Effects and Linguistic Analysis of Written Traumatic Emotional Disclosure in an Eating-Disordered Population

Ashli M Gamber, MD; Susan Lane-Loney, PhD; Martha Peaslee Levine, MD

Abstract

Context: In previous studies, writing about traumatic life events produced positive physical and psychological outcomes in various populations. Specific linguistic trends, such as increasing insight and cognitive words, have paralleled health benefits.

Objective: This study explored the effects of written traumatic emotional disclosure on eating disorder behavior and cognitions as well as linguistic dimensions of the disclosure writings completed by eating-disordered patients.

Design: Twenty-nine female patients, aged 16 to 39 years, from the Penn State Hershey Eating Disorders partial-hospitalization program participated. Twenty-five subjects completed a traumatic disclosure or control writing task, and 21 completed all writings and baseline and follow-up questionnaires to assess eating-disorder symptoms, emotional regulation strategies, self-efficacy, and motivation to change eating-disorder behaviors. The handwritten essays were transcribed into a word-processed document and analyzed on numerous dimensions using the Linguistic Inquiry and Word Count software.

Results: Individuals completing the disclosure writing did not differ from those in the control task group on any of the questionnaires at follow-up. However, the disclosure group used more negative emotion, insight, cognitive, function, and filler words on all writing days along with decrease of tentative words. These changes in word use correlated with previous study findings.

Conclusions: Whereas the expected linguistic trends were evident in the disclosure group writings, no correlating health benefits could be found between the disclosure and control groups. Eating-disordered populations, often alexithymic, may have difficulty engaging with the disclosure task and could potentially benefit from guidance in processing traumatic events and their affective states.

Introduction

Eating disorders include the Diagnostic and Statistical Manual of Mental Disorders (Fourth Edition) diagnoses of anorexia nervosa, bulimia nervosa, and eating disorder not otherwise specified. Eating disorders develop through the interplay of social, genetic, and environmental factors and are characterized by disordered eating behaviors and cognitions. Whereas patients typically struggle with mood disturbances, low self-esteem, ineffectiveness, and perfectionism, eating disorders also may cause many life-threatening complications such as electrolyte disturbances and arrhythmias.  

Many therapies, such as cognitive behavioral therapy, insight-oriented psychotherapy, and psychopharmacologic approaches, are used with varying degrees of success in treating eating disorders. Despite these therapies, patients frequently relapse and are often challenging to treat because of poor motivation, denial of illness, impaired insight, and emotional dysregulation.  

The benefits of written disclosure have been demonstrated across various cultures, socioeconomic statuses, and patient populations. In the commonly reproduced protocol introduced by Pennebaker and colleagues, individuals write for 3 to 5 days for 15 to 30 minutes each day about either a traumatic or upsetting event or about a control task devoid of emotional content. Previous studies have revealed that expressive writing significantly improves health, with greater effect on physical than on psychological health outcomes. Few studies have investigated the linguistics of eating-disordered patients engaging in the written emotional disclosure paradigm. One such study found that undergraduates with moderate to severe bulimia nervosa symptoms who underwent this type of disclosure used more words related to affect and cognitive mechanisms; however, no marked health benefits were elucidated. The present study was devised to investigate the benefits and linguistic trends of written emotional disclosure in patients with eating disorders and to assess whether it is a useful therapeutic modality for this population.

Methods

Twenty-nine patients in a partial-hospitalization program at the Penn State Hershey Eating Disorders Program were matched by age and diagnosis and randomized to the disclosure or control group. Only women were offered the opportunity to participate because of the limited number of men participating in the program. The patient population had all English as their first language. All participants wrote for 15 minutes on 3 consecutive days about 1 of 2 topics. The disclosure group (13 completed all writings) wrote about a traumatic or stressful experience, and members were encouraged to explore their deepest thoughts and emotions about the event, in keeping with the traumatic emotional disclosure paradigm developed by Pennebaker et al. Participants could write about the same trauma or different traumas over the 3 days. Control group participants (12 completed all writings) wrote each day about how they manage their time, as objectively as possible and without any emotional content. All participants were instructed to write continuously for 15 minutes. Throughout the study, unforeseen events required select participants...
to complete timed writings at home so that as few days as possible interrupted the scheduled writing days.

Before the writing, patients completed a series of questionnaires as a baseline measure of eating disorder pathology, psychological well-being, strategies in emotional regulation, and motivation to recover from the eating disorder. The surveys used included the Eating Attitudes Test-26, Difficulties in Emotion Regulation Scale, Eating Disorders Recovery Self-Efficacy Questionnaire, and Motivational Stages of Change for Adolescents Recovering from an Eating Disorder. These questionnaires were also completed at 1-week and 3-week intervals after completing the writing. Each of the surveys used was proved reliable, valid, and appropriate for our study population.12–16

Throughout the study, eating behaviors were observed during program mailtimes, and pathologic eating behaviors were recorded, scored, and averaged each week. Examples of such behaviors include cutting food into tiny pieces, hiding food, and bargaining to exchange lunch items for lower calorie items. Analysis of variance between groups was used to determine whether significant differences existed between the disclosure and control groups on all measures.

Each participant’s three handwritten essays were transcribed and entered into the Linguistic Inquiry and Word Count 2007 application for analysis.17 The external validity of this application is supported as a linguistic analysis method and is valid for measuring verbal expression of emotion.18,19 Given our small sample size, both a two-sample t-test p value and Mann-Whitney test p value were calculated to assess differences between the linguistic dimensions of the essays. Select linguistic dimensions discussed in the traumatic emotional disclosure literature were chosen for analysis in the writings.

Results

The essays were analyzed to determine how the linguistics of the groups’ writings compared on each writing day and across the writing task through parametric and nonparametric analyses (Table 1). On each day, the disclosure group used negative emotion, cognitive, insight, function, and filler words significantly more frequently (p < 0.05). The disclosure group used significantly more positive emotion and causation words on Days 2 and 3, significantly more tentative words on Days 1 and 2, and significantly more death-related words on Days 1 and 3 (p < 0.05). The control group used significantly more words related to eating on Days 1 and 2 and significantly more first-person plural pronouns on Day 1 (p < 0.05). There were no significant differences on any of the days with the use of first-person singular pronouns.

The changes in the writings from the first to last essay were also analyzed. The use of words related to eating declined significantly in the control group compared with the disclosure group (p < 0.001), and the use of tentative words declined slightly in the disclosure group and increased in the control group (p = 0.02). Although not significant, the use of positive-emotion words increased more in the disclosure group (p = 0.09), negative-emotion words increased in the disclosure group and decreased in the control (p = 0.23), and causation words and death-related words increased more in the disclosure group (p = 0.23 and 0.20, respectively). No significant differences were found between groups on any of the surveys used or in the number of pathologic eating behaviors displayed during mailtimes across the study or at any assessment time.

Discussion

Linguistic studies have been used to gain insight into how written emotional disclosure influences health. Most studies have used the Linguistic Inquiry and Word Count application, which has been consistently validated.17 This application contains an expansive dictionary and various linguistic dimensions by which words are categorized.17 Word count strategies provide researchers insight into the hidden psychological meaning of words. These strategies yield an understanding of how word use influences health and the aspects of language that demonstrate reappraisal of traumatic experiences.20 Content words (such as death, money, or friends) reveal the focus of individuals.21 Personal pronouns identify one’s area of interest, whether self or others, and verb tense draws attention to time, whether now, the past, or the future.21 The words we use reflect who we are and our social relationships.21

Individuals experiencing depression and suicidal ideation use more first-person singular pronouns (I, me, mine), reflecting increased self-focus.22–24 On the other hand, individuals using more references to others with first-person plural pronouns (we, us, our) have been found to be happier and healthier because of increased social integration.20,25 Individuals who vary pronoun use across the writing task evidence greater health benefits (decreased health center

Table 1. Changes in linguistic dimensions of disclosure group (n = 12) and control group (n = 13) writings between days 1 and 3

<table>
<thead>
<tr>
<th>Factor</th>
<th>Group</th>
<th>Mean (SD)</th>
<th>95% CI</th>
<th>p valuea</th>
<th>p valueb</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive emotion</td>
<td>Disclosure</td>
<td>1.53 (2.59)</td>
<td>(−1.13, 0.22)</td>
<td>0.09</td>
<td>0.09</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>0.08 (1.13)</td>
<td>(−1.13, 0.22)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Negative emotion</td>
<td>Disclosure</td>
<td>0.36 (1.84)</td>
<td>(−1.91, 0.50)</td>
<td>0.23</td>
<td>0.23</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>−0.35 (0.62)</td>
<td>(−1.60, 0.88)</td>
<td>0.55</td>
<td>0.08</td>
</tr>
<tr>
<td>Insight</td>
<td>Disclosure</td>
<td>0.01 (1.99)</td>
<td>(−1.55, 0.40)</td>
<td>0.23</td>
<td>0.21</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>−0.01 (1.20)</td>
<td>(−1.55, 0.40)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Causation</td>
<td>Disclosure</td>
<td>0.56 (1.15)</td>
<td>(−3.37, −1.45)</td>
<td>&lt;0.001</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>−2.61 (1.48)</td>
<td>(−3.37, −1.45)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tentative</td>
<td>Disclosure</td>
<td>0.22 (0.51)</td>
<td>(0.31, 3.18)</td>
<td>0.02c</td>
<td>0.02c</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>0.02 (0.07)</td>
<td>(−0.33, 0.12)</td>
<td>0.20</td>
<td>0.16</td>
</tr>
</tbody>
</table>

a Two-sample t-test p value.

b Mann-Whitney p value.

c p < 0.05

CI = confidence interval; n = number in group; SD = standard deviation.
effects and linguistic analysis of written traumatic emotional disclosure in an eating-disordered population

Individuals who use causal, insight, and cognitive words across their writings... are engaging in reappraisal of the trauma, which positively influences health.

Disclosure of events tends to increase certainty about them and result in decreased use of tentative words, which is the trend we observed. This suggests that writing about the traumatic event helped individuals process it more clearly and arrive at a more meaningful understanding of it.

Frequent use of emotional words in disclosure indicates "immersion" in the traumatic event. The use of positive-emotion words (e.g., love, nice, sweet) is linearly related to health, whereas negative words (e.g., hurt, ugly, nasty) are curvilinearly related. This means that individuals who either rarely or frequently use negative words derive little benefit from disclosure. Those using a high number of positive and moderate-negative-emotion words derive greatest benefit from emotional disclosure, as measured by frequency of health care visits.

In our study, the disclosure group used significantly more negative-emotion words on all 3 days of writing, suggesting active immersion in the traumatic event. The group also used significantly more positive words on Days 2 and 3, which has been correlated with health in many traumatic emotional disclosure studies. Given the increase in positive word use in the disclosure group, we would have expected some health benefit. However, the concurrent increase in negative words may have interfered with this effect. As previously described, frequent use of negative words has a detrimental relationship to health, indicating potential brooding and/or obsessing.

In the literature, cognitive elaboration, evidenced by use of insight (e.g., think or know), cognitive mechanism (e.g., cause or ought), and causal words (e.g., because or effect), is related to health improvements. Individuals who demonstrate increasing use of causal, insight, and cognitive words across their writings have been shown to derive statistically significant health benefits, particularly in physical symptoms, as measured by health center visits and improved immune functioning. When using words from these categories, individuals are engaging in reappraisal of the trauma, which positively influences health. Although the cognitive and insight words did not increase over the writing task in our disclosure group as expected, causation words, which also suggest cognitive reappraisal of a traumatic event, did.

It appears that the relationship between word use and health benefits of written emotional disclosure is very complex. Whereas increased use of cognitive and insight words typically reflects improvements in health after writing, other studies have also shown this trend but without health benefits at follow-up. One study found that this trend was related to improvements in somatic symptoms but not in subjective distress, suggesting only certain types of benefits are derived. Our study demonstrated increasing use of causation words and significantly greater use of cognitive words in the disclosure group but without reduction in eating-disorder symptoms or cognitions, which is consistent with previous findings.

We also analyzed how common references to food were in the writings. On the first two days, the control group used significantly more words related to food; however, their use of food words declined significantly overall across the writing task. In our study, we noticed that individuals in the control group frequently referenced eating-disorder behaviors such as binging, purging, and calorie counting. Several individuals in the disclosure group also discussed their eating disorder as traumatic or resulting from a trauma. The similarity between groups in writing about eating-disorder themes (in the disclosure group as part of or resulting from trauma and in the control group as part of daily activities) may have evoked strong emotions in all participants and blurred the divide between our disclosure and control groups. Overall, the declining focus on food over the three days in the control group is encouraging and leads us to consider whether both groups derived some therapeutic benefit from the task.

A number of potentially confounding variables may have affected the benefits of writing in this population. Alexithymia, a reduced ability to identify and express emotion, has been observed in both anorexic and bulimic populations and may be linked to disordered-eating behaviors and rituals as well as treatment difficulties. Patients appear to use food rituals to "deaden" their affective experience. There have been mixed results in the literature regarding the utility of written emotional disclosure in alexithymic individuals, with some studies finding increased benefits in those high in...
alexithymia trait and others reporting the opposite trend. It might be that alexithymic individuals do not derive the same benefits from writing about traumatic experiences as do nonalexithymic individuals because of their difficulty in identifying emotional states and the moderating role of alexithymia in disclosure. A necessary component of the expressive writing paradigm is identifying not only the sequence of events in a traumatic experience but also the emotions evoked by it. An inability to identify these emotions, common in eating-disordered and other alexithymic populations, may render the task difficult and possibly even useless without guidance. The utility of written disclosure in alexithymic and eating-disordered populations is currently unclear. Results of some studies have suggested disclosure can modestly reduce cognitive and interpersonal features associated with eating disorders. Another group suggests that emotional arousal from disclosure may be less beneficial for this population. 

Another possible moderating factor of emotional disclosure is the coping style of participants. In patients with breast cancer, writing about the positive aspects of having had cancer is associated with psychological benefit for women high in emotional avoidance, whereas writing about the negative aspects of it was more beneficial for women low in avoidance. As individuals with eating disorders often struggle with emotional regulation and avoidance, the use of these coping strategies may affect the way they engage with and benefit from particular writing tasks.

Mixed findings have been demonstrated regarding the response of posttraumatic stress disorder (PTSD) populations to written emotional disclosure. One group found that individuals with PTSD have more difficulty with disclosure of both traumatic and positive life events. Individuals who have experienced childhood sexual abuse have demonstrated significantly more difficulty disclosing a trauma regardless of the number of times it has been disclosed, and they use less detail in their disclosures. Because childhood sexual abuse often is associated with avoidant coping, which mediates how individuals experience particular writing tasks, this may also influence the disclosure paradigm. Future studies may want to examine the level of alexithymia in the study participants, their coping styles, and their abuse history.

Other limitations related to our study include a small sample size, which left us with limited statistical power. Also, some individuals, because of their treatment schedule, needed to complete one or more writings at home in order to do so on consecutive days. Although it appears that completing writings at home is at least equally effective as completing them on-site and may actually be preferred, it does introduce a new variable into the study that cannot be accounted for otherwise. It is also possible that the effect of the emotional disclosure writing task may have been insignificant in the setting of active enrollment in a treatment program. We also did not account for medications or comorbid psychiatric diagnoses.

The follow-up period may not have been appropriate to capture the benefits of the writing task. Some health benefits from emotional disclosure are apparent within two weeks after follow-up, such as immunologic shifts, whereas changes in somatic symptoms may not occur until four months after writing. Given the varying times at which specific benefits appear and the paucity of studies on disclosure in eating-disordered populations, it is unknown whether we were assessing patients at appropriate time periods to capture the possible health benefits of the paradigm.

We offered participants the option to write about the same or different traumas throughout the task. Although studies have shown that individuals are equally likely to benefit whether writing about the same or different events each day, the freedom to write about multiple events may facilitate the use of avoidant coping in addressing the most severe trauma. If benefits are derived from confrontation of the trauma and extinction of the associated emotional response, writing about the same event may be necessary.

Conclusion

In this study, written traumatic emotional disclosure did not reduce eating disorder behaviors or cognitions. Despite predicted trends in the linguistic dimensions of the disclosure writings such as increased negative emotion, cognitive, and insight words, no health benefits correlating with these trends were found. It is unclear whether eating-disordered patients simply do not benefit because of the inherent psychopathology of illness, benefit differently than we expect, or do benefit but not with particular comorbid diagnoses or coping styles.

Numerous theories have been proposed to explain the underlying mechanism of written emotional disclosure, including inhibition, exposure/emotional processing, and cognitive adaptation. Additionally, conflicting results are reported in the literature in populations characterized by PTSD, alexithymia, and childhood sexual abuse. It is clear that there are myriad factors affecting each individual’s experience of the writing paradigm in our study that may not exist to the same degree in healthy undergraduate populations in which the benefits of emotional disclosure have been replicated time and time again. With so many confounding factors, it is premature at this point in our young understanding of the paradigm of traumatic emotional disclosure writing to conclude that it has no role in the treatment of patients with eating disorders.

Likely, no one theory can explain the benefits derived from disclosure. Instead, each of the stated mechanisms may contribute to the outcomes. Perhaps each unique individual experiences the paradigm differently and achieves benefits by differing mechanisms depending on his/her physiology, past experiences, and personality. We hope that in future studies we can begin to unravel the fascinating, and as of yet mysterious, way in which individuals engage with and benefit from written traumatic emotional disclosure.

Disclosure Statement

The author(s) have no conflicts of interest to disclose.

Acknowledgment

Kathleen Louden, ELS, of Louden Health Communications provided editorial assistance.

References

Effects and Linguistic Analysis of Written Traumatic Emotional Disclosure in an Eating-Disordered Population


O'Connor DB, Ashley L. Are alexithymia and emotional characteristics of disclosure associated with blood pressure reactivity and psychological distress following written emotional disclosure? J Health Psychol 2008 Sep;13(3):349-52. DOI: http://dx.doi.org/10.1177/1359107007322486


