness for therapy, after adjusting for daily phone hours (Tables 3–4).[2]

5.4. Thematic coding and analysis: adolescent patients' perspectives on positive and negative aspects of smartphone deprivation

Positive aspects of smartphone deprivation. Five major themes emerged from inductive thematic analysis of patients' responses to the open-ended question assessing positive aspects of being unable to access one's phone during hospitalization: avoiding stress (19.3%), experiencing a shift in behavioral or cognitive focus away from smartphone activity (23.2%), increasing engagement in other activities (12.2%), and getting a break from phone/screen/social media (7.7%). Approximately 22.7% of participants indicated that they could not identify any benefits to the lack of phone access (Table 5).

Of the patients who expressed avoiding stress as a benefit, 22.9% (n = 8) reported that they felt able to avoid general stress of the outside world, 28.6% (n = 10) social media-specific stress (e.g., stress related to cyberbullying, exclusion, fear of missing out, waiting to see if others would respond to their messages), 17.1% (n = 6) stress associated with drama (e.g., "I'm not in any drama", "Drama is gone"), 17.1% (n = 6) stress associated with having to be available to others, and 8.6% (n = 3) stress associated with having to hear or respond to others' opinions or questions about their mental health.

Among patients who expressed facilitating a shift in focus away from their smartphones as a benefit, approximately 45.2% (n = 19) indicated that it allowed them to shift their focus to themselves, 47.6% (n = 20) that it allowed them to shift their focus to their treatment, and 23.8% (n = 10) that it reduced distraction.

Among patients indicating that a lack of access to their phone provided the benefit of increasing their engagement in other activities, 50% (n = 11) endorsed that it increased their in-person social interaction, 13.6% (n = 3) that it facilitated making friends during their admission, 22.7% (n = 5) that they engaged in other activities (e.g., work on art, play games, art, read), and 9.1% (n = 2) that they were able to be more engaged, present, or mindful.

Negative aspects of smartphone deprivation. Four major themes emerged in regard to negative aspects of smartphone deprivation during hospitalization: being unable to socially connect with others outside of the hospital (53%), experiencing a lack of access to entertainment or distraction tools (16.6%), and experiencing boredom (11.6%). Approximately 7.2% of participants reported being unable to identify any negatives (Table 5). Less than 5% of patients endorsed: increases in general anxiety, sleep disturbance, not knowing what is happening in the outside world, not having access to academic materials, general negative assessment of being unable to access phone, and being unable to tell the time.

Among youth reporting the inability to socially connect with others outside of the hospital as a negative, 66.7% (n = 64) mentioned that they were unable to connect with friends, 20.8% (n = 20) with family, and 13.5% (n = 13) with significant others. Further, 13.5% (n = 13) indicated that they felt disconnected from others and/or missed others, 9.4% (n = 9) that they were worried that they were unable to reassure others that they are okay or fill others in on how they are doing, 7.3% (n = 7) that it was difficult not knowing if others have contacted them, 5.2% (n = 5) that they were worried about being unable to check in to see if close others are okay, 4.2% (n = 4) that they felt anxious about being unable to contact others, 2.1% (n = 1) that without their phones, they did not have access to close others' phone numbers to be able to call them, and 1% (n = 1) that they were unable to rely on a close other to help them cope with their mental health.

Among patients who indicated that lack of phone access reduced their ability to entertain or distract themselves, 40% (n = 12) referenced not having access to music, 13.3% (n = 4) videos or video apps (e.g., TikTok, YouTube), 6.7% (n = 2) photos, 6.7% (n = 2) books, 6.7% (n = 2) other social media apps.

6. Discussion

The present study sought to examine the perceived impact of smartphone deprivation during an acute inpatient psychiatric hospitalization among a diverse sample of adolescents. Findings offer an important first step toward elucidating the positive and negative consequences of smartphone "deprivation" during inpatient treatment, and offer critical insight into the implications of this highly common clinical practice. Furthermore, results add to a growing literature on the clinical implications of problematic smartphone use. Notably, adolescents experienced both positive and negative reactions to lacking access to smartphones during treatment. However, youth with more addictive or emotionally invested patterns of typical smartphone (i.e., more positive and negative emotional reactions to social media use) use were more likely to report negative reactions to smartphone deprivation, and these same youth reported lower readiness for treatment.

6.1. Examining youth perceptions of smartphone deprivation

Youth reported a variety of positive consequences of being unable to access their smartphones upon hospitalization. Reported positive consequences included: being able to shift focus to themselves and their treatment; avoidance or reduction of stress; being able to focus on engaging in other activities (e.g., talking to other teens in-person); and getting a break from screens. These results support findings from a recent qualitative study examining the experience of smartphone confiscation in a small sample of adolescent psychiatric inpatients (Weinstein et al., 2021), and are also in line with the clinical rationale of fostering a therapeutic environment (Burke et al., 2020; O'Connor et al., 2018). Indeed, almost 1 in 4 youth felt that not having access to their phones helped them turn their attention to themselves and to their treatment. Notably, the perceived benefit for social engagement with other teens in the hospital setting may present both a benefit (i.e., increased social support), but also a risk (i.e., due to the possibility for negative peer influences).

In terms of negative consequences, the most commonly endorsed was a resulting lack of social connection, reported by over half of the sample. Findings again echo prior qualitative (Weinstein et al., 2021) and quantitative (O'Connor et al., 2018; Organization of Nurse Leaders Conference, 2018) studies suggesting that smartphone use during hospitalization is desired for social connection purposes. For some youth, it is possible that experiencing social disconnection within the hospital may exacerbate their symptoms, and even complicate reconnection after hospitalization, given known associations between social isolation and poor mental health outcomes (e.g., Calati et al., 2019). Other frequently

[2] The pattern of significant and non-significant results remained the same when adjusting for daily social media hours.

Table 2
Means, standard deviations, and correlations with confidence intervals.

Variable	*M*	*SD*	1	2	3	4	5	6
1. Neg RSD	2.46	0.92						
2. Pos RSD	2.49	0.82	−.29*** [-.42, −.15]					
3. Phone hours	6.49	4.71	.46*** [.34, .57]	−.09 [-.23, .06]				
4. SM hours	4.37	4.31	.54*** [.43, .64]	−.12 [-.26, .03]	.80*** [.74, .85]			
5. APU	2.12	0.79	.51*** [.39, .61]	.04 [-.11, .18]	.34*** [.20, .46]	.28*** [.14, .41]		
6. Neg emotional responses to SM	1.32	0.95	.17* [.03, .31]	.26*** [.12, .40]	.21** [.07, .35]	.16* [.01, .30]	.43*** [.30, .54]	
7. Pos emotional responses to SM	2.48	0.98	.16* [.02, .30]	−.10 [-.24, .05]	.11 [-.04, .25]	.17* [.02, .31]	.01 [-.14, .15]	−.22** [-.36, −.08]

Note. RSD = Reactions to Smartphone Deprivation; APU = Addictive Patterns of Use; SM = Social media; Pos = Positive; Neg. = Negative; Values in square brackets indicate the 95% confidence interval for each correlation. *p < 0.5; **p < 0.01; ***p < 0.001.

Table 3
Linear regressions assessing associations of negative reactions to smartphone deprivation with clinical severity and readiness for therapy.

	Dependent variable:			
	Internalizing sx	Externalizing sx	Suicidal ideation	Readiness for therapy
Negative Reactions to Smartphone Deprivation	−0.183	0.414	−3.610	−4.446***
	p = 0.493	p = 0.059	p = 0.143	p = 0.00003
Phone hours	0.039	0.080	1.148*	0.089
	p = 0.460	p = 0.065	p = 0.018	p = 0.658
Constant	6.470***	1.583**	38.091***	48.686***
	p = 0.000	p = 0.003	p = 0.000	p = 0.000
Observations	181	181	181	181
R^2	0.004	0.069	0.032	0.110
Adjusted R^2	−0.007	0.059	0.021	0.100
Residual Std. Error (df = 178)	2.928	2.388	26.900	11.212
F Statistic (df = 2; 178)	0.350	6.613	2.936	11.041

Note: Sx = symptoms. *p < 0.5; **p < 0.01; ***p < 0.001.

Table 4
Linear regressions assessing associations of positive reactions to smartphone deprivation with clinical severity and readiness for therapy.

	Dependent variable:			
	Internalizing sx	Externalizing sx	Suicidal ideation	Readiness for therapy
Positive Reactions to Smartphone Deprivation	0.309	−0.052	2.327	2.310*
	p = 0.248	p = 0.815	p = 0.346	p = 0.031
Phone hours	0.027	0.116**	0.856*	−0.280
	p = 0.564	p = 0.003	p = 0.048	p = 0.132
Constant	5.328***	2.490***	25.325**	34.402***
	p = 0.000	p = 0.0002	p = 0.001	p = 0.000
Observations	181	181	181	181
R^2	0.009	0.051	0.025	0.041
Adjusted R^2	−0.002	0.040	0.014	0.031
Residual Std. Error (df = 178)	2.921	2.412	26.996	11.638
F Statistic (df = 2; 178)	0.789	4.720	2.287	3.841

Note: Sx = symptoms. *p < 0.5; **p < 0.01; ***p < 0.001.

reported negative consequences of smartphone deprivation were being unable to access digital tools for entertainment or distraction, and boredom. For youth who rely on their devices as a primary means of emotion regulation (e.g., to distract themselves), their abrupt removal may be experienced as particularly stressful.

6.2. Reactions to smartphone deprivation: correlates and outcomes

Our quantitative findings mirror and extend our qualitative findings, suggesting that there are important individual differences in which youth may respond more positively or negatively to smartphone deprivation. Youth who used their smartphones more, and those with more addictive patterns of use, were more likely to have negative reactions to smartphone deprivation. Youth who reported having more frequent negative emotional responses to their social media use experienced greater positive *and* negative reactions to smartphone deprivation. These youth may have mixed feelings about losing access to their smartphone; such a loss of access may perhaps provide a relief, but also may lead to difficulties in adjustment for youth who are emotionally invested in their social media use. Youth reporting more frequent

Table 5
Themes derived from thematic analysis of patient's perspectives on positive and negative aspects of smartphone deprivation during psychiatric hospitalization.

Theme	N	%	Examples
Positive			
Shift in focus	42	23.2	I can focus on myself and my treatment.
No positives identified	41	22.7	I feel neutral; There is nothing good about not having my phone.
Avoid stress	35	19.3	I don't have to worry about drama or having to text people back. Don't have to worry about whether other people have texted me back.
Increase other engagement	22	12.2	It encourages me to talk to people in-person and to make friends.
Break	14	7.7	I can take a break from looking at a screen all day.
Negative			
Lack of social connection	96	53	I can't talk to the people who help me feel better when I'm feeling down. I feel disconnected and alone.
Lack of entertainment/ distraction	30	16.6	There is not enough distractions from my strong emotions. I miss being able to listen to music or watch videos to make me feel better.
Boredom	21	11.6	I am really bored here.
No negatives identified	13	7.2	I feel neutral; There is nothing bad about it.

Note. Reporting broad categories identified that were endorsed by at least 5% of the sample. In order to maintain confidentiality, the examples are not direct quotes but are rather composite examples derived from applicable examples.

positive emotional responses to social media use experienced greater negative reactions to smartphone deprivation, perhaps because these youth may rely more on social media for positive affect generation.

Our findings suggest that neither positive nor negative reactions to smartphone deprivation were associated with severity of internalizing symptoms, externalizing symptoms, or suicidal ideation. However, reactions to smartphone deprivation were associated with indicators of readiness for psychotherapy, characterized as psychological readiness to commit to and engage in therapy (Ogrodniczuk et al., 2009), even after controlling for typical time spent using smartphones outside of the hospital. This has important clinical relevance in that strong negative reactions to confiscation of smartphones may be indicative of poor treatment engagement or may even actively interfere with youths' investment in their treatment. It is also possible that certain trait-like features (e.g., negative affect) may lead to more negative reactions to smartphone deprivation, which in turn may influence therapy readiness and engagement; future longitudinal research will be needed to shed light on such associations.

6.3. Clinical implications

Because of the diversity of reactions to smartphone deprivation, inpatient psychiatric unit clinicians should be aware of the duality of smartphone use and restriction among adolescents. Fostering youths' awareness of the advantages and disadvantages of their smartphone use may facilitate behavior change related to problematic phone use after leaving the hospital. Further, given youths' negative reactions related to social disconnection and boredom, hospital units may consider bolstering innovative digital therapeutic activities, engaging activities, and perhaps, permitting supervised access to smartphones. A range of legal, ethical, and logistical challenges associated with permitting access to smartphones on psychiatric units influences confiscation policies (Burke et al., 2020; Morris, 2018). However, it is possible that such threats could be remedied through a supervised individual or group-based approach. Supervised, structured access may also permit the development and in-vivo practice of healthy smartphone use skills (see also Burke et al., 2020 for further clinical recommendations).

6.4. Strengths & limitations

This study was cross-sectional and largely exploratory; further research examining these constructs in a larger sample (with the power to sufficiently examine differences across demographic groups) will be important, as will longitudinal studies exploring youths' actual engagement in and efficacy of treatment. Relatedly, future studies should be conducted to assess the replicability of the present preliminary exploratory findings. Additionally, future investigations should consider adolescents' perspectives on obtaining access to smartphones after treatment (see Weinstein et al., 2021), given challenges youth may face when reconnecting with peers after hospitalization, and should explore whether youths' perspectives on smartphone deprivation shift over the course of treatment. Notably, this study examined self-reported time spent using phones and social media as a correlate and covariate in analyses. Though meta-analytic evidence suggests only small associations between self-reported screen time and objectively gathered screen time data (Parry et al., 2021), recent work highlights high predictive validity of self-reported screen time measures when compared to objective data (Verbeij T, Pouwels JL, Beyens I, 2021). The use of objective screen time measures remains an important direction for future work. Future studies should also gather input from other relevant stakeholders including hospital staff and parents regarding the pros and cons of this practice.

7. Conclusion

This study addresses a major concern related to adolescents and their psychiatric treatment. Standard clinical practice in many psychiatric hospital settings involves eliminating youths' access to smartphones for the duration of their stay. This study highlights adolescents' perspectives on this phenomenon, including both positive and negative perceived implications of this practice. Furthermore, findings point to the potential role of youths' reactions to smartphone deprivation in subsequent treatment engagement. As smartphones have become universally ubiquitous among US adolescents, identifying clinically appropriate, resiliency-focused approaches to smartphone use among hospitalized adolescents may be critical for their care and treatment success.

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Author statement

Drs. Burke and Nesi conceptualized and designed the study, carried out the initial analyses, drafted the initial manuscript, and reviewed and revised the manuscript. Drs. Domoff, Croarkin, Romanowicz, and Ms. Borgen conceptualized and designed the study, drafted the initial manuscript, and reviewed and revised the manuscript. Dr. Wolff reviewed and revised the manuscript. All authors approved the final manuscript as submitted and agree to be accountable for all aspects of the work.

Declaration of competing interest

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