

SELF-DISCLOSURE IN SOCIAL MEDIA: A CONTENT ANALYSIS OF HOW PEOPLE
EXPRESS ANXIETY DISORDER ON INSTAGRAM

By

Yuehan Liu

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ABSTRACT

SELF-DISCLOSURE IN SOCIAL MEDIA: A CONTENT ANALYSIS OF HOW PEOPLE EXPRESS ANXIETY DISORDER ON INSTAGRAM

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The purpose of this study was to explore how people communicate anxiety disorders on Instagram. Anxiety disorders are one of the most common mental illnesses in the United States, rates of anxiety disorders are increasing globally, yet it's difficult to diagnose it in the early stages. Social media platforms have become one of the primary ways for people to communicate and express themselves, and Instagram, as a photo-based social media site, provides an opportunity to examine both visual and textual content. Based on the social sharing of emotions framework, this paper used the quantitative content analysis method to explore what symptoms, visual content, coping strategies, and social exchange information people shared on anxiety disorder tagged Instagram posts, and the study found that less social networking activity shows on anxiety disorder tagged Instagram posts, compare with general Instagram photo. Seeking social contact and narration are two social exchange behaviors that play a substantial role in anxiety disorder topic communities on Instagram. There are a lot more captioned photo posts with anxiety disorder tagged photo than general Instagram photo, and many of the captioned photo are mental status related content. What's more, large amount of the anxiety disorder tagged Instagram posts contains narration of their experiences, coping strategies and symptoms, which shows peer-to-peer support. A significant association has been found between gender and vigilant coping strategies. These findings underscore the importance to look at mental health related problems on social media.

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INTRODUCTION

Anxiety disorders is one of the most common mental illnesses in the United States, affecting 40 million adults in the U.S. age 18 and older or 18.1 percent of the population every year (Anxiety and Depression Association of America [ADAA], 2017). Anxiety disorders are illnesses that cause people to feel frightened, distressed, and uneasy. Left untreated, these disorders can dramatically reduce productivity and significantly diminish an individual's quality of life (Mental Health America, 2017). Young adults and females are the most likely group to be affected anxiety. The ADAA states that 30 percent of U.S. adults who suffer from anxiety are ages 18 to 29 years-old, and 35 percent are ages 30 to 44 years-old. Women are 60 percent more likely than men to experience an anxiety disorder over their lifetime. Rates of anxiety disorder are increasing globally. The Franciscan University Counseling Center reported a 231 percent increase in yearly visits in 2013 compared with 2008, as well as a 173 percent increase in total yearly clients with a diagnosis of anxiety disorder (Beiter et al., 2015).

Although anxiety disorders are treatable, only 36.9 percent of those suffering receive treatment, according to ADAA (2017). Instead, people are turning to vices such as drinking alcohol, smoking, and recreational drugs to deal with their anxiety. study found that 20 percent people dealing with anxiety disorder also suffered from some form of alcohol abuse or dependence according to ADAA (2017).

One of the reasons for the lack of treatment might be that it is difficult to diagnose early signs of anxiety. In many cases, the primary care physician may be distracted by the presence of physical complaints, may feel too pressed for time, or may not be qualified to probe into mental health problems (Vermani, Marcus, & Katzman, 2011). Research also found that failure to properly diagnose these disorders is related to not only insufficient training of clinicians in this

area, but also because of the time limits of appointments, a central focus on physical aspects of a patient's condition, or insufficient rapport building.

Therefore, the challenge is to provide accurate early detection and identification of people who are at increased risk for anxiety disorders so that they may receive appropriate treatment. To help with detection of early anxiety, social media provides a valid way to observe how people define and cope with anxiety. Social media is central to the lives of many adults. Approximately 90 percent of young adults use social media and visit sites daily, with the majority using two or more social media sites (Perrin, 2015), it has become one of the primary ways for people to communicate and express themselves, including how they deal with mental health issues. According to National Institutes of Health (NIH, 2017), online social networking sites have caused profound changes in the way people communicate and interact during the past decade. In fact, we can observe how people communicate about mental health related topics on social media. The monitoring of expressions on social media can help health care leaders develop an understanding of how people talk about anxiety and treat it themselves. In order to capture how people communicate about anxiety disorder and to better understand the characteristics of anxiety disorder, a quantitative content analysis of Instagram posts that included the hashtag #anxietydisorder was carried out. Content analysis can capture communication patterns of anxiety disorders because of the regular use of Instagram to publicly share information about their anxiety disorders including expressions of their symptoms or feelings about anxiety. Content analysis provides an opportunity for researchers to better understand anxiety disorder and helps identify why large amounts of people don't seek for professional treatment and how people cope with it. In order to better understand about how people communicate about anxiety disorder on Instagram, I examined the content by applying

these concepts: the social sharing of emotions framework; coping strategies, symptoms, and gender, and what visual content are people posting with anxiety disorder hashtag.

LITERATURE REVIEW

Anxiety disorders

Since the 20th century, anxiety has been classified as a psychiatric disorder. The Diagnostic and Statistical Manual of Mental Disorders (5th ed.; DSM-5; American Psychiatric Association, 2013) defines anxiety as the anticipation of future threat; whereas fear is the emotional response to a real or perceived imminent threat. Individuals with anxiety disorders are excessively fearful, anxious, or avoidant of perceived threats (e.g., social situations or unfamiliar locations) or internal to oneself (e.g., unusual bodily sensations) (Craske & Stein, 2016).

Researchers found that the causes of anxiety disorders are complex. Anxiety disorders may develop from a complex set of risk factors, including genetics, brain chemistry, personality, and life events (ADAA, 2017). Anxiety disorders are primarily diagnosed by physicians or psychologists, but 77 percent of counties in the United States have a severe shortage of psychiatrists and non-prescribing mental health providers such as psychiatric nurses, social workers, licensed professionals, counselors, and marriage and family therapists (Thomas et al., 2009). Early stage anxiety disorder is challenging to detect. Anxiety reactions are primarily private events, which are hard to observe or verify objectively (ISHIYAMA, 1986). Anxiety disorders in adults are typically diagnosed on the basis of structured clinical interviews, while young children are diagnosed based on interviews with parents, caregivers, or teachers (Craske & Stein, 2016). Some practitioners diagnose anxiety disorders through self-report questionnaires such as the Overall Anxiety Severity and Impairment scale, which can be used to assess severity and impairment associated with anxiety disorder (Craske & Stein, 2016).

Anxiety disorder can have a negative impact on people's quality of life. Anxiety disorders can cause people to avoid situations that trigger or worsen their symptoms according to

American Psychiatric Association (2017). Anxiety influences task performance because anxious people's working memory is being occupied through worry (Cumming & Harris, 2001). Anxiety can influence job performance, school work, and personal relationships (NIH, 2017). Anxious individuals fearing negative evaluation are often unlikely to disclose their symptoms, leading to more negative outcomes (Voncken, Alden, & Bögels, 2006).

Anxiety disorders are treatable with professional care. Treatment time varies depends on people's situation, and people with co-existing conditions may take longer to successfully treat their conditions. Several approaches have been proven effective in addressing anxiety disorders, according to ADAA (2017). For example, cognitive-behavior therapy (CBT), medication, and transcranial magnetic stimulation (TMS). CBT is a collaborative, short-term psychotherapy treatment, and it provides a practical approach to changing thinking and behavioral patterns. TMS creates a magnetic field in order to induce a small electric current in a specific part of the brain, which delivers pulses to the forehead. Also, medications like benzodiazepines, ketamine, and selective serotonin reuptake inhibitors (SSRIs) can relieve anxiety disorder symptoms as well.

However, studies show a large amount of anxiety disorder sufferers instead address their anxiety by smoking cigarettes and drinking alcohol. Anxiety and alcohol-related disorders occur together at very high rates in the United States, affecting more than three million people; almost one fifth (17 percent) of adults who suffer from alcohol use disorders are also diagnosed with a co-occurring anxiety disorder (Levine & Rafael, 2014). High levels of heavy drinking among people with anxiety suggest that drinking and smoking may be used to cope with anxiety. Smokers often report that they smoke to relieve their anxiety as well (Low, Lee, Johnson, William & Harris, 2008; Schneider & Houston, 1970). Anxiety disorders are more common

among smokers than non-smokers (Piper, Cook, Schlam, Jorenby, & Baker, 2011). These findings show the importance of understanding anxiety disorder since drinking alcohol and smoking cigarettes affects people's well-being and can even cause death. It also underscores the importance of observing what anxiety disorders looks like in social media, because social media has become a main way for people to express themselves, and people who reads mental health related contents from others might also be affected.

Social media and mental health

Social media platforms are internet applications that enable users to generate and exchange content with others (e.g., Facebook; Kaplan & Haenlein, 2010). Approximately 90 percent of young adults use social media and visit sites daily, with the majority using two or more social media sites (Perrin, 2015), it has become one of the primary ways for people to communicate and express themselves. Online and offline worlds have become increasingly interconnected as more interactions are moving online and ubiquitous mobile devices are supporting always-on mediated social connections (Andalibi, 2017).

Social media platforms offer opportunities to both produce and consume content related to health experiences, and they have tremendous potential to reach mentally ill individuals, especially young adults. Therefore, social media has received significant attention in relation to understanding the moods of users and their mental states. And it is important to study how young people use it because emerging adulthood represents a high-risk period for the onset of several anxiety disorders (Kessler et al., 2012). More than 75 percent of all mental health conditions begin before the age of 24 according to the National Alliance on Mental Illness (2017).

The ubiquity of social media has led to an increasing interest in understanding how people use social media to communicate mental health related topics and express their feelings.

Because day-to-day feelings and episodes can be hard to disclose in a short time allowed with the doctor, a social media based mental health dashboard could help doctors be more aware of the patients' daily lives and emotional states. And clinical researchers could explore the effectiveness of discussing social media posts as a part of clinical practice (Park, McDonald, & Cha, 2013).

Research indicates that many people with mental illnesses are turning to social media sites to share personal experiences with a mental illness, seek mental health information and advice, and provide support to other individuals facing similar challenging mental health problems. Millions of people routinely self-disclose personal information on SNS (Bazarova & Choi, 2014).

Research also found that people with a serious mental illness report benefits from interacting with peers online such as greater social connectedness, feelings of group belonging, and coping with day-to-day challenges of living with a mental illness by sharing personal stories and management strategies. Within online communities, individuals with a serious mental illness can challenge stigma through personal empowerment and providing hope (Naslund, Aschbrenner, Marsch, & Bartels, 2016). Studies have shown that knowing that there are others facing similar concerns, frustrations and illness symptoms can be highly reassuring and can create a sense of belonging to a group (Harvey et al. 2007).

Instagram

Instagram is a social networking site created in 2010. It has reached 800 million monthly active users in 2017 and become the third most popular social media site in the United States, following Facebook and Facebook messenger (Statista, 2017). According to the Pew Research Center, 59 percent of 18-29-year-olds use Instagram. The dominant gender on Instagram is

women, 38 percent of online women use Instagram while 28 percent of online men use it. Also, 39 percent of adults living in urban areas use Instagram.

Instagram provides users an instantaneous way to capture and share life moments with friends through a series of often filter-manipulated pictures and videos (Hu, Manikonda, & Kambhampati, 2014). Users can also add a short description to their images and then post them online. These descriptions often take the form of hashtags, which allow users to insert their photo into a wider “hashtag conversation” (Bruns & Burgess, 2011, p. 2). The platform is unique in that it does not have formalized community structures, like forums or private groups. Instead, communities form around more amorphous, public tags (Pater, 2016). Photos and videos have become the key social currencies online (Rainie, Brenner, & Purcell, 2012). Online conversations and interactions revolve around images partially because they are often more effective at conveying a feeling or reaction than text (Murray, 2015). In 2013, Pew reported, 54 percent of adult Internet users post original photos or videos online (up from 46 percent in 2012), and 47 percent of adult Internet users take photos they have found online and repost them on sites designed for sharing images with many people (Thornton, 2014).

Content shared on social media platforms has been identified to be valuable in gaining insights into people’s mental health experiences (Manikonda & Choudhury, 2017). People can benefit from disclosing negative emotions or stigmatized facets of their identities, and psychologists have noted that imagery can be an effective medium for expressing difficult emotions (Andalibi, 2017). Psychologists suggest that people use visual imagery to express feelings and experiences that they may struggle to express verbally.

Research found that one motive for using Instagram is to document their lives. The reasoning behind documentation surfacing as a motive is likely due to the characteristics of

Instagram that sets it apart from other social media forums. For instance, Instagram primarily focuses on images whereas Twitter is a more text-based forum. When people want to document moments of their lives, they are more likely to post a picture on Instagram rather than compose a tweet about such events (Highfield, 2015). In addition, Instagram allows users to provide both a picture and text as there is an option to provide a caption underneath the image. In this way, Instagram acts as a kind of virtual photo album for many people (Sheldon & Bryant, 2016).

To sum up, among the social media sites, Instagram is an ideal medium to study how young adults communicate anxiety disorder because it is the most popular photo and video sharing site that doesn't require to use real name; it has large amount of young adult users, and it has a special hashtag community.

Social sharing of emotions

The social sharing of emotions (SSE) framework by Bernard Rimé (2009) sees online disclosures as a process of meaning making. The social sharing of emotion framework believes the communication of negative emotional conditions stimulates social interaction in many forms: social comparison, story-telling, and conversation in order for their search for emotional support. Research suggests that individuals facing stress attempt to reduce the elicited anxiety by interacting with others sharing their same fate by using others as a gauge for evaluating their own emotional state. In these environments, negative emotions fuel verbal exchanges and social comparisons. Social sharing represents an integral part of emotional experiences (Rimé, 2009), so in this case, to examine social sharing of anxiety examine not only social media communication, but also it helps to understand definitions of anxiety itself. Base on this framework, symptoms, visual content, coping strategies, and social exchange information concept was examined to see what disclose online about anxiety disorder related topics.

Symptoms

People with serious mental illness are increasingly turning to popular social media, including Facebook, Twitter or YouTube, to share their illness experiences or seek advice from others with similar health conditions (Naslund, Aschbrenner, Marsch, & Bartels, 2016). Studies have shown that knowing that there are others facing similar concerns, frustrations, and illness symptoms can be highly reassuring and can create a sense of belonging to a group (Harvey et al. 2007). Therefore, I examined what symptoms people have mentioned on their posts can help to identify what are people communicating on Instagram about anxiety disorder.

Visual expression of anxiety

The value of visual expressions made it possible to overcome some of the limitations of verbal text to convey experiences and to facilitate thinking about those elements of the social world that cannot always be verbally expressed (Du Preez & Roos, 2008). Photo sharing provides a unique lens for understanding how people curate and express personal dimensions of their identity. People use photos to define and record their identity, maintain relationships, curate and cultivate self-representation, and express themselves (Andalibi, Ozturk, & Forte, 2015). The rapidly growth of Instagram users also shows the need for visual expression, both to post content and view other people's content. Research finds that *knowledge about others* was the most influential reason behind Instagram use (Sheldon & Bryant, 2016)

Coping strategies

People cope with threat or situations in often unstable manners by deploying vigilant as well as avoidant strategies. The term *unstable* means that there is no apparent relationship to the situational aspects relevant for coping (Krohne, 1989). Coping strategies play a central role in dealing with stress. People react to crisis with considerable variability and appear to tailor their

coping strategies to the specific situation they encounter (Feifel, 1987). *Vigilance* and *cognitive avoidance* are two main class of coping strategies. Vigilance is characterized by an intensified processing of threat-relevant information. The person seeks to gain control over the main threat-related aspects of a situation, thereby protecting the individual from the expected threat that would result from a confrontation with an unexpected danger. Cognitive avoidance is viewed as a withdrawal from threat-relevant information to reduce the arousal that could take place during an aversive event (Krohne, 1989).

Gender

Gender differences are showing in many aspects related to social media and mental health problems. First of all, what triggers people to use social media are different: It was found that curiosity and interest were the factors that affected females, whereas variety was the strongest factor affecting males (Lee & Kozar, 2009; Ozdemir & Kilic, 2011). What's more, males are more influenced by involvement and females are more influenced by satisfaction levels (Lim, Heinrichs & Lim, 2017). And besides motivations, research also found gender differences in functions and degrees of satisfaction of social media use: males tend to think posting content is more important while females values more of the responsiveness of the social media users (Lim, Heinrichs & Lim, 2017). Females are less satisfied than males with their online experience since females tend to show greater risk aversion and less trust in the use of the internet (Sanchez-Franco, Ramos, & Velicia, 2009).

Gender difference has also been found in social comparison (Steers, Wickham, & Acitelli, 2014). Research has indicated that males differentiate themselves from others more often than females. Conversely, women viewed themselves as at the same or below others on most levels. Women use more affective words and express themselves more emotionally on

social media, while men more often display assertiveness and serious expressions in their self-presentations (Waterloo, Baumgartner, Peter, & Valkenburg, 2017).

Gender differences are also showing in how people reveals mental illness in social media. Research indicates that female users express more positivity, greater involvement in social and familial concerns, a higher propensity to engage in health discourse, and a desire to seek help (Choudhury, Sharma & Logar, 2017), it also shows that male tend to use Twitter to show greater detachment from the social realm and hesitation to seek help. To sum up, researches has found gender differences in social media use, social comparison and mental illness disclosure on social media, which are all related to the goal of this paper, to better understand how people talk about anxiety disorders on Instagram.

Presence of face

The presence of face is important in both online and offline communication. One of the major example of the presence of face is selfie. Selfie refers to a self-portrait picture taken by an individual using a digital camera or a smartphone for posting on social network sites [SNS] (Moreau, 2015). The major motivations for posting selfies are attention seeking, communication, archiving, and entertainment (Sung et al., 2016). Research founds that selfie viewing behavior have influence on people's mental health. Frequent selfie viewing behavior led to decreased life satisfaction, selfie posting behavior was not associated with self-esteem or life satisfaction (Wang, Yang, & Haigh, 2017). Selfie posting behavior increased one's narcissism or vice versa and selfie content reflected people's personality and gender stereotyping (Döring et al., 2016; Qiu et al., 2015). Other than online communication, face-to-face communication was found strongly associated with positive social well-being and continues to be recognized as a key determinant of social and emotional development (Denzin, 2010; Rogoff, 2003).

Research questions

The literature review suggests that we can better understand anxiety disorders by observing how people talk about it on social media, especially Instagram. In order to observe how people communicate about anxiety disorders and to better understand the characteristics of anxiety disorders, the following research questions are put forth:

RQ1: What type of visual expressions do people share on anxiety disorder tagged posts?

RQ2: What symptoms do people share on anxiety disorder tagged posts?

RQ3: What coping strategies do people share on anxiety disorder tagged posts?

RQ4: What types of social exchange information are shared on anxiety disorder tagged posts?

RQ5: What seeking treatment behaviors and vices are present on anxiety disorder tagged posts?

RQ6: To what extent does gender predict differences in coping strategies, seeking treatment behaviors, and seeking social contact behavior on anxiety disorder tagged posts?

RQ7: To what extent does the presence of the face predict differences in coping strategies, seeking treatment behaviors, and seeking social contact behavior on anxiety disorder tagged posts?

METHOD

Sample

A quantitative content analysis of Instagram's photo and textual posts with the hashtag #anxietydisorder has been carried out. Although there are more posts on #anxiety than #anxietydisorder, this paper chose to examine under #anxietydisorder hashtag because posts were relevant to the mental illness rather than a general feeling of anxiety expressed by users. Content analysis is a nonreactive method commonly used by researchers and applied to all types of media content (Krippendorff, 2004). This study employed both a visual and textual content analysis. Visual content analysis is a systematic, observational method, which often use for testing hypotheses about the ways in which the media represent people, events, situations, and so on. It allows observable content classified into distinct categories (Leeuwen & Jewitt, 2001). Content analysis is the most appropriate method for this paper because the goal is to observe what content are people sharing about anxiety disorders on Instagram.

Sampling procedure

Instagram users can insert their photo into a wider *hashtag conversation* by identifying the hashtags that the community uses (Bruns & Burgess, 2011). Previous research has shown that hashtags are used to provide information about a photograph and to help others find content about certain topic. Using different hashtags can also increase the possibility for reaching more audience (Jungselius, Hillman, & Weilenmann, 2014).

More than 187,943 posts with hashtag #anxietydisorder have been found on Instagram, this paper will use an Instagram Application Programming Interface (API) and python to download and examine the samples. A constructed week in March 2018 was selected by random number generator, and every post with hashtag #anxietydisorder, which shows in that time

period has been downloaded. A constructed week samples involve identifying all Mondays, and randomly selecting one Monday, then identifying all Tuesdays, and randomly selecting one Tuesday, etc., to ‘construct’ a week that ensures that each source of cyclic variation, each day of the week, is represented equally (Hester & Dougall, 2007).

Each image’s URL has been stored together with its user ID, date, time of creation, and tags. The images have been separated into seven different bins by the download date. A total number of 1225 posts have been downloaded, after removed posts with foreign language and commercial contents, a total number of 959 posts were included for analysis.

To test the inter-coder reliability, the author and another graduate student has independently coded a batch 100 posts, for which the Cohen’s Kappa coefficient was 0.88 which is consider very good agreement. In particular, the average reliability for visual contents are 0.95, for symptoms are 0.82, for social exchange are 0.83, for vices, seeking treatment, coping strategies and overall tone are 0.88. The author and the graduate student each coded half of the rest posts.

Measures

Visual expression. The Social Sharing of Emotions framework also leads us to ask how Instagram is being used as a space for psychological self-disclosures like anxiety disorder, what content people disclose about, and what are the most related topics and events. Hu, Manikonda, and Kambhampati’s (2014) research used computer vision techniques to examine the photo content on Instagram, and that research revealed eight popular photos categories: friends (i.e., users posing with other friends; at least two human faces are in the photo), food (food, recipes, cakes, drinks, etc.), gadget (electronic goods, tools, motorbikes, cars, etc.), captioned photo (pictures with embed text, memes, and so on), pet, general activity (both outdoor and indoor

activities, places where activities happen, e.g., concert, landmarks), selfie (self-portraits; only one human face is present in the photo), and fashion. Those six categories have been applied to the codebook with the exception of gadget and fashion, because based on observations, very few anxiety disorders tagged posts can be categorized into these two fields. In addition, four more items have been added to the codebook based on observations: graphic (cartoon, drawings, etc.), landscape, face present (whether the whole face can be seen in selfie photos) and photo (photo of certain object which cannot show location or activity information, for example, a flower).

Anxiety disorder symptoms. Worry, insomnia, fear, fatigued, panic, and other symptom like physical symptoms, tension or stress and eating problem, which are common items from the Hospital Anxiety and Depression scale (HADS) and Hamilton Anxiety scale (HAM-A) and DSM-5, these variables have been coded in both visual (mostly caption photo) and verbal posts. The HADS and HAM-A are popular tools for clinical practice and research to measure anxiety in general medical population of patients.

Coping strategies. Coping strategies from research by Krohne (1989) included two main classes of coping strategies: vigilance and cognitive avoidance. Vigilance is view as an intensified process of threat-relevant information. Six most common vigilance coping strategies include information searching, comparison with others, planning for the future, escape tendency, anticipation of negative events, and situation control. Cognitive avoidance is viewed as a withdrawal from threat-relevant information. Six most common avoidance coping strategies are minimization (minimizing the severity of the experience), self-enhancement (being narcissism and over-claiming), attentional diversion, denial, emphasizing one's own efficacy and accentuating positive aspect.

Social exchange. Base on Rimé’s social sharing of emotion as meaning creation framework, and Anadalibi’s research on sensitive self-disclosures on Instagram (2017), I examined three types of social exchange: 1) *seeking social contact*, 2) *narration*, and 3) *social comparison*. The first dimension *seeking social contact* was measured by whether there shows behaviors like asking questions, apologizing to the public, tagging specific IDs, or directly talking to the audience such as addressing them as “you” (awareness of audience). The second dimension *narration* refers to personal narratives and storytelling about their personal experiences with anxiety disorders, what they think or how they feel about it by capturing deep

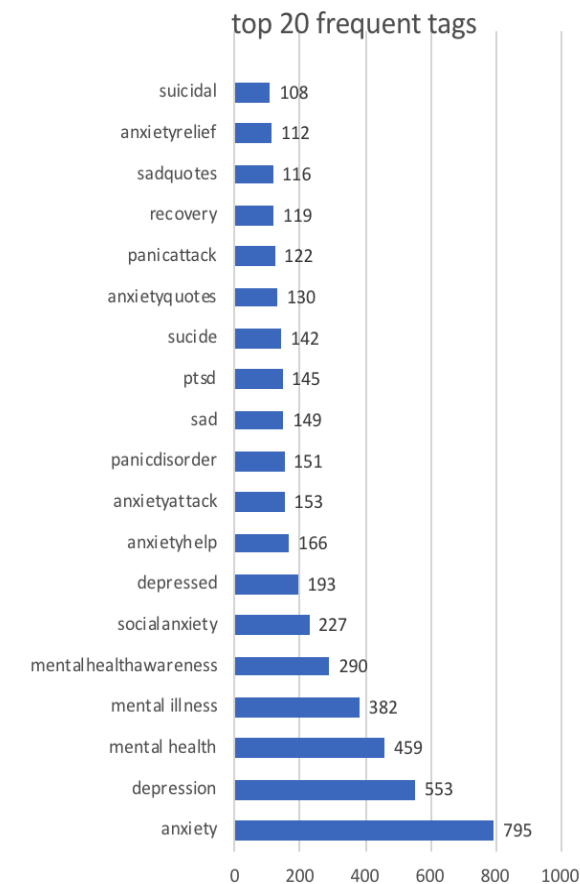


Figure 1: Top 20 frequent tags

and detailed disclosures about anxiety. The third dimension *social comparison* refers to content in which they see themselves or their feelings in relation to the wider societal context and

other people. Three variables in the category of *social comparison* has been set to code: personal self-view (including self-blame, low self-esteem, etc.), social self-view (showing a sense of group identity). And beyond outer appearance (refers to posts mentioning how they are pretending to be one way yet feels different inside).

Vice and seeking treatment. Smoking, drinking and marijuana has been set to code for vices, in order whether or not people will disclose their vices behaviors on social media, and what percentage shows on. The paper has also coded whether or not there shows seeking treating behaviors like going to professional help, taking medicine, trying to find therapy, etc.

RESULTS

A total number of 959 posts were analyzed, including image captions and hashtags. About the first research question, what type of visual expressions do people share on anxiety disorder tagged posts: Among the 959 posts, captioned photos (which refers to pictures with text on it) were the most frequent (47.1 percent), followed by selfies 19.2 percent (only one human face present in the photo), among the selfie posts, 85 percent were identified as female and 15 percent were identified as male. There are 134 selfie posts included a fully recognizable face and 47 posts showed a face covered by sunglasses or a hat, half of the face, or no face showing the rest of the body. What's more, there are 11.7 percent in graphic category, which refers to drawings, cartoons, etc., and 8.4 percent in photo category (photo of certain object which cannot show activity or location). General-activity category has 3.9 percent, pet category has 3.3 percent, following by landscape with 2.8 percent, food with 2.6 percent, and in these nine categories, friends (with at least two human faces present in the photo) posts showed up the least frequently, with only 1.5 percent. And the overall

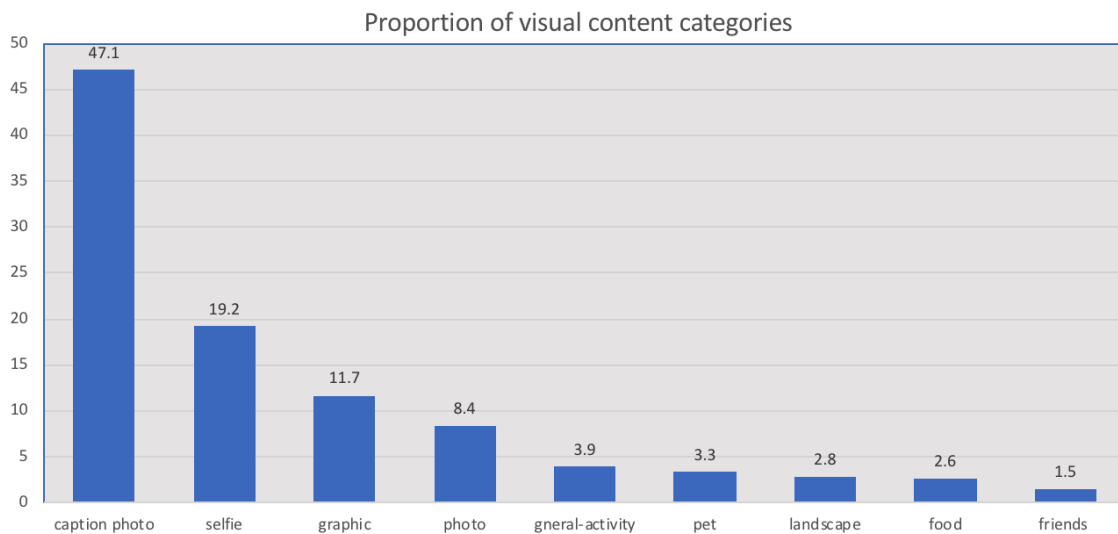


Figure 2: Proportion of visual categories

food with 2.6 percent, and in these nine categories, friends (with at least two human faces present in the photo) posts showed up the least frequently, with only 1.5 percent. And the overall

tone of the post has also been analysis, there were 54 percent that were neutral, 24.5 percent were positive, which showed happy, confidence etc., and 21.4 percent were negative in tone which featured content such as suffering and feeling sad.

The second research question asked what symptoms people share on anxiety disorder tagged posts, 17.7 percent of the posts mentioned worry and restlessness, 12.7 percent mentioned fear, 12.6 percent mentioned fatigued and tiredness, and 9.7 percent mentioned insomnia and other types of sleeping problems. Other symptoms showed up to a lesser extent: panic (8.2 percent), stress (6.4 percent), physical illness (5.3 percent) tension, and eating problems (2.4 percent) which includes overeating and appetite loss.

The third research question, what coping strategies people talk about, There were 26.1 percent of posts mentioning vigilant coping strategies and 22.3 percent mentioned avoidant coping strategies.

The fourth research question, which is about what social exchange information are shared on anxiety disorder tagged posts, and its showing that narration (45.3) and seeking social contact (40.3 percent) represented the greatest proportion. While beyond appearance (13.2 percent), personal self-view (12.3 percent), and social self-view (10.2 percent) which together are in social comparison category, were present less.

For the fifth research question about vices and seeking treatment behaviors, it showed that only a small amount of users posted content about their use of unhealthy vices on Instagram, with 2.4 percent of drinking alcohol, 2.1 percent posts containing marijuana, and 1.4 percent smoking cigarette. It also showed only 21.8 percent posts in which users were seeking treatment (going to a psychologist, using or looking for therapy, taking medicine, etc.).

The sixth research question asked about to what extent does gender predict differences in coping strategies, seeking treatment behaviors, and seeking social contact behavior on anxiety disorder tagged post: a significant association was only found between gender and vigilant coping strategies, according to regression analyses (see Table 1).

And the final research question, to what extent does the presence of face predict differences in coping strategies, seeking treatment behaviors, and seeking social contact behavior on anxiety disorder tagged posts: no significant association was found between the face of presence and each variable, according to regression analyses (see Table 1).

Predicting vigilant coping strategies

predictor	Beta	SE
gender	.159	.092*
Face presence	-.088	.071

Predicting avoidant coping strategies

predictor	Beta	SE
gender	.025	.089
Face presence	.072	.069

Predicting social contact behavior

predictor	Beta	SE
gender	.017	.101
Face presence	.054	.077

Predicting seeking treatment

predictor	Beta	SE
gender	.022	.084
Face presence	-.048	.064

Note. * correlation is signification at .05 level. Betas are standardized coefficients.

Table 1: Regression analysis for gender and the presence of face

DISCUSSION AND CONCLUSION

The current study explored what are people sharing about anxiety disorders on Instagram, in order to better understand anxiety disorders.

This study found that less social networking activity shows on anxiety disorder tagged Instagram posts, compare with general Instagram photos. It underscores the importance to look at mental health related problems on social media, especially Instagram because this study found that what visual content are people frequently posting are relating to their mental health situation, and there are a lot more captioned photo posts with anxiety disorder tagged than general Instagram photo, and many of the captioned photo are mental status related content. What's more, large amount of the anxiety disorder tagged Instagram posts contains narration of their experiences, coping strategies and symptoms, which shows peer-to-peer support. Significant association has been found between gender and vigilant coping strategies, no significant association between the presence of face and the other variables.

The first research question asked what type of visual expressions do people share on anxiety disorder tagged posts. Based on observation and research that reveals popular photos categories on Instagram (Hu, Manikonda, & Kambhampati, 2014), nine categories of visual content in anxiety disorder tagged posts has been set to code(Friends, food, captioned photo, pet, landscape, general activity, selfie, graphic, photo), the captioned photo categories contains the largest proportion of the posts, and friends (with at least two human faces in the photo) category contains the least. These findings align with Hu's research, friends' category's proportion shows heavily decrease. In Hu's research, friends' category is the second most frequent posts among all Instagram posts which takes 22.4 percent (the first is selfie, which takes 24.2 percent). In the anxiety disorder tagged community, friends category only takes 1.5 percent. Hu's research

discussed that the large proportion of friends' post shows how people are using Instagram as a function of social networking with their friends. This study found that less social networking activity shows on anxiety disorder tagged Instagram posts, which supports that anxiety disorders have negative impacts on people's quality of life and can influence personal relationships (NIH, 2017). And anxiety disorders might make people with less desire to social network, considering fear is one of the key component of anxiety disorders. What's more, the category of friends' posts is significant less with anxiety disorder tagged photos than with general Instagram photos, it emphasizes how loneliness might be affecting anxiety disorders. According to American Psychological Association (APA, 2017), approximately 42.6 million adults over age 45 in the United States are estimated to be suffering from chronic loneliness, more than a quarter of the population lives alone, more than half of the population is unmarried and marriage rates and the number of children per household have declined.

What's more, it supports that photo sharing provides a unique lens for understanding how people express their mental status, especially from what visual content are people frequently posting. People use photos to define and record their identity, curate and cultivate self-representation, and express themselves (Andalibi, Ozturk, & Forte, 2015). Therefore, social media's visual posting contents has the ability to provide more mental health related information for doctors and other professionals who works for mental health. From the results for this research question, it also suggests that not just the content of the visual posts, but also how frequent certain visual posts shows up matters. For example, how frequent photos of activities and with friends shows up versus how frequent photos of drinking or negative quotations can imply the person's mental status. These findings also suggest that loneliness might be a factor of anxiety disorder, and with more company might be able to help people with anxiety disorder to

get better. Compare with Hu's research, another item shows obvious difference is captioned photo, in Hu's research, caption photo is the fifth most frequent showing category and in anxiety disorder tagged community, captioned photo category contains the largest proportion. The finding of large increasing amount of captioned photo in anxiety disorder tagged community supports the Social Sharing of Emotions framework, which suggest that negative emotions would trigger people to more self-disclosure behavior. Which also underscores the importance to look at mental health related problems on social media.

The second research question, which is about what symptoms do people share on anxiety disorder tagged posts. Researches shows that people with mental illness are increasingly turning to popular social media to share their illness experience, and This form of unsolicited communication among self-forming online communities of patients and individuals with health concerns is also referred to as peer-to-peer support (Naslund, Aschbrenner, Marsch, & Bartels, 2016). Within online communities, individuals with serious mental illness could challenge stigma through personal empowerment and providing hope by sharing personal stories, their symptoms and experiences. Base on the result from this study, large amount of the anxiety disorder tagged Instagram posts mentioned their symptoms, which supports the peer-to-peer support communication form, and the most frequent mentioning symptoms are worry and restless.

The third research question, about what coping strategies do people share on anxiety disorder tagged posts. This study uses two main categories of coping strategies to measure: vigilant coping strategies (information searching, comparison with others, planning for the future, escape tendency, anticipation of negative events, and situation control), which is view as an intensified process of threat-relevant information. And avoidant coping strategies

(minimization, self-enhancement, attentional diversion, denial, emphasizing one's own efficacy and accentuating positive aspect), which is viewed as a withdrawal from threat-relevant information. From the results for this research question, this study found that there is a large amount of posts mentioned coping strategies, which also supports the increasing of peer-to-peer support with mental illness in social media, and vigilant coping strategies has been mentioned slightly more. However, more anxiety disorder tagged Instagram posts mentioned vigilant coping strategies than avoidant coping strategies could also related to how people use social media. As the social sharing of emotions framework mentioned, negative emotions would trigger people to more self-disclosure behavior, and seems people choosing vigilant coping strategies tend to intensify the threat-relevant information, it is also possible that people choose vigilant coping strategies would disclosure more about their experience on anxiety disorder tagged Instagram posts.

The fourth research question asked what types of social exchange information are shared on anxiety disorder tagged posts. This study finds that seeking social contact and narration are two social exchange behaviors that play a substantial role in anxiety disorder topic communities on Instagram. These findings emphasize the importance of social support and how social media can be a place benefit for mental illness. Social support, an umbrella term that generally refers to the link between one's well-being and relationship with others (Albrecht & Goldsmith, 2003), is associated with a lot of positive health outcomes (Rains & Keating, 2011). The large amount of seeking contact behaviors, for example asking questions, tagging other people, talking directly to audience, reveals psychological needs for people with anxiety disorders. The same as Narration, the large amount of narration contents, which user shared personal story of what they have been

going through, what they think, and feel, have benefits not just from expressive writing but also social support by social support.

The fifth research, how frequent are seeking treatment behaviors and vices shows on anxiety disorder tagged posts. And it shows that only 21.8 percent are mentioning seeking treatments like medicine or professional help. Meanwhile, although large amount of research shows that people are turning into vices like smoking cigarette and drinking alcohol, there's only a small proportion of anxiety disorder tagged Instagram posts mentions these vices. One of the reason might be related to positive self-presentation, which means users may post content that can reflect the most exciting parts of their lives, such as parties with friends and glamorous vacations, to create a flattering depiction of themselves (Kim & Lee, 2011). Also, a research on students' attitude toward sharing vices behaviors on social media founds that people are less accepting sharing marijuana content because it depicts illegal behaviors. And for smoking and drinking, their attitude shows although they think it is okay for others to share smoking and drinking content on social media, students frequently no endorsing the behavior for themselves (Morgan, Snelson and Bowers, 2010).

The sixth research question asked to what extent does gender predict differences in coping strategies, seeking treatment behavior and seeking social contact behavior on anxiety disorder tagged posts. And base on the result, significant association has been found between gender and vigilant coping strategies, with male has been set code as 1 and female has been set code as 0. Base on the specialty of Instagram, the only way to know the gender of the user are only through self-portrait photos. In this study, amount the 959 posts, only 181 (19 percent) contains gender recognizable photo, which limits the condition to see gender or face presence difference in social disclosure behaviors. Also, because self-portrait photos are in selfie category

when analyzing visual contents, it limits the conditions to see the gender and face presence difference in visual content categories.

And finally, the seventh research question, to what extent does the presence of face predict differences in coping strategies, seeking treatment behaviors, and seeking social contact behaviors on anxiety disorder tagged posts. Base on the result, there is no significant association between the face of presence and each variable. According to research, selfie viewing behavior are more associate with self-esteem and life satisfaction while neither selfie nor groupie (photo with at least two human faces posts) posting behavior was associated with self-esteem or life satisfaction (Wang, Yang, & Haigh, 2017). This study only explored selfie posting behaviors and found that posting content with the presence of a person's have no association with each variable. And future studies can examine more about how selfie viewing behavior can association with these variables.

LIMITATION AND FUTURE STUDIES

Although it is important to examine what are people with anxiety disorders sharing on social media, content analysis itself cannot guarantee all the users posting with anxiety disorder related topics has serious anxiety disorder. Future study can combine content analysis and survey together to find out more on how people with self-rated anxiety disorders shares on social media. What's more, content analysis can show whether or not certain behavior exists in these contents, but it cannot show the reasons for it. Future study can develop more on why these findings exists.

This paper is the first content analysis research about anxiety disorders on Instagram, although visual content shows its importance, there's lack of research on visual and textual together content analysis. Future research could develop more on how visual content helps with online self-disclosure, in order to better understand mental health problems.

APPENDIX

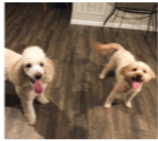
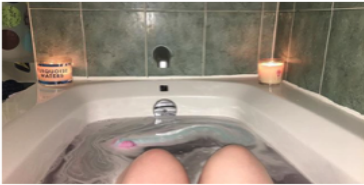
Category	Exemplary photos
Friends (users posing with other friends; At least two human faces are in the photo)	
Food (food, recipes, cakes, drinks, etc.)	
Captioned Photo (pictures with embed text, memes, and so on)	
Pet (animals like cats and dogs which are the main objects in the picture)	
Landscape (visible features of an area of countryside or land, or sea, etc.)	
General Activity (both outdoor & indoor activities, places where activities happen, e.g., concert, landmarks)	
Selfie (self-portraits; only one human face is present in the photo)	
Graphic (drawings, cartoons, etc.)	
Photo (photo of certain object which cannot show activity or location)	

Figure 3: Visual content categories

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