

EXPRESSIVE WRITING AS A STRATEGY TO REDUCE ACADEMIC STRESS
AND ENHANCE WRITING PRODUCTIVITY AMONG A SAMPLE OF
GRADUATE STUDENTS

A Dissertation

by

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ABSTRACT

A growing number of graduate students report high levels of academic stress and experience diminished writing productivity. Scholars have suggested that Expressive writing (EW) has numerous health-related benefits. However, to date, no previous research has been implemented to investigate the role of EW in handling academic stress and writing productivity, or explored the connection among EW, writing anxiety, writing self-efficacy, writing self-awareness, and writing productivity among *graduate students*. This dissertation fills this gap by examining whether EW is an effective toward this end.

The first study comprised a meta-analysis on the relationship between EW and stress and answered two questions: 1) Does EW alleviate stress? And, if so, 2) For whom does EW as a stress management tool work best?

This meta-analysis updated previous syntheses of research examining the findings of EW and various health outcomes of 22 studies, summarized the effect of EW interventions on stress. The overall effect size — Hedges $g = 0.411$ — indicated a positive, statistically significant, and moderately sized relationship between EW and stress reduction. An analysis of various moderators revealed that EW interventions seem to work best for reducing stress among younger populations (< 49 years old).

The second study comprised an exploration of the effect(s) of EW on academic stress and writing productivity with the number 42 graduate students from a large university in the US involved. The following three questions were asked:

Question 1: What are the main characteristics of graduate students concerning writing anxiety, writing self-efficacy, and writing self-awareness, as these relate to their academic stress and writing productivity?

Question 2: What is the impact of completing an EW intervention on graduate students perceived academic stress, writing anxiety, writing self-efficacy, writing self-awareness and writing productivity?

Question 3: Based on the content of the participants' essays — written during the intervention — what are the characteristics of these essays (e.g., length of the text, use of positive/negative terms, and topics expressed)? Furthermore, does the content of these essays suggest any patterns or trends?

The outcome of this study shows that EW was useful for enhancing writing self-awareness and potential for being a useful, cost-effective stress management strategy/tool.

DEDICATION

This dissertation is dedicated to my parents, my family, and my mentor, Dr. Patricia Goodson. I am so thankful for your encouragement and support. Dr. Goodson, you welcomed me to the field, taught, inspired, influenced, and supported me from every way. Thank you!

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Contributors

This work was supervised by a dissertation committee consisting of Professor Patricia Goodson [advisor] and Lei-Shih Chen, Meg Patterson of the Department of Health & Kinesiology and Professor Erin McTigue of the Department of Teaching, Learning & Culture.

All other work conducted for the dissertation was completed by the student independently.

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NOMENCLATURE

EW	Expressive Writing
AS	Academic Stress
WP	Writing Productivity
WA	Writing Anxiety
SE	Self-efficacy
SW	Self-awareness
TAMU	Texas A&M University

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1. INTRODUCTION

J.W. Pennebaker, one of the leading scholars on the topic of Expressive Writing (EW), states that EW can help people strengthen their immune system, increase working memory, improve sleeping quality, and reduce their alcohol and drug abuse (Ames, 2007; Orr et al., 2008; Pennebaker & Chuang, 2011; Spera, Buhrfeind, & Pennebaker, 1994). Dozens of studies have been conducted focusing on writing among populations within clinical settings, such as among the patients of breast cancer, lung cancer, or HIV (Lu, 2018; Rivkin, et al 2006; Wagner, 2010). Other studies have focused on non-clinical samples and examined the use of EW to improve job performance, self-efficacy, and academic success (Baddeley & Pennebaker, 2011; Fernández, Páez, & Pennebaker, 2009; Fuentes, Kahn, & Lannin, 2021; Harrist, 2007).

In 2021, 80% of college students in the US reported they experienced academic stress at certain time of their lifetime; 71% claimed they felt academically stressed in the past year, and 56.3% felt academically stressed in the month prior to the survey (ACHA, 2020). Even though undergraduate college students go through high levels of academic stress, graduate students tend to be six times more likely to feel stress, depression, and anxiety, according to some reports (Flaherty, 2018; Mendes-Rodrigues, Ranal, & Carvalho, 2019).

Although there have been many studies regarding academic stress interventions and strategies to enhance writing productivity among students in higher education, to

the best of my knowledge, no study has investigated EW as an intervention for reducing academic stress and enhancing writing productivity among graduate students, specifically.

In this dissertation I will argue that EW could be a useful strategy/intervention for graduate students, for coping with academic stress and enhancing writing productivity. EW, because of its unique features as a brief, cost-effective tool could be incorporated as a component in current health promotion programs serving graduate student populations.

This dissertation, therefore, aims to explore the potential effects of EW on reducing academic stress and enhancing writing productivity among graduate students. The outcomes of this study will be significant because they constitute a first step toward understanding how EW can positively impact graduate students. Findings from this study have the potential to stimulate the use of an innovative, cost-effective component for health promotion/health education programs and interventions for stress management among academic populations.

The studies presented in this dissertation are innovative in two aspects: 1) the review described in Chapter 2 represents the first meta-analysis to review the relationship between EW and various forms of stress, systematically, and 2) the report presented in Chapter 3 is one of the first, to the best of our knowledge, to explore the effects of EW on reducing academic stress and enhancing writing productivity among a convenience sample of graduate students.

The long-term objective of this dissertation is to explore mechanisms to facilitate the well-being and academic success of graduate students enrolled in US universities. Short-term applications of the current study's findings will extend new insights into academic stress, as well as further exploration and understanding of expressive writing as an intervention and coping mechanism to manage complex, multi-factorial health problems such as stress. My central hypothesis is that EW, mediated by factors such as writing anxiety, writing self-efficacy, and writing self-awareness, is an effective tool for reducing academic stress and enhancing writing productivity among graduate students.

This dissertation consists of 4 chapters, of which Chapters 2 and 3 represent manuscripts that will be submitted for publication in peer-reviewed journals. A description of each chapter is as follows:

- Chapter 1 (this chapter) has provided a brief introduction to EW, along with the purpose, rationale, significance, and innovation of this dissertation.
- Chapter 2 presents a meta-analysis of the available literature on the relationship between EW and health outcomes as they are influenced by stress, specifically. This study answers the following questions: 1) Does expressive writing alleviate stress? and, if so, 2) *For whom* does expressive writing as a stress management tool work best?
- Chapter 3 documents the findings from a brief EW intervention among graduate students that attempted to address four research questions:

Question 1: What are the main characteristics in terms of writing anxiety, writing self-efficacy, and writing self-awareness among graduate students, as these relate to their academic stress and writing productivity?

Question 2: What is the impact of completing an EW intervention on graduate students' perceived academic stress, writing anxiety, writing self-efficacy, writing self-awareness and writing productivity?

Question 3: Based on the content of the participants' essays — written while taking part in the intervention — what are the characteristics of these essays (e.g., length of the text, use of positive/negative terms, and topics expressed)? Furthermore, does the content of these essays suggest any patterns or trends?

- Chapter 4 lists the summary on the findings drawn from Chapters 2-3. It also discusses the implications for future EW research and practice and its effect on academic stress and writing productivity.

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2. THE RELATIONSHIP BETWEEN EXPRESSIVE WRITING AND STRESS: A META-ANALYSIS

2.1. Introduction

When people experience stressful thoughts or emotions, they often rely on various management or coping strategies: some ignore those thoughts and emotions altogether; others share their feelings with trusted ones, while some simply write them down. Many researchers have shown that by writing down one's feelings and thoughts, some people report their stress levels reduce significantly (Mogk & Otte, 2006; Zachariae & O'Toole, 2015; Reinhold & Bürkner, 2018).

This type of writing — writing about one's feelings and emotions — is known as Expressive Writing (EW). A brief therapeutic intervention to reduce tension, EW has been applied with people undergoing psychological treatment(s) since the early 18th century (McKinney, 1976). EW has also been acknowledged as a way for people to heal their “bodies and souls” (Cameron and Nicholls, 1998) and is considered one of the most well-studied examples of bibliotherapy (Pardeck, 1994; Lenkowsky, 1987; Adderholdt-Elliott & Eller, 1989). In the current literature, EW is defined as a “personal and emotional writing process focusing on deep thoughts and feelings without worrying about grammar or spelling” (Evans, 2009).

Pennebaker and Beall pioneered, in 1986, the use of EW interventions to systematically explore the connection between EW and health. In their study, people in the intervention group were asked to write freely about their deep thoughts and feelings

related to a personally stressful or traumatic life experience, for 15 minutes each day and 4 days in a row. After the intervention, the treatment group reported a reduction in hospital visits, enhanced immune system functions, and overall better health outcomes (Pennebaker & Beall, 1986).

During the past three decades, an increasing number of literature has revealed increased interest in EW. Over 10,000 studies on EW have been published in English-language, peer-reviewed journals (identified via a literature search in 6 major databases). Among these studies, some indicate that EW helps increase working memory, improve sleep quality, and reduce alcohol or drug abuse (Lieberman & Goldstein, 2006; Slatcher & Pennebaker, 2006; Matthiesen et al., 2012; Averill, Kasarskis, & Segerstrom, 2013; Castillo & Fischer, 2017). Others have reported the use of EW to improve job performance, achieve academic success, and boost self-efficacy (Barclay & Skarlicki, 2009; Kirk, Dalton & Glenwick, 2009; Frattaroli, Thomas, & Lyubomirsky, 2011; Usichenko et al., 2020). Still other studies have documented that emotional disclosures, such as those facilitated by EW, can assist in the prevention of depression among students (Ramirez & Beilock, 2011; Rodriguez, Young, Neighbors, Tou, & Lu, 2016; Usichenko et al., 2020).

While in many studies, EW seems to promote self-reflection and re-evaluation of a stressful experience, some researchers document not-so-positive findings. They claim significant discrepancies cannot be observed between intervention and control groups after an EW intervention, and some even report a *negative* impact of EW on health outcomes. For example, studies such as those conducted by Lewis et al., (2005), and by

Kirk, Schutte, & Hine (2011) documented that by using EW (especially when writing about a traumatic event), participants' stress levels *increased*, they were stressed more frequently, and felt more confused.

Among relevant studies, 8 meta-analyses provided summaries on the effects of EW and various health outcomes (Smyth, 1998; Frisina et al., 2004; Meads & Nouwen, 2005; Frattaroli, 2006; Mogk, Otte, Reinhold- Hurley, & Kröner- Herwig, 2006; Reinhold, Burkner, & Holling, 2018; Pavlacicic et al., 2019; Qian et al., 2020) and have answered two specific questions: 1) *Does expressive writing affect health outcomes?* and 2) *Who benefits the most?* Findings from these meta-analyses provide, however, contradictory answers; they have revealed both positive and negative associations (of various magnitudes) between EW and various health outcomes, including stress. Therefore, the relationship between EW and stress, specifically, remains unclear.

The aim of the meta-analysis here presented is to update and add to these extant meta-analytic reviews of the literature on the topic. Meta-analyzing the updated literature can contribute to clarifying the previous contradictions. Furthermore, a meta-analysis has inherent benefits as a review method, because not only can it help develop an improved understanding on the relationship between EW and stress, but it also increases statistical power, improves estimates of effect size(s), derives meaningful conclusions from the data, and helps resolve uncertainty when studies' results differ (Glass, McGaw, & Smith. 1981).

Therefore, with the aim of updating the previous syntheses of the research on EW and its effects on stress, the objectives of this meta-analysis are similar to those of

the previous ones: 1) To determine if EW is an effective intervention to alleviate stress and 2) to identify *for whom* it is more effective.

2.2. Method

The following questions guided the review presented here: (1) Does expressive writing alleviate stress and, if so, 2) *For whom* does expressive writing as a stress management tool work best? To answer these questions, I conducted a meta-analysis because — adding to the benefits outlined above — meta-analysis has several advantages: (1) it enables a better estimation on potential relationships than single studies can, (2) the estimates are more precise due to a larger volume of data and increased statistical power, (3) it can test hypotheses and assess biases associated with publications, (4) it can help resolve inconsistencies within a body of research, and (5) it can identify potential moderating or mediating factors/mechanisms (Glass, McGaw, & Smith, 1981; McTigue, Solheim, Zimmer, & Uppstad, 2020).

I used the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) checklist (www.prisma-statement.org) to guide the presentation of results because these criteria promote full transparency in the reporting. See Figure 2.1 for the PRISMA flow diagram of search, selection, and inclusion procedures (Moher, Liberati, Tetzlaff, Altman, & The PRISMA Group, 2009).

I also employed Garrard's Matrix Method to guide the search and abstraction /coding procedures (Garrard, 2007). Furthermore, I conducted a methodological quality screening to detect potential methods-related biases in each study (details below). Following the PRISMA guidelines/criteria, I applied a five-step process to my

review: “(a) identification of studies; (b) initial screening process via inclusionary criteria; (c) eligibility decision according to methodological quality indicators; (d) descriptive synthesis; and (e) quantitative analysis of studies appropriate for meta-analytic review” (Liberati et al., 2009).

2.2.1. Search Process & Inclusion Criteria

I searched 6 major databases: PubMed, Ovid, Science Direct, Web of Science, Psych Info, and Google Scholar (Figure 2.1). The initial search yielded 1,158 articles published after 2006, the date the last meta-analysis on this topic was published. The last update for the search was conducted in December, 2019. No further relevant studies were identified during the update. Search terms included: “expressive writing,” “written emotional disclosure,” “health,” “trauma,” “depression,” “stress,” and “Pennebaker.” Additional relevant articles were determined by all the relevant cross-referenced literature.

The 1,158 articles initially identified were imported into RefWorks. After removing 780 duplicates and non-relevant articles, 378 documents remained. I reviewed the reference lists of each source. Identified articles were thoroughly reviewed, and to capture more recently published sources I utilized the “cited by” function in Google Scholar.

Four scholars active in EW research and meta-analysis methodology reviewed the identified studies and established inter-rater agreement (Mackinnon, 2000). Using Cohen’s Kappa, the inter-rater reliability scores indicated that substantial agreement was achieved (Viera & Garrett, 2005). When needed, reviewers discussed each discrepancy,

and all disagreements were fully resolved before proceeding to the next steps and analyses.

I then screened abstracts to determine if the EW intervention the studies described focused on health outcomes, specifically stress. After the abstract screening, 303 articles were excluded (See Figure 2.1).

At the full-text level, 75 studies were double-checked for inclusion. To be qualified for the inclusion in this review, studies had to (1) be written in English, (b) be published in a peer-reviewed journal, (c) used Expressive Writing as an intervention, and (d) have followed Pennebaker's experimental protocol. Studies that did not report effect size(s) but reported means and standard deviations also were eligible for inclusion.

I established criterion (d), above ("followed Pennebaker's experimental protocol") because researchers agree that Pennebaker's is the most well-known and widely used study protocol for examining the effects of EW (Robertson, Short, Sawyer, & Sweazy, 2020). The protocol is considered a rigorous design that ensures adequate internal and external validity. In this meta-analysis, studies investigating how to reduce/manage stress that were *not* following Pennebaker's protocol were excluded.

Articles were not included also if not peer-reviewed ($n = 19$), or written in a language other than English, or not follow Pennebaker's experimental protocol ($n = 16$). Two articles' full texts were not available, and 4 articles did not report means and standard deviations or other correlation metrics that could be meta-analyzed. A total of 41 articles were, therefore, excluded.

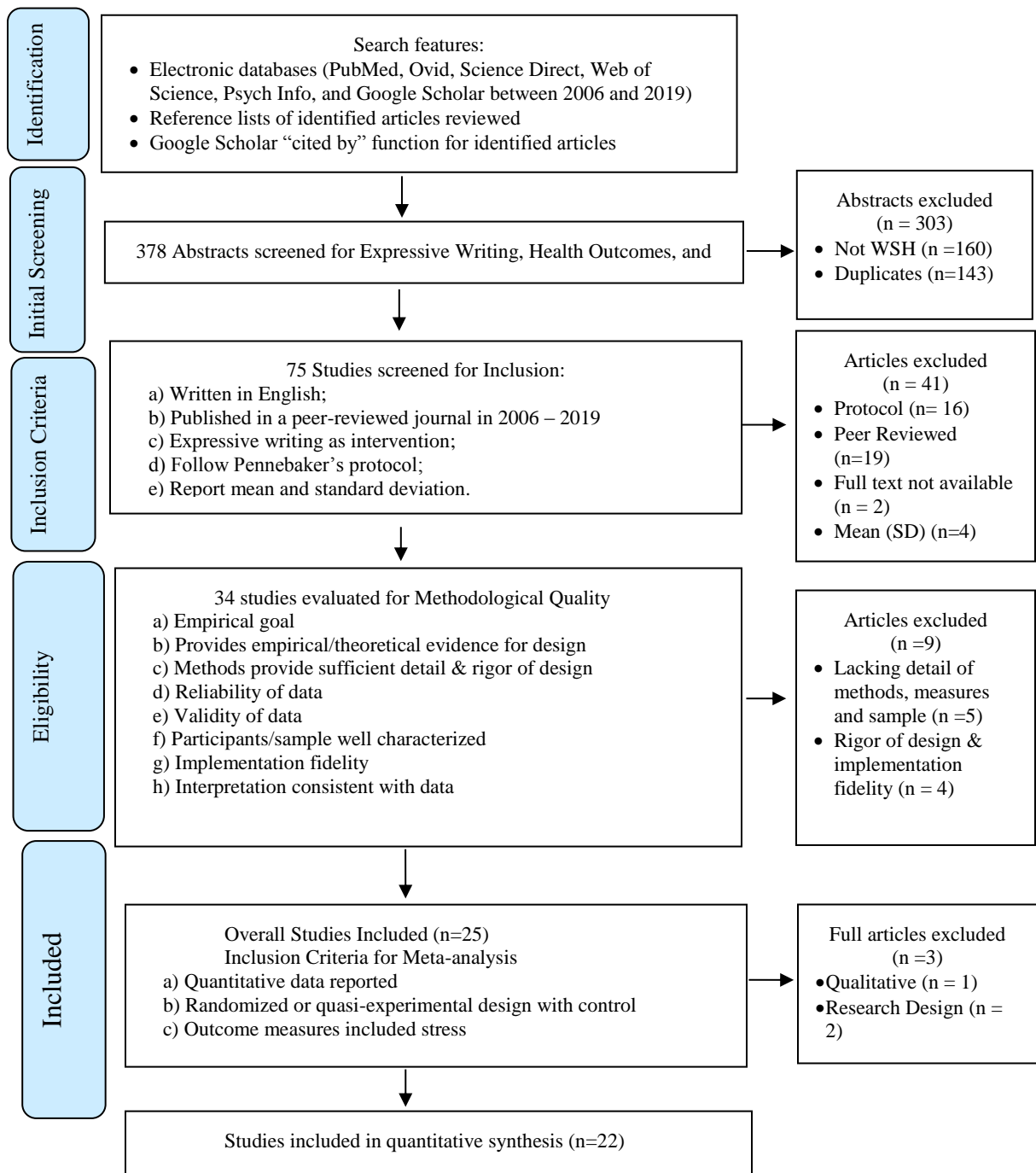


Figure 2.1 Flow diagram of search and inclusion criteria for studies in this review. Adapted from: Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group (2009). Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement. PLo

2.2.2. Methodological Quality Screening

To include only good-quality studies and, consequently, strengthen the validity of the synthesis, I screened each study using the Methodological Quality Evaluation Questionnaire adapted from McTigue (2019). The questionnaire/checklist assesses whether each study provides empirical objective(s), empirical/theoretical confirmation for its design, adequate detail to support the exactness of the design, reports on the reliability of the data, reports on the validity of the data, participants'/sample's detailed characteristics, assesses implementation fidelity (when testing an intervention), and provides an interpretation that is consistent with the data.

Based on this methodological quality screening, 9 studies were further excluded for two reasons: 5 studies lacked detailed methods, measures, and sample characteristics, while the other 4 failed to report rigor of design and implementation fidelity assessments.

All remaining studies ($n = 22$) met the quality criteria fully and were coded at the full-text level. The final sample size, therefore, comprised 22 studies (Table 2.1 presented at the end of this chapter, due to its size/length).

2.2.3. Coding Procedures

I developed an electronic codebook by following principles specified by Lipsey and Wilson (2001) to eliminate potential coding errors. The codebook included the specifications on the data items to be drawn from the main studies. The information obtained from each study was listed below:

- Authors, date, and source of study.

- Participant information including sample size, age, gender, and ethnicity.
- Treatment information including number, time, length, and location of the intervention (writing sessions), writing groups (EW group and control group), and writing information.
- Methodological information including attrition and outcomes, types of the control condition (assessment only vs. neutral writing).
- Effect size information, including statistic type, value, significance, and direction.

Stress was the outcome variable of interest. I allowed the control groups to be either treated or non-treated. Furthermore, age, gender, ethnicity, duration, and attrition rates were coded and tested as moderators.

2.2.4. Moderators

Figure 2.2 summarizes the information below regarding how the moderators were conceptualized and coded.

Age

Age was categorized into four groups: Group 1: 0-17, Group 2: 18-22, Group 3: 23-49, Group 4: 50 years and older.

Gender Groups

Gender was categorized into five groups with each group representing the male and female distribution in each study's sample. Group 1: more females; Group 2: more males; Group 3: the number of male participants equaled the number of female participants; Group 4: all female; Group 5: all male.

Ethnicity

Ethnicity was categorized into five groups representing the race composition of the population in the study: Group 1: more Caucasians; Group 2: more African Americans; Group 3: more Asian Americans; Group 4: more Hispanics, and Group 5: Internationals.

Duration

Intervention times were either directly reported, or calculated from the treatment schedule (e.g., 15-20 minutes, 3-4 days).

Moderators	Coding	Values
Age Group	Categorical variable representing four age groups in the studies.	1=below 17 years 2=18-22 years 3=23-49 years 4= 50 and above
Gender Group	Categorical variable representing five gender distributions in the studies' samples.	1=More Female 2=More Male 3=Equal number of males and females 4= All Female 5= All Male
Ethnicity	Categorical variable representing the race of the populations in the studies.	1=More Caucasians 2=More African Americans 3= More Asian Americans 4= More Hispanics 5= Internationals
Duration	Categorical variable representing the prescribed amount of time participants should write, in the studies.	1= 60 minutes or less 2= 60-80 minutes 3= 90 minutes or more

Figure 2.2 Moderators, Coding, & Values¹.

¹*These variables were coded as categorical for subgroup comparisons.*

2.2.5. Meta-Analytic Procedure

Analyses were implemented by the use of the Comprehensive Meta-Analysis program, Version 3 (Borenstein, Hedges, Higgins, & Rothstein, 2005). Effect sizes were

computed using Hedges' g . When Hedges' g was positive, the intervention group exhibited lower stress levels than the control. Hedges' g was calculated as the difference in gain (pretest and posttest) between the intervention and control groups divided by the pooled standard deviation.

For studies that reported multiple stress measures, I calculated a weighted-average Hedges' g with the mean standard error based on the reported effect sizes. Specifically, I first input the different means, standard deviations, and sample sizes. Then I calculated each Hedges' g , and the associated weight, and divided the sum of weighted Hedges' g by the sum of weights (i.e., $\sum w_i g_i / \sum w_i$) to produce a weighted average Hedges' g for that study.

The overall effect sizes were estimated by calculating a weighted average of individual effect sizes using a fixed effects model. Fixed effects models are most appropriate when a common effect size metric is employed across all studies. I converted each studies' effect size(s) into Hedge's g (Hedge & Vevea, 1998).

2.2.6. Publication Bias

I used a Funnel Plot to estimate publication bias. In Meta-analyses, effect sizes are assumed to be symmetrical with respect to the mean, and results are considered as biased if the Funnel Plot visually shows an asymmetrical distribution (Borenstein et al., 2010).

2.3. Results

2.3.1. Studies' Characteristics

A total of 22 relevant studies were published between 2006 and 2019 — with a pooled sample size of 2,459 participants — specifically designed to inspect the relationship between EW and stress and were included in the current review. The summary of the reviewed studies and their key characteristics can be found in Table 2.1 (presented at the end of this chapter, due to its size/length).

The 22 reviewed studies were published in 20 different journals in a variety of fields. Half of the reports (n=11) were found in health, medical, or nursing research journals. The other half were published in psychology or stress related journals. All 22 studies included a theoretical framework to guide the research. The most commonly applied theories were Inhibition Theory, Cognitive-Processing Theory, and Self-Regulation Theory. Social Integration Model, and Exposure Theory were also mentioned, albeit less frequently, in the reviewed studies.

Among the reviewed reports, 63.6% (n=14) utilized medium-sized samples, ranging from 26 to 99 participants. Most studies employed a non-random, convenience sample to conduct a pre-post EW intervention. However, 6 studies (27.2%) employed a Randomized Controlled Trial design (RCT) by recruiting participants online.

2.3.2. Effect Sizes

The Hedge's *g* effect size values for each of the 22 studies ranged from 0.026-0.175. Figure 2.3 depicts the effect sizes for each individual study ("*Std diff in means*" column), and the overall effect size across all studies. Across all studies, EW exhibited a

positive effect in terms of decreasing or alleviating stress. The overall Hedges' g was 0.411 ($Z= 7.017$, $SE =0.059$, $p < .001$) with a 95% confidence interval of 0.296-0.525.

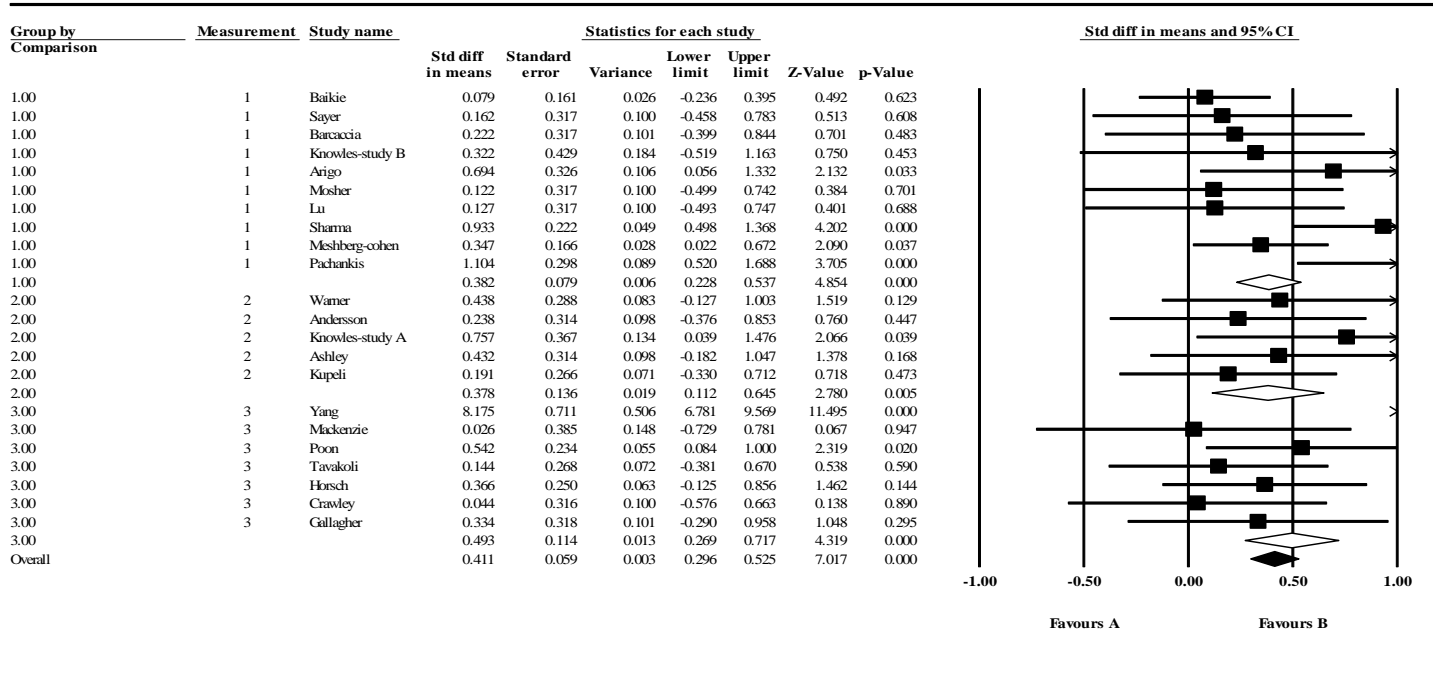
2.3.3. Moderator Analyses

Many factors might be considered as moderators of expressive writing effects. I examined whether the effect sizes changed based on age group differences, gender distribution of the studies, ethnicity, and duration of the intervention.

Moderator analysis helps ascertain if the relationship between two variables relies upon the value of a third variable. I used the standard I^2 method to determine whether a moderating effect existed. I^2 is a descriptive statistic for the ratio of true heterogeneity to total variance across the effect sizes (Higgins et al., 2003). By running CMA (Comprehensive Meta-Analysis Software, Version 3), a relatively large heterogeneity was detected among these studies ($I^2 = 85.37\%$), therefore warranting an examination of potential moderators.

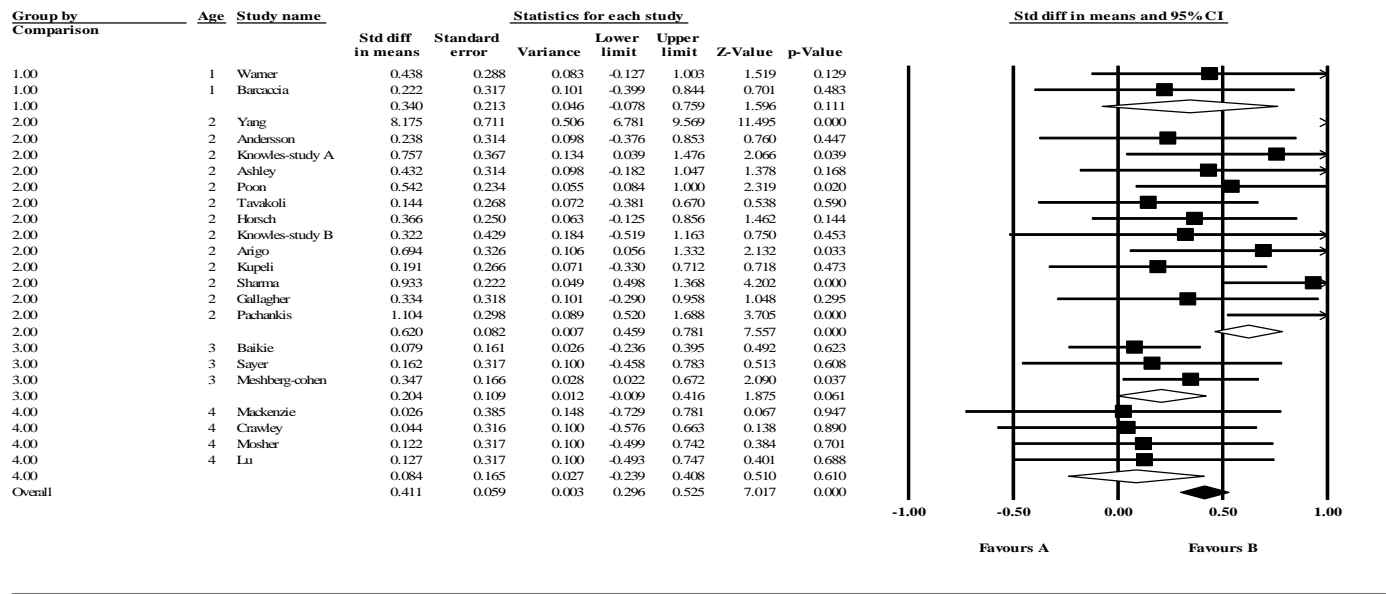
Age Group

The mean age of participants was 31 years, ranging from 12 to 75 years. Two studies included participants with a mean age of 12-14 years; 11 studies had participants with a mean age of 19-21 years; The participants in 6 studies had a mean age of 25-38 years and the remaining three studies included participants with a mean age of 58-62 years. I categorized the studies as containing four different age groups (see Figure 2.2), below 17 years; from 18-22 years; 23-49; and 50 or above. The analysis revealed that studies with younger participants (72.73% <49 years) had relatively large effect sizes (see Figure 2.4).



Meta Analysis

Figure 2.3 Effect sizes of each individual study assessing the impact of EW on stress, and overall effect size across the 22 reviewed studies.



Meta Analysis

Figure 2.4 Effect sizes according to studies' age groups (1=below 17 years; 2=18-22 years; 3=23-49 years; 4= 50 and above).

Gender

I categorized studies into five groups (Figure 2.2), according to the distribution of gender in each study's sample. Across all studies, more than half of the pooled sample (57.10%) was female, and 31.23% male, while 11.67% of participants did not report their gender. Among the studies, 8 had samples with female participants, exclusively (36.36%, n=8). Another 9 studies contained mixed gender samples, averaging 53.19% males and 46.81% females. Three studies (10%, n=4) did not report participants' gender. Figure 2.5 depicts rather inconclusive findings: If the outlier study is counted (Yang, 2015), it would appear that studies with larger effect sizes had more women in their samples (or female-only samples). However, Pachankis' (Pachankis & Goldfred, 2010) study – with an effect size of 1.104 – had an all-male sample.

Ethnicity

In the reviewed articles, 11 studies had more Caucasian participants, 4 had more Asian Americans, 3 studies had more International participants, 2 studies had more African Americans, 1 study had more Hispanics, and the remaining 3 studies didn't report the ratio of race/ethnicity for the EW intervention.

Figure 2.6 reveals most of the EW interventions with larger effect sizes had more Caucasians. The data suggest, however, a possible trend in researchers' interest in the effects of EW interventions for Asian Americans / International population groups.

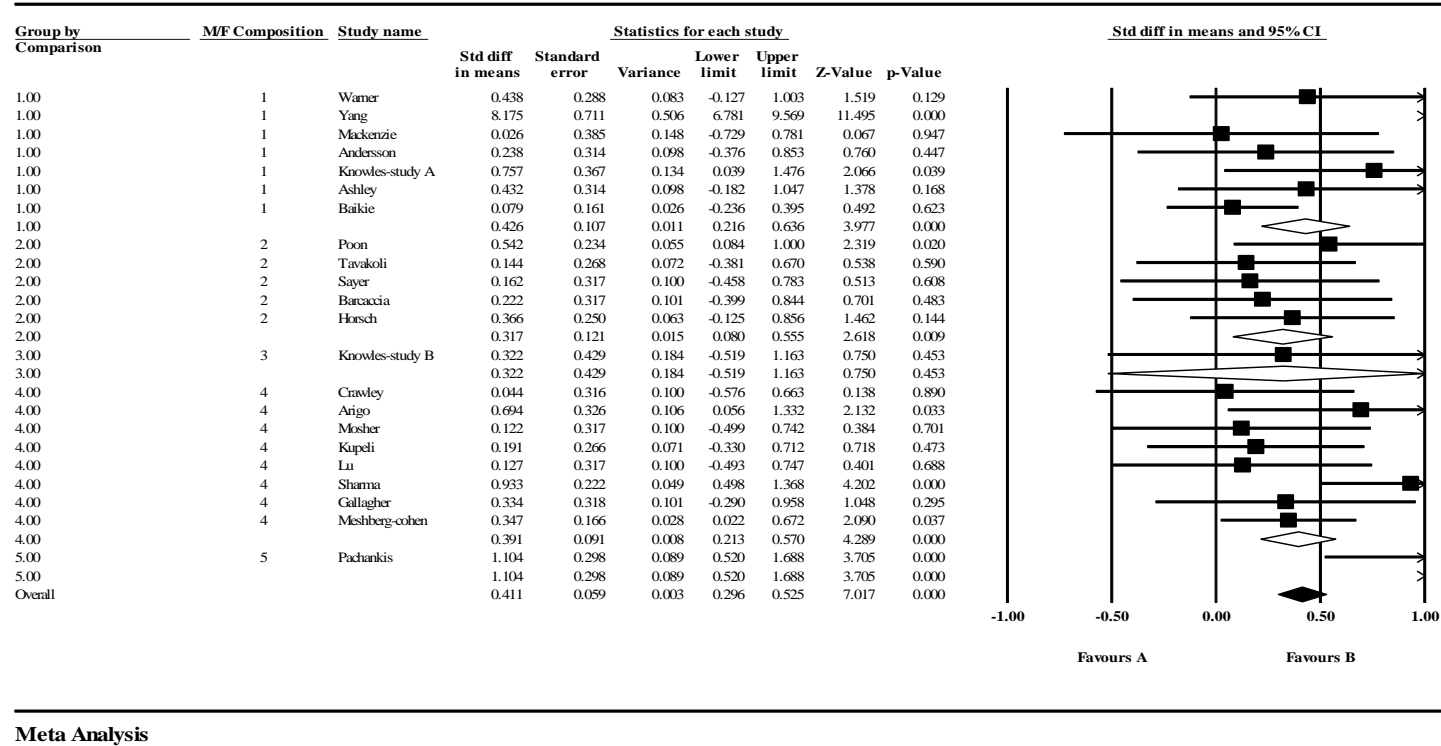
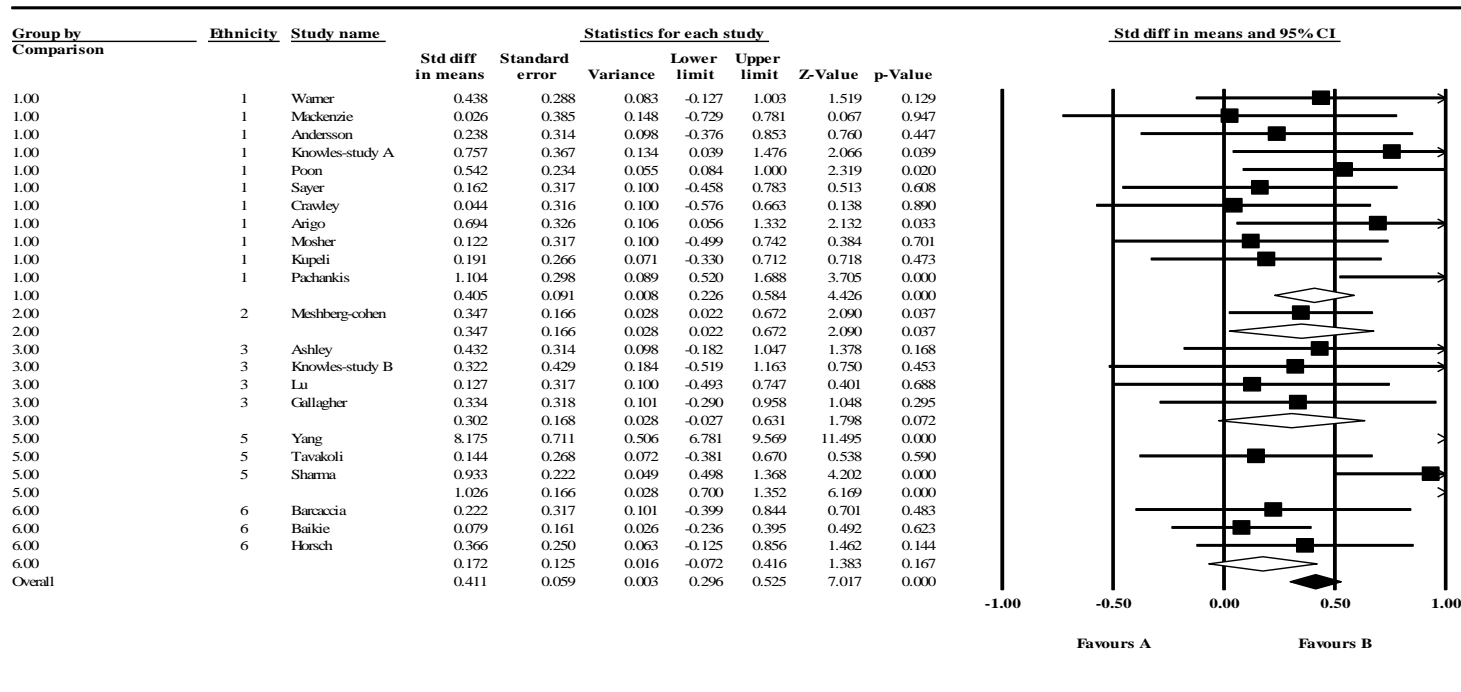


Figure 2.5 Effect sizes according to study-samples' gender distribution (1=More Female; 2=More Male; 3=Equal number of males and females; 4= All Female; 5= All Male).



Meta Analysis

Figure 2.6 Effect sizes according to study-samples' ethnic distribution (1=More Caucasians; 2=More African Americans; 3= More Asian Americans; 5= More Internationals; 6= Didn't report).

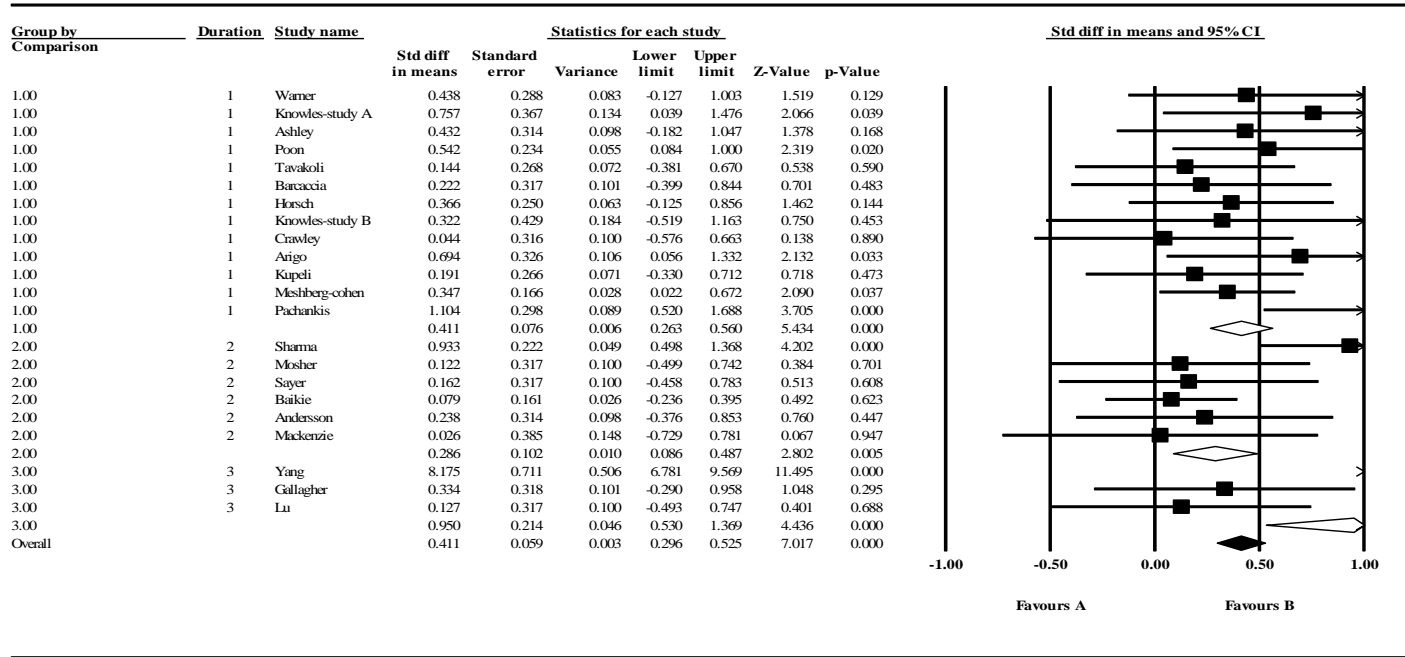
Duration

Regarding characteristics of the EW intervention in terms of dosage (specifically, days/ sessions), 1 study had participants writing for 8 sessions; in 6 studies, participants wrote for 4 days/sessions and in 15 studies the majority of participants wrote for 3 days/sessions. In terms of the timing of each session, 4 studies asked participants to write for 15 minutes; 16 studies were designed to have participants write for 20 minutes, and 2 studies required 30 minutes of EW per session. The reported durations varied between 45 minutes and 160, total. Interventions were therefore coded as 1: 60 minutes or less; 2: 61 – 80 minutes; and 3: 90 minutes or more.

According to Figure 2.7, there appears to be no clear pattern regarding the intervention's duration/dosage and effect sizes. Various studies that employed intervention sessions totaling 60 minutes or less (Code = 1) exhibited moderate-to-large effect sizes. Only Yang's (2015) study – the outlier in this sample – had a large effect size associated with larger exposure/dosage.

2.3.4. Publication Bias

Publication bias was evaluated by examining the Funnel Plot (Figure 2.8) for the reviewed studies. In the plot we observe the studies were nearly symmetrical with respect to the mean effect size, except for one study (Yang, 2005). I included this outlier because in this study, the EW intervention group was asked to write for 8 sessions, or a total of 160 minutes – and the study met all the methodological quality criteria during screening. The reported effect size from Yang's study demonstrated the effect of EW intervention on stress reduction (Yang, 2015). I also ran Egger's regression test to detect publication bias by *p*-value, where *p*-values



Meta Analysis

Figure 2.7 Effect sizes according to study-samples' intervention duration/dosage (1: 60 minutes or less; 2: 61 – 80 minutes; and 3: 90 minutes or more).

smaller than 0.05 indicate publication bias. The Egger's regression test returned a non-statistically significant result ($t = 1.6, p = 0.1$), indicating these data are free from publication bias. In the end, the Forest Plot exhibited a stable overall effect size. Considering these assessments in tandem, I concluded that these data do not suffer from publication bias.

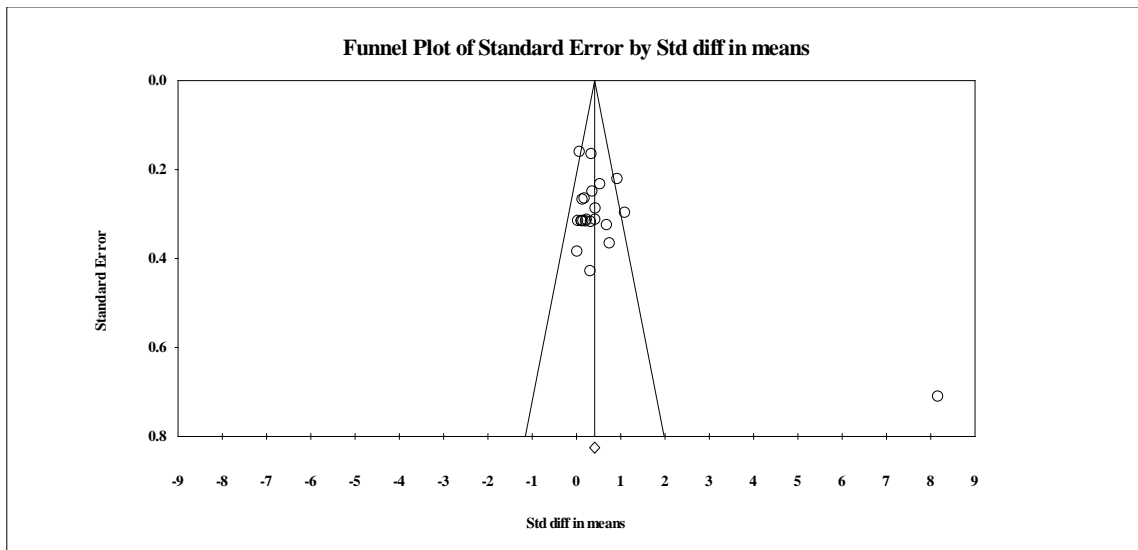


Figure 2.8 Funnel Plot for 22 studies examining the effect of EW on stress.

2.4. Discussion

The goal of the current meta-analysis was to update and add to the extant body of literature published since the last meta-analytic study was reported on the topic of EW and health. Specifically, by synthesizing the newest literature on the topic, I aimed to: 1) determine if EW is an effective intervention to alleviate stress (given the previous meta-analyses have contradictory findings); 2) identify *for whom* it is more effective.

Across the 22 studies reviewed in this meta-analysis, the overall effect was positive and moderate in size (Hedge's $g = 0.411$), ranging from a negligible effect of 0.026 to an extremely large 8.175. These findings align with those from Smyth (1998), who documented an average effect size of .230; with the findings from the meta-analysis by Frissina et al., (2004), reporting an effect size of .101, and with Frattaroli's (2006) synthesis, observing an effect size of .075. Our findings, however, contradict Mogk et al.'s (2006) meta-analytical results. Mogk (2006) and colleagues reported EW exerted minor or no effects on health.

The lack of consensus on this topic may be related to the substantial variability we see in the original studies of EW and stress. Even though the studies claimed to use Pennebaker's protocol for the intervention, the actual implementation of EW differed among reports. For example, in Pennebaker's protocol, participants are asked to write about "the most traumatic and upsetting experience of their entire life" (Pennebaker et al., 1988). Each study adjusted the instructions to their own purposes. Some focused on positive experiences (Ashley et al., 2013; Kupeli, 2018), some focused on writing mindfulness (Poon, 2011), and some were instructed to write about their life transitions (Arigo, 2012). Such deviations from the standard protocol regarding the *type of writing* participants were asked to produce may, therefore, explain the variability in findings and in outcomes.

Nonetheless, it is of great importance to realize that among the studies reviewed here, none had control groups that outperformed the intervention groups, and none documented the intervention as *harmful* to participants (as some of the earlier literature

on the topic has described — see introductory paragraphs in this chapter). All effect sizes were positive, even if some were quite small.

Based on this assessment, it is reasonable to conclude that EW appears to have potential benefits that require further (and more rigorous) exploring. Flaws in the original studies — such as failure to report specific gender or ethnic distributions in the samples studied — make researchers who wish to synthesize these data unable to conclude much with certainty. A point in case is this meta-analysis' inability to determine, clearly, *for whom* the EW intervention can be most helpful — one of the questions I proposed to answer when conducting this study.

More research is needed, not only to clarify the effects of EW, but also to further the understanding of the *mechanisms* that make EW effective, and under which circumstances, settings, and cultural environments it can be useful. There is some indication that EW can be particularly useful in dealing with addictive behaviours (Ames, et al., 2007; Ames, et al., 2014; Young, et al., 2013), for instance, but the ways in which it helps, and why, are not fully understood. In a sense, there is a need for further theorizing about the relationship between writing and health, too, not merely more research.

Furthermore, studies of EW as a stress management strategy for specific population groups subject to intense stressors (such as students pursuing graduate degrees, dealing with academic stress or high levels of writing anxiety) also should be conducted. A recent study by Huerta et al., (2017), for instance, documented rather high levels of writing anxiety among graduate students at a research-intensive university in

the US. A brief writing intervention (but not EW) was shown to decrease writing anxiety and strengthen writing self-efficacy among that group (Goodson et al., 2021, *in review*). Such findings indicate that EW might be a useful intervention for that group, also.

Therefore, further experimental, or quasi-experimental research regarding the effects of EW as a stress management tool — involving more rigorous measures and designs as well as exploring its effects for various population groups — are sorely needed, not only because these studies can be meta-analyzed, but also because they can help answer the question as for the direction and magnitude of the relationship between EW and stress. Yet, alongside more experimental/quantitative studies, *qualitative* research methods such as interviews or focus group also may add much-needed in-depth meaning and value to identifying and understanding the *mechanisms* through which EW can help people clarify their emotions and minds (Borgatti, Everett, & Johnson, 2013; Valente, 2010). Researchers wishing to explore the topic further should consider either a mixed-methods study, in which a qualitative component is added to an experimental design, or a fully qualitative exploration of the topic — to better understand how people experience and manage their feelings through writing.

Fidelity in applying Pennebaker's protocol and/or re-conceptualizing methods for more accurately and rigorously capturing the impact of EW, might be important contributions that researchers can make in the future, on the topic of writing-for-health-promotion. The available evidence, however weak currently, suggests rather consistently that EW has the potential to be an effective and easy-to-implement intervention for coping and managing stress among various populations and age groups.

Given the documented benefits from EW, it is rather surprising that health promotion/health education scholars, researchers, and practitioners are not systematically researching or exploring this topic. Although I do not have empirical data to support this claim, informal interactions with colleagues at other universities indicate that my interest in EW as a health-promotion tool is quite novel and surprising to them — although colleagues in fields such as psychology or counseling appear to consider writing an effective tool for self-management (Frattaroli, Thomas, & Lyubomirsky, 2011; Sloan & Marx, 2018; Taylor, 1999).

Finally, researchers such as Frattaroli, 2006 have concluded that a well-designed EW intervention can be effective and incentive for participants when directed and supported by professional instructors – a finding that sparks the question for the health education field, “*Could health educators be trained to fill in the role of these “professional instructors”?*” If scientific evidence supporting the effects of EW were stronger, perhaps health promotion researchers and practitioners might be more motivated to explore this tool and strengthen its knowledgebase.

2.4.1. Limitations

While this meta-analysis showed a moderate effect of EW interventions on stress reduction, important limitations should be considered. First, the systematic search for studies only focused on English language publications, which might have left out important studies written in other languages. Moreover, though efforts were made to retrieve all articles on the topic by using major electronic databases, these databases are limited by the journals and outlets they index. Other types of studies such as reports,

dissertations, conference presentations, and working papers were not incorporated in this review.

Second, my interpretation of the moderation analyses only reflects a trend, given I could only examine the frequency distribution of the effect sizes by each moderator variable. Because several reviewed studies did not report data for the moderators that could be statistically examined, I was unable to test for statistically significant relationships.

Lastly, although this meta-analysis provides insight into the usefulness of EW to alleviate stress, it focuses specifically on one's perceived stress or depressive emotion. Its generalizability to other emotions that may affect or trigger stress, such as financial situations, relationships with close family members or friends, or even environmental insecurities (Rude & Haner, 2017) is not warranted.

Table 2.1 Descriptive Summary of Main Findings from Reviewed Studies Presented by Year of Publication

Study ID	Sample		Dosage		Research Goals		Main Findings		
	N	EW Group	Control Group	Duration & Location	Session Length	Focus	Positive Findings related to EW	Null or Negative Findings related to EW	Conclusions
1. Wamer, 2006	50 Adolescents M=14 21 Boys 29 Girls	n=28 11 boys 17 girls	n=22 10 boys 12 girls	3 days Home	15-20 minutes	To test “the effects of EW on the health of adolescents with asthma and to examine how language in disclosures predicts outcomes”	“EW leads to improved positive affect. Disclosures with more negative emotion, insight, and causal words—and increased causal or insight words over days—predicted improved health.”		“EW improves emotional and behavioral functioning among adolescents with asthma, particularly those whose writings suggest emotional processing and cognitive restructuring.”
2. Mackenzie 2007	27 Family Caregivers M=62 8 Male 19 Female	n=14 61.79 10 F 4 M	n=13 59.46 9 F 4 M	4 days Home	20 minutes	To examine “whether written emotional disclosure reduces stress and improves health outcomes for family caregivers of physically frail and cognitively impaired older adults, as it has been shown to do for certain student and clinical population”		EW group and Control group performed similarly across outcomes	“Expressive-writing and history-writing participants performed similarly across outcomes. Only caregiver participants in the time-management condition experienced significant mental and physical health improvements after writing.”
3. Tavakoli 2009	100 International university students M= 25 60 Male 40 Femal	n=50	n=50	3 days Home	20 minutes	To test “the effects of group assertiveness training, private EW, their combination, and a wait-list control on the acculturative stress, affect, and health of 118 international students at an urban North American university.”	EW group received higher positive affect		EW has mixed effects and needs further development and study.

Study ID	N	Sample		Dosage		Research Goals		Main Findings	
		EW Group	Control Group	Duration & Location	Session Length	Focus	Positive Findings related to EW	Null or Negative Findings related to EW	Conclusions
4. Meshberg-Cohen 2010	132 M=36 100% Female	n=74	n=58	3 days Home	20 minutes	To determine whether Pennebaker's EW is beneficial as a brief adjunct to traditional treatment for women currently undergoing residential treatment for SUDs	"EW participants showed greater reductions in posttraumatic symptom severity, depression, and anxiety scores, when compared with control writing participants at the 2-week follow-up."		"A brief, safe, low-cost, adjunct to SUD treatment that warrants further study as a strategy for addressing posttraumatic distress in substance-abusing women".
5. Pachankis 2010	52 M=20 100% Gay	n=27	n=25	3 days Private place	20 minutes	To test "the effectiveness of an EW intervention for gay men on outcomes related to psychosocial functioning."	"Participants who wrote about gay-related stress, regardless of whether they read their previous day's writing, reported significantly greater openness with their sexual orientation 3 months following writing than participants who wrote about a neutral topic."		"...particularly beneficial for those men who write about more severe topics and for those with lower levels of social support."
6. Andersson 2011	41 College students M=21	20	21	4 days	20 minutes	To examine "whether a distanced, third-person approach to EW might be more beneficial than a traditional, first-person intervention for high baseline levels of event-linked intrusive thinking"	"Third-person writers perceived expressing their emotions to a greater extent with higher levels of event impact, whereas perceived emotional expression remained constant across all levels of event impact for first-person writers."		"Results suggest overall that third person EW may be a special fitting technique for recovering from traumatic or highly stressful life events as it optimizes perceived benefits and health outcomes relative to a traditional, first person approach."

Study ID	N	Sample		Dosage		Research Goals		Main Findings	
		EW Group	Control Group	Duration & Location	Session Length	Focus	Positive Findings related to EW	Null or Negative Findings related to EW	Conclusions
7. *Knowles 2011	32+22 M=21 5 Male 49 Female	Case 1 15	7	3 days Home	20 minutes	To test whether the benefits of EW extend to Asian Americans.		“The present findings suggest that expressive writing might not benefit health in cultures that deemphasize verbalization as a route to meaning making and discourage the explicit communication of personal problems.”	“Asian Americans who wrote about traumatic events exhibited no increase in insight over the four writing sessions.”
		Case 2 11	11						
8. Poon 2011	76 College Students M=20 30 M 46 F	39	37	3 days Private place	20 Minutes	“To extend previous research on moderators of EW by examining whether individual differences in mindfulness would moderate the intervention’s impact on physical and psychological benefits.”	“Main effects favoring expressive writing were found, and these were qualified by significant interactions with mindfulness. Specifically, individuals with higher mindfulness scores responded better to expressive writing, experiencing greater physical and psychological benefits than individuals with lower mindfulness scores.”		“In particular, the study will shed light on how constructs, such as alexithymia and mindfulness, will function as moderator in expressive writing and clarify how the processing of internal experience will affect those who might benefit from expressive writing.”

Study ID	N	Sample		Dosage		Research Goals		Main Findings	
		EW Group	Control Group	Duration & Location	Session Length	Focus	Positive Findings related to EW	Null or Negative Findings related to EW	Conclusions
9. Arigo 2012	110 Female College Students M=19	57	54	3 days Private place	15 minutes	To test “the efficacy of a structured EW intervention on health-relevant difficulties related to females’ transition to college.”	“Findings suggested that women who are highly stressed may be at risk for additional health-compromising experiences (e.g. disordered eating behaviors) and an EW intervention may help to protect them from the negative effects of stress.”		It concluded that “the effects of EW under such conditions may be particularly beneficial for females who experience high perceived stress during college, and may positively impact other health and well-being outcomes during later development.”
10. Baikie 2012	156 Online recruited M=38	70	86	4 Days Private place	20 minutes	To examine “whether either expressive writing or positive writing offers benefits for people with mood disorders.”	“All 3 groups showed significant improvements over time on mental health and some physical health outcomes. There were no significant differences between groups and no significant group by time interactions. These results were not moderated by demographic factors, personality subtypes or coping styles.”		“When expressive and positive writing groups were combined, the resulting emotional writing group’ showed significantly lower scores on the stress subscale than the control writing group at all time-points. Potential reasons are discussed and areas of further study identified.”

Study ID	N	Sample		Dosage		Research Goals	Positive Findings related to EW	Main Findings	Conclusions
		EW Group	Control Group	Duration & Location	Session Length	Focus		Null or Negative Findings related to EW	
11. Mosher 2012	86	44	42	4 sessions Home	20 minutes	To examine “the health effects of expressive writing in an advanced breast cancer patient sample and extends prior work in several respects.”	“In this sample of women with metastatic breast cancer and significant distress, expressive writing did not result in better existential and psychological well-being, reduced fatigue or enhanced sleep quality as compared to neutral writing.”	“Although both writing groups in this study showed little change in their distress over time, the expressive writing group reported more than double the rate of mental health service use during the study compared to the neutral writing group.”	
12. Ashley 2013	42	23	19	3 days Home	20 minutes	To examine “the effects of written emotional disclosure (WED) interventions on the self-reported health and job satisfaction of school teachers.”	“There was no significant effect of any of the three WED interventions, compared to control writing, on psychological or physical health or job satisfaction. There was, however, a significant and sizeable improvement in physical health across writing conditions.”	“Most previous studies have examined EW with students or patient groups, and the findings also raise an important question about the feasibility of multi-session writing interventions for mid-life working samples. Further studies with occupational groups are warranted, as is further investigation into the role of positive expectancies in WED effects.”	

Study ID	Sample		Dosage		Research Goals		Main Findings		
	N	EW Group	Control Group	Duration & Location	Session Length	Focus	Positive Findings related to EW	Null or Negative Findings related to EW	Conclusions
13. Sayer 2015	785 Online recruited M=37 475 Male 310 Female	508 304M	277 171 M	4 days Private place	20 minutes	To examine “the efficacy of a brief, accessible, nonstigmatizing online intervention—writing expressively about transitioning to civilian Life.”	“Online expressive writing holds promise for improving health and functioning among veterans experiencing reintegration difficulty, albeit with small effect sizes.”		“Overall, there were fewer than expected differences between expressive and factual writing, and effect sizes comparing expressive to factual writing were smaller than those comparing expressive writing to the no-writing treatment as usual control condition.”
14. Yang 2015	74 M=20 43 Male 31 Female	35	39	8 days Classroom	20 minutes	To examine “the efficacy of expressive writing among Chinese undergraduates.”	“After the intervention on the eighth week, the self-reported psychological, social and physical health of the experimental class improved. Psychological health obtained the maximum degree of improvement, followed by social and physical health. Furthermore, female participants gained more psychological improvement than males.”		“These results demonstrated that the expressive writing approach could improve the physical, social and psychological health of Chinese undergraduates, and the method can be applied in university psychological consulting settings in Mainland China.”

Study ID	Sample		Dosage		Research Goals		Main Findings		
	N	EW Group	Control Group	Duration & Location	Session Length	Focus	Positive Findings related to EW	Null or Negative Findings related to EW	Conclusions
15. Horsch 2016	65 Mothers of preterm infants M=32 100% Female	33	32	3 days Private place	15 minutes	To investigate “the efficacy and acceptability of the expressive writing paradigm for mothers of very preterm infants.”	“This research showed that mothers thought it was worth spending the time to do the expressive writing intervention despite the fact that they tend to be preoccupied with their baby’s health and the attendance of medical appointments.”		“Expressive writing is a brief, cost effective, and acceptable therapeutic approach that could be offered as part of the NICU care.”
16. Sharma 2016	90 Nursing students M=20	45	45	4 days	20 minutes	To assess “the effectiveness of Expressive Emotional Writing on perceived stress and general wellbeing of nursing students.”		“The subjects in experimental group showed a statistically significant increase (p=0.013) in perceived stress reactivity after intervention.”	“On the domain of general well being, there was statistically significant improvement in general wellbeing of experimental group (p=0.010). Results showed that expressive emotional writing is effective in improving general wellbeing of the subjects.”
17. Barcaccia 2017	138 Pre- adolescents M=12 70 Male 68 Female	69	69	3 sessions Classroom	20 minutes	To examine “the effectiveness of expressive writing as a positive coping strategy for children who had experienced a transgression by a friend.”	“No significant effects between control and experimental groups were found for the considered variables, except for positive and negative affect.” A significant linear effect was found between the pre and post intervention time points for both EW and control group from depression perspectives.		“The results provide useful information in order to better design future studies and prevention/intervention programmed to be implemented with preadolescents.”

Study ID	Sample		Dosage		Research Goals		Main Findings		
	N	EW Group	Control Group	Duration & Location	Session Length	Focus	Positive Findings related to EW	Null or Negative Findings related to EW	Conclusions
18. Crawley 2018	180 M=33 100% Female	86	94	3 days	15 minutes	To examine “the feasibility and acceptability of expressive writing for postpartum women as part of a randomized controlled trial (RCT).”		“Acceptability measures showed that women who wrote expressively rated the materials/task both more positively and more negatively than those in the control writing group, and qualitative comments revealed that women enjoyed the writing and/or found it helpful even when it was upsetting.”	“The feasibility of offering EW as a universal self-help intervention to all postpartum women 6 to 12 weeks after birth was low, but the EW intervention was acceptable to the majority of women who completed it.”
19. Gallagher 2018	62 Chinese American Breast Cancer survivors M=55 100% Female	33	29	3 days Home	30 minutes	To examine “the impact of expressive writing on reducing posttraumatic stress disorder symptoms (PTSS) and facilitating posttraumatic growth (PTG) in Chinese American breast cancer survivors”	“Chinese American breast cancer survivors may benefit more from expressive writing instructions targeting cognitive processes such as insight-finding, but not emotional expression and disclosure.”		EW is effective to improve quality of life for Chinese American cancer survivors. Future efforts are warranted to apply EW to community and clinical settings.

Study ID	N	Sample		Dosage		Research Goals	Positive Findings related to EW	Main Findings	Conclusions
		EW Group	Control Group	Duration & Location	Session Length	Focus		Null or Negative Findings related to EW	
20. Lu 2018	82	36	46	3 sessions Home	30 minutes	To evaluate “whether a culturally sensitive EW intervention improved quality of life.”	“The condition that improved quality of life the most was the enhanced self-regulation condition, which was designed to facilitate cognitive reappraisal, emotional disclosure, and benefit finding in that order, and delivered maximum health benefits.”	“Engaging in cognitive processing first is more beneficial than engaging in emotional disclosure first for the study population.”	
21. Kupeli 2018	57	27	30	3 days Home	15 minutes	To examine “the effects of writing about Intensely Positive Experiences on weight and disordered eating during a naturalistic stressor.”		EW intervention is “a simple and light touch intervention that has the potential to be widely applied. However, it remains for future research to replicate these results and to identify the mechanisms of action.”	

*This study analyzes two different types of samples so I coded as two independent study cases in the meta-analysis.

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3. THE EFFECT OF EXPRESSIVE WRITING ON ACADEMIC STRESS AND WRITING PRODUCTIVITY AMONG A SAMPLE OF GRADUATE STUDENTS

3.1. Introduction

A growing number of graduate students report high levels of academic stress and experience diminished writing productivity (Bedewy, & Gabriel, 2015. Nicklin, Meachon, & McNall, 2019). Academic stress can be defined as, “the inability to cope with a perceived threat to one’s mental, emotional, and spiritual well-being which is related to educational programs” (Seaward, 1997, p. 5). More specifically, according to Gupta and Khan (1987) academic stress can be considered as mental distress resulting from students’ anticipated frustration due to academic failure or even awareness of the possibility of such failure. It has been well established that academic stress can affect overall health, self-efficacy, and academic performance of those within academic settings (Oswalt & Riddock, 2007; Risal, Sanjel, & Sharma, 2016).

Writing productivity is one dimension of academic performance that is significantly affected by stress. Conceptualized as a measure of time spent and or output/pages written over time (Gardner, 2018) writing productivity is often diminished among higher education students as a result of overall academic stress (Jenaabadi, Nastiezaie, & Safarzaie, 2017; Pelayo, Jose Maria, 2018) . Diminished writing productivity results in poor academic performance, especially at the graduate level, and is often the reason students do not complete their degrees which, ultimately, can affect their quality of life (Conley et al., 2013; Goodson et al., 2021, *in review*). While recent research has suggested different strategies to reduce academic stress and enhance academic writing productivity, many scholars have noted that further research is necessary to develop and

test cost-effective tools and interventions (Brandon et al., 2015; Jenaabadi, Nastiezaie, & Safarzaie, 2017; Nicklin, Meachon, & McNall, 2019; Pelayo, & Jose Maria G, 2018).

Expressive writing, or writing about one's deepest feelings and thoughts, has been identified as a cost-effective intervention for behavior and attitude change (Rodriguez, et al., 2016; Young, et al., 2013). Moreover, in the past three decades, scholars have suggested that expressive writing (EW) has numerous health-related benefits including those related to mental, physical and psychological health (Borod, & Lepore, 2004; Baikie & Wilhelm, 2005; Frisina et al., 2004; Meads & Nouwen, 2005; Frattaroli, 2006; Pavlacicic et al., 2019; Reinhold, Burkner, & Holling, 2018; Smyth, 1998; Qian et al., 2020). Recommendations have been supported by evidence for the relationship between EW and health outcomes such as coping with depression, drinking intentions, smoking cessation, eating disorders, and sleep difficulty among college students (Neighbors et al., 2020; Rodriguez, et al., 2015; Young, Rodriguez, & Neighbors, 2013).

Among the available evidence, one study examined the effectiveness of EW in boosting academic exam performance, by reporting on two laboratory and two randomized field experiments demonstrating that EW significantly improved students' (college undergraduates and grade school students') exam scores and prevented "choking" (i.e., poor performance after adequate preparation; Ramirez & Beilock, 2011). Another study investigated the effects of EW on graduate school entrance examination performance. In that study, the authors claim that EW significantly improved performance and reduced depressive symptoms shortly before the examination (Harwood & L'Abate, 2010). Further, they point out that such a brief, easy, and inexpensive intervention can deliver better performance to students seeking graduate education.

These, and the majority of studies examining the relationship between EW and health, focus either on adults or college students (undergraduates) as the populations of interest. However, to the best of my knowledge, none of the previous research has inspected the role of expressive writing in managing academic stress, or explored the connection among expressive writing, academic stress, and writing productivity among *graduate students*. Therefore, this study proposes to bridge this gap by examining the influence of EW on academic stress, writing anxiety, writing self-efficacy, writing self-awareness, and writing productivity among graduate students, specifically.

Based on the empirical evidence obtained from the meta-analysis I conducted (reported in Chapter 2), and on the theoretical model proposed (see Figure 3.1), in this study I examine the relationship among EW, academic stress, writing anxiety, writing self-efficacy, writing self-awareness, and writing productivity among the graduate students sampled at a research-intensive university in the US. To examine these relationships, I tested an EW intervention with a sample of 42 participants. The current study addresses the following questions:

Question 1: What are the characteristics of graduate students regarding writing anxiety, writing self-efficacy, and writing self-awareness, as these relate to their academic stress and writing productivity?

Question 2: What is the impact of completing an EW intervention on graduate students perceived academic stress, writing anxiety, writing self-efficacy, writing self-awareness and writing productivity?

Question 3: Based on the content of the participants' essays — written during the intervention — what are the characteristics of these essays (e.g., length of the text,

use of positive/negative terms, and topics expressed)? Furthermore, does the content of these essays suggest any patterns or trends?

The hypothesis of the current study is that after participating in a brief EW intervention, graduate students in the intervention group will experience reduced academic stress and enhanced writing productivity, alongside lower writing anxiety, stronger writing self-efficacy, and enhanced writing self-awareness. The long-term objective of this study is to explore whether a brief EW intervention is effective and should be promoted as a feasible, cost-effective tool for reducing academic stress and enhancing writing productivity among graduate students.

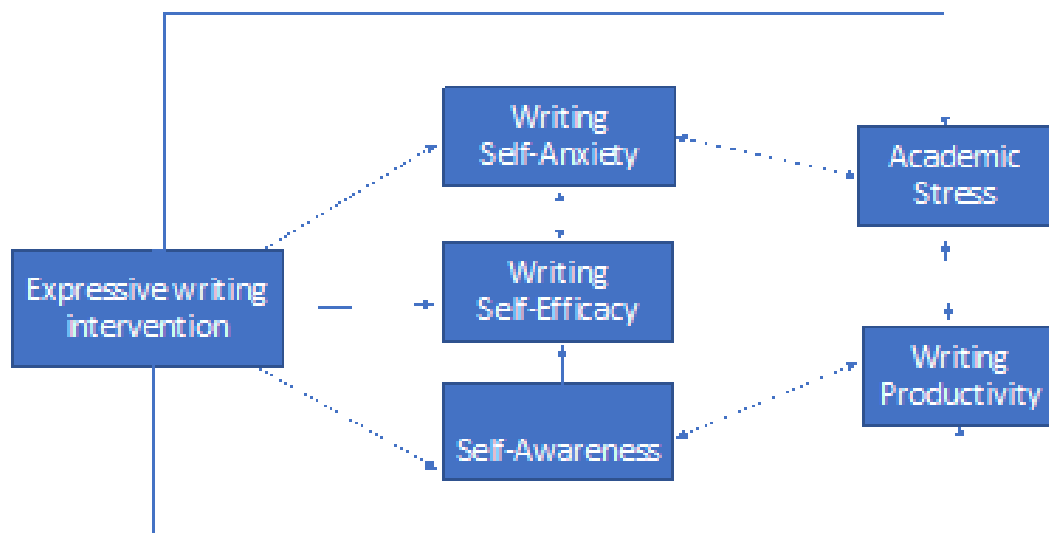


Figure 3.1 Theoretical Framework

3.2. Theoretical Framework

There are several theories elaborating on the mechanisms underlying EW interventions, such as, Inhibition Theory (Pennebaker, 1982; Pennebaker & Beall, 1986), Cognitive-Processing Theory (Das, et al., 1975), and Self-Regulation Theory (Carver & Scheier, 1981) (See Chapter 2). The theory employed as the framework for this current

study is Self-Regulation Theory (SRT) given the fact that SRT has been applied to understanding the effects of expressive writing for more than a decade.

Zimmerman (1986) states that self-regulation is a systematic effort to shift thoughts, feelings, and actions toward the achievement of one's goals. EW is considered a self-regulation strategy/technique that can shape/influence a person's self-awareness while, at the same time, increase self-efficacy for writing. As self-awareness and self-efficacy increase (in an interactive, non-linear manner), writing anxiety decreases (Bandura, 1977). These dynamics, in turn, can lead to behavior and emotional changes, such as reduced academic stress and enhanced writing productivity.

3.3. Methods

3.3.1. Study Design

This study is an adapted replication of the study protocol implemented by Pennebaker and Beall (1986). Pennebaker's is the most well-known and widely used study protocol for examining the effects of EW (Robertson, Short, Sawyer, & Sweazy, 2020). Not only has this protocol been widely used in EW research, studies' results have provided insightful information about the relationships between EW and important health outcomes (Manzoni, Castelnuovo, & Molinari, 2011; Meshberg-Cohen, Svikis, & McMahon, 2014). The protocol is considered a rigorous design that ensures adequate internal and external validity.

The design of this study consists of a pre and post-test of a brief intervention, conducted with a convenience sample of graduate students at a large university in the Southwestern US. The study participants were randomly assigned to either intervention or control group after the baseline assessment. Then the intervention group was asked to

write 20 minutes consistently for 4 days. The control group only took the pre- and post-intervention survey (also taken by the intervention group).

All study procedures were approved by the university's Institutional Review Board (IRB Number: IRB2016-0750M).

3.3.2. Sample Size and Recruitment

Between the Fall 2017 and the Spring of 2018, I recruited a convenience sample (by email and personal invitations) from the pool of active POWER¹ Writing Consultants and from the graduate student population enrolled in the Health & Kinesiology Department, College of Education and Human Development, at Texas A&M University. I emailed students in these pools to explain the purpose of the study and invited their participation. I also spoke with potential participants face-to-face, by announcing the study in select Fall semester courses (after faculty approval). Students were encouraged to contact me by email if they were interested in participating.

In reply to their first contact, I sent an email that included a link to a Qualtrics²-based informed consent form, alongside a strategy for creating a coded ID number. Once the coded ID was created, I randomly assigned each participant to either the EW (intervention) or the control group. After assignment, participants received another email, with specific instructions appropriate to their group (intervention or control).

A total of 42 graduate students were randomly assigned to control group (n=21) and intervention group (n=21). The intervention group's final sample size, however, was

¹ POWER stands for "Promoting Outstanding Writing for Excellence in Research". POWER comprises a set of services providing motivational and instrumental support for graduate students' and faculty's academic writing through a select group of graduate students and faculty who function as peer supporters. See: <http://power.tamu.edu/>

² Qualtrics is an on-line survey software enabling users to collect and analyze data.

11 because not all participants completed the writing requirements delineated in the intervention protocol.

3.3.3. Procedures

A brief summary of the procedures could be described as: the control group (n=21) did not receive the intervention but filled out a pre and post-survey at the start and the end of the study period. Participants in the EW intervention group (n=21) were asked to write for 20 minutes each day and 4 days in a row about their deepest feelings and thoughts associated with academic stress, writing productivity, and the challenges they were facing in their academic lives at that moment.

The detailed procedural instructions participants received were as follows:

On day 1, the email I sent to the control group participants contained a link to the pretest (Qualtrics based). Participants were instructed to follow the link and fill out the pretest survey; no other task was required. The EW group's email contained a link to the Qualtrics pretest and the following instructions for the brief intervention:

“In today’s session I would like for you to write about your current most stressful experience and challenges in your academic life. Really let go and explore your feelings and thoughts about it. The text will be kept completely confidential. If you wish, you may use pseudonyms or initials to refer to specific people in your text. The only rule is that you must write continuously for the entire time for 20 minutes. Don’t worry about grammar, spelling, or sentence structures. Don’t worry about erasing or editing.”
(Chung & Pennebaker, 2008)

The intervention group was asked to write the essays in the Qualtrics platform, so the material could be sent back to me for analysis.

On days 2 and 3, participants in the control group wrote nothing while participants in the EW group received one email each day (as a reminder), containing the Qualtrics link to write their essays.

On day 4, after the EW group finished writing their fourth essay, an email containing a link to the posttest was mailed to all 42 participants

3.3.4. Measures

The pre and post surveys were identical in every regard. The survey instrument included a total of 86 questions assessing the demographic characteristics of the participants and study variables. Below I present further details on each of the measures.

Demographic Information – Participants were asked to provide basic demographic information, e.g., age, gender, race, and academic classification.

Perceived Academic Stress – This is a widely used psychological instrument (PSS; Cohen, Kamarch, & Mermelstein, 1983) for measuring the perception of stress with diverse samples including college students (VanKim & Nelson, 2013). This scale consists of 10 items on a 5-point Likert scale (1=strongly agree, 5=strongly disagree). Example items include: “*In the last month, how often have you been upset because of something that happened unexpectedly?*” and “*In the last month, how often have you felt that you were unable to control an important thing in your life?*” Scores were summed across all items and could range in values from 10 to 50 (when all items were answered). The higher the score, the higher the level of stress. For our sample, the preintervention data yielded a

0.87 coefficient of reliability/internal consistency, and the post-test, a Cronbach alpha of 0.88.

Writing Anxiety – To assess the construct, the Daly-Miller (Daly & Miller, 1975) questionnaire was adopted. The questionnaire has 26 items on a 5-point Likert scale (1=strongly agree, 5=strongly disagree). Scores were summed across all items and could range in values from 26 to 130 (when all items were answered). Higher scores indicated stronger or worse writing anxiety. Example items include, “*I avoid writing*” and “*I have no fear of my writing being evaluated*”. Testing of these items revealed a high Cronbach alpha reliability coefficient of 0.921, in Day & Miller’s study (1975). I calculated the Cronbach alpha coefficient of 0.93 for the pre intervention survey and 0.94 for the post-test.

Writing self-efficacy – The questionnaire developed by Zimmerman and Bandura (1994) was adopted to evaluate this construct. The instrument is made up of 26 questions on a 7-point Likert scale (1=No, I cannot do this at all, 7=Yes, I can do this very well). For this variable, scores also were summed across items, and ranged in value from 26 to 182; higher scores indicated stronger or better self-efficacy. Example items include: “*When given a specific writing assignment, I can come up with a suitable topic in a short time*” and “*I can start writing with no difficulty.*” In terms of this scale, the Cronbach alpha reliability test delivered a coefficient of 0.91, in Zimmerman and Bandura’s study (1994). I calculated a Cronbach alpha coefficient of 0.95 for the pre intervention survey and 0.96 for the post-test.

Self-awareness – The questionnaire designed by Schutte and his co-authors (Schutte, Cooper, Golden, & Dornheim, 1998) was adapted to assess this construct. Originally it consisted of 33 items, however, 20 items were chosen specifically for the current study. Items were introduced with the stem, “*While you are thinking of writing ...*” and responses fell on a 5-point Likert scale (1=strongly agree, 5=strongly disagree). Responses could vary from 20 to 100. Items were reverse-coded for analysis; higher scores mean stronger awareness. Examples of items following the stem include, “*I easily recognize my emotions when I experience them*” and “*When I feel a change in emotions, I tend to come up with new ideas.*” In Schutte et al.’s study, the Cronbach’s alpha reliability coefficient was 0.90. I calculated a Cronbach alpha coefficient of 0.89 for the pre intervention survey and 0.90 for the post-test.

Writing Productivity – The questionnaire designed by Lonka and her co-authors (2014) assesses Ph.D. students’ notions of academic writing productivity. The instrument consists of 4 items on a 5-point Likert scale (1=do not agree, 5=fully agree). Summed scores could range between 4 and 20 (when all were answered). Example items include: “*I produce a large number of finished texts*”, and “*I am a regular and productive writer*”. The Cronbach alpha reliability coefficient for the data collected by Lonka et al., was 0.76. I calculated a Cronbach alpha coefficient of 0.87 for the pre intervention survey and 0.88 for the post-test.

Essays – As part of the EW intervention, graduate students in the intervention group were asked to write 20 minutes a day for 4 days. The instructions for EW writing can be found in the procedure session above.

3.3.5. Data Analyses

The current study consisted of a case-control, quasi-experimental design, employing a pre- and post-assessment of a brief intervention to examine the relationships among academic stress, writing anxiety, writing self-efficacy, writing self-awareness, and writing productivity, in a sample of 42 graduate students. The brief intervention was an adaptation of the one proposed by Pennebaker in 1986.

After concluding the intervention and pre-and-post survey data collection, I first assessed the missing data and determined they were random with no detectable pattern (Buhi, Goodson, & Neilands, 2008). However, because the number of participants not completing the post-survey ($n=10$, 16%), or not completing the essay writing in the intervention group (i.e., did not write 4 essays, $n=10$, 52%) exceeded 10% of the pre-test sample, I excluded those participants from further analysis. This resulted in a final sample size of 11 participants for the intervention group.

To examine differences in pretest scores on the academic stress, writing anxiety, writing self-efficacy, writing awareness, and writing productivity variables by demographic characteristics — which aimed to answer the first research question — independent t -tests were conducted. I adjusted the critical alpha level to accommodate for multiple comparisons, resulting in $\alpha = .01$.

Effect sizes for the various demographics sub-groups' comparisons were reported as Hedges' g . The cut-off points corresponding to small, medium, and large effect sizes are set to be 0.2, 0.5, and 0.8, respectively. Since the sample size was small, Hedges' g was preferred over Cohen's d .

To assess differences between the control and intervention groups' pos-test scores on academic stress, writing anxiety, writing self-efficacy, writing awareness, and writing

productivity — in answer to the second question in this study — I ran ANCOVAs on each of the focal variables, controlling for pre-test scores. For the ANCOVA analyses I set the probability level alpha at .05 (instead of the more stringent .01) due to the small post-test sample size (Reichard & Mark, 2001; ITE). ANCOVAs provide an *Eta*² value for effect size (Longford, 2010).

I employed content analysis (Lincoln & Guba, 1985) to determine the characteristics of participants' essays, such as themes generated, and the positive, negative, and mixed feelings and emotions related to academic stress revealed in the essays. These analyses address/answer the third research question in this study. I also used NVIVO 12 (QSR International Pty Ltd, 2018) as a qualitative data management tool. By creating nodes for the themes from each essay, key themes were generated, compared, and contrasted to identify any differences between Day 1 and Day 4 essays.

It is important to point out that in qualitative research, researchers have to recognize their biases because culture and beliefs often shape study findings. (Chen, 2016). As a doctoral student myself, I was biased toward finding themes and text in the essays that reflected my own beliefs about the constructs of the study (in particular, my belief that EW *can be* a helpful stress management tool).

3.4. Results

The study results are reported in four sections. The first section reports participants' demographic characteristics, and the remaining three sections address the research questions.

3.4.1. Participants' Characteristics

A total of 42 graduate students were recruited for this study. These students were either enrolled in Health and Kinesiology courses (HLKN) or acted as trained volunteer POWER Consultants providing academic writing support for other graduate students. Participants were predominately female (86%), with an average age of 31 years ($SD=6.53$, range=21-50). Less than half of the respondents (40%) were Caucasian; the remaining were Asian American (29%), African American (12%), Hispanic American (5%), International (10%), and 5% reported dual ethnicity. More than half of the sample ($n=24$, 57%) comprised US citizens, while the remaining ($n=18$, 43%) were international students. More than half of the participants reported English as their first language ($n=22$). Among these participants, 10 were first year graduate students, 17 were in their second year, 5 were in the third year, 7 were in the fourth year, and 3 had been in their programs for 5 or more years. Overall, 10 were masters' students and 32 were doctoral students.

Among the sample, 26% ($n=11$) were graduate student POWER Consultants, 55% ($n=23$) were graduate students enrolled in HLKN, and 19% were both POWER Consultants and HLKN graduate students ($n=8$). Table 3.1 summarizes the details of the demographic information for the 42 participants.

3.4.2. Research Questions

Question 1: What are the characteristics of graduate students concerning writing anxiety, writing self-efficacy, and writing self-awareness, as these relate to their academic stress and writing productivity?

To answer this question, I used the pre-test data. Table 3.2 describes the sample's pre-test scores about these factors, for both the combined sample and for sub-groups within each factor. The critical p value was set at 0.01 due to the adjustment described earlier.

Taken together, participants at pretest showed moderate levels of perceived academic stress ($M = 21.60$ $SD = 6.17$), low levels of writing productivity ($M = 9.95$; $SD = 4.47$), high level of self-efficacy ($M = 112.03$; $SD = 27.57$), moderate levels of writing self-awareness ($M = 45.49$; $SD = 11.64$), and moderate levels of writing anxiety ($M=69.49$; $SD = 17.87$).

Table 3.1 Frequency distribution of study sample’s demographic characteristics (N=42).

Characteristics	n (%)
Gender	
Female	36 (85.71)
Male	6 (14.29)
Age	
Mean	31.03
SD	6.53
Range	21 - 50
Race/Ethnicity	
Caucasians	17 (40.48)
African Americans	5 (11.90)
Hispanic Americans	2 (4.76)
Asian Americans	12 (28.57)
International	4 (9.52)
Dual ethnicity	2 (4.76)
Country of origin	
U.S.	24 (57.14)
International	18 (42.86)
Year in graduate school	
First year	10 (23.84)
Second year	17 (40.46)
Third year	5 (11.90)
Fourth year	7 (16.66)
Fifth year	2 (4.76)
Sixth year	1 (2.38)
Academic level	
Master’s	10 (23.81)
Ph.D.	32 (76.19)
Sample Pools	
POWER Consultant	11 (26.19)
HLKN graduate student	23 (54.76)
Both	8 (19.05)
English as first language	
Yes	22 (52.38)
No	20 (47.62)

When comparing sub-groups within each demographic factor, I found no statistically significant differences among sub-groups (Table 3.2) at pre-test. The only exception was writing anxiety: For this factor, POWER Consultants had statistically significant lower levels, than the participants from the HLKN pool ($M_{POWER} = 61.53$ [$SD = 13.33$], $M_{HLKN} = 76.25$ [$SD = 18.72$], $p = 0.008$). The size of the difference (Hedges’ $g = 0.03$), however, was small. Therefore, except for this small difference, the intervention and

control groups reflected similarities concerning all demographic characteristics measured, prior to the start of the intervention (Table 3.2).

Table 3.2 Demographic characteristics of sample of 42 graduate students, by outcome measures*, at pre-test.

Variable	Writing Productivity Means (SD)	Academic Stress Means (SD)	Writing Anxiety Means (SD)	Writing Self-efficacy Means (SD)	Self-awareness Means (SD)
Overall Sample	9.95 (4.47)	21.60 (6.17)	69.49 (17.87)	112.03 (27.57)	45.49 (11.64)
Gender					
Female (N=36)	10.13(4.43)	22.40(5.92)	68.47(17.17)	113.59(27.36)	45.56(11.22)
Male (N=6)	8.80(5.34)	16.00(5.34)	76.00(22.87)	102.00(29.83)	45.00(15.60)
	<i>p</i> =0.545	<i>p</i> =0.028	<i>p</i> =0.388	<i>p</i> =0.389	<i>p</i> =0.921
Age Group					
<30 (N=22)	10.00(4.34)	21.57(6.18)	67.17(17.99)	118.50(21.68)	42.44(7.64)
30+ (N=20)	9.89(4.71)	21.63(6.33)	71.68(17.95)	105.89(31.53)	48.37(14.06)
	<i>p</i> =0.944	<i>p</i> =0.975	<i>p</i> =0.449	<i>p</i> =0.164	<i>p</i> =0.120
Race/Ethnicity					
Caucasians (N=17)	9.67(5.43)	21.18(6.98)	68.40(20.15)	116.40(31.96)	45.93(13.41)
Others (N=25)	10.14(3.81)	21.91(5.64)	70.23(16.59)	109.05(24.47)	45.18(10.59)
	<i>p</i> =0.774	<i>p</i> =0.723	<i>p</i> =0.773	<i>p</i> =0.458	<i>p</i> =0.857
Country of Origin					
English-Speaking (N=10) ¹	7.80(3.43)	19.80(6.63)	74.10(15.29)	113.20(22.86)	44.40(12.73)
Non-English-Speaking (N=32)	10.74(4.60)	22.20(6.00)	67.78(18.70)	111.59(29.51)	45.89(11.44)
	<i>p</i> =0.047	<i>p</i> =0.327	<i>p</i> =0.307	<i>p</i> =0.862	<i>p</i> =0.750
Major					
Health Education (N=20)	10.06(4.25)	19.17(5.54)	70.24(22.21)	115.65(25.07)	42.35(9.76)
Others (N=22)	9.85(4.76)	23.59(6.04)	68.85(13.74)	108.95(29.82)	48.15(12.66)
	<i>p</i> =0.888	<i>p</i> =0.020	<i>p</i> =0.825	<i>p</i> =0.462	<i>p</i> =0.125
Years in Program/Degree					
<3 Years (N=28)	9.92(4.75)	21.07(6.39)	70.76(17.44)	112.52(28.92)	46.16(13.08)
3+ Years (N=14)	10.00(4.02)	22.69(5.76)	66.83(19.23)	111.00(25.72)	44.08(8.20)
	<i>p</i> =0.957	<i>p</i> =0.429	<i>p</i> =0.555	<i>p</i> =0.873	<i>p</i> =0.560
Classification					
Master (N=10)	7.22(3.60)	19.56(6.25)	78.67(21.11)	107.67(27.06)	51.33(12.69)
Doctor (N=32)	10.82(4.42)	22.19(6.12)	66.54(16.02)	113.43(28.07)	43.61(10.86)
	<i>p</i> =0.025	<i>p</i> =0.283	<i>p</i> =0.141	<i>p</i> =0.590	<i>p</i> =0.126
Currently Enrolled in POWER					
POWER (N=19)	11.12(4.73)	22.16(5.92)	61.53(13.33)	121.59(26.29)	44.18(12.24)
HLKN (N=23)	8.95(4.10)	21.10(6.49)	76.25(18.72)	103.90(26.58)	46.60(11.30)
	<i>p</i> =0.149	<i>p</i> =0.591	<i>p</i> =0.008	<i>p</i> =0.050	<i>p</i> =0.538
First Language					
None-English (N=30)	10.69(4.69)	22.04(6.19)	67.58(19.05)	111.08(29.97)	45.92(11.67)
English (N=12)	8.18(3.49)	20.58(6.27)	74.00(14.51)	114.27(21.97)	44.45(12.08)
	<i>p</i> =0.084	<i>p</i> =0.507	<i>p</i> =0.275	<i>p</i> =0.721	<i>p</i> =0.736

Note.

¹: Students from U.S.A., England, and Canada.

P: *t*-test *p*_{calc} value.

* *p*_{critical} = 0.05

Question 2: What is the impact of completing an EW intervention on graduate students' perceived academic stress, writing anxiety, writing self-efficacy, writing self-awareness and writing productivity?

To answer this question, I ran an analysis of covariance (ANCOVA) for each of the factors, controlling for the pre-test scores. Results of these analyses are detailed in Table 3.3. The only significant difference between the intervention and control groups (at $\alpha = .05$) was found in the self-awareness scores ($M_{Interv} = 56.00$, $SD = 11.23$; $M_{Control} = 49.67$, $SD = 8.60$; $F = 4.69$, $p = .0420$) with the intervention group exhibiting stronger self-awareness than the controls, after the intervention. Though statistically significant, the magnitude of the difference was small (Partial $\eta^2 = .18$).

Table 3.3 Analysis of Covariance (ANCOVA) results comparing intervention and control groups' post-test scores on focal variables, controlling for pre-test scores¹.

Variables	Groups		Partial η^2	F	p
	Control (N=21) Mean (SD)	Intervention (N=11) Mean (SD)			
Writing Productivity	12.89 (4.40)	9.64 (4.44)	.06	1.41	.2486
Academic Stress	21.76 (5.39)	22.64 (7.06)	.07	1.69	.2059
Writing Anxiety	66.83 (17.36)	75.36 (21.66)	.01	.10	.7568
Writing Self-Efficacy	105.78 (26.33)	101.55 (37.45)	.04	0.98	.3341
Self-Awareness	49.67 (8.60)	56.00 (11.23)	.18	4.69	.0420*

¹ $p_{Crit} = .05$

Further examination of individual participants' scores and their changes from pre-test to post-test, however, provides important insights.

Table 3.4 Individual academic stress score changes over time, by group.

Control Group				Intervention Group			
ID	PRE Stress	POST Stress	Change	ID	PRE Stress	POST Stress2	Change
1	23	23	0	2	25	21	-4
3	15	16	1	-	-	-	-
5	17	20	3	6	23	26	3
7	22	23	1	-	-	-	-
9	10	11	1	-	-	-	-
11	18	19	1	12	23	18	-5
13	24	24	0	-	-	-	-
15	15	19	4	16	17	20	3
17	21	21	0	18	20	25	5
19	9	12	3	-	-	-	-
21	15	19	4	22	25	16	-9
23	22	22	0	-	-	-	-
27	21	22	1				
28	13	19	6	26	27	22	-5
29	26	26	0	-	-	-	-
31	28	26	-2	-	-	-	-
33	28	27	-1	32	28	42	14
35	29	29	0	36	20	20	0
38	28	28	0	-	-	-	-
39	33	33	0	40	32	18	-14
42	18	18	0	41	28	21	-7
Total	20.71	21.76	1.05		24.36	22.64	-1.73
Score	(SD=6.57)	(SD=5.39)	(SD=1.91)		(SD=4.34)	(SD=22.64)	(SD=7.73)

Difference in academic stress scale score change between groups: -2.78, P= 0.1254
Effect size: Hedges' g = 0.59

Note.

-: Cases dopped from intervention.

P: *t*-test *p* value.

For example, in Table 3.4, academic stress scores declined, overall, (-1.73) in the intervention group, while they increased (1.05) in the control group; the difference between the two groups, however, (-2.78) was not statistically significant ($p=0.125$). Among the 11 cases in the intervention group, over half ($n=6$, 55%) reported a decrease in academic stress from pretest to post-test. In comparison, the number of students in the control group reporting a decrease in academic stress was 2 (10%) out of 21.

As shown in Table 3.5, the scores for writing anxiety in the control group remained very stable over time with almost no change. However, among the 11 students in the intervention group, changes in anxiety scores varied substantially. While one student

reported no change over time, half (n=5) of the remaining students experienced an increase in anxiety, and the other half (n=5) experienced a decrease.

Table 3.5 Individual writing anxiety score changes over time, by group.

Control Group				Intervention Group			
ID	PRE Writing Anxiety	POST Writing Anxiety	Change	ID	PRE Writing Anxiety	POST S Writing Anxiety	Change
1	64	65	1	2	60	104	44
3	48	49	1	-	-	-	-
5	61	62	1	6	86	63	-23
7	49	50	1	-	-	-	-
9	47	47	0	-	-	-	-
11	110	110	0	12	61	56	-5
13	.	.	.	-	-	-	-
15	53	53	0	16	60	61	1
17	62	63	1	18	71	86	15
19	66	66	0	-	-	-	-
21	54	55	1	22	73	40	-33
23	80	80	0	-	-	-	-
27	52	53	1				
28	84	84	0	26	65	64	-1
29	89	89	0	-	-	-	-
31	.	.	.	-	-	-	-
33	59	58	-1	32	118	115	-3
35	89	89	0	36	78	80	2
38	.	.	.	-	-	-	-
39	75	74	-1	40	69	78	9
42	57	56	-1	41	82	82	0
Total	66.61	66.83	0.22		74.82	75.36	0.55
Score	(SD=17.57)	(SD=17.36)	(SD=0.73)		(SD=16.82)	(SD=21.66)	(SD=19.74)

Difference in writing anxiety scale score change between groups: 0.33, P=0.9445

Effect size: Hedges' $g = 0.03$

Note.

-: Cases dopped from intervention.

P: t -test p value.

For self-awareness (see Table 3.6), among the 11 students in the intervention group, most (n=7, 64%) reported an increase in self-awareness from pretest to posttest. In contrast, only a few students (N=5, 28% of the 18 students in the control group) reported some, but negligible, increases in their scores (1 or 2 points). There were 3 students in the control group who didn't complete the self-awareness scales, either at pre or post-test. Nonetheless, post-test scores detected a small, but statistically significant difference in favor of the intervention group.

Table 3.6 Individual self-awareness score changes over time, by group.

Control Group				Intervention Group			
ID	PRE Self Awareness	POST Self Awareness	Change	ID	PRE Self Awareness	POST Self Awareness	Change
1	54	54	0	2	33	47	14
3	27	27	0	-	-	-	-
5	43	43	0	6	49	43	-6
7	38	38	0	-	-	-	-
9	37	37	0	-	-	-	-
11	37	39	2	12	48	45	-3
13	.	.	.	-	-	-	-
15	44	44	0	16	46	62	16
17	38	38	0	18	49	62	13
19	45	46	1	-	-	-	-
21	38	38	0	22	45	43	-2
23	35	35	0	-	-	-	-
27	30	30	0				
28	28	28	0	26	57	59	2
29	44	44	0	-	-	-	-
31	.	.	.	-	-	-	-
33	48	49	1	32	73	76	3
35	35	35	0	36	47	50	3
38	.	.	.	-	-	-	-
39	57	59	2	40	47	70	23
42	47	48	1	41	59	59	0
Total Score	40.28 (SD=8.24)	40.67 (SD=8.60)	0.39 (SD=0.70)		50.27 (SD=10.06)	56.00 (SD=11.23)	5.73 (SD=9.27)

Difference in self-awareness scale score change between groups: 5.34, T-test P= 0.0206
Effect size: Hedges' $g = 0.99$

Note.

-.: Cases dopped from intervention.

^p: *t*-test *p* value.

For writing self-efficacy (Table 3.7), in the intervention group some students (n=5) reported an increased self-efficacy score, some (n=5) reported a decrease, and one (n=1) reported no change. In the control group, 17 students exhibited lower self-efficacy scores, and 1 reported no change. There were 3 students in the control group who didn't complete the self-efficacy scales at both pre and post-test.

Table 3.7 Individual writing self-efficacy score changes over time, by group.

Control Group				Intervention Group			
ID	PRE Self-Efficacy	POST Self-Efficacy	Change	ID	PRE Self-Efficacy	POST Self-Efficacy	Change
1	70	66	-4	2	136	76	-60
3	157	144	-13	-	-	-	-
5	128	115	-13	6	83	131	48
7	117	101	-16	-	-	-	-
9	172	152	-20	-	-	-	-
11	79	71	-8	12	124	126	2
13	.	.	.	-	-	-	-
15	132	121	-11	16	113	105	-8
17	106	102	-4	18	108	92	-16
19	141	123	-18	-	-	-	-
21	140	127	-13	22	125	174	49
23	93	90	-3	-	-	-	-
27	143	133	-10	-	-	-	-
28	85	82	-3	26	71	72	1
29	106	83	-23	-	-	-	-
31	.	.	.	-	-	-	-
33	106	106	0	32	52	33	-19
35	120	89	-31	36	117	128	11
38	.	.	.	-	-	-	-
39	74	69	-5	40	101	87	-14
42	149	130	-19	41	93	93	0
Total	117.67	105.78	-11.89		102.09	101.55	-0.55
Score	(SD=29.94)	(SD=26.33)	(SD=8.24)		(SD=25.41)	(SD=37.45)	(SD=30.51)
Difference in writing self-efficacy scale score change between groups: -11.34, T-test P= 0.2531							
Effect size: Hedges' $g = 0.60$							

Note.

-.: Cases dopped from intervention.

P: *t*-test *p* value.

For writing productivity (Table 3.8), in the intervention group some students (n=5) reported an increased productivity score, some (n=3) reported a decrease, and others (n=3) reported no change. In the control group, 10 students reported an increased productivity score, and none of them reported either a decrease, or change. There were 3 students in the control group who did not complete the writing productivity scales at pre or posttest.

Table 3.8 Individual writing productivity score changes over time, by group.

Control Group				Intervention Group			
ID	PRE Productivity	POST Productivity	Change	ID	PRE Productivity	POST Productivity	Change
1	8	10	2	2	10	4	-6
3	19	19	0	-	-	-	-
5	14	14	0	6	10	10	0
7	12	12	0	-	-	-	-
9	20	20	0	-	-	-	-
11	4	4	0	12	12	13	1
13	.	.	.	-	-	-	-
15	10	14	4	16	8	13	5
17	12	12	0	18	10	9	-1
19	7	13	6	-	-	-	-
21	14	14	0	22	12	18	6
23	10	16	6	-	-	-	-
27	12	14	2				
28	11	15	4	26	8	9	1
29	4	4	0	-	-	-	-
31	.	.	.	-	-	-	-
33	8	12	4	32	4	4	0
35	6	10	4	36	13	10	-3
38	.	.	.	-	-	-	-
39	6	10	4	40	4	12	8
42	17	19	2	41	4	4	0
Total	10.78	12.89	2.11		8.64	9.64	1.00
Score	(SD=4.76)	(SD=4.04)	(SD=2.22)		(SD=3.35)	(SD=4.41)	(SD=4.02)

Difference in writing productivity score change between groups: -1.11, P=0.3444
Effect size: Hedges' g = 0.38

Note.

-.: Cases dopped from intervention.

P: *t*-test *p* value.

Question 3: Based on the content of the participants' essays — written during the intervention — what are the characteristics of these essays (e.g., length of the text, use of positive/negative terms, and topics expressed)? Furthermore, does the content of these essays suggest any patterns or trends?

To answer this question, data were drawn from the intervention group's essays. As mentioned previously, the participants were asked to write 20 minutes a day for 4 days during the intervention. Consequently, there were a total of 59 essays with 21 (35.6%) in Day 1, 14 (23.7%) in Day 2, 13(22%) from Day 3, and 11 (50%) from Day 4. The length of

the essays varied across the 4 days. The longest essay had 365 words (from Day 1), while the shortest essay had just 92 words (from Day 4).

Of the 59 essays collected, 26 (45%) shared the students' worries and frustrations about manuscripts, publications, academic writing, or conference abstract writing. Sixteen (27%) essays expressed writing anxiety with course work and how to "fit" in graduate school. Eleven (19%) essays focused on goals and plans needed to take action in the future. The remaining 6 (10%) essays shared some specific reasons to feel stressed. For example, one graduate student (ID 32) used this EW intervention to write about personal stories, joys and sadness. Overall, participants expressed that this was a "great" intervention. Some concluded that, because "writing is thinking, now I feel more clear-minded" (ID 26).

I performed a brief content analysis to examine and contrast essays written on Day 1 and Day 4. Doing so could provide potentially insightful information about patterns or trends over time. Findings from this analysis are reported in Table 3.9 and Table 3.10. As shown in the table, the five themes assessed by the questionnaires in the study also emerged from the texts.

Though similar themes can be found in Day 1 and Day 4 essays, one potential trend was observed. First, the essays on Day 1 showed great concerns/ frustrations about academic life (course work, conference paper submissions, uncertainty about future career, and professional development). On Day 4, the essays revealed fewer worries and concerns about academic life. For example, one participant wrote, "...I feel like my self-esteem is building up and I am getting more mature. I have ten more minutes left...I mean I cannot write my stressful experience in my academic lives for four days. Lol... I mean I

don't feel that much stressful anymore.” (ID 12). Another (anticipated) trend was a decrease in the length of essays on Day 4, compared to Day 1.

As shown in Table 3.11, which includes full quotes from selected essays, the content analysis also revealed themes relating to positive, negative, and mixed feelings reported by participants. It is interesting to note that both the negative and mixed feelings illustrative quotes contain ambiguous emotions that could fall into either category depending on context, which provides evidence of the challenges that participants encounter as they work toward higher levels of writing productivity.

Table 3.9 Qualitative themes from Intervention group on Day 1

Theme	Illustrative quotes
Academic stress	<ul style="list-style-type: none"> •Having so so so so much to do always. ID 2 •My most stressful current experience is the learning process that comes with beginning a doctoral program ID 6 •I am worried about my preliminary examination. However, I believe I can make it. ID 12 •I am presenting at a conference at the end of this week that provides many challenges of its own. ID 16 •My current most stressful experience and challenges in my academic lives is to write manuscripts. ID 22 •Knowing someone is going to read all of this stresses me out. It's hard to identify me but not that hard. I would tell more specific stories if I felt it was truly anonymous. ID 32 •My stressful experience was to conduct a project and a study. -ID 40 •My current stressful experience/challenge today is two-fold: scheduling and resistance to writing. I want to be a disciplined person who follows a schedule, but I have never really been that. ID 41 •I feel pressed for time almost all the time. And I think I don't have the energy to do all the things I have to do. ID 2
Writing Anxiety	<ul style="list-style-type: none"> •I have been pretty stressed out about writing for two conferences ID 18 •My current stressful experience/challenge today is two-fold: scheduling and resistance to writing ID 16 •Finally, I am feeling pressured to write it. My advisor often asks me about my progress about the paper and when I am going to present it. ID 26 •There's something about putting things on paper that I have an almost irrational avoidance of. ID 40
Writing self-efficacy	<ul style="list-style-type: none"> •I should start a little "toolbox" of articles, resources, etc., that seem to be the most useful. That way I have a quick reference point. I bet studying for the CHES will help me to revisit everything I've learned. ID 2 •The other thing I was thinking of doing was getting a virtual writing pal, another doctoral student at another institution who doesn't know me and I don't know them but I just write and write and then send the work to the other for edits and critique. ID 22
Self-awareness	<ul style="list-style-type: none"> •I have tried my best. It is only the concentration that I sometimes don't have because of being stressed and also the resistance to doing other things. ID 12 •I need to figure out how to use certain libraries of the program I am using. ... The good thing though is that there is an online support community, and actually I can ask to the developers about issues with this program. ID 32 •I also need to go ahead and get my reading and writing logs going. ID 41
Writing Productivity	<ul style="list-style-type: none"> •This (copying write method) is a really great way to practice writing. I found if I did that repeatedly, I would use similar sentence structure when I wrote my manuscript. ID 40 •I also trying to be more active in my professional society. I am volunteering to edit a wiki page. Seems fun, so far I have created my profile. I want to do it to push myself to write. ID 41

Table 3.10 Qualitative themes from Intervention group on Day 4

Theme	Illustrative quotes
Academic stress	<ul style="list-style-type: none"> • I am struggling here to make my dissertation a little toward practice, so I have something to offer. ID 002 • This morning I just got a rejection letter from a journal that I submitted one of my manuscript. It was a very quick rejection. I submitted it last week and received the assignment number this morning ID 12 • It's not easy to concentrate on writing papers. ID 22 • Having trouble with MAX hours remains my stressful situation. I worry about school the most, but there are other things as well. I worry I will fail; I worry I didn't change a citation enough; I worry that I won't have my books to start the semester... ID 32
Writing Anxiety	<ul style="list-style-type: none"> • My current most stressful experience and challenges in my academic lives is to write manuscripts. ID 40 • I feel pressed for time almost all the time. And think I don't have the energy to do all the things I have to do. ID 6 • I am not sure what exactly that will consist of and if I will be able to map all that is required. I do not feel confident in this, even though I have taken several classes to try and prepare me. ID 16 • I haven't yet gotten a good schedule down for when to work on school related tasks. ID 26
Writing self- efficacy	<ul style="list-style-type: none"> • The other thing I was thinking of doing was getting a virtual writing pal, another doctoral student at another institution who doesn't know me and I don't know them but I just write and write and then send the work to the other for edits and critique. ID 22 • I have a plan to realize it. day by day, my writing skill become better. It is true that if you have a writing habit, you will like to write. It is a kind of developing a writing habit similar to developing exercise habit. You be good. ID 26
Self-awareness	<ul style="list-style-type: none"> • I have tried my best. it is only the concentration that I sometimes don't have because of being stressed and also the resistance to doing other things. • I guess I have already told everything. But I repeat them here. Publication, several steps you need to pass to get your degree ID 6 • I need to figure out how to use certain libraries of the program I am using. ... The good thing though is that there is an online support community, and actually I can ask to the developers about issues with this program. ID 32 • I also need to go ahead and get my reading and writing logs going. ID 41
Writing Productivity	<ul style="list-style-type: none"> • Try to write papers every day recently. ID 26

Table 3.11 Positive, negative and mixed feelings expressed by participants in their written essays, in Day 1 and Day 4 of the intervention.

	Feelings expressed in written essays	Feelings expressed in written essays
	<i>Day 1</i>	<i>Day 4</i>
Theme	Illustrative quotes	Illustrative quotes
Positive feelings and thoughts	<ul style="list-style-type: none"> • Try to write papers every day. I have a plan to realize it. Day by day, my writing skill become better. It is true that if you have a writing habit, you will like to write. It is a kind of developing a writing habit similar to developing exercise habit. You be good. ID 26 • Academic writing includes specific structures and ways to organize everything of a study. However, I am so lucky to have great colleagues and friends working with me. ID 40 	<ul style="list-style-type: none"> • I started a new habit (started this morning) of generating a list of 10 ideas daily. It was hard. I didn't even know what kind of ideas to think about. But I did actually get a few good ones. I read something recently about how doing that every day gets your brain used to coming up with ideas - good and bad, doesn't matter - will help you to be able to think better on your feet and come up with ideas in your work and in your life. ID 2 • Instead of all those impatient times I just could sit down and write and get rid of the anxiety that I had within. I think I won't need 20 minutes. even 10 minutes will do me good. ID 18 • Try to write papers every day. I have a plan to realize it. day by day, my writing skill become better. It is true that if you have a writing habit, you will like to write. It is a kind of developing a writing habit similar to developing exercise habit. You be good. ID 26 • I should go ahead and order one soon so I can start getting used to it and be able to transfer dates from my old, heavy planner. I also need to go ahead and get moving on turning in my transcript to my advisor. ID 41
Negative feelings and thoughts	<ul style="list-style-type: none"> • I feel like I'll be judged if I don't write how others do or if I'm not performing at the level others think I should be. It's a never-ending cycle of writing and exposing oneself. I sometimes can't believe I'm in the program or that I may one day be in the shoes of my professors and chair, it's like how I am supposed to lead other students to greatness if I'm mediocre. ID 36 • There's something about putting things on paper that I have an almost irrational avoidance of. I know that a big part of it comes 	<ul style="list-style-type: none"> • The hard thing is that faculty members do not have the insight to help me out with that. They have not worked in such environments before and they cannot guide me. I will and I should find a way to solve this problem otherwise I will end of working in a job that do not like. ID 6 • I always questioned about myself. Or just earn a degree from the USA? What's your next step? What's your future? It's really hard to adjust myself. I am at a loss what to do. Every day is lack of efficiency. I am wasting my life. ID 32

from the fear of vulnerability that comes with putting things in writing. It's what keeps me from writing a journal--the idea that someone will read it and know my deepest, darkest secrets and know that I am not the person they think I am. ID 41

- I feel like I'll be judged if I don't write how others do or if I'm not performing at the level others think I should be. It's a never-ending cycle of writing and exposing oneself. I sometimes can't believe I'm in the program or that I may one day be in the shoes of my professors and chair, it's like how I am supposed to lead other students to greatness if I'm mediocre. ID 40

Mixed feelings and thoughts	<ul style="list-style-type: none"> • I want to do it to push myself to write. Normally I write a kind of diary. Sometimes a paragraph, sometimes less. Here I write very personal stuff; the kind of stuff that I will not show to anybody. ID 16 • I worry about school the most, but there are other things as well. I worry I will fail; I worry I didn't change a citation enough; I worry that I won't have my books to start the semester... ID 36 • I don't know if I would say writing has not become a habit for me yet, but I can see the benefits of writing a little bit every day. Just someplace to let my mind wander. ID 41 	<ul style="list-style-type: none"> • So far it is a kind of a lonely journey for me. However, one of the reasons I registered to this seminar was to find out what other faculty and students are doing in their research. In that aspect I think it has been a good experience overall. -ID 36 • I was thinking, have I wasted my time in grad school going through all the difficulties to get my PhD and now they tell me it is worthless in real world. ID 41
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3.5. Discussion

This study aimed to investigate the relationship among expressive writing (EW), academic stress, writing anxiety, writing self-efficacy, writing self-awareness, and writing productivity among 42 graduate students sampled at a research-intensive university in the US. Analyses indicated a significant change in writing self-awareness scores, but no changes in the other variables. Although not statistically significant, changes in the other factors I examined were in a positive direction, e.g., individual participants' academic stress scores decreased and writing productivity scores increased.

Although several previous studies have documented opposite findings (Lepore & Smyth, 2002; Travagin, Margola, & Revenson, 2015; Sloan & Marx, 2018), Cho &

Hacker (2007) suggest self-awareness is an important factor in enhancing writing productivity for graduate students. Having the chance to write/reflect on one's academic stress and – perhaps for the first time – identify its causes and consider coping strategies, could have significantly affected participants by sharpening their self-awareness. In future research, the potential role of self-awareness as a moderator to reduce academic stress and enhance writing productivity deserves further exploring.

Close examination of the data for individual participants also suggests that an EW intervention also may be useful for reducing writing anxiety among graduate students – as changes were in a positive direction, over time, even if not statistically significant. While we know of no other studies assessing the utility of EW as an intervention with graduate students, some studies have investigated different approaches to overcoming writing anxiety (Jahin, 2007; Bobanovic, 2016). These authors suggest workgroups or establishing a sense of community might be useful strategies. In other studies, a brief writing intervention, designed to expose students to strategies and tools for improving writing self-efficacy and reducing writing anxiety, also demonstrated positive outcomes (Huerta et al., 2017; Goodson et al., 2021, *in review*).

In our sample, the EW intervention did not affect participants' perceived academic stress or their writing productivity, significantly. It is likely there is no “magic-pill” solution for these difficulties, given these are complex phenomena which involve personal traits, cognitive skills, as well as complex self-management behaviors. Nonetheless, EW appears to be a simple, feasible, and cost-effective strategy graduate students can explore to cope specifically with writing self-awareness (and, perhaps, indirectly, with writing anxiety), given this study's findings. Indeed, support for EW as a useful tool to manage various types of emotional stress (including trauma and anxiety), is quite established in the

writing research literature (Ames et al., 2005; Baddeley & Pennebaker, 2011; Fernández, Páez, & Pennebaker, 2009; Fuentes, Kahn, & Lannin, 2021; Gortner, Rude, & Pennebaker, 2006; La Marca, Maniscalco, Fabbiano, Verderame, & Schimmenti, 2019; Neighbors et al., 2020a; Neighbors et al., 2020b; Pennebaker, 2017; Pennebaker, 2018; Qian et al., 2020; Seih, Chung, & Pennebaker, 2011; Sexton et al., 2009; Slatcher Richard & Pennebaker James, 2006; Smyth & Pennebaker, 2008; Spera, Buhrfeind, & Pennebaker, 1994)

Because EW is cheap and rather easy to implement, it can also be a strategy that health educators might consider adding to their toolkits when designing stress management programs for graduate students. As EW has shown to be useful for achieving healthy outcomes (see the meta-analysis reported in Chapter 2), health educators should be encouraged to learn about, try for themselves, and consider adding EW as one more health-enhancing technique/tool to their program design toolbox. Health education programs and professional development workshops could also begin to incorporate EW in their training curricula.

Alongside the one positive finding in this study (i.e., a statistically significant improvement in writing self-awareness), surprisingly, there were no observable changes in the sample's scores for writing anxiety or writing self-efficacy. A few elements might explain this null finding: First, the small sample size in this study. Even though the study's design called for equally balanced groups, attrition was a serious problem, especially for the intervention group. Of the 21 students assigned to the intervention, only 11 completed the full protocol (all 4 days of writing). This level of attrition led to reduced statistical power and, potentially, the inability to capture any changes for which a larger sample would be needed.

Other studies following Pennebaker's protocol have not experienced a level of attrition as high as this study's because those protocols usually have participants writing in classrooms or laboratory settings (Knowles et al, 2011; Lu et al., 2012; Niles, 2014). In these instances, participants are "forced" to write at designated times, and protocols are strictly followed, preventing attrition almost entirely. In my study, participants volunteered and wrote their essays at the time they chose; they did not adhere to a regular or strict writing routine. This freedom may explain the number of essays completed varying from 21, to 14, 13, and 11 on Days 1, 2, 3, and 4, respectively.

Another reason the scores for writing self-efficacy, specifically, did not change significantly could be the fact that EW interventions are not designed to focus on increasing participants' confidence about writing, but only on expressing emotions. To develop/change self-efficacy would require intentionally designing interventions to allow participants to learn and to practice writing, in specific ways. A recent study evaluating the effects of a brief writing intervention targeting self-efficacy (among other factors such as writing anxiety) has documented large effect-sized differences in self-efficacy scores, among a sample of graduate students (similar in characteristics to this study's sample; see Goodson et al, 2021, *in review*). Therefore, a simple reason my study did not capture significant changes in self-efficacy could be the scope and nature of the EW intervention, itself.

In this study, perceived academic stress and writing productivity scores did not change significantly, either. Similar to self-efficacy, the intervention group's attrition and subsequent loss of statistical power may explain the null findings. Moreover, the complex nature of the variables may not have been adequately captured with the measures I employed (despite their adequate reliability). However, it is reasonable to assume that

writing productivity, at least, is difficult to change substantially in the span of only 4 days. Future research, therefore, should plan periodic and long-term post-test follow-ups with participants, in order to detect potential productivity changes over time.

Despite what we can learn from this study, it is important to acknowledge its inherent limitations. First, as discussed above, attrition represented a significant problem. The freedom to write without supervision or strict contingencies, led to substantial attrition in the intervention group. Future studies would do well to consider different protocols when carrying out a similar inquiry with a graduate student population.

A second limitation of this study was my inability to test the proposed theoretical model and explore whether writing anxiety, writing self-efficacy, and writing self-awareness mediated the effect of EW upon academic stress and writing productivity. The sample size I recruited, and the attrition observed in the intervention group precluded this analysis. It was unfortunate that the study lacked statistical power, because the measures performed quite well with my sample (see the internal consistency/reliability coefficients I reported under *Measures*). Future studies of this topic, therefore, should weigh whether to design a manageable intervention or recruit a large enough sample for model testing (researchers must consider the volume of essay-data to be analyzed and managed, if samples larger than, say, 200 participants are recruited).

Another potential limitation was the reliance on self-reported data, especially that contained in the essays. Because participants knew their writing would be read, later, and because they knew that I (the researcher) was also a graduate student, fear of appearing weak, or experiencing high levels of academic stress, might have shaped participants' essay writing and responses to the surveys. Replications of this study (or others like this one) should consider this potential limitation and plan accordingly, perhaps by sharing

with participants the kind of analyses their essays would undergo. If participants could “see” how their texts, during content analysis, are completely de-identified and fragmented into units of meaning, they might feel more comfortable expressing themselves freely.

In conclusion, although this study did not provide overwhelming support for EW as a tool for managing perceived academic stress and enhancing writing productivity among a sample of graduate students, findings *do* point to a potential intervention effect. Combined with previous studies’ findings on EW’s utility to manage stress of all kinds, it is reasonable to assume that EW can become a useful and cost-effective tool for individuals in academic settings, as well as for health promotion programs at colleges and universities.

As the research on EW and academic stress among graduate students is still sorely lacking, and scholars have only recently begun to examine graduate students’ struggles with academic writing (Huerta et al., 2017; Goodson et.al., 2021, *in review*), it is reasonable to conclude that a substantial gap remains, ready for further exploration. Further research by health education/health promotion scholars on this topic could contribute to developing a stronger evidence-base in support of EW for academic populations. This research could also influence program development for academic populations, by refining the ways in which writing (in general) and EW (in particular) can be used with different academic groups such as undergraduates, faculty, staff and other academic stakeholders. Health educators would do well, therefore, to learn more about the potential benefits of EW and contribute to the emerging, albeit still small, knowledgebase regarding the relationship between writing and health.

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4. CONCLUSIONS

The central purpose of this dissertation was to investigate the effects of expressive writing (EW) on reducing academic stress and enhancing writing productivity among a sample of graduate students at a research-intensive university in the US. In order to achieve this purpose, I conducted two independent studies: (1) A meta-analysis assessing the relationship between EW and stress (Chapter II); and (2) a quasi-experimental intervention study designed to examine the effects of EW on reducing academic stress and enhancing writing productivity among a sample of graduate students.

The meta-analysis on the relationship between EW and stress (Chapter 2) resulted in two major findings. First, the analysis revealed a positive, statistically significant, and moderately sized relationship between EW and stress reduction (Hedges' $g = 0.411$).

The second major finding from the meta-analysis was that EW interventions work best for reducing stress among younger populations (less than 49 years old). Thus, it may, indeed, be beneficial to add EW interventions as a component in health promotion programs designed for populations such as university students — both undergraduate and graduate students.

In Chapter 3, I report on a study designed to assess the effect(s) of an EW intervention on reducing academic stress and enhancing writing productivity among a sample of graduate students. The study provided three key findings and insights. The first was that EW was beneficial for enhancing writing self-awareness among the sample. Even though not statistically significant, the other factors examined also showed changes in a positive direction. The small sample size resulting from attrition in the intervention group may have affected the study's statistical power and resulted in statistically null

findings. The changes in the groups' raw scores, however, suggest a potential impact that deserves further scrutiny. Given the significant gap in the literature regarding studies exploring the relationship among expressive writing, academic performance, and health, my study helped confirm that Pennebaker's EW protocol can be a useful intervention to help manage academic stress, overall, but specifically for my sample, to enhance writing self-awareness.

The second key insight from Chapter 3 was identifying important considerations for introducing EW as a component in health promotion studies or interventions. Researchers and practitioners would do well to carefully consider protocols that prevent high attrition rates, studies with larger (and more diverse samples), and expanding EW interventions to other academic populations.

Given the benefits of EW I uncovered in these two studies, it is reasonable to conclude the findings from this dissertation *do* support a rationale for further exploring EW interventions to manage academic stress in general (but, particularly, writing self-awareness) and, potentially, additional forms of stress, among graduate student populations.

4.1. Recommendations for Future Research and Practice

Other studies, similar to the one I report in Chapter 3, are needed to validate my findings and to test various contingencies, populations, and designs. Future studies using EW to reduce academic stress and enhance writing productivity also could benefit from extending the intervention to various populations *within academic settings*, such as faculty and staff. It is plausible that creating a culture favorable toward using EW to manage

stress might benefit graduate students, also, through the positive influence/behavior of other members in the academic communities they belong to.

Moreover, researching EW interventions might be a case in which the *research becomes the intervention*, allowing participants to observe, for themselves, the benefits of EW and, perhaps, experience some stress reduction *while participating* in the research study, alongside adopting a long-lasting habit of using EW to manage daily stressors.

In summary, despite its limitations (see Chapters 2 and 3), this dissertation, as an integrated body of work provided: (a) a rationale for future use of EW to study (and intervene upon) academic stress; (b) ways in which expressive writing has been used in the health research literature; and (c) specific considerations for programmatic interventions and research aimed at reducing academic stress and enhancing writing productivity among graduate students in research-intensive universities.

APPENDIX A

QUESTIONNAIRE

STATEMENT OF CONSENT

I agree to be in this study and know that I am not giving up any legal rights by agreeing to complete this survey. The procedures, risks, and benefits have been explained to me, and my questions have been answered. By entering and completing the survey, I agree to give the researcher permission to use the survey data for research purposes.

PLEASE SELECT EITHER “I AGREE” OR “I DISAGREE” BELOW.

- I agree
- I disagree

Demographic questions

1. What is your age?
2. Are you male or female?
3. What do you consider yourself in terms of race/ethnicity?
4. Is English your first language?
5. What do you consider your first language?
6. Are you an international student?
7. What is your country of origin?
8. What is your academic classification?
9. What is your area of study?
10. What is your area of teaching/researching? (If it does not apply, type in N/A)
11. What is your academic department? (Example: Architecture, Animal Science, Educational Psychology, Health & Kinesiology, Aerospace Engineering, Oceanography, Communications, etc.)
12. How long have you been in your current academic program or position?
13. You are currently enrolled in:

Perceived Academic Stress Scale (never, almost never, sometimes, fairly often, very often)

1. In the last month, how often have you been upset because of something that happened unexpectedly?

2. In the last month, how often have you felt that you were unable to control the important thing in your life?

3. In the last month, how often have you felt nervous and “stressed”?

4. In the last month, how often have you felt confident about your ability to handle your personal problems?

5. In the last month, how often have you felt that things were going your way?

6. In the last month, how often have you found that you could not cope with all the things that you had to do?

7. In the last month, how often have you been able to control irritations in your life?

8. In the last month, how often have you felt that you were on top of things?

9. In the last month, how often have you been angered because of things that were outside of your control?

10. In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?

Writing Anxiety (strongly agree, somewhat agree, neither agree nor disagree, somewhat disagree, strongly disagree)

-
1. I avoid writing.

 2. I have no fear of my writing being evaluated.

 3. I look forward to writing down my ideas.

 4. I am afraid of writing papers when I know they will be evaluated.

 5. Taking a writing course is a very frightening experience.

 6. Handing in a paper makes me feel good.

 7. My mind seems to go blank when I start to work on a paper.

 8. Expressing ideas through writing seems to be a waste of time.

 9. I would enjoy submitting my writing to peer-reviewed journals for evaluation and publication.

 10. I like to write my ideas down.

 11. I feel confident in my ability to clearly express my ideas in writing.

 12. I like to have my colleagues read what I have written.

 13. I'm nervous about writing.

 14. People seem to enjoy what I write.

 15. I enjoy writing.

 16. I never seem to be able to clearly write down my ideas.

 17. Writing is a lot of fun.

 18. I expect to do poorly in classes that involve a lot of writing.

 19. I like seeing my thoughts on paper/computer.

 20. Discussing my writing with others is an enjoyable experience.

 21. I have a terrible time organizing my ideas when writing a paper.

 22. When I hand in a paper I know I'm going to do poorly.

 23. It's easy for me to write a good paper.

 24. I don't think I write as well as most other people.

 25. I don't like my papers to be evaluated.

 26. I'm not good at writing.

Writing Self-Efficacy (No I cannot do this at all, 2, 3, 4, 5, 6, Yes, I can do this very well)

-
1. When given a specific writing assignment, I can come up with a suitable topic in a short time.

 2. I can start writing with no difficulty.

 3. I can generate “messy drafts” that, later, I edit and refine.

 4. I can adjust my style of writing to suit the needs of my audiences.

 5. I can find a way to concentrate on my writing even when there are many distractions around me.

 6. When I have a pressing deadline on a paper, I can manage my time efficiently.

 7. I can meet the writing standards of an evaluator who is very demanding.

 8. I can come up with examples from the reviewed literature, to illustrate an important point.

 9. I can rewrite my wordy or confusing sentences clearly.

 10. I can locate and use appropriate reference sources when I need to document an important point.

 11. I can write very effective transitional sentences from one idea to another, when I’m editing my paper(s).

 12. I can effectively separate generating text from editing text.

 13. I can refocus my concentration on writing when I find myself thinking about other things.

 14. I can schedule my writing times during a given week, at more-or-less the same time.

 15. I can protect my writing schedule/times.

 16. I can write “tight” paragraphs, centered on a single key idea.

 17. I can plan my writing, before I start, using mind maps.

 18. When I get stuck writing a paper, I can find ways to overcome the problem.

 19. I can find ways to motivate myself to write a paper even when the topic holds little interest for me.

 20. When I edit a long or complex paper I have written, I can find and correct most of my grammatical errors.

 21. I can revise a first draft of any paper so that it is better organized.

 22. I can obtain the appropriate feedback I need, during various stages of my writing project.

 23. I can write comfortably in academic English.

 24. I can begin a new writing session easily, because I make notes to myself that remind me where to begin, each time.

 25. I can use writing to think my way through a problem, or to answer a question I have.

 26. I can find other people who will give feedback on early drafts of my paper(s).

Writing Self-Awareness (strongly agree, somewhat agree, neither agree nor disagree, somewhat disagree, strongly disagree)

-
1. I know when to speak about my personal problems to others.

 2. When I am faced with obstacles, I remember times I faced similar obstacles and overcame them.

 3. Some of the major events of my life have led me to re- evaluate what is important and not important.

 4. When my mood changes, I see new possibilities.

 5. Emotions are one of the things that make my life worth living.

 6. I am aware of my emotions as I experience them.

 7. I expect good things to happen.

 8. I like to share my emotions with others.

 9. When I experience a positive emotion, I know how to make it last.

 10. I seek out activities that make me happy.

 11. I am aware of the non-verbal messages I send to others.

 12. I present myself in a way that makes a good impression on others.

 13. When I am in a positive mood, solving problems is easy for me.

 14. I know why my emotions change.

 15. When I am in a positive mood, I am able to come up with new ideas.

 16. I easily recognize my emotions as I experience them.

 17. I motivate myself by imagining a good outcome to tasks I take on.

 18. When I feel a change in emotions, I tend to come up with new ideas.

 19. When I am faced with a challenge, I give up because I believe I will fail.

 20. I use good moods to help myself keep trying in the face of obstacles.

Writing Productivity (do not agree, 2, 3, 4, fully agree)

-
1. I produce a large number of finished texts.

 2. I am a regular and productive writer.

 3. I write regularly regardless of the mood I am in.

 4. I write whenever I have the chance.

Essay writing for EW intervention group:

In this session I would like for you to write about your current most stressful experience and challenges in your academic lives. Really let go and explore your feelings and thoughts about it. The text will be kept completely confidential. If you wish, you may use pseudonyms or initials to refer to specific people in your text.

The only rule is that you must write continuously for the entire time for 20 minutes. Don't worry about grammar, spelling, or sentence structures. Don't worry about erasing or editing.

You may start: