Insights from an expressive writing intervention on Facebook to help alleviate depressive symptoms

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ABSTRACT

Depression is one of the most common mental disorders. Studies have shown that various online social network (OSN) activities can be used as a marker for people's moods as well as symptoms of sub-syndromal depression, suggesting possibilities for online-based interventions. This study investigates one such potential by developing an expressive writing application within Facebook and by investigating how the designed intervention as well as various online social network activities contribute to improving one's emotional state. Experimental data show that negative emotional words and cognitive words in online expressive writing are the two most important factors in alleviating depressive symptoms. Furthermore, participants who have had previous experience expressing emotions in OSNs reported the greatest reduction in depressive symptoms. Our findings have implications that can assist in designing personalized online intervention platforms and for sophisticated writing therapy to maximize the effect of expressive writing.

1. Introduction

Depression is a serious mental illness with a high prevalence. The one-year prevalence of major depressive disorder (MDD) is 5.3% and the lifetime prevalence is 13.3% (Kessing, 2007). Beyond the MDD patients, a portion of the general population also suffers from clinically relevant depression although they do not meet all the criteria of MDD—a case that is called subsyndromal depression (SSD) (Pan et al., 2011). Previous studies found that 7–12% of the general adult population have SSD and these people are 4.4 times more prone to developing MDD than those without SSD (Cuijpers & Smit, 2004; Pietrzak et al., 2013).

Although SSD has a high prevalence rate and a considerable rate of morbidity (Horwath, Johnson, Klerman, & Weissman, 1994), symptoms of SSD are often unrecognized in the clinical field (Trudgen & Lawn, 2011; van Zoonen et al., 2015) and lack attention from people around patients (Trudgen & Lawn, 2011). Therefore, developing a method that can identify and intervene in subsyndromal symptoms can have a large impact. Several recent studies have tried to find ways to intervene in people with subsyndromal depressive symptoms through online media. One study reviewed the effects of Internet-based interventions for children, youth, and young adults with depression, where the effects of online-based platforms were similar to their offline counterpart (i.e., face-to-face interventions) on depressive symptoms (Ye et al., 2014). Another study verified the positive effects of cheer-up messages via mobile devices on enlightening subjects' emotional status (Whittaker et al., 2012). However, previous studies did not consider whether factors such as characteristics of individuals such as activities in their daily life determine the possible effect of intervention. Therefore, a more delicate design for an intervention

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experiment is needed to discern the various characteristics of participants.

As online social networks (OSN) have become a major communication platform, many people are using OSNs to express their thoughts and identities by uploading contents or logging behaviors (De Choudhury, Counts, Horvitz, & Hoff, 2014; Kosinski, Stillwell, & Graepel, 2013). Looking at the contents in OSNs may help researchers identify key features of SSD in the circumstance of social interaction (Baikie, Geerligs, & Wilhelm, 2012; Bradley & Lang, 1994; Lange, Van De Ven, Schrieken, Bredeweg, & Emmelkamp, 2000). For instance, popular networks like Facebook and Twitter and the data within these sites can bring novel opportunities that can help discover and track the mood changes in subjects with SSD. In addition, online intervention tools such as expressive writing have been developed to alleviate psychiatric symptoms. Expressive writing is a method that encourages writing about impressive experiences and feelings from key personal events. One study found that expressive writing decreases trauma-related symptoms as well as psychological functioning among post-traumatic stress disorder (PTSD) patients (Lange et al., 2000), and another study showed that expressive writing also benefits relieving depression and anxiety in patients with mood disorders (Baikie et al., 2012). In order to seize this novel opportunity through online intervention, we developed a non-clinical online application that is targeted at SSD subjects to help them improve their emotions. The application was connected to the Facebook Application Programming Interface (API) that can monitor Facebook activities and allowed us to follow each participant's footprints via his or her logged history of Facebook usage. The application also provided a set of web interfaces for expressive writing.

In our study, we tried to investigate the benefits of online expressive writing in connection with symptoms of depression, quantify which writing guidelines maximize benefits, as well as understand the modulating effects of factors related to previous Facebook activities (such as wall posts and the number of friends) on the designed intervention.

2. Materials and methods

2.1. EmotionDiary

We designed a web-based Facebook application called an EmotionDiary to conduct the experiment. We constructed two versions of the EmotionDiary: a PC version and a mobile version that allowed participants to participate in the experiment at their convenient times. For participants who gave us a written consent, the EmotionDiary application collected various activity data for those participants on Facebook.
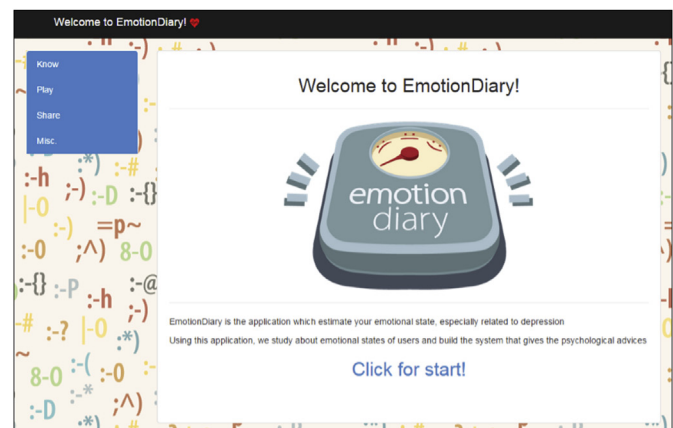
Through the EmotionDiary, participants recorded their overall emotional state on a daily basis. The app consists of four main web pages. On the first and second pages, participants can choose the general mood of the day and indicate the intensity of the chosen mood by clicking on the Self-Assessment Manikins (SAM) that is a pictorial rating system to acquire self-assessments of experienced emotions (Bradley & Lang, 1994). SAM is a standardized method and provides an easy way to measure the valence and intensity of subjects' mood regardless of age, education level, and cultural background (Bradley & Lang, 1994). Checking the valence and intensity of mood of the day is equivalent to an activity of emotional recognition, which acts as a preparatory stage for expressive writing. On the third page, participants engaged in expressive writing, which is the main focus of this study. This stage was carefully designed to guide participants to experience a train of thought on recognition, expression, and reappraisal of emotion, by asking the following three questions:

- "Please write about today's event that mainly affected your mood"
- "Please write about your feelings related to the event you mentioned"
- "Are there any words (e.g., compliment, encouragement, enlightenment) that you'd like to tell yourself? Please write freely"

Guided by these questions, participants wrote about an event that largely affected their emotion (a step for *recognition*), any emotion related to the event (a step for *expression*), and any emotional words that can be helpful for themselves (a step for *reappraisal*). In the final web page, participants were asked how much they were affected by the experience they wrote about and how well they perceived their emotional state by moving the heads of the slide bar. Screen snapshots on the main menu of the EmotionDiary app and its page for engaging in expressive writing are shown in Fig. 1. All interactions within the EmotionDiary app were recorded and stored in a database for later analysis, including the timestamp of each button click as well as the daily logs.

2.2. Recruitment and selection of participants

This study was conducted at a large university in South Korea and participants consisted of undergraduate and graduate students.

(a)

(b)

Fig. 1. (a) Snapshot of the main menu of EmotionDiary. (b) Snapshot of EmotionDiary asking participants to write about events that most affected them that day, related feelings, and any words that can encourage themselves.