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An Analysis of Depression, Self-Harm, and Suicidal Ideation Content on Tumblr

Patricia A. Cavazos-Rehg, Melissa J. Krauss, Shaina J. Sowles, Sarah Connolly, Carlos Rosas, Meghana Bharadwaj, Richard Grucza, and Laura J. Bierut

Department of Psychiatry, Washington University School of Medicine, St. Louis, MO, USA

Abstract

Background—Social networking about depression can be indicative of self-reported depression and/or can normalize risk behaviors such as self-harm and suicidal ideation.

Aim—To gain a better understanding of the depression, self-harm, and suicidal content that is being shared on Tumblr.

Method—From April 16 to May 10, 2014, 17 popular depression-related Tumblr accounts were monitored for new posts and engagement with other Tumblr users. A total of 3,360 posts were randomly selected from all historical posts from these accounts and coded based on themes ascertained by the research team.

Results—The 17 Tumblr accounts posted a median number of 185 posts (range = 0–2,954). Content was engaged with (i.e., re-blogged or liked) a median number of 1,677,362 times (range = 0–122,186,504). Of the 3,360 randomly selected posts, 2,739 (82%) were related to depression, suicide, or self-harm. Common themes were self-loathing (412, 15%), loneliness/feeling unloved (405, 15%), self-harm (407, 15%), and suicide (372, 14%).

Conclusion—This study takes an important first step at better understanding the displayed depression-related references on Tumblr. The findings signal a need for suicide prevention efforts to intervene on Tumblr and use this platform in a strategic way, given the depression and suicidal content that was readily observed on Tumblr.

Keywords

social media; depression; self-injurious behavior; suicidal ideation; adolescent

Social networking sites (SNS) are online communities whereby individual users virtually connect to each other, resulting in their own personal networks (Lenhart & Madden, 2007). These networks can consist of family, friends, coworkers, classmates, and even strangers with shared interests. SNS have transformed the way in which people communicate with each other. Over the past decade, SNS users have skyrocketed from just 7% of all US adults in 2005 to 65% in 2015 (Perrin, 2015). Youth and young adults make up the largest groups of SNS users, with approximately 90% of 13–29-year-old Internet users using at least one

SNS (Brenner, 2014). SNS have presented young people with new opportunities for self-expression, and the possibility to interact with peers without adult supervision (Boyd, 2014). In particular, the option to create accounts under a pseudonym or obscure username that separates users from their true identity may facilitate a sense of anonymity that allows for the disclosure of sensitive information on these sites (Marwick & Boyd, 2011; Robinson et al., 2015; Tufekci, 2008).

Given the widespread use of SNS, especially among young people, there has been emerging interest in studying posts about mental health problems (i.e., expressions of depression, suicide, and/or self-harm behaviors) on social media platforms and online. For instance, Moreno et al. (2011) found that 25% of a sample of 200 college-aged SNS users socially networked about feeling depressed on Facebook, and related studies have found that individuals who post depression-related content on SNS likewise self-report symptoms of depression (Moreno et al., 2012; Park, Lee, Kwak, Cha, & Jeong, 2013). For 2 months in 2009, Microsoft researchers monitored the keyword *depression* on Twitter and obtained 20,000 depression-related tweets; their analysis of these tweets suggested that tweeters were posting about their depression and mental health treatment (Park, Cha, & Cha, 2012). In a recent review of suicide and social media, Robinson, Rodrigues, Fisher, and Herrman (2014) reported that in the six studies that examined the relationship between suicide and social media, people commonly used social media as a space to interact with individuals who shared similar problems. In one such study, Baker and Fortune (2008) conducted interviews with young adults that utilized suicide and self-harm websites. Their participants viewed these websites as supportive communities that assisted them in coping with their problems (Baker & Fortune, 2008). Additionally, in an analysis of responses to YouTube videos containing content relating to self-harm, the viewers often socially networked with the individual posting the content and subsequently shared their own experiences with self-harm. Some viewers also expressed admiration and/or encouragement for the individual posting the self-harm content (Lewis, Heath, Sornberger, & Arbuthnott, 2012). However, the comments rarely mentioned recovery and many expressed continued engagement in the self-harm behavior (Lewis et al., 2012). These studies indicate that online social networking about depression and related behaviors occurs on SNS and may normalize risk behaviors such as self-harm and suicidal ideation (Whitlock, Powers, & Eckenrode, 2006; Ybarra, Alexander, & Mitchell, 2005).

Foundational research on this topic exists for many social media platforms; however, one site is curiously absent despite its increasing popularity. Tumblr is a mostly anonymous, content-centered microblogging site that allows users to blog with text, pictures, and video clips about topics that are of interest to them, creating a community of people with shared interests. Tumblr has approximately 268 million users (i.e., blogs) and 125.7 billion posts (<http://tumblr.com/about>), and 42% of its user traffic originates from the US (<http://tumblr.com/press>). Tumblr is widely used among teens and young adults, with almost one seventh (14%) of teens aged 13–17 using Tumblr and 40% of Tumblr users being 13–25 years old (Brenner, 2014; Zain, 2013). Tumblr's lenient user terms (e.g., allowing users to sign up/interact anonymously), its role as a largely public site, and its content-centered nature helps fuel its popularity among youth and young adults (Mander, 2014). The growing popularity of Facebook among older adults is another factor that may be driving teens and

young adults to the community of Tumblr users (Brenner, 2014). With its multiple types of media options, Tumblr offers itself as an alternative to more restrictive social media platforms such as picture-based Instagram and character-limiting Twitter. Tumblr is also unique because, instead of using the platform to connect with family, friends, and coworkers, many users choose to connect with members of the Tumblr community whom they may not know personally (i.e., offline), but with whom they share common interests (Attenberg, 2012). Because of this, it is possible that a community of Tumblr users will share depression as their focus.

This exploratory study examines the expression of depression-related content on Tumblr, specifically focusing on the most *popular* posts (as designated by the Tumblr search algorithm) relating to depression, self-harm, and suicidal ideation. Self-harm is defined as deliberate self-injury or poisoning, regardless of suicidal intent (Hawton et al., 2003; Hawton, Saunders, & O'Connor, 2012). The content and engagement of these posts are also characterized. Gaining a better understanding of the types of depression, self-harm, and suicidal content that is being shared on Tumblr could be an important step toward informing suicide prevention efforts on social media.

Method

The Tumblr data in the current study are public. The University's Institutional Review Board (IRB) reviewed the project and determined that it does not involve activities that are subject to Institutional Review Board oversight.

Identifying Tumblr Accounts Related to Depression and Self-Harm

On April 16, 2014, the research team searched Tumblr for posts related to the terms *depressed* and *suicide*. In addition, because many young people who engage in self-harm behaviors suffer from depression (Andover et al., 2005; Moran et al., 2012), the research team also examined Tumblr for posts related to the terms *self-mutilation* and *cutting*. When searching for these terms, Tumblr first provides a screen with suggestions for seeking help or finding more inspirational content, and then provides the option of continuing to the next screen to view the results of the search (see Figure 1). The Tumblr search landing page defaults to the *Most Popular* posts displayed in a grid view. The research team searched Tumblr for the most popular posts related to each of the four search terms. Accounts with posts appearing on the top of the results page were scanned by the coders, and five were selected for each search term (total $n = 20$ Tumblr accounts for analysis). Only the accounts that explicitly posted about depression-related content (i.e., posted images, video clips, and/or text that expressed feelings of depression, suicide, and/or self-harm behaviors) in about 50% of the posts were selected for analysis. Screenshots were not captured from the initial searches on April 16, but as an example Figure 2 shows a screen shot of results from a search for *self-mutilation* performed on July 7, 2014.

Characteristics of Tumblr Accounts and Engagement With Other Users

Similar to other SNS, Tumblr allows its users to provide basic information such as gender and age. Thus, in order to characterize the selected Tumblr accounts, each account was reviewed individually for demographic information provided on their profile page.

Simply Measured, a company that provides social media analytics and measurement (<http://www.simplymeasured.com>), was used to collect all available posts (all historical posts that were available) for the 20 Tumblr accounts chosen and to monitor the posts and engagement of each account with other Tumblr users over several weeks (April 16 to May 10, 2014). Because of the exploratory nature of the study, this shorter period of time for monitoring posts was chosen to offer a snapshot of the accounts' activity. Before data collection and analysis could be completed, three Tumblr accounts became inactive, leaving 17 accounts for analysis.

To describe the engagement of each account with other Tumblr accounts, the number of posts from the account during the reporting period was documented. The number of times someone else re-blogged their content during the reporting period and the total number of notes a post had from its creation (original post date) to the end of the report time period (lifetime notes) were also recorded. On Tumblr, a post gets a note when someone either likes or re-blogs the post.

Coding Tumblr Posts for Common Depression-Related Themes

Using the SAS Proc SURVEYSELECT procedure, 200 posts were randomly selected from all posts available for each Tumblr account, including historical posts (or all posts if less than 200 posts were available), resulting in 3,360 posts for analysis. This number of posts was manageable in enabling manual coding and permitting discussion between team members as needed. Two members of the research team with expertise in mental health research studied a sample of these posts and developed a list of relevant themes based on repeatedly observed topics (Ryan & Bernard, 2003; listed here). These senior team members trained five research assistants and those five viewed the content of the posts online and coded the posts appropriately. Each post was coded by two research assistants individually. Any discrepancies were then discussed and resolved.

Coders first determined whether the post contained images, text, or video relating to depression, suicide, and/or self-harm behaviors. Those that were not related to the subject of interest were excluded from further analysis. For posts that were related to the subject of interest, the type of content of the post was then coded as a photo/image, text (including images of text), and/or short video clip (i.e., .gif), and it was noted whether a picture or video clip from a popular movie/television show was used.

Coders then examined each post and coded for the following five themes: (1) self-loathing, (2) loneliness/feeling unloved, (3) self-harm and/or scars from self-harm, (4) suicide/suicidal thoughts/death, (5) posts of graphic images/video clips related to suicide or self-harm. Last, it was noted whether the post involved interacting with another Tumblr user (e.g., asking/answering a question or correspondence between users), including seeking/giving advice, recommending professional help/therapy, or supporting each other. Each post could have

more than one of the above themes. In addition to examining themes across posts in the 17 accounts in our sample, the most prominent themes within each individual Tumblr account were also determined in order to identify the primary topic that was most emphasized by the owners of each account.

A random sample of 200 Tumblr posts was also coded by a senior research team member for reliability of the research assistants. Percent agreement for whether the post was related to depression was 91% ($\kappa = .69$). Median percent agreement for all other themes was 94% (range = 82–100%) and median κ value was .79 (range = .57–1.0).

Results

Tumblr Account Demographics and Engagement

Of the 17 Tumblr accounts, nine did not provide demographic information in their profile. Of the eight Tumblr accounts that did provide some demographic information, six were female and two were male users; ages provided ranged from 14 to 20 years. The number of posts and engagement of this study's sample of Tumblr users with other Tumblr users is shown in Table 1. The median number of total posts across accounts was 874 (range = 160–11,378). About half of the accounts posted mostly original content, while the rest relied mostly on re-blogs from others' accounts. Engagement of posts with other Tumblr users was tracked over approximately 3.5 weeks in April and May of 2014. The median number of posts during that period was 185 (range = 0–2,954). The median number of times their content was re-blogged was 6,893 (range = 0–407,796). Finally, the median number of total lifetime notes (i.e., someone either likes or re-blogs the original post) on posts published during this period was 1,677,362 (range = 0–122,186,504).

Themes Across Accounts

Up to 200 posts from each account were randomly selected for qualitative analysis. This selection was from all posts available for each Tumblr account. Of the 3,360 total posts that were randomly selected, 350 (10%) did not appear to be related to depression, suicide, or self-harm and were excluded from content analysis. In addition, the links for 271 (8%) of the posts did not work and thus could not be analyzed. This left 2,739 posts for qualitative analysis.

The most common themes found in the 2,739 depression-related posts are shown in Figure 3, along with example posts. Posts about self-loathing, loneliness/feeling unloved, and self-harm and/or scars from self-harm were the most popular observed themes. Specifically, self-loathing was apparent in 15% (412) of the posts, and 15% (405) of the posts expressed loneliness or feeling unloved. Approximately 15% (407) of the posts were about self-harm and/or scars from self-harm; 14% (372) were about suicide or death. Among the 717 posts that were about self-harm or suicide/death, 18% (127) were graphic images/video clips.

Approximately 8% (220) of the posts were comforting, supportive, or prevention posts. Nine percent (249) of the posts involved directly interacting with another Tumblr user, among which 47% (117/249) provided emotional support or reassuring messages to each other. Among these interactive posts, over half (127/249, 51%) represented seeking or providing

advice, 41% of which (52/127) provided positive/supportive advice (e.g., encouragement in stopping self-harm or fighting depressing thoughts), 25% of which (32/127) provided potentially harmful advice (e.g., advising how to secretly engage in self-harm or maladaptive behaviors), and 34% of which (43/127) could not be distinguished as positive/supportive or potentially harmful advice. Among posts providing advice, only 13% (17/127) suggested professional help or therapy to cope with their mental health problems.

The media used in the posts varied, including text only (some of which were images of text, 1,024, 37%), text and photos/images together (556, 20%), text and short video clips (i.e. gifs; 545, 20%), photos/images only (438, 16%), and video clips only (176, 6%). Approximately 15% (407) of the posts used images or video clips of celebrities from popular movies or television shows.

Prominent Themes Within Individual Accounts

Over 20% of the posts from three accounts focused on suicide/death. Nearly 30% or more of the posts from four accounts focused on self-harm. Two accounts expressed self-loathing in nearly 30% of their posts. Some of the selected accounts also had a relatively high number of posts that were direct interactions (i.e., engaging in online correspondence) with other Tumblr users, including one account where the majority of posts (63%) were interactions with other Tumblr users. Among the interactive posts found within this account, most (59/90, 66%) represented seeking or providing advice, 37% of which (22/59) provided positive/supportive advice (e.g., tips on coping with/overcoming eating disorders, finding resources to help fight depression), 46% of which (27/59) provided potentially harmful advice (e.g., advising how to fast to lose weight or how to skip meals without others knowing), and 17% of which (10/59) could not be distinguished as positive/supportive or potentially harmful advice.

Discussion

Social media use has become increasingly popular, and there is emerging research signaling that social networking about depression occurs online (Moreno et al., 2011; Moreno et al., 2012; Park et al., 2012; Park et al., 2013). In response, this exploratory study examines the most popular posts relating to depression and suicide on Tumblr, a popular social media platform where individuals can network with other members via text, pictures, and video clips about topics that are of interest to them. In addition, because many young people who engage in self-harm behaviors suffer from depression (Laye-Gindhu & Schonert-Reichl, 2005; Lloyd-Richardson, 2007), Tumblr accounts related to the terms *self-mutilation* and *cutting* were also examined. The most common themes from these accounts were posts about self-hatred, loneliness, and suicide/death. Posts about self-harm, including graphic pictures of cutting, were also readily shared.

In the present study, an extensive amount of depression-related content came from popular Tumblr posts that displayed harmful behaviors including self-harm behaviors and suicide. In recent years, researchers have found that SNS can facilitate social networking about health-related topics, even concerns about challenging conditions such as a cancer diagnosis and mental health topics (Himmelboim & Han, 2014; Naslund, Grande, Aschbrenner, & Elwyn,

2014), and there is some indication that online communities can provide a supportive, nurturing environment that helps individuals cope with their struggles (Baker & Fortune, 2008; Barak & Dolev-Cohen, 2006; Hawton, Rodham, Evans, & Weatherall, 2002). However, there is concern that the posts observed in this study are glorifying these dangerous behaviors, especially when considering that suicide and suicidal behaviors can cluster among youth and young adults (Becker, Mayer, Nagenborg, El-Faddagh, & Schmidt, 2004; Duggan, Heath, Lewis, & Baxter, 2012; Lewis, Heath, St. Denis, & Noble, 2011; Mitchell & Ybarra, 2007; Whitlock, Powers, & Eckenrode, 2006). Because the vast majority of social media users are young people who may be easily influenced by their peers and the media, it is important to work toward understanding why this content is being posted and if there is an impact on the individuals who post it as well as those who view it.

The posts studied in this sample connected with a sizeable audience, as evidenced by the large number of responses from other Tumblr users (i.e., re-blogs and lifetime notes) accumulated by these blogs. Given the spread of the posts observed, it is inferred that many Tumblr users have an interest in and likely seek out this type of content. In addition, direct interactions between users about depression, suicide, and/or self-harm behaviors on Tumblr was observed in 9% of the posts, and most of these extended conversations were online exchanges where individuals offered emotional support and/or sought out suggestions on how to cope. Advice exchanges between Tumblr users tended to be positive and/or supportive and thus show promise for benefiting individuals in need of support. Still, a sizeable amount of discussions was observed to be potentially harmful advice, and in these cases, oversight from parents and/or mental health professionals appears warranted in order to offset interactions that seem to endorse unhealthy behaviors.

Given the content of these accounts, it is not surprising that few of them provided identifying information in their profiles. It is likely that anonymous accounts help to facilitate the disclosure of intimate thoughts and feelings about depression observed in this sample, and it is also probable that providing demographic information would hinder this type of expression. Nonetheless, of those accounts that contained age details, there were a range of youth and young adults who were between 14 and 20 years old. It is concerning that individuals who by self-report are quite young are posting this type of content, especially when it is about engaging in self-injury and/or struggling with suicidal ideation and there were few prevention messages that countered this content. A better understanding is needed on how to respect the freedom of expression and support that these social media platforms facilitate while using social media data in order to identify and help individuals who may benefit from intervention.

This study is exploratory and the first of its kind to examine the depression, suicide, and self-harm related content on Tumblr; therefore, a number of limitations are worth noting. Seventeen accounts were examined, based on posts designated by Tumblr to be among the most popular resulting from selected search terms on a specific day. Including more accounts, and perhaps a more comprehensive list of search terms and at different time points, would create a more complete picture of what is being shared on this platform. The biographical and demographic information provided on Tumblr varies. For the accounts in this study, only eight provided some form of demographic information, and its absence

hinders the research application of understanding the population of interest. In addition, three of the accounts that were selected for analysis became inactive prior to analysis. The reason for these accounts becoming inactive is unknown, but could be related to Tumblr's policy that permits discussion and support about sensitive topics like self-injury but does not allow blogs that "actively promote self-harm" (Tumblr, 2015).

Despite these limitations, coding over 3,000 posts allowed a baseline picture to be established of the depression, self-harm, and suicidal ideation content on Tumblr and can serve as a starting point for discussions of this topic in the mental health community. The results here show that blogging about self-hatred, loneliness, and suicidal thoughts occurs on Tumblr. Furthermore, the online dialog indicates that people who socially network about these topics may be forming relationships to chat about their shared interests in depression, self-harm, and/or suicidal ideation. The accounts/posts in this study are considered to be popular and are potentially connecting with a sizeable audience. Peer-led efforts to aid in suicide and self-harm prevention have started to appear across the Tumblr platform (Cuen, 2015). The American Foundation for Suicide Prevention supports this form of initial contact by peers with a subsequent referral to a skilled professional (Cuen, 2015; American Foundation for Suicide Prevention, 2015). This research presents an opportunity for mental health professionals to work toward further understanding how people socially network about these topics, assess the content of the conversations including how it materializes, and consider ways to access those at high risk in order to offer appropriate avenues for prevention and treatment (Han et al., 2009; Himelboim & Han, 2014).

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Biographies

Patricia A. Cavazos-Rehg, PhD, is Associate Professor of Psychiatry at the Washington University in St. Louis School of Medicine, MO, as well as a clinically trained licensed psychologist. She specializes in mental health epidemiology, policy, and social media research.

Melissa J. Krauss, MPH, is Research Statistician in the Department of Psychiatry at the Washington University in St. Louis School of Medicine, MO, USA. She has 15 years of experience analyzing and interpreting data from public health studies on substance use and mental health.

Shaina J. Sowles, MPH, is Clinical Research Coordinator in the Department of Psychiatry at the Washington University in St. Louis School of Medicine, MO, USA. She is experienced in managing studies related to tobacco, marijuana, and mental health.

Sarah Connolly is an undergraduate at Truman State University, Kirksville, MO, studying chemistry.

Carlos Rosas is a PhD candidate at the University of Illinois at Chicago, IL, USA, obtaining a degree in psychology.

Meghana Bharadwaj is a senior at Lafayette High School, Wildwood, MO. She plans to study political science and psychology.

Richard Gruzza, PhD, is Associate Professor of Psychiatry at the Washington University in St. Louis School of Medicine, MO, USA. His research is focused on policy influences on substance abuse, mental health, and health behaviors.

Laura J. Bierut, MD, is a physician scientist and Alumni Endowed Professor of Psychiatry at the Washington University in St. Louis School of Medicine, MO, USA. She has significant experience in genetic studies of smoking behaviors, addiction, and other psychiatric and medical illnesses.

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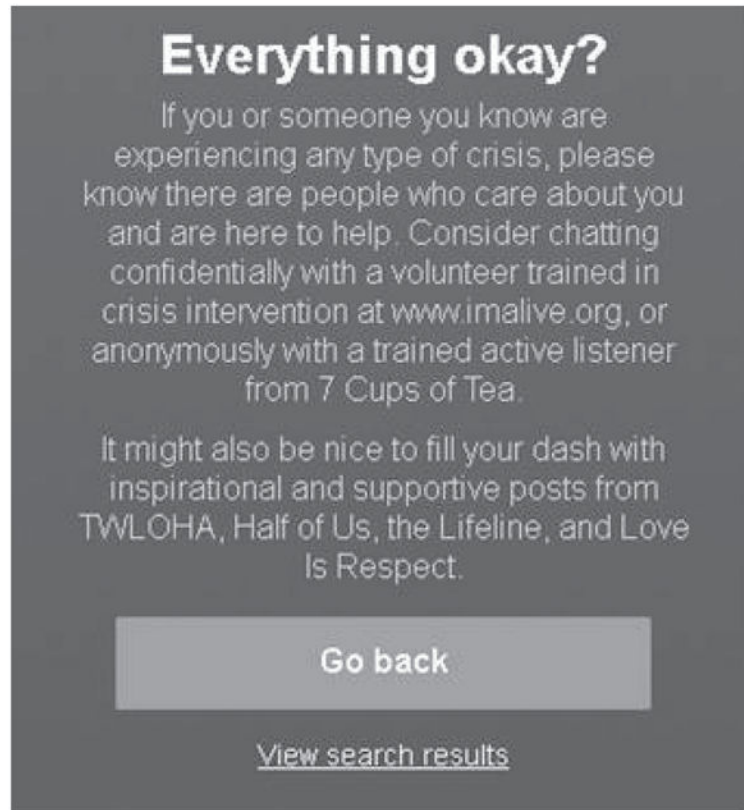


Figure 1.
First Tumblr screen after searching for the depression-related terms.

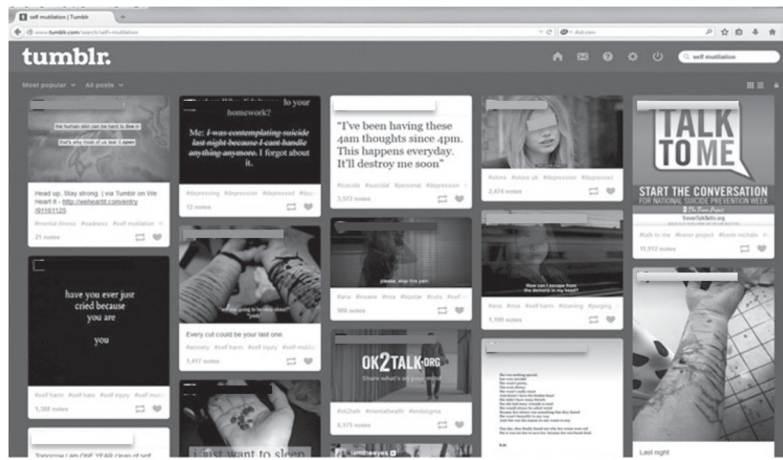


Figure 2. Example of the search results page on Tumblr (search was for *self-mutilation*, on July 7, 2014).

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Figure 3. Common depression-related themes and example posts from Tumblr random sample ($n = 2,739$).

Table 1
Engagement of the sample of Tumblr accounts that focus on depression, suicide, or self-harm

Account number	No. of available posts published anytime	Percentage of all available posts that are original posts (vs. re-blogs)	No. of posts during 4/16–5/10/2014	No. of reblogs during 4/16–5/10/2014	No. of lifetime notes on posts published during 4/16–5/10/2014 ^a
Most popular accounts to post about <i>depressed</i>					
1.	1,565	99%	508	260,369	383,467
2.	1,337	86%	992	343,507	13,615,908
3.	874	32%	93	3,389	1,677,362
4.	425	71%	18	71	754,277
5.	160	100%	61	6893	30,705
Most popular accounts to post about <i>suicide</i>					
6.	11,378	68%	2,954	407,796	83,962,003
7.	3,339	12%	412	49,913	40,538,023
8.	394	78%	111	20,479	1,143,416
Most popular accounts to post about <i>self-mutilation</i>					
9.	6,154	13%	2,904	286,493	122,186,504
10.	1,734	2%	318	243	19,964,880
11.	769	13%	254	1,868	15,055,666
12.	538	78%	61	498	3,479,473
13.	475	13%	0	0	0
Most popular accounts to post about <i>cutting</i>					
14.	1,149	15%	185	1,974	6,365,903
15.	1,009	100%	268	101,041	148,432
16.	307	100%	85	18,003	29,844
17.	203	30%	25	4,986	258,487

Note.

^aThe number of lifetime posts also includes notes (i.e., someone likes or re-blogs its content) on re-blogs that were originally posted before the reporting period.