

## The Relationship between Social Media Bullying and the Adolescent's Self Report of Emotional Health: A Study of Urban Youth on an Acute Inpatient Psychiatric Unit

Arunditi Xantus, Samantha B. Saltz<sup>\*</sup> and Jon A. Shaw

University of Miami School of Medicine, Miami, USA

<sup>\*</sup>Corresponding author: Samantha B Saltz, MD, University of Miami School of Medicine, Miami, FL, USA, E-mail: [samantha.block@jhsmiami.org](mailto:samantha.block@jhsmiami.org)

Rec Date: Jan 21, 2015; Acc Date: April 27, 2015; Pub Date: April 29, 2015

Copyright: © 2015 Saltz SB, et al. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

### Abstract

**Background:** Bullying through social media, known as cyberbullying, is increasingly prevalent amongst today's youth. There is little research on a wide range of internalizing symptoms in conjunction with a measure of self-concept in relationship to cyberbullying.

**Methods:** This prospective research study examined the cross-sectional relationship between cyberbullying victims in children and adolescents 10-17 years of age within an acute inpatient psychiatric unit. Participants completed four separate measurements of anxiety and depression (the Modified Cyberbullying Questionnaire, the Children's Depression Inventory, the Screen for Child Anxiety Related Emotional Disorders (SCARED), and the Piers-Harris Children's Self Concept Scale).

**Results:** 51 subjects completed the study. Twenty-four of the 51 participants reported some form of bullying (47.1%). Of the 24 bullied participants, bullying via Facebook was most commonly reported (63% of bullied participants), followed by text messaging (50% of bullied participants). The mean total score on the Children's Depressive Inventory for the group in which social media bullying was reported was significantly higher than those in which no bullying was reported (14.00 ( $\pm 3.56$ ) versus 9.07 ( $\pm 2.34$ ), ( $p=0.020$ )). The mean total score on the SCARED for the group in which social media bullying was reported was statistically significant (26.83 ( $\pm 6.52$ ) versus 14.33 ( $\pm 3.98$ ), ( $p=0.0015$ )). The mean total T-score on the Piers-Harris Children's Self Concept Scale (2nd ed) for the group in which social media bullying was reported was significant (42.75 ( $\pm 5.20$ ) versus 49.26 ( $\pm 3.97$ ), ( $p=0.043$ )). The Behavioral Adjustment domain was the only individual domain in which statistical significance was not achieved (bullied versus nonbullied (43.18  $\pm$  4.21 vs. 44.41  $\pm$  3.49),  $p=0.61$ )).

**Discussion:** Results indicated significant differences between mean total depression scores, mean total anxiety scores, and mean total T-score for the self-concept scale. These findings indicate an association between depression, anxiety, and self-esteem/self-concept and the presence of cyberbullying.

**Keywords:** Depression; Anxiety; Children and adolescent psychiatry; Original research

### Background

Technology-based bullying, either through internet-based applications or cellular phones, is the newest form of peer victimization or has been receiving a growing amount of attention over recent years. The prevalence of this type of victimization varies, from 4 to 35% in adolescent samples [1,2]. A study conducted in 2008 on 1,200 randomly selected middle-schoolers demonstrated about 23% of youth had been victims of cyberbullying, and 16% engaged in bullying via the Internet and text message [3]. Another study conducted on 2,000 middle schoolers in 2010 found nearly 30% of middle school students were victims of cyberbullying two or more times in the past 30 days; 22% admitted to engaging in cyberbullying two or more times during this same time period [4]. The most frequently used nature of harassments in these studies was name-calling and gossiping. However, internet and cellular phone victimization can extend to use of hate sites, death sites, and unwanted sexual experiences/exposure including wide dissemination of pictures

of video clips which compromise the victim's anonymity and can be potentially devastating to the youngster. Engaging in social media via online/internet based sites and cellular phones are among the most common daily activities of today's children and adolescents. According to a poll conducted of over 2,000 teenagers, 22% of teenagers log on to their favorite social media site more than 10 times a day, and >50% log on to a social media site at least twice a day [5]. In a five year old study, 75% of teenagers reported owning a cellular phone; 25% reported using the phones for social media, 54% of them for texting, and 24% of them for instant messaging [6]. These numbers have likely increased over the last five years.

Social media has been shown to have tremendous benefits to youth. The Digital Youth Project [7] interviewed 800 youth and young adults and conducted over 5,000 hours of online observations. Engaging in social media was found to enhance children and adolescent's communication, social connection, and even technical skills. A longitudinal study [8] of the effects of social media on existing friendships found Internet to provide youth with opportunities to enhance their identity, search for support and information about potentially sensitive topics, and advance meaningful relationships.

Anonymity, asynchronicity, and accessibility may all be beneficial for adolescents who may not be secure about their identity. Existing research suggests benefits of online communication include enhanced self-esteem, development of relationships, and sexual self-exploration [9]. However, existing research also yields overwhelming evidence of potential risks which include cyberbullying and unwanted sexual solicitations, and the subsequent psychological effects on youth. Based on the concepts of traditional bullying, youth with depressive symptomatology may be especially prone to victimization through social media. In a telephone survey about internet behaviors and experiences of over 1500 adolescents between the ages of 10 and 17, the odds of reporting an internet harassment experience in the previous year were more than three times higher (OR:3.38, CI 1.78, 6.45) for youth who reported major depressive symptomatology compared to mild/absent symptomatology [10]. Ongoing studies through the Cyberbullying Research Center [11] suggest an association between cyberbullying, both as a victim and as an offender, and lower levels of self-esteem. Lower levels of self-esteem have repeatedly been implicated with poor academic achievement, absenteeism, poor health, criminal behavior, and other problematic consequences [12,13]. There have been an increasing amount of high profile anecdotal cases linking both traditional bullying and cyberbullying to adolescent suicides. For this reason, amongst others, our study team feels that analyzing cyberbullying in the inpatient unit is imperative as these children are more likely to be hospitalized. Additionally, cyber bullying may contribute to the reason for hospitalization. In a large study of almost 2,000 middle schoolers, youth who experienced either traditional bullying or cyberbullying, as either an offender or a victim, reported having more suicide attempts than those who had not experienced such forms of peer aggression [4]. A self-report survey of over 2,300 high school students indicated that frequent exposure to any type of peer victimization was related to high risk of depression, suicidal ideation, and attempts when compared to students not victimized [14]. In contrast to other studies, in this study by Klomek and colleagues being bullied via e-mail or the Internet occurred with the lowest frequency of any type of peer victimization studied (infrequently, 5%; frequently, 2.3%). There is little existing research on a wide range of internalizing symptoms in conjunction with a measure of self-concept, in relationship to cyberbullying. This current investigation examined the cross-sectional relationship between cyberbullying victims, not perpetrators of cyberbullying, and the different domains of self-concept as well as the presence of anxiety and depressive symptoms, within an acute inpatient psychiatric population.

## Methods

### Participants

All patients ages 10-17 hospitalized on the University of Miami/Jackson Memorial Hospital Acute Inpatient Child and Adolescent Psychiatry Unit from March 19 through May 18 were eligible to participate in this prospective study. All patients not meeting the exclusion criteria were asked to voluntarily complete a packet of self-report questionnaires/scales as part of a quality improvement project. Approval for the quality improvement project was received from the appropriate administrators, including the Medical Director of the unit and the Associate Director of Patient Care and Transitional Care Services of the Jackson Health System. Parents did not need to provide consent for their children to participate. Reasons for exclusion included (1) inability to read and write in English at an estimated second grade level and (2) overt disorganization. Patients were

admitted to the inpatient setting for a variety of reasons including suicidal ideation/behaviors, depression, anxiety, mood disorders, etc. The treatment team was involved in determining which patients were disqualified on the basis of these two exclusion criteria; a total of 16 patients were disqualified from the study based on the above mentioned exclusion criteria. All patients who were not disqualified based on exclusion criteria participated in the study voluntarily. No children were forced to participate. Data were collected on patients who were on the inpatient unit from Monday through Friday excluding holidays. All patients not meeting the above exclusions were asked to voluntarily complete a packet containing four self-report questionnaires/scales as part of a quality improvement project. The packet was asked to be completed in its entirety. Potential participants were informed of the voluntary nature and were instructed to ask any available staff for assistance if they did not understand the material presented.

### Materials

Four separate self-report measurements were utilized to assess the presence of victimization through social media (cellular phones and online applications), depressive symptoms, anxiety symptoms, and the adolescent's self-concept profile.

### Modified cyberbullying questionnaire

The Modified Cyberbullying Questionnaire is a 32-item survey used to measure the presence, severity, and duration of cyberbullying over the past two months. It included 8 sub-categories of cyberbullying, including text message bullying, mobile phone call bullying, picture/video-clip bullying, email bullying, chat-room bullying, bullying through instant messaging, bullying through websites, and bullying on Facebook. The original questionnaire designed by Goldsmiths College at the University of London included 88 multiple-choice questions, which covered 7 sub-categories of cyberbullying (all of the above mentioned except the subcategory of bullying on Facebook) and included qualitative items where participants could comment on a certain question and give a more detailed answer [15]. A more concise version was developed for this study to increase valid response rates that looked exclusively at victims of cyberbullying, not perpetrators of cyberbullying. The bullying on Facebook subcategory was added due to the clinical observation that many youth in this population reported spending a great deal of their online time on Facebook. For each of the 8 subcategories in this study, participants were asked to answer four questions, which included how often they had been a victim of the particular form of cyberbullying, by how many individuals, for how long, and by the gender(s) of the aggressor(s). Items were scored using a 3 to 4-point Likert scale, with a total maximum score of "15" for any of the eight categories. The first page of the Modified Cyberbullying Questionnaire included basic demographic information including the sex of the participant, age, current school grade or last grade completed, accessibility to a laptop/desktop computer with internet access ("yes/no"), and accessibility to a cellular phone with internet access ("yes/no.") Results were considered invalid if answers were inconsistent across the four questions for each subcategory (for example, indicating being bullied several times per week but then stated "I haven't been bullied" when asked "by how many people?")

## Depression

The Children's Depression Inventory was used to measure the severity of depressive symptoms over the last 2 weeks in this clinical sample of youth ages 10-17. The Children's Depression Inventory (CDI) contains 27 items scored from 0 to 2, and is a commonly used self-report of depressive symptoms in children and adolescents age 7-17. As an index of severity of depressive symptoms, a cut-off score of 19 has been found to identify major depressive disorder/clinically depressed children and adolescents, whereas levels between 13 and 18 are regarded as subclinical or minor depressive episodes [16]. For the purpose of this study, participants with CDI>18 formed the high depressive symptoms group (HDSG), those with CDI between 13 and 18 formed the moderate depressive symptoms group (MDSG), and those with CDI<13 the low depressive symptoms group (LDSG). The response to item nine on the inventory, which assessed for suicidal thoughts, was selected for individual analysis.

## Anxiety

The Screen for Child Anxiety Related Emotional Disorders (SCARED), Child Version, consists of 41 items for measuring self-reported anxiety symptoms in youth ages 8-18 years over a 3 month time frame. Items are scored using a 3-point Likert scale with choices ranging from "not true or hardly ever true" to "very true or often true." Scoring consists of a total score, as well as analysis of five factors, including panic disorder or significant somatic symptoms, general anxiety disorder, separation anxiety disorder, social anxiety disorder, and significant school avoidance. Cutoffs for positive indications of an anxiety disorder, as determined by the authors of the screen, were used to indicate the presence of anxiety symptoms within this study [17]. The total score as well as the individual scores within the five factors were utilized for analysis. The scale was considered invalid if more than three items were left unanswered. Psychometric properties of the 41 item SCARED are good, with an internal consistency of  $\alpha=0.90$ .

## Self-concept

The adolescent's self-concept profile was included to see if self-concept may have impacted symptoms of anxiety and depression. The Piers-Harris Children's Self Concept Scale, 2nd Edition, is a self-reported multidimensional measurement of mental and emotional wellbeing in children and adolescents [18]. The scale consists of 60 "yes/no" response items, and provides a Total Score (TOT) intended to communicate the overall essence of self-concept, as well as six domain scores and validity scores which provide a more interpretive analysis. The authors of the scale recommend reading and comprehension to be at a second grade level. The six subscales or domains include physical appearance and attributes (PHY), intellectual and school status (INT), happiness and satisfaction (HAP), freedom from anxiety (FRE), behavioral adjustment (BEH), and popularity (POP.) In an effort to distinguish chance, bias, and exaggerated responses, the Piers-Harris 2 includes two validity scales: inconsistent responding (INC) and response bias (RES). In line with the scoring interpretation guidelines described in the Piers-Harris 2 manual, results were considered invalid if (1) seven or more total responses were invalid (nonresponses or both "yes" and "no" selected) or three responses within any 1 domain were invalid, (2) INC score of  $T>70$ , or (3) RES score of  $T>70$ . The total score was calculated by the number of items endorsed in the direction of positive self-concept, and thus had a raw score range of 0-60. The normalized raw score was then converted to a T-score, with a mean of 50 and standard deviation of

10. A higher score indicated a more favorable measure of self-concept (higher degree of self-esteem or self-regard.) Participants with a Total T score of  $>60$  were considered in the high range for this study and were considered to have a strong general self-appraisal; those with Total T score  $<40$  were considered to fall in the low range, and were expected to have serious doubts about their own self-worth. In calculating the individual domain scores, T scores  $>56$  (above average) were considered to have a strong general self-appraisal within this domain, and T scores  $<40$  (low range) were considered to have significant struggles with self-worth within the individual domains.

## Procedures

Participants were recruited using the above mentioned criteria. All patients not meeting the exclusion criteria were given the opportunity to participate on a voluntary basis. The participants were given a brief explanation of the purpose of the quality improvement project and were then given a packet of four self-administered questionnaires. They were informed of the voluntary nature of the study and were in no way coerced or incentivized to complete the questionnaires. Upon completion, they were asked to return the questionnaires to any staff available on the unit, and the packets were collected at the end of each day. The packets were briefly reviewed upon completion, namely to screen for positive responses to item nine on the Children's Depression Inventory which investigated suicidal thoughts. Appropriate actions were taken if the response to this question was positive, including informing the primary treatment team.

## Data analysis

For the purposes of the current analysis, participants were required to have valid (i.e. non-missing and consistent) data for all of the self-report measures, as outlined above; 51 participants were included in the analysis. Chi-square analyses were conducted to examine gender, ethnicity, and internet accessibility via laptop/computer or cellular phone, in both the bullied group of participants and the group who experienced no bullying/victimization via social media. Chi-squared analyses were also conducted to examine differences in the prevalence of suicidal thoughts, total mean CDI score, and total mean SCARED score, between bullied participants who experienced  $<2$  methods of social media victimization versus the group of bullied participants who experienced  $>2$  methods. The results of the chi-square calculations were then used to calculate the P-values; results were considered significant at  $\alpha < 0.05$ . Two-tailed t-tests were utilized to examine various relationships between the bullied and nonbullied groups of participants, including measures of anxiety, depression, and self-concept. Again, results were considered significant at  $\alpha < 0.05$ . The effect size was determined using Pearson's correlation coefficient ( $r$ ). Post-hoc power calculations were performed for the three main outcomes, based on a two independent study group design with a continuous primary outcome (mean.)

## Results

### Descriptive results

Fifty-one participants were included in the study ( $N=51$ ). A total of 22 patients (18 males, 4 females) refused to complete the packet verbally, or initially agreed to participate but then returned the packet without completion of any of the four questionnaires. An additional 12 patients were excluded due to an invalid response profile on at least

one of the four questionnaires/scales. Of these 12 patient excluded on basis of invalid responses, two were deemed invalid due to inconsistent responses on the Modified Cyberbullying Questionnaire (one male, one female); eight (5 males, 3 females) were considered invalid due to the number of nonresponses on the Children's Depression Inventory, the Screen for Child Anxiety Related Emotional Disorders, or the Piers-Harris Children's Self-Concept Scale 2nd Edition (invalidity based on nonresponses followed the guidelines set forth in each scale's manual); and the remaining 2 patients were excluded due to high scores on either the Response Bias index or the Inconsistent Responding index of the Piers-Harris Children's Self-Concept Scale 2nd Edition (1 male, 1 female.)

The participants who were included ranged in age from 11 to 17 years of age, with a mean age of  $14.48 \pm 2.00$  years. The participants ranged in academic grade from 3rd to 12th grade, with a mean academic grade of  $8.32 \pm 2.10$ . Sixteen (31.4%) of the participants were males and 35 (68.6%) were females. Thirteen (25.5%) were white non-Hispanic, 21 (41.2%) white Hispanic, and 17 (33.3%) were black. Thirty seven (72.5%) participants reported having regular access to a laptop or computer with internet access, and 36 (70.6%) reported having regular access to a cellular phone with internet access. There was no statistical difference between gender, race/ethnicity, or internet accessibility via phone and/or computer amongst the participants who reported any method of social media bullying and the non-bullied participants (Table 1).

Demographic Variables	Total (N=51)	Cyberbullying (N=24)	No Cyberbullying (N=27)
<b>Gender</b>			
Male	16 (31.4%)	6 (25.0%)	10 (37.0%)
Female	35 (68.6%)	18 (75.0%)	17 (63.0%)
		P= 0.50*	P= 0.53*
<b>Ethnicity/Race</b>			
White Non-Hispanic	13 (25.5%)	3 (12.5%)	10 (37.0%)
White Hispanic	21 (41.2%)	13 (54.2%)	8 (29.6%)
Black	17 (33.0%)	8 (33.0%)	9 (33.0%)
		P= 0.28*	P= 0.32*
<b>Internet accessibility</b>			
Laptop/computer	37 (72.5%)	20 (83.3%)	17 (63.0%)
		P= 0.23*	P= 0.27*
Cellular phone	36 (70.6%)	17 (70.8%)	19 (70.4%)
		P= 0.98*	P= 0.98*
<b>Other variables</b>			
Mean Age	$14.48 \pm 2.00$	$14.61 \pm 1.84$	$14.30 \pm 2.19$
Mean Grade	$8.32 \pm 2.10$	$8.66 \pm 1.80$	$8.04 \pm 1.95$
<b>Note:</b> *No statistical significance between total participants and cyber-bullied versus non-cyberbullied participants; p-values calculated from chi-squared analyses.			

Table 1: Demographic characteristics of participants.

Twenty-four of the 51 participants reported some form of bullying (47.1%). Of the 24 bullied participants, bullying via Facebook was most commonly reported (63% of bullied participants), followed by text messaging (50% of bullied participants), and mobile phone calls (29% of bullied participants). The average age of those bullied by Facebook was slightly higher (14.1 years of age) than the average age of participants bullied by other methods of internet bullying. There were participants bullied by members of the opposite sex across all methods of bullying, ranging from 47% of bullying by the opposite sex in Facebook bullying to 100% of bullying by the opposite sex in email bullying.

The mean total score on the Children's Depressive Inventory for the group in which any form of social media bullying was reported was  $14.00 (\pm 3.56)$  versus a mean total score of  $9.07 (\pm 2.34)$  for the group in which no bullying was reported; these findings are considered statistically significant ( $p=0.020$ .) Using previously established cut-off scores, the group in which social media bullying was reported met criteria for moderate depressive symptoms ( $CDI > 13$  but  $< 18$ ) while the group with no reported bullying met criteria for low depressive symptoms ( $CDI < 13$ ). The correlation coefficient ( $r$ ) for the mean total CDI scores in the cyberbullied group ( $14.00 \pm 3.56$ ,  $N=24$ ) versus the group of patients without cyberbullying ( $9.07 \pm 2.34$ ,  $N=27$ ) was 0.629, indicating a moderate positive relationship between increased depressive symptoms and the presence of cyberbullying. Post-hoc analysis of the magnitude of depressive symptoms in the cyberbullied group ( $CDI 14.00 \pm 3.56$ ,  $N=24$ ) versus the group of patients without cyberbullying ( $9.07 \pm 2.34$ ,  $N=27$ ) revealed a power analysis of 100% (using a P value of 0.05.)

### The association of anxiety symptoms and social media bullying

The mean total score on the Screen for Child Anxiety Related Anxiety Disorders (SCARED) for the group in which any form of social media bullying was reported was  $26.83 (\pm 6.52)$  versus a mean total score of  $14.33 (\pm 3.98)$  for the group in which no bullying was reported; these findings are considered statistically significant ( $p=0.0015$ .) Using a total score of 25 or greater, the group exposed to bullying met criteria for an anxiety disorder while the group with no reported bullying did not. There was a statistically significant difference between the average score of the bullied group and the non-bullied group for 4 of the 5 anxiety factors, including the panic disorder/somatic symptoms score ( $5.83 \pm 2.45$  versus  $2.67 \pm 1.55$ ,  $P=0.030$ ), generalized anxiety disorder score ( $7.71 \pm 2.13$  versus  $4.15 \pm 1.24$ ,  $P=0.0050$ ), separation anxiety disorder score ( $4.25 \pm 1.42$  versus  $1.93 \pm 0.76$ ,  $P= 0.0054$ ), and the social anxiety disorder score ( $6.79 \pm 1.50$  versus  $3.93 \pm 1.28$ ,  $P=0.0039$ ). School avoidance was the only anxiety factor in which there was not a statistically significant difference between the bullied and nonbullied group ( $2.28 \pm 1.01$  versus  $1.48 \pm 0.78$ ,  $P=0.22$ ). The correlation coefficient ( $r$ ) for the mean total SCARED scores in the cyberbullied group ( $26.83 \pm 6.52$ ,  $N= 24$ ) versus the group of patients without cyberbullying ( $14.33 \pm 3.98$ ,  $N=27$ ) was 0.761, indicating a strong positive relationship between increased anxiety symptoms and the presence of cyberbullying. Post-hoc analysis of the magnitude of anxiety symptoms in the cyberbullied group (SCARED  $26.83 \pm 6.52$ ,  $N= 24$ ) versus the group of patients without cyberbullying ( $14.33 \pm 3.98$ ,  $N=27$ ) revealed a power analysis of 100% (using a P value of 0.05.)

## The association of a youth's self-concept and social media bullying

The mean total T-score on the Piers-Harris Children's Self Concept Scale (2nd ed) for the group in which any form of social media bullying was reported was  $42.75 (\pm 5.20)$  versus a mean total score of  $49.26 (\pm 3.97)$  for the group in which no bullying was reported; these findings were considered statistically significant ( $p=0.043$ .) There was a statistically significant difference between the mean T-score of the bullied group and the non-bullied group for 5 out of the 6 domains within the self-concept scale, including the physical appearance and attributes score ( $45.25 \pm 4.49$  versus  $52.18 \pm 3.07$ ,  $P=0.0012$ ), the intellectual and school status score ( $44.46 \pm 3.51$  versus  $49.30 \pm 3.04$ ,  $P=0.036$ ), the happiness and satisfaction score ( $41.71 \pm 4.56$  versus  $47.63 \pm 3.21$ ,  $P=0.031$ ), the freedom from anxiety score ( $42.71 \pm 4.52$  versus  $50.52 \pm 3.27$ ,  $P=0.0057$ ), and the popularity score ( $42.54 \pm 3.76$  versus  $51.59 \pm 3.44$ ,  $P=0.00049$ .) The Behavioral Adjustment domain was the only individual domain in which there was not a statistically significant difference between the bullied and nonbullied group ( $43.18 \pm 4.21$  versus  $44.41 \pm 3.49$ ,  $P=0.61$ ). The correlation coefficient ( $r$ ) for the mean Piers-Harris Self Concept Scale mean T-scores in the cyberbullied group ( $42.75 \pm 5.20$ ) versus the group of patients without cyberbullying ( $49.26 \pm 3.97$ ) was  $-0.578$ , indicating a moderate negative relationship between increased emotional and mental wellbeing and the presence of cyberbullying. Post-hoc analysis of the Pier's-Harris self-concept scores in the cyberbullied group (mean T-score  $42.75 \pm 5.20$ ,  $N=24$ ) versus the group of patients without cyberbullying ( $49.26 \pm 3.97$ ,  $N=27$ ) revealed a power analysis of 99.9% (using a P value of 0.05.)

A total of 5 (20.8%) of the 24 bullied participants reported experiencing more than 2 forms of social media bullying. There was no statistically significant difference between the prevalence of suicidal thoughts, mean total CDI score, or mean total SCARED score in the participants with 2 or less forms of bullying compared to the participants with > 2 forms of bullying.

## Discussion

Nearly half of all participants (47%) encountered some form of cyberbullying in this sample. Of all the forms of cyberbullying explored, bullying via Facebook was the most prevalent (29% of all participants), followed by text messaging bullying (20%), and mobile phone call bullying (14%). There was no statistically significant difference between rates of being victims of bullying for males versus females, however a large number of bullied participants were bullied by peers of the opposite sex. Results indicated significant differences between mean total depression scores, mean total anxiety scores, mean anxiety scores for all of the individual anxiety factors except for school avoidance, mean total T-score for the self-concept scale, and mean domain T-scores on all scales of self-concept except for the Behavioral Adjustment domain. These results are consistent with the wider literature suggesting that cyberbullying may result in lower levels of self-esteem [12,13]. They also indicate a very likely association between depression, anxiety, and self-esteem/self-concept and the presence of bullying via social media. Although there was no statistical difference between the prevalence of suicidal thoughts, mean total CDI score, or mean total SCARED score in the participants with 2 or less forms of bullying compared to the participants with >2 forms of bullying, the authors argue that with a large number of participants there would be a statistical significance between these two groups.

## Perception versus reality

It is important to mention that young people with anxiety symptoms or depression may be more likely to perceive a situation as malicious compared to youngsters without anxiety or depressive symptoms. The presence of anxiety and/or depressive symptoms, in conjunction with generally poorer social skills may "skew" the interpretation of their internet/phone experiences more negatively.

## Limitations

This study adds an important step in understanding the links between emotional/mental health and social media experiences for young people. However, the findings in this study were certainly limited by the number of participants. In addition, the cross-sectional nature of the data do not allow for temporal inferences; it cannot be determined, therefore, whether the participants experienced the depressive or anxiety symptoms first and then were harassed, or alternatively were harassed and experienced the internalizing symptoms as a result. Other limitations include the tendency for hospitalized patients to either under-report or exaggerate their symptoms, depending on possible underlying secondary gain, presence of character pathology, or a number of other reasons. This study was designed as a small pilot study to determine the clinical need for routine screening of cyberbullying in the inpatient psychiatric unit. Given the relatively small sample size, sub-group analysis was not performed. In larger future study endeavors, the relationship between cyberbullying and the main outcome measures will certainly require adjustment for the various demographic factors. All measures administered were self-reports by the youth; additional information from the guardians of the participants would have been helpful to determine if some of the participants were either under- or over-reporting. Also, all participants were required to read and write in English; it would be of interest to determine how these results extend to youth of non-English speaking backgrounds. Finally, with the numerous separate analyses that were conducted, the study team recognizes that there is an increased risk of type 1 error.

## Future Directions

With advances in technology, cyberbullying is becoming increasingly prevalent. This study was limited to those children and adolescents who were victims of cyberbullying. It would be interesting to expand this study to include adults. It would also be beneficial to assess perpetrators of bullying as well as those who are both victims and perpetrators. Quantitative and objective data would be helpful as well as information from parents of children and adolescents involved in cyberbullying.

## Clinical Implications

Despite limitations, the current study adds important implications to the literature. With the current trends of internet and cell phone use among young people, it is safe to assume that increased numbers of children and adolescents with mental health challenges will utilize these methods of social media [5,6]. Internet and cellular phones are a pervasive mode of peer communication in the lives of children and adolescents, and can be used in health and unhealthy manners. Nearly one half of the participants in this study endorsed being the victim of at least one form of bullying via cellular phones or internet based applications. Results suggest that youth who endorsed social media bullying experienced a greater degree of major depressive symptoms,

symptoms of anxiety, and a general lower self-regard. Given the significant morbidity associated with anxiety, depression, and low self-esteem, any association between these symptoms and cyberbullying is a significant public health and mental health issue worthy of future research. Educating youngsters on the possible dangers of social media is paramount in fighting this battle. The education can begin at the level of a parent, teacher, pediatrician, or mental health professional. It is a clinician's duty, when working with children and adolescents, to educate families about both the complexities of the digital world and the challenging social and health issues that online youth experience [19]. It is especially important to encourage the family unit to acknowledge important issues of bullying, popularity and status, depression and social anxiety, risk-taking, and sexual development as it relates to use of social media, and to monitor for the development of problems along the way. While this study was limited to children and adolescents who were victims of cyberbullying, in the future it is imperative to assess those children and adolescents who are perpetrators of cyberbullying, and those who are both victims and perpetrators. Cyberbullying is becoming increasingly more prevalent with advances in technology and must be monitored closely.

## References

1. Patchin JW, Hinduja S (2006) Bullies more beyond the schoolyard: A preliminary look at cyberbullying. *Youth Violence and Juvenile Justice* 4: 123-147.
2. Ybarra ML, Mitchell KJ (2004) Online aggressor/targets, aggressors, and targets: A comparison of associated youth characteristics. *Journal of Child Psychology and Psychiatry & Allied Disciplines* 45: 1308-1316.
3. Dehue F, Bolman C, Völlink T (2008) Cyberbullying: youngsters' experiences and parental perception. *Cyberpsychol Behav* 11: 217-223.
4. Hinduja S, Patchin JW (2010) Bullying, cyberbullying, and suicide. *Arch Suicide Res* 14: 206-221.
5. Common Sense Media (2009) *Is Technology Networking Changing Childhood? A National Poll*. San Francisco, CA: Common Sense Media.
6. Hinduja S, Patchin J (2007) Offline consequences of online victimization: school violence and delinquency. *Journal of School Violence*. 6: 89-112.
7. Ito M, Horst H, Bittani M (2008) *Living and learning with new media: Summary of Findings from the Digital Youth Project*. Chicago, IL: John D. and
8. Catherine T (2102) *MacArthur Foundation Reports on Digital Media and Learning*.
9. Valkenburg PM, Peter J (2009) The Effects of instant messaging on the quality of adolescent's existing relationships: A longitudinal study. *Journal of Communications* 59: 79-97.
10. Valkenburg PM, Peter J (2011) Online communication among adolescents: an integrated model of its attraction, opportunities, and risks. *J Adolesc Health* 48: 121-127.
11. Ybarra ML (2004) Linkages between depressive symptomatology and Internet harassment among young regular Internet users. *Cyberpsychol Behav* 7: 247-257.
12. Patchin JW, Hinduja S (2010) Cyberbullying and self-esteem. *J Sch Health* 80: 614-621.
13. Hansford BC, Hattie JA (1982) The relationship between self and achievement/performance measures. *Review of Educational Research*. 52: 123- 142.
14. Davies J, Bember, I (1999) Reading and mathematics attainment and self-esteem in years 2-6—an eight-year cross-sectional study. *Educational Studies* 25: 145-157.
15. Klomek AB, Marrocco F, Kleinman M, Schonfeld IS, Gould MS (2008) Peer victimization, depression, and suicidality in adolescents. *Suicide Life Threat Behav* 38: 166-180.
16. Smith P, Mahdavi J, Carvalho M, Tippett N (2006) *An investigation into cyberbullying, its forms, awareness and impact, and the relationship between age and gender in cyberbullying: A Report to the Anti-Bullying Alliance*. University of London.
17. Kovacs M (1992) *Children's Depression Inventory*. New York: Multi-Health Systems.
18. Birmaher B, Brent DA, Chiappetta L, Bridge J, Monga S, et al. (1999) Psychometric properties of the Screen for Children Anxiety Related Emotional Disorders (SCARED): a replication study. *Journal of the American Academy of Child and Adolescent Psychiatry*. 38: 1230-1236.
19. Piers EV, Herzberg DS (2002) *Piers-Harris Children's Self Concept Scale, Second Edition: Manual*. Los Angeles: Western Psychological Services.