


A Current Paradigm: Written Emotional Disclosure

Güncel Bir Paradigma: Yazılı Duygusal Dışavurum

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Abstract

It has been supposed for years that expressing feelings and thoughts about stressful or traumatic events is helpful for health. In this regard, Pennebaker developed "Written Emotional Disclosure Paradigm" that refers to the importance of not only verbal but also written disclosure of feelings and thoughts. He suggested that written emotional disclosure improves physical and psychological health. The studies pointed out that individuals who are healthy or have health problems experience positive changes in various health outcomes when they wrote for 3-4 consecutive days, for at least 15 minutes and after about 2 months from traumatic or stressful experiences. Also, important findings from studies that examine who can benefit from this paradigm attracted attention. The aim of this article is to review the structure of written emotional disclosure paradigm, its effects and benefits, mechanisms of action underlying these effects, its procedure and relationship with individual differences on the basis of the studies in the literature and to discuss the implications of these studies in terms of practice.

Keywords: Written emotional disclosure, trauma, stress, psychological health, physical health

Öz

Stres verici ya da travmatik olaylarla ilgili duygu ve düşünceleri ifade etmenin sağlık için yararlı olduğu uzun yıllardan beri düşünülmektedir. Bu bağlamda, Pennebaker duygu ve düşüncelerin sadece sözlü değil yazılı dışavurumunun da önemine işaret ederek "yazılı duygusal dışavurum paradigmasını" geliştirmiş ve yazılı duygusal dışavurumun fiziksel ve psikolojik sağlığı geliştirdiğini vurgulamıştır. Araştırmalar, hem sağlıklı hem de sağlık sorunları olan bireylerin travmatik ya da stres verici deneyimlerinden yaklaşık 2 ay sonra, birbirini takip eden 3-4 günde ve en az 15 dakika yazdıklarında birçok sağlık sonucunda olumlu değişim yaşadıklarına işaret etmektedir. Ayrıca, bu paradigmadan kimlerin fayda sağlayabileceğini inceleyen araştırmaların önemli bulgular sunduğu da göze çarpmaktadır. Bu derleme makalesinin amacı, yazılı duygusal dışavurum paradigmasının yapısını, ortaya çıkardığı değişim ve faydaları, bu değişimlerin temelindeki etki mekanizmalarını, prosedürünü ve bireysel farklılıklar ile ilişkisini alan yazındaki araştırmalar eşliğinde gözden geçirmek ve ele alınan çalışmaların uygulama açısından doğurgularını tartışmaktır.

Anahtar sözcükler: Yazılı duygusal dışavurum, travma, stres, psikolojik sağlık, fiziksel sağlık.

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STRESSFUL life events and its effects are an inevitable part of our lives as well as important factors in maintaining and sustaining human functioning (Selye 1976). However, literature shows that long and/or short-term intense stressors (such as trauma) also lead to numerous negative outcomes. In order to cope with these negative outcomes, individuals express feelings and thoughts about traumatic events which is a suggested process for physical and psychological health (Esterling et al. 1994, Smyth 1998, Pennebaker and Graybeal 2001, Pennebaker and Chung 2007). Similarly, it has also been shown that not sharing stressful or traumatic events with other people for a long time is associated with health problems (Pennebaker and Beall 1986).

Although the importance of sharing traumatic events with other people is mentioned, it may not be possible to share some traumas (e.g. incest, sexual assault, violence, etc.) with others (Pennebaker and Beall 1986). For this reason, Pennebaker and Beall (1986) developed written emotional disclosure (WED) paradigm to test the effects of disclosing traumatic experiences on psychological and physical health.

The aim of this article is to review the structure of WED paradigm, its effects and benefits, mechanisms of action underlying these effects, its procedure and relationship with individual differences and to discuss the implications of these studies in terms of practice.

Written Emotional Disclosure Paradigm

For the past two decades, laboratory studies have been conducted to investigate the importance of speaking or writing about emotional experiences. It is emphasized that encouragement of individuals to express their feelings clearly through WED is important (Pennebaker 1997). In the first study conducted on the subject, effects of inability to disclose the traumatic life events on physical health were investigated. Within the context of this research, 46 university students were randomly assigned to one of four writing conditions. These conditions are trauma-fact group, in-which participants were asked to write only about the facts related to their trauma; a trauma-emotion group, in which participants were asked to write only about the emotions related to their trauma; a trauma-combo group, in which participants were asked to write about both the facts and emotions related to their trauma; and a control group, in which participants were asked to write about a trivial topic (e.g. a description of living-room or worn shoes). After assignment in the conditions, participants were asked to write 15 minutes for 4 consecutive days and no feedback was given to the participants about their essays. As a result of the study, it was determined that participants who wrote about both feelings and facts had higher blood pressure following writing sessions and despite more negative mood reports they visited health centers less as found in the 6-month follow-up. These findings have shown that creating a story and disclosure are associated with positive health outcomes (Pennebaker and Beall 1986). While WED paradigm is applied in different formats in subsequent studies, generally, participants are randomly assigned to conditions to write about their deepest emotions and thoughts about their stressful or traumatic experiences (experimental condition) or trivial topics (control condition) in WED paradigm practices. Writing sessions are also carried out on 3-4 consecutive days for 15-20 minutes each day (Slavin-Spenny et al. 2011). The impact of the paradigm on health is assessed by pre, post and long-term

follow-up measurements (Pennebaker 2004, Manier and Olivares 2005, Bornstein 2010).

For WED paradigm to be applied in the field, verifying the effectiveness of it and understanding the mechanism of action underlying is important. In literature, it is emphasized that WED paradigm occurs through biological changes in addition to immediate and long-term cognitive/emotional changes (Pennebaker 2004). In terms of immediate cognitive change, individuals write about an emotionally charged event and organize, label and structure events in ways they have never had to do. They also express the event in a linguistic form, often for the first time to themselves (Pennebaker 2004). In terms of emotional change, confronting with an emotionally charged event by writing is associated with habituation and extinction as consistent with exposure therapy (Foa and Kozak 1986). It is emphasized that WED can reduce the intensity of trauma related thoughts (Pennebaker 2004). It is also reported that individuals may feel unhappy and distressed immediately after writing, but this emotional intensity fades within a few hours (Pennebaker and Seagal 1999). In the context of long-term cognitive change; writing allows individuals to think less about their traumas after weeks and to deal with other areas of life through making working memory free up (Klein and Boals 2001). On the other hand, as noted earlier, the emotional arousal that occurs immediately after writing decrease over time. According to Lepore (1997) this process decreases the emotional intensity of thoughts related to the traumatic event. Finally, many study results (Pennebaker et al. 1988, Esterling et al. 1994) support that the biological change writing reveals occurs through the autonomic nervous system and the immune system after several months. In other words, the effects of WED on health outcomes arise gradually and cumulative through cognitive, emotional and biological changes (Pennebaker 2004).

Objective and Subjective Benefits

Literature shows that WED has positive changes on a large number of outcome variables. Compared to individuals writing about trivial topics, the benefits of individuals who write deepest emotions and thoughts about their stressful or traumatic experiences can be addressed in two groups which were suggested by Baikie and Wilhelm (2005): physical and psychological health outcomes and behavioral outcomes.

The effects of WED on physical and psychological health have been examined in various studies (Pennebaker and Beall 1986, Baikie 2008). As previously reported, the first study of WED has shown that individuals who wrote emotions and thoughts about traumatic event had fewer health center visits at 6-month follow-up (Pennebaker and Beall 1986). Similarly, King and Miner (2000) found that university students who wrote benefits of a traumatic event had fewer health center visits during three-month follow-up. In another study, decreases in health center visits due to WED were repeated for individuals with alexithymia and individuals with ambivalent world views (Baikie 2008). A study with breast cancer patients showed that writing positive aspects of cancer as well as writing feelings and thoughts about cancer reduced doctor visits (Stanton et al. 2002).

In addition to doctor visits, one of the effects of WED on physical health is improvement in lung function. A study with rheumatoid arthritis and asthma found that pulmonary function of patients writing about any stressful event improved at 4-month

follow-up compared with control condition (Smyth et al. 1999). In a study conducted with adolescents with asthma, participants were asked to write about a stressful event in their lives and these writing sessions were executed at home. Lung function of participants who wrote about stressful experiences had no change, but the symptoms of asthma reduced and their positive affect increased compared to the control group who wrote about time management (Warner et al. 2006).

The effects of WED on psychological distress and mood are also among common findings in the literature. A study with adolescents found that psychological distress reduced following the disclosure of an emotional topic through writing and negative mood decreased more than the control group at 2 and 6-month follow-ups (Soliday et al. 2004). Similarly, victims of sexual assaults who wrote about their traumatic experiences reported a decrease in negative mood at 1-month follow-up (Kearns et al. 2010). Lepore (1997) showed that in addition to psychological distress, depressive symptoms were also reduced by WED among individuals who will take graduate entrance exam. Similarly, a significant decrease in depression scores by WED was shown in studies with depression-vulnerable college students (Gortner et al. 2006), outpatient psychotherapy clients (Graf et al. 2008) and individuals with major depression (Krupan et al. 2013). In a study with police officers, it was found that WED was associated with low levels of stress and anxiety (Ireland et al. 2007).

Current studies indicate that WED has positive changes on posttraumatic stress symptoms as well as negative affect and depressive symptoms. A study, also testing the effectiveness of online WED, found that participants who participated in 3 online writing sessions on 3 consecutive days and were asked to write about emotions (emotion-focused group) and facts (fact-focused group) related to the traumatic event reported decrease in post-traumatic stress symptoms (avoidance, intrusion and hyperarousal). At the 5-week follow-up, trauma symptoms decreased more in emotion-focused group compared with fact-focused group (Hirai et al. 2012). In another study, it was found that decrease in post-traumatic stress symptoms due to WED was mediated by negative emotion expression (Hoyt and Yeater 2011).

The effects of WED are also examined in terms of behavioral outcomes. Studies show that WED leads to positive behavioral outcomes too. A study with 41 university personnel showed that participants who were asked to write about their traumatic experiences for 20 minutes once a week for 4 weeks reported a decrease in absenteeism during one month in which writing sessions were performed (Francis and Pennebaker 1992). In a study with 63 unemployed professionals, Spera and his colleagues (1994) found that participants who wrote their emotions and thoughts about the job loss and its effects on their lives could find new jobs more quickly compared to control condition.

Studies indicate that WED also effects academic performance in students. Grade point averages of university students who wrote about stressful experiences for 4 days improved at the end of the semester (Lumley and Provenzano 2003). A similar study was conducted with students preparing for exams such as GRE, MCAT and LSAT (Frattaroli et al. 2011). Participants who wrote about upcoming exams got higher test scores and reported lower depressive symptoms than control group before the exam. Similar results were obtained for students with high test anxiety (Ramirez and Beilock 2011).

WED produces numerous positive health outcomes in both clinical and healthy populations and these findings were supported by meta-analyses (Smyth 1998, Frisina et al. 2004, Frattaroli 2006). Moreover, Smyth (1998) stated that the effect size ($d = .47$) of WED on healthy sample was similar to those obtained by psychological, behavioral and educational interventions.

Affecting Procedural Differences

One of the factors effecting results in WED paradigm is the duration of writing sessions. In WED studies, participants are asked to write in a number of sessions ranging from 1 to 5 days, on consecutive days or particular days of the week, each session ranging from 15 to 30 minutes (Pennebaker 1997). Although in Smyth's (1988) meta-analysis, the duration of writing sessions weren't related to the effectiveness of writing, in Frattaroli's (2006) comprehensive meta-analysis, the sessions more than 15-min were reported to be more helpful compared to sessions less than 15-min.

Burton and King (2008) investigated the lower boundary of the writing duration required for health improvements. Participants were randomly assigned to conditions in which traumas and positive experiences were written as well as control condition. Unlike the writing durations of other studies, these participants were asked to write for 2 minutes each day for 2 consecutive days (4 minutes in total). Participants who wrote about their traumas and positive experiences reported less physical health complaints at 4-6 week follow-ups than control group. Burton and King (2008) pointed out that writing duration required for positive health outcomes may be shorter than those reported in previous studies.

Another factor effecting the results in WED paradigm is duration between writing sessions. Literature reveals that writing sessions were performed in differing time lines such as a single day (Tamagava et al. 2013), consecutive days (Lacetti 2007, Graf et al. 2008) or once a week (Francis and Pennebaker 1992, Jensen-Johansen et al. 2013). On the other hand, in his meta-analysis, Smyth (1998) stated that longer duration between sessions was associated with stronger effect size. Chung and Pennebaker (2008) also investigated the effect of duration between writing sessions on health outcomes. Participants were asked to write for 15 minutes 3 times in experimental or control condition. Duration between sessions also varied in this study as follows: (1) 10 minutes for the 1-hour condition, (2) 35 minutes for the 3-hour condition and (3) 24 hours for the 3-day condition. Individuals in experimental conditions reported more decrease in symptoms compared to control group. However, immediately after writing sessions and at 1-month follow up no difference was found between 3 day-condition and 1-hour condition. The researchers suggested that 1-hour writing can lead to similar benefits with 3-day writing although it may look tiring (Chung and Pennebaker 2008).

Another factor in studies that examine the effects of WED paradigm, is timing of follow-up. It is stated that positive health outcomes of WED may be temporary and these changes may also last for weeks, months or even years (Pennebaker and Chung 2007). For this reason, duration between the last writing session and follow-up assessments, and how often measurements should be taken are an object of curiosity. In a study that examined durability of WED on outcomes, follow-up measurements for academic, physical and psychological health outcomes were obtained from experimental and control conditions at 2nd, 4th and 6th months. Results indicated that the severity

of depression decreased at 2 months follow-up for experimental condition but this decrease did not continue. Additionally, there was no significant change for physical health outcomes, stress symptoms or academic performance (Sloan et al. 2009).

Literature reveals that generally 1-month follow-up measurements are taken in studies (Baikie 2008, Lu and Stanton 2010). However, in some studies, follow-up measurements are taken at different times such as 6 weeks (Kovac and Range 2000, Manier and Olivares 2005, Burton and King 2009, Kearns et al. 2010), 3 months (Stanton et al. 2000, Lacetti 2007), 4 months (Park and Blumberg 2002), 6 months (Zakowski et al. 2004, Averill et al. 2013). Pennebaker and Chung (2007) stated that giving a certain time for follow-up measurements is difficult therefore using usual follow-up times is suggested for practical reasons. Sloan and Marx (2004a) reported that taking follow-up measurements at different times would be useful.

Disclosure topic also affects the results of WED. Greenberg and Stone (1992) state that effects of WED on health outcomes occur especially when written about traumatic experiences. Smyth (1998) reported that instructions don't have any impact on overall effect size but when compared to participants who wrote about traumas (past or current), participants who wrote about current traumas reported more well-being.

As noted earlier, in the first study of WED (Pennebaker and Beall 1986) participants were asked to write about their most stressful experiences, topic was not specified and health benefits were observed. Studies point out that writing about certain topics generate certain changes. For example in a study with junior college students in which they were asked to write about the stress of coming to college, both their health scores and academic grades improved. However, when students were asked to write about any traumatic experience, academic performance didn't improve (Pennebaker 1995, Pennebaker and Keough 1999, Pennebaker and Chung 2007).

In later studies, certain writing topics were requested for experimental conditions. These writing topics change from coming to college (Pennebaker et al. 1990, Manier and Olivares 2005, North et al. 2011), interpersonal conflict (Landry et al. 2005), leave of employment (Spera et al. 1994) to medical illnesses (Keefe et al. 2008, Radcliffe et al. 2010, Averill et al. 2013, Jensen-Johansen et al. 2013). With the rise of positive psychology, current studies investigate the effects of disclosing positive topics such as best possible future self (Burton and King 2009), life goals (King 2001) and happy events (Yamasaki et al. 2008) on health outcomes. Craft and his colleagues (2013) pointed out that participants who write selectively about any of their traumatic events had no benefits, thus giving a specific writing topic may be useful. Lastly, research suggest that disclosing closed events do not have any beneficial effects (Naufel and Beike 2004, Frattaroli 2006).

The instructions given to the participants are also important in the WED paradigm since the way of writing requested from participants may affect the results (Sloan et al. 2007). Therefore, whether the instruction sets given in studies produce different responses during writing sessions and whether these responses are in accordance with instruction goals are among suggested research topics. While some researchers find Pennebaker's standard disclosure instruction in which individuals are asked to write about their deepest feelings and thoughts about most stressful/traumatic experiences sufficient to get significant health outcomes (Sloan and Marx 2004b), others disagree. Standard disclosure instruction was reported to be non-directive because it gives no

advice on how to write best which was viewed as a limitation of the paradigm (Guastella and Dadds 2006). Furthermore, even though people choose their writing styles themselves in standard WED, it is emphasized that writing ruminatively and without modifying linguistic patterns don't produce beneficial results (Pennebaker et al. 1997). Therefore, original WED instruction sets were modified both to investigate the mechanism underlying the paradigm and increase health benefits (Nazarian and Smyth 2013).

In general, WED studies' instruction sets emphasize increase in emotional expression, finding meaning, changing perspective and insight (Ulrich and Lutgendorf 2002, Sloan et al. 2007, Lu and Stanton 2010). Participants who wanted to focus on emotions and thoughts in writing sessions reported greater awareness of benefits of the stressful event than the other two conditions (focusing on only emotions and control condition). Participants focusing on emotions reported more severe illness symptoms at 1-month follow-up than those in other conditions (Ulrich and Lutgendorf 2002). In another study, emotional expression condition, insight and cognitive assimilation condition (focus on how the traumatic event has affected their lives and what the event has meant) were compared with control condition. Contrary to expectations, results showed that instructions emphasizing cognitive assimilation and insight did not produce positive results, whereas emotional expression condition was associated with more beneficial outcomes than other conditions (Sloan et al. 2007). In one of the studies that test cognitive behavioral model of WED, emotional processing theories were reviewed to provide participation of individuals in certain emotional processes (Guastella and Dadds 2006). Standard WED and control conditions were compared to 'exposure to traumatic event', 'reappraisal of threatening stimulus' and 'benefit-finding from trauma' condition. The study results showed that participants assigned to different writing instructions could participate in different emotional processes during and after the writing sessions. Therefore changing and structuring the standard writing instruction is a way for participants to participate in different emotional processes and allows researchers to test different instruction sets changed gradually (Guastella and Dadds 2006). In another study, guided disclosure condition, in which participants were asked to write according to exposure, cognitive reappraisal and benefit-finding instructions, was compared with standard disclosure and control conditions. Disclosure conditions did not differ from control condition for the severity of negative events, appraisal of upsetting event, coping styles, trait anxiety and perceived social support in pre-test, post-test and follow-up assessments (Cantekin 2008). In a current study, similar instruction sets were used and results showed that participants in exposure condition used negative emotion words more and their negative mood that provide emotional habituation in progress of time increased. Although participants in benefit-finding condition used positive emotion words more, they reported no change for their affect (Nazarian and Smyth 2013).

Mechanism of Action

Three theoretical models draw attention to explain the mechanism underlying the effects of WED on physical and psychological health. These are emotional inhibition, exposure and cognitive processing.

One of the models that explain the mechanism of action of WED is emotional inhibition. In psychology, hypotheses about emotional inhibition leading to dysfunctional

outcomes have existed for many years (Sloan and Marx 2004a). Inhibition is defined as the failure to acknowledge, understand, emotionally grasp stressful event and has negative effects on health (Soper and Bergen 2001). In theoretical model of inhibition, Pennebaker and Beall (1986) suggested that inhibiting thoughts and feelings in response to a traumatic event is related to increased autonomic activity which demands physiological work. Accordingly, physiological work prevent the working of immune system by spreading to body stress areas, which also leads to an increase in physical and mental illnesses. In addition to effects on immune system, inhibition limits the cognitive processing, prevents the understanding, and leads to impairments of dreams and thoughts, increase in ruminations (Pennebaker 1997). For these reasons, it is expected that WED will reveal physical and psychological relief by allowing individuals to think about their experiences actively and accept the process. Studies have focused on the effect of WED on immune function to support this expectation. In one of the studies, researchers found that t-helper cells of those who wrote about traumatic experiences improved from pre-writing to post-writing more than those who wrote about trivial topic (Pennebaker et al. 1988). In another study, participants who wrote about the stressful event developed antibodies to the Epstein barr virus (Esterling et al. 1994). However, not all findings about emotional inhibition theory show consistency. For example, Greenberg and Stone (1992) randomly assigned university students to writing conditions about disclosed trauma, undisclosed trauma or neutral topic. They found that there was no difference between writing conditions for long-term health care use and physical symptom measurements. According to researchers of this study, disclosing deepest feelings and thoughts about the traumatic experience may be qualitatively different from sharing this experience with others and its effects on results should be considered. Sloan and Marx (2004a) indicate that emotional inhibition is inadequate by itself for explaining the mechanism of action of WED.

Another model developed to explain the mechanism of action of WED is exposure/emotional processing. Mowrer's (1960) two-factor theory which is the most effective learning theory in the behavioral treatment of anxiety disorders, was developed primarily to understand the process of fear or stress reduction and avoidance behavior in this theory can elucidate the mechanism of disclosure (Kloss and Lisman 2002, Sloan and Marx 2004a). From the perspective of two-factor theory, Kloss and Lisman (2002) state that inhibition can be considered as avoidance behaviour and disclosure as an exposure. Additionally, writing about emotional content of trauma allows individuals not only to confront with the emotional reaction but also to re-evaluate and accept their fears. This process result in both an increase in sense of control and extinction of event.

According to Foa and Kozak (1986) negative emotion and arousal is necessary for successful exposure and habituation occurs following confronting the situation repetitively (Sloan and Marx 2006). In this context, in order to talk about effect of exposure in WED, increase in affect of participants in the first stage of writing sessions, gradual decrease in their affect in the end of sessions and between sessions, positive results in the long term are expected (Kloss and Lisman 2002). A great number of studies on this subject have supported this expectation by finding that moods of disclosure groups have improved from the first to the last writing day (Lumley and Provenzano 2003, Sloan et al. 2005). For example, in a study with 49 woman, it was found that salivary cortisol level of participants in disclosure conditions was higher in the first writing session than

those in control condition (Sloan and Marx 2004b). The arousal reduced from the first to the last session which was related to the decrease in psychological symptoms. In another study with healthy women, participants who had written about their traumas reported more negative affect and arousal at the beginning of the study and after the writings compared to participants without trauma history (Creech et al. 2011). In a study with patients with breast cancer, when compare autonomic nervous system activity (heart rate) of participants who disclosed feelings and thoughts were found to be higher than other writing conditions (writing about positive feelings and thoughts, facts). Habituation to heart rate during experimental conditions predicted physical symptoms (Low et al. 2006).

In addition to emotional arousal, it is emphasized that the exposure effect of WED may also be simultaneous with the effects of posttraumatic stress symptoms such as intrusive thoughts and avoidance behaviors (Sloan and Marx 2004a). Correspondingly, in a study with 73 women, positive correlation between intrusive thoughts and physical and psychological symptoms was weakened by WED (Lepore and Greenberg 2002).

Although it is necessary to confront the same stimulus repetitively in exposure-based therapies, participants are not required to write about the same topic each writing session in the standard WED (Pennebaker and Beall 1986). In a study, effects of writing about the same traumatic experience, different traumatic experiences and nontraumatic experience each session were compared for individuals with trauma history or moderate posttraumatic stress symptoms. As a result of the study, while participants who wrote about same traumatic experience reported less depressive symptoms and posttraumatic stress symptoms at 4 and 8-week follow-ups, participants who wrote about different traumas did not benefit from WED (Sloan et al. 2005). All in all, it is emphasized that sufficient occurrence of emotional reactions and arousal is important for testing exposure/emotional processing model, so collecting data about emotional response to writing sessions is required (Sloan and Marx 2004a).

Another model that explains the mechanism of action of WED is cognitive processing theory. It was stated that expressing traumatic experiences leads to positive results by allowing restructuring, organizing and adapting traumatic memories (Smyth et al. 2001). Pennebaker and Beall (1986) point out that confronting with event through writing allows the experience to be evaluated in more meaningful frame and increases insight. Moreover, verbalizing emotions and images through writing changes individuals' way of thinking about trauma (Pennebaker and Seagal 1999). Individuals reach more consistent cognitive schemas or stories by reviewing irrational thought patterns when they write about events repetitively (Manier and Olivares 2005). Further, it is emphasized that once formed, the event can be summarized, stored and forgotten more efficiently (Pennebaker and Seagal 1999).

Cognitive processing is often tested by analyzing the writing contents in WED. Pennebaker and Seagal (1999) point out that an increase in the use of insight (e.g. realize, understand) and causal (e.g. because, reason) words in writing sessions is related to subsequent positive health outcomes. It was found that the usage of positive and moderate negative words predicted reduce in doctor visits while the usage of too much and too little negative emotion words was related to continuing health problems (Pennebaker et al. 1997). Several other studies also supported these findings (Schwartz and Drotar 2004, Parker et al. 2006, Warner et al. 2006).

Another aspect of cognitive processing in WED that researchers draw attention to is changes in frequency of intrusive thought and avoidance. While some studies found that WED reduces intrusive thoughts and images (Klein and Boals 2001, Park and Blumberg 2002), Lepore (1997) showed that WED had no effect on frequency of intrusive thoughts, instead it reduced depressive symptoms by decreasing negative emotional effect of intrusive thoughts. Furthermore, Park and Blumberg (2002) focused on cognitive appraisals of traumatic event in order to test cognitive processing in WED. It was found that appraisal of traumatic event (e.g. uncontrollability, threat, stressfulness) improved from pre-writing to follow-up for participants who wrote about traumatic experiences. Although mentioned studies emphasize cognitive changes, in recent years, it was reported encouraging emotional expression in WED may be associated with better outcomes (Sloan et al. 2007).

Individual Differences

In literature, it is difficult to talk about consistent measures of who is benefiting from the writing action (Pennebaker 1997). Therefore, in studies, many personality traits have been tested as a moderator or mediator between paradigm and health outcomes. Among studies on this topic, one of the frequently studied variable is alexithymia, defined as difficulty in expressing and describing emotions (Poon and Danoff-Burg 2011). In one of the studies examining alexithymia as a moderator, university students with alexithymia who participated in WED reported progress in general practitioner visits, depression symptoms and sleep disturbance (Baikie 2008). Accordingly, although individuals with high alexithymia scores seem to benefit from the paradigm, Ashley and her colleagues (2011) found the opposite findings in their studies. Caregivers who had low alexithymia reported decrease in their depression and anxiety levels in the positive writing condition.

Among studies that examine who is benefiting from WED, another frequently studied variable is ambivalence in emotional expression. In a study with women with chronic pelvic pain, it was found that WED predicted decrease in physical disability for individuals with high ambivalence in emotional expression (Norman et al. 2004). In another related study, Asians and Caucasians with high ambivalence in emotional expression reported more improvement in physical symptoms after cognitive reappraisal condition and more improvement in negative affect after emotional disclosure condition than those with low ambivalence in emotional expression (Lu and Stanton 2010). On the other hand, in a study with individuals with amyotrophic lateral sclerosis, the opposite findings were obtained. Ambivalence in emotional expression lead to an increase in well-being 3 months after the intervention but individuals with low ambivalence in emotional expression reported higher well-being than individuals with high ambivalence in emotional expression regardless of their conditions (Averill et al. 2013).

Some researchers suggest that high levels of emotional expression may increase the benefits of WED (Niles et al. 2014). In this context, in a study with third year medical students, level of emotional expression and processing was found to strengthen the relationship between writing and depressive symptoms at 3-month follow-up (Austenfeld et al. 2006). The results also showed while individuals with high emotional expression/processing reported less depressive symptoms in the emotional topic condition, individuals with low emotional expression/processing reported fewer depressive symp-

toms in the best possible self condition. In another study with 116 adults, a significant decrease in the anxiety of participants with high emotional expression and increase in the anxiety of participants with low emotional expression at 3 months after the writing task were observed (Niles et al. 2014).

The last factor examining individual differences in WED is gender. In WED literature, although there are no studies examining the direct effect of gender, a meta-analysis of 19 studies showed that men were likely to experience more benefit than women (Symth 1998). Although men often avoid expressing their emotions, they can benefit from expressing emotions when they have the opportunity to express (Manier and Olivares 2005).

Conclusion

Recently, WED is one of the frequently explored subjects in mental health field and it is open to further investigation. Experimental studies on WED showed that writing at least 15 minutes for 3-4 consecutive days, nearly 2 months after traumatic/stressful experiences lead to positive changes on both physical and psychological health. Writing can be used as a self-help intervention in preventive health practices due to its cost-effectiveness, ease of application and shortness.

Although it is difficult to talk about a single mechanism underlying WED's health effect and a consensus about this subject, studies reveal that WED helps thinking about the stressful or traumatic experience by reducing emotional inhibition and increases the acceptance of events. In addition, WED helps individuals to restructure memories by changing their way of thinking about stressful or traumatic experiences until they reach more consistent schemas about themselves, others and the world.

Assessment of individual differences is suggested for future studies since the results are inconsistent for alexithymia, emotional expression level and ambivalence in emotional expression. Hopefully, future studies will expand explanations about observed health changes due to WED. Recent studies moved writing sessions from laboratory to house and online settings (Baikie et al. 2012, Hirai et al. 2012, Stockton et al. 2014). However, Frattaroli (2006) reported that disclosing at home may lead to more positive effect. Consequently, conducting more research testing the impact of writing sessions carried out at home or online would increase the ease of WED in practice. Although WED was studied extensively internationally, it was observed that it was not addressed adequately in our country. Current studies testing the effects of different conditions on long-term health outcomes for different samples are thought to be important in dissemination of writing as a self-help intervention in Turkey. In addition, future studies can provide new perspectives to the interventions implemented in the protection, development and maintenance of the individuals' health. Therefore, investigating the effects of WED for different samples and identifying differences between cultures and individuals are required.

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