



Differences in physical status, mental state and online behavior of people in pro-anorexia web communities



Elad Yom-Tov^{a,*}, Anat Brunstein-Klomek^{b,c}, Arie Hadas^b, Or Tamir^c, Silvana Fennig^{b,d}

^a Microsoft Research Israel, Israel

^b Department of Psychological Medicine, Schneider Children's Medical Center of Israel, Israel

^c School of Psychology, Interdisciplinary Center (IDC) Herzliya, Israel

^d Sackler School of Medicine, Tel Aviv University, Israel

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ABSTRACT

Background: There is a debate about the effects of pro-anorexia (colloquially referred to as pro-ana) websites. Research suggests that the effect of these websites is not straightforward. Indeed, the actual function of these sites is disputed, with studies indicating both negative and positive effects.

Aim: This is the first study which systematically examined the differences between pro-anorexia web communities in four main aspects: web language used (posts); web interests/search behaviors (queries); users' self-reported weight status and weight goals; and associated self-reported mood/pathology.

Methods: We collected three primary sources of data, including messages posed on three pro-ana websites, a survey completed by over 1000 participants of a pro-ana website, and the searches made on the Bing search engine of pro-anorexia users. These data were analyzed for content, reported demographics and pathology, and behavior over time.

Results: Although members of the main pro-ana website investigated appear to be depressed, with high rates of self-harm and suicide attempts, users are significantly more interested in treatment, have wishes of procreation and reported the highest goal weights among the investigated sites. In contrast, users of other pro-ana websites investigated, are more interested in morbid themes including depression, self-harm and suicide. The percentage of severely malnourished website users, in general, appears to be small (20%).

Conclusions: Our results indicate that a new strategy is required to facilitate the communication between mental health specialists and pro-ana web users, recognizing the differences in harm associated with different websites.

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1. Introduction

“Pro-ana” websites are sites that promote anorexia and advise people how to maintain the disorder (Yom-Tov et al., 2012). These websites are usually visited by individuals with an eating disorder (Lyons et al., 2006; Knapton, 2013). Indeed, around a third of patients with eating disorders have used these websites (Christodoulou, n.d.).

For some professionals in the field, censorship of pro-ana sites might seem to be the most logical step, but a censorship campaign in 2010 showed that despite regulatory pressures and social stigma, the pro-ana network has not shrunk (Casilli & Pailler, 2013). One might assume that individuals with an eating disorder experience negative effects

from viewing these websites. Research, however, suggests both negative and positive effects (Lyons et al., 2006; Harper et al., 2008). Some studies indicate that individuals who actively participate in these sites are more likely to hold anti-recovery attitudes, engage in pathological behaviors, and hold higher levels of body dissatisfaction than those who do not take part in these sites (Harshbarger et al., 2008; Harper et al., 2008; Csipke & Horne, 2007; Wilson et al., 2006). Other studies, however, have shown that these sites provide those with active eating disorders a temporary relief from hostile reactions and increases feelings of being understood, especially in participants who are actively engaged in the website and seek out emotional support from other members (Csipke & Horne, 2007; Yeshua-Katz & Martins, 2013; Brotsky & Giles, 2007; Tong et al., 2013).

The aim of the current study is to explore the characteristics of people who participate in different pro-anorexia web communities and the differences between them. We hypothesized that different pro-ana web communities vary with regard to their users' profiles and behaviors, and

* Corresponding author.

E-mail addresses: eladyt@microsoft.com (E. Yom-Tov), bkanat@idc.ac.il (A. Brunstein-Klomek), ariehadas@013.net (A. Hadas), orkeshok@gmail.com (O. Tamir), silvanaf@clalit.co.il (S. Fennig).

may explain the apparent differences between websites (Juarascio et al., 2010).

2. Methods

Several sources of data were used in this study, as detailed below. If the same person appeared in two datasets, investigators had no way of identifying the same user in both datasets. This was done to maintain the privacy of users.

2.1. Pro-anorexia website data

We extracted all available posts from the discussion board of the myproana.com website. A total of 57,911 posting threads totaling 530,451 posts were extracted. These postings span a period from December 3rd 2012 to May 9th 2014 (522 days). This site was chosen as it is (at the time of writing) one of largest pro-anorexia communities on the Internet.

One of the postings¹ initiated by a user of the myproana website, which began on December 11th 2013, included a detailed questionnaire about eating disorders. The questionnaire was uploaded by the user, and was copied and filled by other users of the site. The questionnaire included questions on the following:

1. Demographics: age, gender, weight (starting, current goal, ultimate goal, lowest, and highest).
2. Self-harm: suicide attempts and self-harm.
3. Substance abuse: illicit drugs and alcohol use.
4. Sexuality.
5. Eating disorder status and diagnosis.
6. Family status.

This questionnaire totaled over 200 questions and was filled by 1024 users. We extracted the filled questionnaires and their analysis is reported below.

For comparison, we also extracted postings from two additional pro-anorexia websites: Pro-ana nation (<http://pro-ana-nation.livejournal.com>) and Proanorexia (<http://proanorexia.livejournal.com>). A total of 15,239 posts were extracted from the first and 40,018 from the second of these.

In many of the postings on all three sites, users added weight information at the bottom of their postings. These typically included one or more of the following (for each user):

1. High weight: the maximal weight ever achieved.
2. Low weight: the minimal weight ever achieved.
3. Current weight.
4. Goal weight: the current weight which the user is striving to reach.
5. Ultimate goal weight.

Posts were automatically categorized into five not mutually-exclusive categories according to whether the following keywords appeared in them:

1. Pro-anorexia: proana, thinspiration, thinspo, ana buddy.
2. Suicide: suicide, suicidal, kill myself.
3. Self-harm: cut my, self-harm, self-injury, self-poisoning, pulling hair.
4. Treatment: psychologist, psychological, hospital, clinic.
5. Depression: hopeless, helpless, depressed, depression.

Note that minor variations in spelling were also considered (e.g., “pro-ana” and “pro ana” were considered in addition to “proana”).

2.2. Search queries

We extracted all English-language queries submitted to the Bing search engine from US users between July 2014 and February 2015. Each query included an anonymized user identifier, time and date, and query text.

We identified users who used the terms in the 5 categories above. For those users, the most popular terms were categorized as follows:

1. Myproana: users who queried for the myproana.com website.
2. Tumblr: users who queried for the social network tumblr.
3. Manorexia: users who queried for the term “manorexia”, meaning anorexia in males.
4. Thinspiration.
5. Yahoo Answers: visitors to the popular Yahoo Answers website.

The overlap of users who made queries in the first three categories was the lowest, with under 2% of users. Therefore, we focus on these three, categorizing users into one of these three, according to the most commonly queried category per user. In our data we identified 4790 users in the “myproana” category, 7698 users in the “tumblr” category, and 627 users in the “manorexia” category.

Queries were categorized according to the same keywords as those used for website postings.

3. Results

3.1. Transition graphs

We computed the probability that a user would query about one of the five categories outlined above (see [Methods](#) section), given the previous category they asked in. From this transition matrix we computed the stationary probability of each category: we ran a random walk along the transition matrix, with a restart probability of 15%. The stationary probability represents the most likely category that a person will end at, at the end of their search.

Treatment is the most common query category for people in the Myproana and Manorexia groups (43% and 56%, respectively), and significantly more than in the Tumblr group (19%). The Tumblr group tends to query more in the suicide (31%), self-harm (18%) and depression (32%) categories, compared to the two other groups. This is also evident in the stationary probabilities. Here too, the most common stationary state for the Myproana group is treatment (32%), whereas for the Manorexia group it is suicide (34%) and for the Tumblr group – depression (30%). Thus, whereas the Tumblr and Manorexia groups are associated more with self-harm and depression, the Myproana group is relatively more interested in treatment.

3.2. Analysis of weights

Many of the users of the three websites provide their weights in their postings, as footnotes or signatures. A comparison between the survey respondents and the entire website population showed no statistically significant differences for the high weight category, and statistically significant differences (of up to 6 kg) for low, goal, and ultimate goal weight categories (ranksum test, $P = 0.05$). Comparing the three websites, we found that the Proanorexia website has the lowest current and goal weights. We interpreted this finding to indicate that users on this site are significantly more at risk than those on the two other websites.

The percentage of people with a calculated BMI of under 18.5 is similar across sites, with only around 20% of participants in these pro-ana websites reporting weights that would be considered clinically underweight.

¹ <http://www.myproana.com/index.php/topic/97075-eating-disorder-questionnaire/>.

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