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A Systematic Review of the Methodology of Expressive
Writing Intervention Studies:
Examining Location

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Candidate for B.A. Degree
in Psychology with Honors

May 2006

APPROVED

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To my brother, and friend, Raffael:

You are a constant role model for me to admire and follow.
Your success has continued to inspire and guide me towards my own.

This is for you.

Abstract

Expressive writing interventions pertain to emotional disclosure through structured writing. Despite the encouraging results of controlled expressive writing studies, efforts to expand it into applied settings have been less successful and results have been more inconsistent. One varying factor among pertinent studies is the investigators' alteration of the location of writing (both within and between studies). The purpose of this study is to systematically review the methodology and parameters of expressive writing intervention studies. A computer literature search was conducted using the PsycINFO and MedLine databases to identify peer reviewed articles of randomized controlled trials of the expressive writing intervention studies. A total of 406 articles were found, of which 68 qualified for this study. Two blind raters independently evaluated and rated the methodology and parameters of randomized expressive studies using a standardized rating scale. Disagreements in ratings were resolved through consensus. A significant inconsistency in the qualities of reporting methodological features were revealed. Specifically, the selected literatures were characterized by an acute lack of reporting contextual factors relating to the location of writing. The variation in location of writing has implications for both the internal and external validity of these studies; therefore, derived inferences of the reviewed articles are limited in strength. Overall, trends indicate that articles are meeting the recommended minimum standards for reporting features pertaining to the location of writing, but at relatively low percentages.

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Preface

Psychology is more than just a discipline; it is an entire world of its own. Starting out with an endless spectrum of interest in psychology, I was somehow able to narrow it down into the area of health. The way people cope with illnesses and diseases has always been fascinating to me and a while back I realized I wanted to become involved in this area professionally. I wanted to make a contribution to help improve people's quality of life, no matter how unhealthy they were. Life is too short to let a disease or illness take away all sense of feeling happy and live.

These personal values are what began an exploration into various psychologically-based methods that professionals were using to help various medical populations. Through a psychology class of mine, I became familiar with my mentor's extensive research in the area of health psychology and began helping in his lab as a research assistant. To become familiar with what I was working with, I read his book, "The Writing Cure", and numerous other articles published on expressive writing interventions. It soon became obvious to me that this was the kind of opportunity that suited my interests.

Expressive writing interventions provide the means to reflect on a specific topic with the objective of improving overall health and well-being. Participants take part in several writing sessions that are intended to increase self-awareness and reflection by focusing on a particular stressful or traumatic event or experience. This may mistakenly be compared to diary writing, but

indeed, is far from it. The writing sessions that participants go through have well-defined instructions that avoid this task from becoming a non-structured journal entry.

The exact shape of this thesis became a bit more defined over time by working with a graduate student on one of her publications. She wanted to explore the nature of the expressive writing intervention paradigm and investigate the validity within its domain. In other words, she decided to systematically review randomized trials of the expressive writing intervention with respect to the reporting quality of methodological and statistical features. Her project became the foundation on which I built my thesis.

An adequate amount of time was spent brain-storming on ideas that I wanted to explore within this general milieu. In thinking about the various writing intervention studies I had read, I began to realize that there was a great deal of variation between them. More specifically, it appeared as though there was a large discrepancy of how the intervention was implemented and administered among these articles. Trying to narrow down on a particular issue was difficult, but I finally decided that one of the things that could have a possible effect on this intervention's efficacy was the location of writing. It seemed obvious that people writing in a sterile laboratory would have a much different experience than people writing in their homes. Skimming over some of the pertinent articles, it was clear that numerous other contextual factors (i.e., solitary disclosure) were linked to the location of writing and that they would have to be addressed as well. This stirred up the purpose of

investigating those particular aspects within this relatively new intervention that I was placing so much hope in. My topic was finalized and my title came to follow: A Systematic Review of the Methodology and Context of Expressive Writing Intervention Studies.

The process of collecting the data was very extensive and time consuming. I received extensive training to evaluate and rate the reporting of randomized controlled trials by using CONSORT (Consolidated Standards of Reporting Trials) checklist items (referred to in the paper and presented in the Appendix). I became very familiar with diverse methodological, statistical, and hypothesis testing features and spent many hours rating articles with the help of a Coding Rulebook (also referred to in the paper and presented in the Appendix). The entire rating process took about 4 months, consisting of weekly meetings to discuss rating disagreements and come to a final consensus on each article.

Formulating and writing a thesis is a learning process all of its own, but I found myself gaining more knowledge than I had expected. Spending countless hours reading psychological journal articles really exposed me to a wide variety of aspects that I would have never come across otherwise. Throughout the rating process, I obtained extensive practice of searching articles for required details (i.e., reporting statistical measurements, describing the sample used in the study). It allowed me to develop a solid understanding of the requirements considered necessary for scientific research pertaining to psychology. One of the most rewarding facets of the work I put into this

project is the skills I have acquired because of it. It has bestowed a greater sense of confidence in me as a scholar in training. When I read a psychology publication now, I am able to comprehend it at a greater capacity and am decisively more proficient in distinguishing its quality.

Note to Future Honors Students

There are a few thoughts to keep in mind throughout the thesis project process that may be helpful. First of all, no matter how much you think you are going to start early and finish the paper in January of your Senior year...you are most likely not going to and that is just a fact you have to deal with. Considering your interest in a thesis in the first the place, your academic ethics will probably still keep you from taking on anything less than a full course load. Not to mention, it *is* your last year at college and there are some things you are required to do partake in (mainly, spending a lot of time with your friends). A lot of little things will tend to get in the way that you never counted on. Come January, the supposed deadline you gave yourself so you can enjoy the rest of the semester, you will find yourself frantically contemplating your future and the meaning of life as you see this significant part of your development come to an end. At this time, it is definitely important to stay organized and keep your mind on the here and now.

Second of all, trying to keep a good balance of time is extremely important. We all have our own way of completing assignments, some people work better under time constraints, but I strongly advise you against waiting until the last month to start the thesis. This is not just some required paper you are turning in for a grade in that class you never really liked in the first place. This is a piece of work that, to an extent, will reflect you and your dedication to your subject matter; you should treat it as such. Your thesis is

something you should be proud of and although I am sure it is possible to scrap together some 50 pages in a month's worth of time, don't. It will feel much more satisfying to turn in a paper that you know you worked hard on. You want to give yourself enough time to put in the extra effort to make it just right. It would be a complete waste if you ended up turning in a thesis which you feel is semi-finished or not quite perfect because it would defeat its purpose; the purpose being an opportunity to perfect a piece of work that is entirely your own.

Most important, however, is that you chose a topic that is important to you. You do not necessarily need to have a personal attachment to your topic, but you need to spend some time reflecting on what will keep you interested for a couple of months. It needs to be something you find worthwhile when you spend countless hours researching it at a library or online. Not only will a good topic keep you inspired to work, but it will also produce a much better thesis. You will also want to present your thesis to people with a bit of excitement and that just is not possible if the subject does not appeal to you to begin with. Do not chose a mentor and just create a thesis based on her/his work or interests. Chose a mentor based on *your* interests. Basically, if you are not ecstatically interested in 14th Century French Literature, do not write an entire thesis on it because it will show in the final work you turn in.

Remember that this is also just a learning process. You are not expected to know everything or be a flawless scholar. This thesis is an experience all of its own but, perhaps even more importantly, it can serve as

an experiment to help you find out some of your limitations in respect to committing yourself to this kind of work in the future. Starting out you see it as just another paper you got yourself into by being an over-achiever. In the end, however, you will find that you grew as a student. You realize suddenly that you learned much more than you ever thought you would.

If nothing else, when the point comes of doubting whether or not you *really* want to write a thesis (and this point will come), just remember what sparked your interest in it in the first place. And even when you feel like it would be easier to pretend your computer crashed and erased the 25 pages you just wrote (providing you the ideal opportunity to scrap the project entirely), try to ignore that voice in your head telling you to stop and just keep going. You may find that the more time you spend on your thesis, the more attached you will become to it, and the more eager you are to stand next to that printer waiting for the last page to come out. Good luck!

Acknowledgements

Acknowledgements are given to my thesis advisor and second reader for steering this thesis from conception to completion through their helpful feedback and advice: I would like to thank Dr. Joshua Smyth, for his sustaining influence in the field and in the development of my own interest in health psychology; I would also like to thank Dr. Craig Ewart, for supporting my educational maturation and training over the past four years.

Special acknowledgement is given to Deborah Nazarian, to whom I am especially grateful. She patiently provided me with endless guidance and valuable input to make this thesis a memorable educational opportunity and exploration of personal growth. Collaborating with her formed this into an incredible learning experience, making all the long hours of hard work worthwhile. A sincere thank you to a mentor and a friend.

Lastly, I would like to thank my family and friends who encouraged and supported me to achieve this personally meaningful goal and challenge.

Introduction

Over the past decade and a half, expressive writing has developed into an intriguing new psychosocial intervention within the field of psychology (Pennebaker & Beal, 1986). The intervention has produced beneficial results across a wide range of outcomes in both healthy and non-healthy populations (e.g., Smyth, 1998; Smyth & Pennebaker, 1999). The ultimate goal of this new paradigm is to translate the writing intervention into a supplemental treatment plan in medical and/or psychological care settings, while improving the cost-benefit relationship with the health care system (Smyth & Catley, 2002). Participants in the experimental group are typically instructed to write about a stressful or traumatic experience for 20 minutes across 3 to 5 days. Control group participants are usually asked to write about an emotionally-neutral writing topic (e.g., time management) and are explicitly instructed to avoid writing about their emotions.

A meta-analysis of 13 randomized experiments that utilized experimental manipulation of written emotional disclosure revealed that the writing intervention produced beneficial health outcomes across several domains (each of which was measured several months post-writing; Smyth, 1998). These outcomes include improved physical health, beneficial physiological and immunological outcomes, psychological well-being, and improvements in general functioning and quality of life (Smyth, 1998). Research has also been carried out with specific medical populations, such as patients with rheumatoid arthritis, asthma, cancer, and fibromyalgia and

demonstrated significant improvements in health and mood (Smyth, Stone, Hurewitz, & Kaell, 1999; Warner et al., 2005; Broderick et al., 2005). On the whole, a large variety of community populations appear to benefit from expressive writing interventions. These benefits include: absentee reduction in university employees (Francis and Pennebaker, 1992); increased re-employment pace of recently unemployed individuals (Spera, Buhrfeind, and Pennebaker, 1994); decreased illness visits among maximum security penitentiary inmates (Richards, Beal, Segal, and Pennebaker, 2000); improved health among chronic illness patients experiencing either asthma or rheumatoid arthritis (Smyth et al., 1999); reduced self-reported confusion and perceived stress for lesbians reserved about their sexual orientation (Lewis et al., 2005); and reduced psychological distress among bereaved elderly (Segal et al., 1999). As evident by the proven efficacy of these studies, the written disclosure intervention displays success and promising potential for effective treatment for other populations in need of emotional expression.

Expressive writing has proven to be a valuable intervention for various populations. However, despite the fact that some researchers have strongly promoted its clinical usefulness (e.g., Lepore & Smyth, 2002; MacCurdy, 2001), the effects on clinical populations remain to be fully determined. The response of psychological health to this new paradigm has yet to be considered entirely conclusive and is rather limited (e.g., Schoutroup, Lange, Hanewald, Davidovich, & Salomon, 2002). This is due in part to participants reporting inconsistent changes in mood (improved versus unaffected; Lepore,

1997; Greenberg & Stone, 1992; Pennebaker et al., 1988). Moreover, most research on this topic has focused mainly on mood as the sole indicator of psychological well-being (Sloan et al., 2004). In addition to these self-reports, more objective measures, such as physiological testing (i.e., blood pressure), could be administered. In other words, clinical significance is an important factor for the alleged therapeutic tool to establish a stronger degree of external validity which has yet to be adequately examined (Jacobson & Truax, 1991). Furthermore, some studies have found the effects of expressive writing to be weak or non-significant (e.g., DeMoor et al., 2002; Gidron et al., 2002; Stroebe et al., 2002). For example, the treatment has not been effective with sexual abuse survivors (Batten et al., 2002). The variability of outcomes prompted the present study, the goal of which is to examine the reporting quality of the location of writing through evaluating 70 randomized controlled trials of such studies.

The quality of methodological reporting is an essential part to empirical studies trying to enhance knowledge in behavioral and remedial health sciences. Accurate results and conclusions of scientific investigations depend on “numerous methodological issues, such as clear delineation of inclusion/exclusion criteria for subjects, adequate description of recruitment strategies for subjects, thorough presentation of subjects’ demographic information, careful description(s) of the methodological procedures in each study...and adequacy of measurement” (Wonderlich et al., 2003). For the writing intervention studies particularly, it is believed that the procedures used

to administer the interventions influence the derived results. That is to say, modifications made over the years by numerous investigators may have caused discrepancies in the results; these may include: reporting the setting and location where the writing took place; a description of the writing session's immediate environment (i.e., office space, lab room, etc.); if the researcher(s) had contact with participants writing at home; whether the writing was carried out in the same location across all sessions; the use of solitary disclosure; whether the investigator(s) collected the writing booklets; and whether treatment adherence was monitored and reported. Together, these factors can produce wide variation in critical administration procedures, and thus have adverse effects on a study's scientific legitimacy.

This study's focus is on the location of writing factor and its role in the writing intervention studies. It is believed that certain locations (i.e., participants' homes) do not provide a favorable environment for administering or completing the intervention due to ancillary, contextual influences that may have notable effects on the study. From the 70 articles that were rated, it was discovered that the location where the participants wrote varied a great deal. While some studies involved medical populations (e.g., Booth et al., 1997), others involved prison inmates (Richards et al., 2000), school children (Reynolds et al., 2000), or undergraduate university students (e.g., Kloss et al., 2002). As a result, the choice of the location of writing appears to be largely directed by convenience. Consequently, depending on the population, the writing took in a variety of locations, including university laboratories,

medical settings, classrooms, participants' homes, and college dormitories to prison rooms. It would make sense that each of these locations will provide a much different environment and atmosphere in which to carry out the emotional disclosure process. One important requirement of the writing intervention procedure is that it be done in a quiet solitary space, which is not always the case when participants write at home, in classrooms, or with other participants in group settings. It is hoped that the results of this study will provide valuable information regarding the influence of this specific contextual variable in expressive writing studies.

By administering an intervention on various populations, empirical science expands its knowledge and strengthens its validity, but that can only be achieved if contextual factors are held constant. The primary aim of this study is to emphasize the importance of strict adherence to preliminary procedures when reproducing experiments. The secondary aim of this study is to underline the imperative role of accurate and complete reporting of scientific studies' methodological and contextual elements. Each qualified article's randomized controlled trial was rated and evaluated by using a Coding Rule Book consisting of 87 checklist items obtained from CONSORT (Consolidated Standards of Reporting Trials) guidelines (David et al., 2001), an Evidence-Based Behavioral Medicine source (Davidson et al., 2003), and a literature review. It is believed that this Coding Rule Book enabled the raters to objectively evaluate the articles and come to a consensus on each item.

The primary purpose of the present study was to systematically review the reporting quality of the implementation and administration of the expressive writing intervention. In particular, examining the quality of reporting of parameters pertaining to the experimental context of the intervention (e.g., the location of writing, treatment adherence, solitary disclosure). The quality of reporting was assessed in the literature overall and in five year intervals, in order to investigate changes over time.

Methods

Literature Search

In order to obtain a sufficient number of articles for this study, a literature search was conducted using PsycINFO and MedLine databases. Various permutations of search terms (presented in Appendix A) were developed for searching the aforementioned electronic bibliographic databases. The reference lists of retrieved articles and related reviews were also hand-searched for potentially relevant studies. The flowchart in Appendix B describes the process of identifying relevant literature (Khan et al., 2003). Out of the initial 406 citations obtained through the literature search, 289 were excluded because the studies were either unrelated to expressive writing interventions or appeared more than once. Hard copies were retrieved for 117 potentially relevant citations, of which 49 were excluded for not meeting the pre-specified inclusion criteria. In the case of articles that included two experiments, each experiment was evaluated independently and each respective experiment had to meet inclusion criteria; this explains why out of 68 relevant citations, a total of 70 studies were reviewed. Qualified articles were then entered into an Excel spreadsheet for efficient management purposes (presented in Appendix C).

The following three inclusion criteria were used: (1) Random assignment of participants to conditions; (2) Outcomes must have been collected at least one month post-intervention; and (3) Inclusion of a neutral writing control/comparison group. Inclusion was restricted to randomized

designs because of their stable and unassailable nature. The second inclusion criterion followed the precedence set forth in Smyth's meta-analysis (1998), in which various types of health outcomes were measured at least one month post-writing. The third requirement is based on the customary procedure to include an emotionally neutral writing control group in the majority of expressive writing intervention studies.

Rating Scheme

The rating scheme that was used to examine the parameters of the expressive writing intervention was comprised of 20 items that assessed various aspects of the administration and implementation of the intervention. These items focused specifically on contextual factors, such as the location of writing, interactions between study personnel and participants, legitimate authority of investigators, writing instructions, and writing topics. These items were selected for the rating scheme because they are parameters that are unique to the implementation of the expressive writing intervention and are also frequently altered by investigators. This rating scheme was part of a larger study that systematically reviewed randomized trials of the expressive writing intervention with respect to three other content areas: CONSORT statement for reporting randomized trials (the pertinent checklist of rated items is available in Appendix D), methodological reporting quality, and statistical hypothesis testing issues. The rating scheme pertinent to the purpose of the present study is presented in Appendix E.

Training

A team of three raters, which included two advanced undergraduate students and one doctoral-level graduate student, was formed to carry out the ratings. The undergraduate raters met separately on a weekly basis with the graduate student in order to attain a reliable rating procedure. Each rater independently rated five practice articles that were reviewed and discussed over a two week period in order to establish a refined and efficient rating instrument, as well as to train the undergraduate students in rating the articles.

A Coding Rulebook (Appendix F) was also developed and refined with specific rules and procedures for raters to follow. This Coding Rulebook served the purpose of providing a uniform point of reference for each question item on the rating scheme. It explained and described the specific details of each question item to eliminate any erroneous interpretations among raters.

In order to facilitate coding decisions, the each rater was encouraged to make notes on the rating scales and article. The notes served as guidelines for assigned scores for each scale. Coders were trained to become very familiar with each article, first reading the article in its entirety and then completing the rating scales.

Rating Procedures

After the raters demonstrated a conceptual understanding of the individual items of the rating scheme and obtained a consistently high consensus level with the graduate student, all raters began evaluating the 70 articles that were collected from the literature searches. It was decided that the articles would be evenly divided and independently rated by the two

undergraduates (35 articles each), while the graduate student rated all 70 articles for inter-rater reliability purposes. All raters were blinded to journal name, author name, author affiliation, year of publication, and all other information that may lead to identifying clues to the articles' origins by using masked articles. Masking has been shown to produce significantly lower and more consistent scores than open assessment, thereby limiting bias risks in systematic reviews and meta-analyses (Jadad et al., 1996).

Both undergraduate students met with the graduate student on a weekly basis to resolve any discrepancies. If a disagreement arose, it was settled via consensus and only the final consensus rating was tabulated. Ratings were tabulated separately by each rater into an Excel spreadsheet, which were then compared to compute inter-rater reliability. (No inferential statistics were conducted because this review was primarily descriptive in nature.) The following items were included in the rating scheme in order to examine parameters of the expressive writing intervention: (1) Reporting the setting and location where the writing took place; (2) Describing the writing session's immediate environment (i.e., office space, lab room); (3) Researcher(s) contacting participants who wrote at home; (4) Using the same location across all writing sessions; (5) Using solitary disclosure; (6) Collecting or retaining writing booklets by investigator(s); and (7) Monitoring and reporting treatment adherence.

Results

Inter-Observer Agreement (IOA)

In order to establish the degree to which raters agreed on the ratings used in the rating scheme, Inter-Observer Agreement (IOA) was calculated (presented in Table 1). The IOA was computed for each item by dividing the total number of agreements by the total number of agreements plus disagreements. The IOA for the items examined in this review were as follows: Description of setting and location (0.93); Treatment adherence (0.74); Description of writing location (0.96); Writing completed in same location across all days (0.90); Report of adherence if participant wrote at home (1.0); Experimenter contact with participants writing at home (1.0); Writing booklets returned to or retained by investigator (0.91); Mode of writing (0.97); Sample of study (0.96); and Solitary disclosure clearly specified (0.96). The IOA for individually rated items ranged from 0.74 to 1.0, with a mean of 0.95 across all items. Only one item (Treatment Adherence) had a lower IOA (0.74), which is probably due to variations in rater interpretations of the item.

The inter-rater reliability for continuous items, sample size and completion rates, were computed using Intraclass correlation coefficients (ICCs). ICCs for both the study sample and completion were also high (0.999), and were significant at $p < .0001$.

Overall, these findings imply that the Rating Scheme and Coding Rulebook possess high validity, and that the raters were adequately trained to evaluate the studies.

Review

The results presented in Table 2 indicate that the majority of articles assessed in this study did not provide an adequate report of contextual factors. Methodological and procedural details pertaining to the location of writing appear to have improved slightly over the past ten years, but a large number of fundamental details are not being reported.

Reporting Quality: Overall

This review searched for a 75% compliance rate in order for the quality of reporting to be considered adequate or good. A small percentage of studies assessed for quality of reporting writing parameters were rated as adequate or good (refer to Figure 1).

Writing Booklets

One of the items which did show to have adequate reporting quality was the collection of writing booklets by investigator(s). Fifty-four (77%) of the studies reported conducting this procedure. Collection of writing booklets is a good means of checking participants' adherence to treatment and reporting the flow of participants through a study. It can strengthen a study's internal validity by revealing information regarding the number of participants that were enrolled versus those that actually completed the study.

Treatment Adherence and Monitoring

Figure 3 indicates that 58 (83%) of the reviewed articles monitored adherence to treatment in their participants; however, only 31 of them (44% of all studies) clearly reported monitoring procedures (i.e. collection of writing booklets, participant completion of all materials, etc.); and 12 (17%) of the reviewed articles neither monitored nor reported any adherence issues in their experiments. It is suggested, as stated by Davidson et al., that investigators should assess adherence to treatment by self-reported and objectively measured evidence of following treatment recommendations and that investigators should report the decision rules used to combine these adherence measures (2003). The reviewed studies display a strong compliance to reporting these details.

Attrition

An additional strength in the reviewed publications is a low average rate of attrition (Appendix J). Study enrollment consisted of a maximum of 546 participants and a minimum of 11 participants. Study completion had a maximum of 535 participants and a minimum of 10 participants. On average, 78 participants (85%) completed the treatment versus 92 participants who were enrolled, leaving an average of 14 participants (15%) who failed to complete the studies.

Setting and Location

A description of the settings and locations in which the trials were carried out was provided only in 41 (59%) of the studies; twenty-nine (41%) did not address this detail.

Immediate Environment

Figure 4 presents the studies' specific description of the immediate writing environment (pertaining to the specific location where the participant wrote, i.e. medical setting, university laboratory, etc.). Twenty-three (33%) of the studies neglected to report a location of writing altogether; only forty-seven (67%) of the studies reported a specific description. Out of the studies that did report the immediate environment of the writing sessions, 28 (40%) of them were administered outside of the suggested controlled settings: participants' homes (11%), a combination of locations (14%), or somewhere not specifically stated (14%).

Experimenter-Participant Contact

Out of the studies that had participants write at home, 41% of them did not have experimenters contact the participants, either by mail or phone; suggesting a weakness of the reported confidence in adherence.

Consistent Location of Writing

Forty-four (63%) of the studies reported using the same location across all writing sessions; four (.05%) of the studies did not follow these recommended guidelines. Had the remaining 22 (31%) studies reported information on this topic, the level of adherence could be more completely evaluated. Although 63% indicates a decent compliance rate, it is still short of being considered adequate for this review.

Solitary Disclosure

Thirty-four (49%) of the studies reported the use of solitary disclosure in their procedures; however, 12 (17%) studies did not use solitary disclosure and more importantly, the remaining 24 (34%) studies were unclear or did not address this feature at all.

Reporting Quality: Interval Specific

In appraising the patterns of reporting contextual factors of writing parameters over time (1986-2005), there seems to be an inconsistency across the rated items (refer to Figure 2). For instance, on the item concerning a description of the settings and locations in which the experiment took place, there was an initial drop of studies adhering to this feature (75% to 17%), until the last 10 years during which a trend of improvement appeared (17% - 50% - 66%). Correspondingly, monitoring and reporting of adherence was weak initially (75% to 0%), but has been steadily improved during the 1995-2000 time period (31% - 52%). This pattern of improvement could be due to increased attention and legitimacy of expressive writing interventions caused by Smyth's meta-analysis (1998). Its publication in 1998 may well have caused the shift in quality and, essentially, be responsible for the proliferation of the paradigm on a whole. Likewise, the percentage of studies reporting that writing booklets were retained by the investigator has remained consistently high over the 20 year time span of the writing interventions (75% - 83% - 75% - 77%).

Meanwhile, studies with reported use of solitary disclosure in their procedures, have been rather inconsistent over the past 20 years (75% - 33% -

37% - 52%), and too low to be considered of sound quality. Similarly, studies which reported the use of the same location across all writing sessions appeared to decrease over the past 15 years (85% - 75% - 55%). This combination of results signifies a lack of homogeneity in the quality of reporting among expressive writing interventions.

During the rating procedure, it became apparent that some of the auxiliary data collected (presented in Table 4) was related to the above-mentioned a priori questions of contextual influences. Some of the following exploratory questions may contribute to the location of writing variable. For instance, the sample that was used in a study played a large role in determining the location of the writing sessions. Thirty-nine (56%) of the studies (refer to Figure 5) included university undergraduate students in their study, restricting the writing to occur either at university laboratories, health center settings, or the students' homes. This could be due to a lack of resources or the previously mentioned issue of convenience in adjusting methodological factors to the study's population. Moreover, some studies had their participants send in their writing via email from their homes (Lange, A. et al., 2001). The recommended mode of writing to be used is long-hand because it is thought to evoke greater attentiveness (than typing) by the participant. Although convenience is a tempting and often exclusive factor in deciding on the location of writing for participants, a consistently designated location, between and with-in studies, would improve treatment adherence.

Discussion

This study systematically reviewed the reporting of methodological details and parameters of expressive writing intervention studies. The findings were predominantly mixed with respect to parameters of the writing intervention, soft in terms of study conduct and reporting.

Strengths

There appears to be a general improvement in the reporting quality of only a few writing parameters. Namely: monitored adherence; experimenter contact with participants writing at home; writing booklets being returned to or retained by investigator; and the mode of writing used (long-hand).

Treatment Adherence and Monitoring

Treatment adherence consists of several layers that can be differentiated and should be described individually in intervention studies. Reporting of treatment adherence improved by 52% from the 1991-1995 to the 2001-2005 interval and has been monitored in 83% of the reviewed publications; these statistics are ideal for expected improvement in newly developing interventions. Some rudimentary procedures provide tangible evidence of adherence, and have been adequately reported by the writing interventions reviewed by this study. The most basic of these is whether participants attended the treatment session and were thereby present to receive the interventions as delivered (Davidson et al., 2003). An appropriate assessment of adherence in expressive writing studies may be obtained by collecting writing booklets after each writing session (reported in 77% of the

reviewed studies overall). When studies include writing sessions that take place outside of supervised settings, relying solely on participants' self-report of treatment adherence (i.e., whether they wrote for 20 minutes each day, across several days) is unreliable. Furthermore, a study's outcomes are not equivalent to treatment adherence (Davidson et al., 2003). Efficacy of physiological and/or psychological measures may therefore not be used in place of reporting treatment adherence. One method for controlling treatment adherence when participants write at home (or in other unsupervised settings) is to request that writing booklets be returned to investigators or to have investigators contact participants directly at home.

Weaknesses

Despite the obvious noted strengths in the writing intervention paradigm, some weaknesses in reporting quality were evident from the results of this systematic review. Above all, the quality of reporting of contextual factors unique to the location writing was less than desired (e.g., descriptions of the country, city, and immediate environment).

Setting and Location

Approximately 43% of trials did not describe the settings and locations in which the experiment was carried out. Findings revealed, however, that reporting of this issue improved over time. The setting and location of a study influences external validity, since the immediate and geographic environment of an experiment can influence outcomes. Omission of this important information prevents readers from determining the generalizability of results.

Furthermore, this information provides details regarding ancillary, contextual influences that may have noteworthy effects on the study. In effect, the purpose of describing the setting and location provides a basis of comparison across study populations (Davidson et al., 2003). This requirement hopes to provide a full categorical description for each study with the intent of establishing its apparent external validity.

Immediate Environment

In reporting location, a more detailed description of the immediate environment where the writing took place is required. On a whole, the descriptions of the immediate environments (e.g., university laboratory, medical setting, private office, participants' homes, or "other") in which participants completed their writing were inadequately reported in the literature as a whole, at 67%. Locations outside of the laboratory do not necessarily provide an environment that is conducive to administering or completing the intervention. Randomized controlled trials have the advantage of eliminating main effects due to environment or location, but interactions between experimental conditions (i.e., writing about traumatic events) and environments (research/medical settings) cannot be overlooked (Smyth & Catley, 2002). Permitting participants to write at home may be convenient and lead to increased acceptability among some study samples.

Unfortunately, the cost of these "participant benefits" may be offset by a less effective intervention because of various influences that cannot be controlled outside of formal laboratory settings. Nonetheless, while trials conducted in

highly formalized research settings of universities or medical centers appears to be more reliably successful (Smyth & Catley, 2002), efficacy has also been reported outside of these contexts, such as the home (Lepore & Greenberg, in press) and over the internet (Lange et al., 2001).

Consistency in Writing Location

Reporting of whether participants completed the writing sessions in the same location during all days of writing was inadequate (63%) overall due to a sudden 20% drop after 2000. No explicit reason could be found for the trend of general decline in reporting this feature. It is important to report this detail because of the apparent effects that different writing locations can have on a participant's consistency in mood, mode of writing, familiarity and comfort with the environment and researcher. In particular, it should be clear whether the trial was carried out in one location or if the location of writing was varied within a study. Writing carried out in more than one setting can cause distinct effects on participants' moods and writing experiences overall. Furthermore, this information is important because a change in location of writing within a study can present threats to internal validity. If locations are varied within or between studies, assessment of writing interventions should be done at multiple levels and should include organizational influences (Klein & Smith, 1999). Because single effectiveness studies may not produce generalizable results, multi-site effectiveness trials are needed (Smyth & Catley, 2002).

Experimenter-Participant Contact

Having minimal or no contact with participants is another factor that may contribute to a decrease in adherence to the writing instructions. Indeed, only 23 (33%) of studies were carried out in supervised environments (university laboratory, university office, or medical setting); this shows a poor level of adherence to basic research reporting guidelines. The experimenter was present in these more formal environments and thus contributed to a more controlled writing environment for participants. For instance, participants' attentiveness to instructions, treatment adherence, and perceived benefits of the study may be affected by "legitimate authority engendered by the research environment" (Smyth & Catley, 2002). In comparison to writing at home, participants are more likely to feel that their involvement had a positive and influential outcome because of the heightened sense of awareness and legitimacy that is attributed to these controlled research settings.

Solitary Disclosure

The use of solitary disclosure serves the purpose of establishing a controlled and stable writing environment for participants; this feature was inadequately reported in 49% of the studies. Having the opportunity to write in a private room, without any distractions, allows participants to concentrate on completing the writing task. Knowledge of these basic, yet influential, details is necessary in interpreting results and determining generalizability to other expressive writing studies. Additionally, a basic premise of the expressive writing intervention is its characterization as a solitary disclosure

task and thus, changing this crucial component alters the intervention on a whole.

No clearly identifiable patterns exist to defend the inadequate quality of reporting among randomized controlled trials of expressive writing intervention studies. The average quality of reporting of the specific methodological factors evaluated by this study is 60%. Forty percent of the written emotional disclosure interventions are therefore not reporting methodological details. In part, the lack of reporting could conceivably be due to the fact that investigators have different ideas about what qualifies as necessary reporting. Also, investigators may assume that alterations made to the writing intervention do not have an effect on the results (which remains to be fully determined). For example, some of the minute differences between treatment administrations (i.e., collecting writing booklets) may not be thought to affect external validity. However, incorrect conclusions about validity (internal and external) are likely without mentioning these details. Furthermore, details concerning the study protocol are necessary to draw conclusions about the general efficacy of the expressive writing intervention paradigm.

Benefits

Expressive writing has immense potential to serve as an adjunctive treatment that may decrease the need for direct assistance from healthcare professionals. As such, expressive writing is a highly accessible intervention that is cost-effective, could be widely distributed, and easily implemented.

Not only is the privacy and anonymity appealing to many individuals (especially when dealing with confidential issues), but expressive writing provides individuals with a private outlet by which to process their thoughts and emotions.

One of the several positive aspects of written emotional disclosure is its possible potential to offer clinical populations with a desirable alternative to traditional therapeutic methods. If nothing else, writing interventions have the capacity to be used as an effective supplement to traditional face-to-face treatment. Writing about traumatic events in a structured and confidential manner may provide participants with the opportunity to reach a deeper level of emotional awareness. Some individuals may find it easier to express their feelings and emotions via writing in lieu of interpersonal contact.

What's more, expressive writing interventions allow individuals to avoid stigmatization associated with discussing various distressing issues. Social stigma may create social constraints that restrain people from seeking help (Smyth and Catley, 2002). Some traumatic events or stressful experiences may be suppressed due to people experiencing fear of receiving potentially negative reactions and may therefore make it difficult for some to disclose such experiences. Expressive writing interventions make it possible to avoid this dilemma.

Another appealing attribute of the expressive writing interventions is the low cost of implementation. In fact, this intervention may be easily integrated into psychological and/or medical treatment procedures without

excessive encumbrances on human resources (Smyth & Catley, 2002).

Previous evidence from large non-clinical samples (e.g., university students, school children) suggests that treatment effects would be profitable at a community level (Smyth & Catley, 2002). Therefore, expressive writing has the potential to reach large numbers of people at minimal costs.

Risks

In spite of these apparent benefits, researchers must exercise caution in taking expressive writing out of the laboratory and into the field. The issue of adverse side effects becomes a factor when this intervention is self administered by participants in their homes. When writing about traumatic experiences, self-awareness is likely to be heightened and may evoke negative emotional side effects that cause concern for the participant's safety. Writing at home does not allow study personnel to carefully monitor participants, nor does it give healthcare professionals a chance to intervene if necessary. Of course, this need not be an issue with all study samples. In fact, it has been shown that the negative affect experienced immediately after a writing session does not persist for an extended length of time (e.g., Stone, Smyth, Kaell, & Hurewitz, 2000) and has a tendency to dissipate after a few hours (Hockmeyer, Smyth, Anderson, & Stone, 1999). In order to reach an assessment of a treatment's complete risks and benefits, side effects, treatment complications, or adverse events should be explicitly presented (Davidson et al., 2003).

Limitations

Despite the strengths of the present systematic review, some limitations warrant mention. Although every attempt was made to keep raters masked to the year of publication and journal source of the reviewed articles, general information regarding the publication dates of some journal articles could not be masked. For instance, articles published in recent years looked more current than those published several years ago.

Search restrictions may have limited the number of articles that were retrieved in that they were only included if they were written in English. Additionally, although the key terms used for the literature search were chosen for their precise correspondence to this study, a different set of terms may have found different sets of articles.

Recommendations for future research

The expressive writing intervention has an exciting and promising future. Expressive writing interventions have been conducted in other countries and a compilation of multi-cultural studies could expand the generalizability of the intervention. One of the next steps is to deliver the intervention (e.g., through media programs, self-help materials, Web sites) to various communities (Smyth & Catley, 2002). Some other ideas concerning future research ideas lead to an assessment of what kind of writing intervention works best for specific populations. By matching participants (e.g., medical populations, bereavement clients, clinical inpatients and outpatients, children, university students) with specific contextual factors of written emotional disclosure (e.g., mode of writing, number of writing

sessions necessary, length of each writing session, location of writing, etc.) may help further advance this area of research. However, it is important to consider that changes in the writing parameters' contextual factors and adjustments in writing instructions may change the intervention itself (Smyth & Catley, 2002).

Differences in the quality of reporting among contextual features might be related to the location used for the writing sessions. It is possible that the studies which did not have good or adequate overall quality of reporting were those which were not carried out in highly formalized settings. For instance, studies that were carried out in participants' homes may also be the ones not to report adherence, the use of solitary disclosure, the use of the same location across all sessions, and the collection of writing booklets. When interventions are implemented and administered in uncontrolled settings, reporting becomes concurrently more difficult. Some studies may try to bypass the effects of changing contextual factors by simply not reporting them or not considering them when reporting derived outcomes; this may have possible implications for ethical dilemmas. Further explorations examining whether studies that failed to report the location of the writing sessions also had low quality of reporting other contextual features could provide useful knowledge.

Being a low cost intervention, the type and availability of funding should not be a reason for variations in treatment administration. Nonetheless, it may be beneficial to investigate the relationship between

financial support (e.g., the size and source of grants allocated to a study) and contextual parameters (i.e., location of writing, collection of writing booklets, experimenter-participant contact, solitary disclosure).

The quality of reporting in other specific interventions (e.g., substance abuse, psychiatric, etc.) should also be systematically reviewed. Examining qualities of reporting of features related to location and supplementary variables in other realms of psychology will increase the efficacy of the field as a whole and shape it into a more ethical, reliable, and respected profession.

Conclusions

Overall, findings from the present review suggest that the reporting quality of the parameters of the expressive intervention have much room for improvement. In particular, this includes reporting of factors related to the context of the intervention. Enhancing uniformity in research on expressive writing provides the scientific community with a medium to more effectively promote health, prevent and reduce disease, and improve psychological well-being (Smyth & Catley, 2002). It is best to err on the side of excessive attentiveness in experimental designs in order to foster external validity (Chambless & Hollon, 1998). As defined by Davidson et al., “evidence-based behavioral medicine consists of interventions for which there is accepted evidence of clinical efficacy or effectiveness” (2003). In order to increase the effectiveness of the expressive writing intervention, researchers must reassess how to apply it in a real-world setting (i.e., in order to increase

generalizability), and to carefully document all research and clinical attempts at translating this new intervention into practice.

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Table 1. Inter-observer Agreement (IOA): A Priori and Exploratory Items

Rated Item	IOA
Description of writing location	0.96
Description of location and setting	0.93
Description of immediate environment:	
University setting	0.94
University office	1.00
Medical setting	0.97
Participant's home	0.96
Combination of different locations	0.99
Other	0.94
Not stated	0.96
Writing completed in same location across all days	0.90
Report of adherence if participant wrote at home	1.00
Experimenter contact with participants writing at home	1.00
Writing booklets returned to or retained by investigator	0.91
Treatment Adherence	0.74
Solitary disclosure clearly specified	0.96
Mode of writing	0.97
Sample of study	0.96
Average	0.95

Table 2. Contextual factors of expressive writing interventions by 5-year intervals and overall

Expressive Writing Items	1986-1990	1991-1995	1996-2000	2001-2005	Overall
Total number of published randomized controlled trials	4	6	16	44	70
Provided description of writing location	3 (75%)	1 (17%)	8 (50%)	29 (66%)	41 (59%)
Writing completed in the same location across all days	3 (75%)	5 (83%)	12 (75%)	24 (55%)	44 (63%)
Adherence reported	3 (75%)	0 (0%)	5 (31%)	23 (52%)	31 (44%)
Experimenter contact with participants if writing at home	.	.	1 (6%)	9 (53%)	10 (59%)*
Writing booklets returned to or retained by investigator	3 (75%)	5 (83%)	12 (75%)	34 (77%)	54 (77%)
Solitary disclosure clearly specified	3 (75%)	2 (33%)	6 (38%)	23 (52%)	34 (49%)
* This item only applied to 17 studies.					

Table 3. Participant enrollment in and completion of treatment in expressive writing studies

	Mean (SD)	Median	Minimum	Maximum
Number of participants enrolled in study	92 (70)	78	11	546
Number of participants completed study	78 (66)	62	10	535

Table 4. Exploratory expressive writing factors by 5-year intervals and overall

Expressive Writing Items	1986- 990	1991- 1995	1996- 2000	2001- 2005	<i>Overall</i>
Total number of published randomized controlled trials	4	6	16	44	70
Mode of writing was long-hand (handwritten)	3 (75%)	5 (83%)	14 (88%)	40 (91%)	62 (89%)
Sample of study					
Undergraduate students	4 (100%)	3 (50%)	10 (63%)	22 (50%)	39 (56%)
Individuals recruited from the general public	.	.	1 (6%)	9 (53%)	10 (59%)
Medical population	.	.	1 (6%)	11 (25%)	12 (17%)
Other	.	3 (50%)	5 (31%)	10 (23%)	18 (26%)

Figure captions

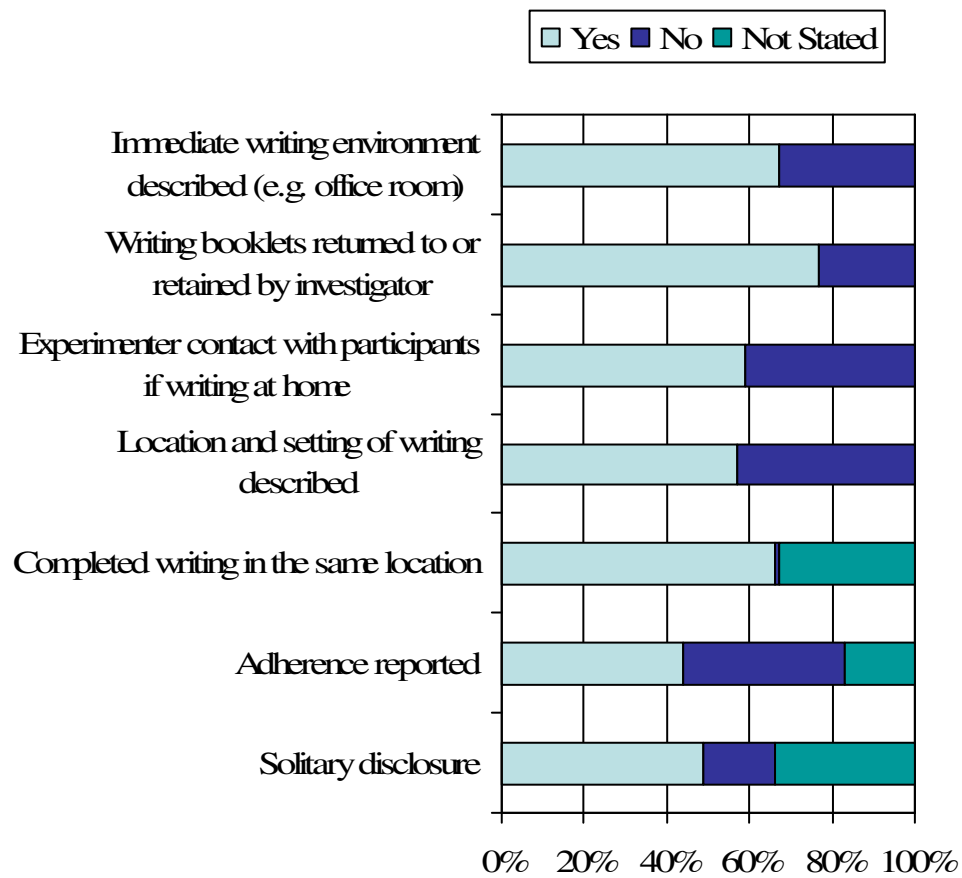
Figure 1. Contextual factors of writing parameters overall (Percentages)

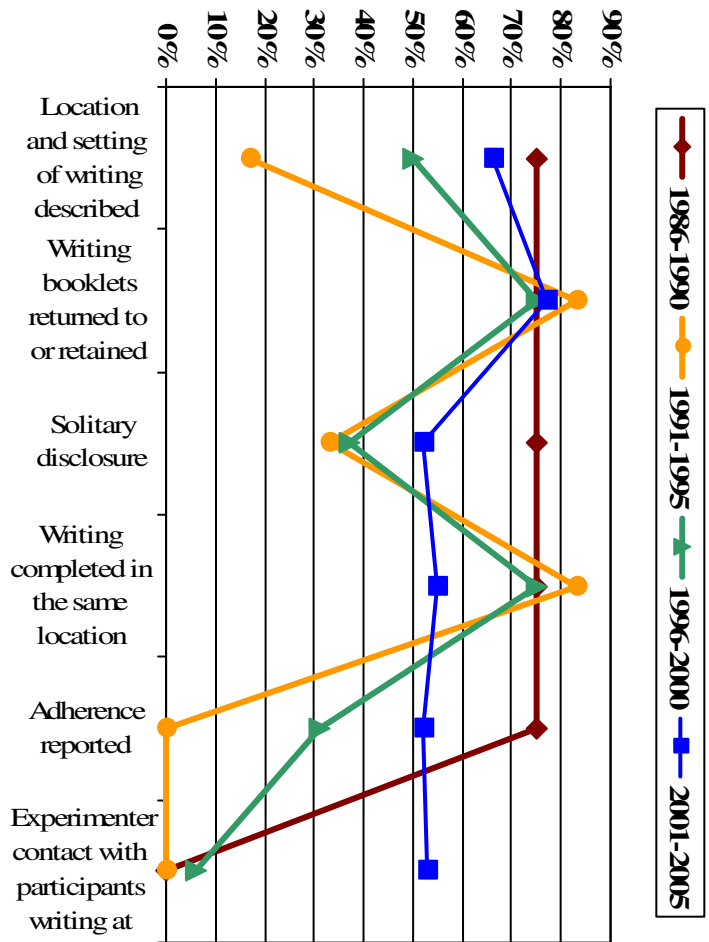
Figure 2. Contextual factors of writing parameters in 5 year intervals (Percentages)

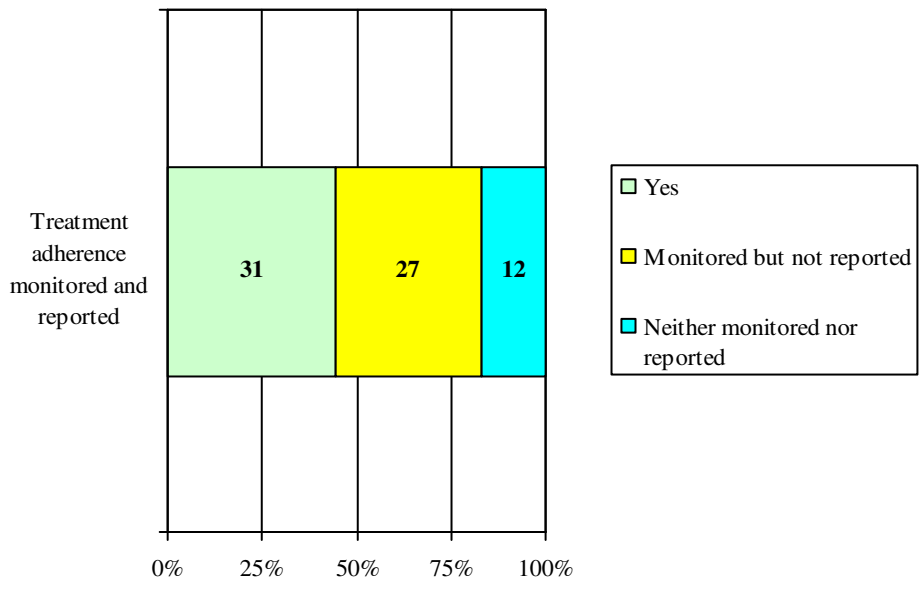
Figure 3. Monitored and Reported Adherence

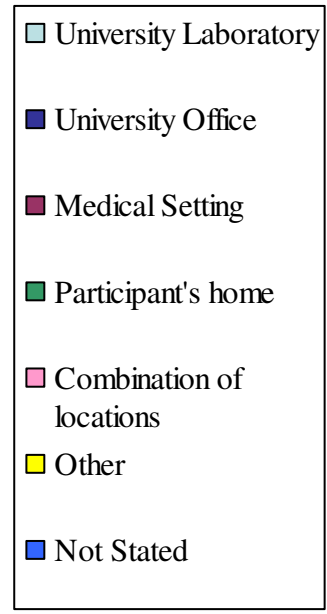
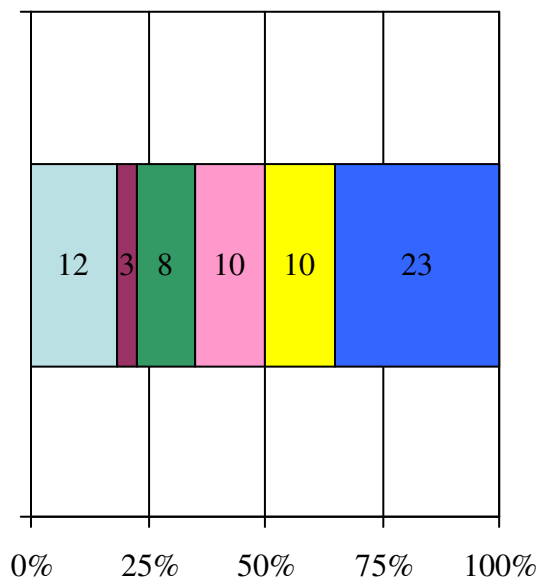
Figure 4. Description of Immediate Writing Environment

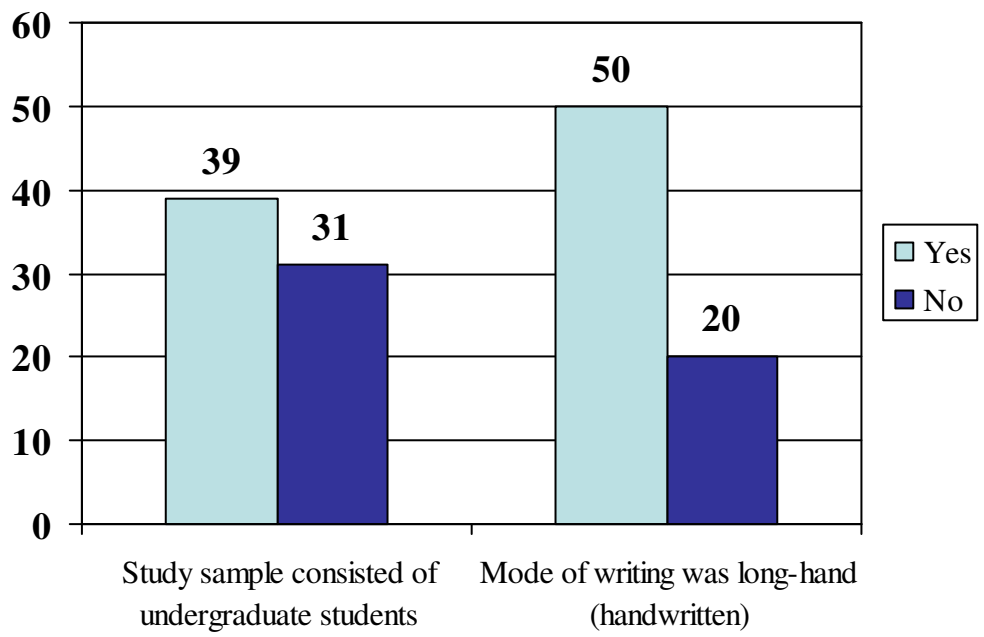
Figure 5. Exploratory Contextual Factors











APPENDIX A:

Literature Search Procedures

PsycINFO

Written emotional disclosure
Expressive writing
Trauma AND Disclosure
Writing AND Trauma AND Disclosure
Narratives AND Trauma AND Written
Emotional expression AND writing

Limits: English
Peer reviewed article

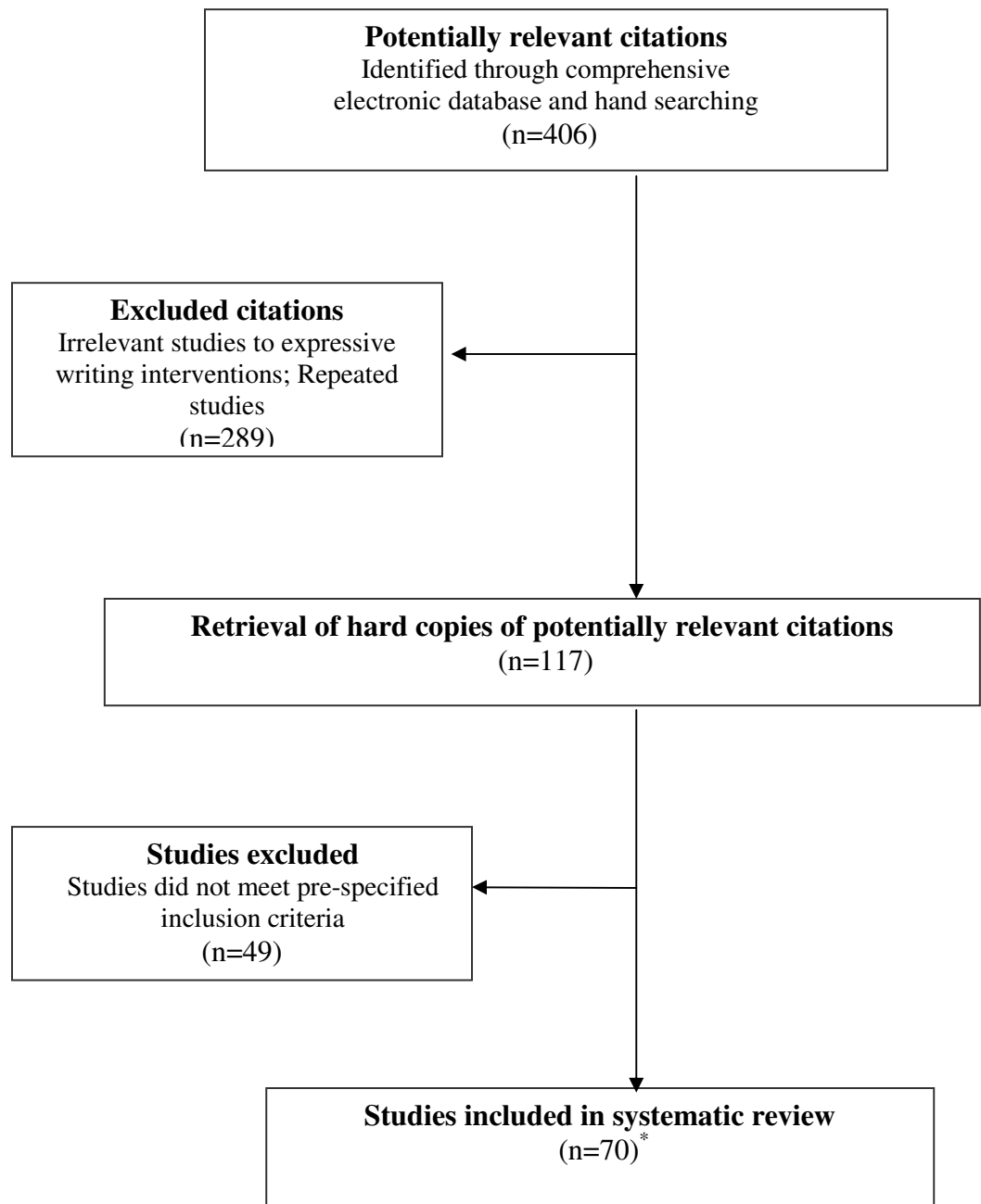
MedLine

Written emotional disclosure
Expressive writing
Trauma AND Disclosure
Narratives AND Trauma

Limits: English
Randomized Controlled Trial

APPENDIX B:

Study Identification Flowchart
(Khan et al., 2003)



*Final sample included 68 articles, but two articles included 2 studies each; resulting in a total of 70 studies.

APPENDIX C:

Reviewed and Rated Articles

Author(s)	Year	Title of Study	Journal of Publication
Abel, E., Rew, L., Gortner, E.M., Delville, C.L.	2004	Cognitive reorganization and stigmatization among persons with HIV	J. Adv Nurs. 2004, Sept. 47(5): 510-525
Batten, Sonja V., et al.	2002	Physical and psychological effects of written disclosure among sexual abuse survivors	Behavior Therapy, Vol 33(1), Win 2002. pp. 107-122
Booth, R.J., Petrie, K.J., & Pennebaker, J.W.	1997	Changes in circulating lymphocyte numbers following emotional disclosure: Evidence of buffering?	Stress Medicine, Vol. 13(1), 23-29.
Broderick, J., Junghaenel, D., Schwartz, J.	2005	Written emotional expression produces health benefits in fibromyalgia patients	Psychosomatic Medicine, Vol. 67(2), 326-334.
Broderick, J.E., Stone, A.A., Smyth, J.M., et al.	2004	The feasibility and effectiveness of an expressive writing intervention for rheumatoid arthritis via home-based videotaped instructions.	Annals of Behavioral Medicine, Vol. 27(1), 50-59.
Burton, C.M., et al.	2004	The health benefits of writing about intensely positive experiences	Journal of Research in Personality, Vol. 38(2), Apr. 2004, pp. 160-163
Cameron, L.D. & Nicholls, G.	1998	Expression of stressful experiences through writing: Effects of a self-regulation manipulation for pessimists and optimists.	Health Psychology, Vol. 17(1), 84-92.
De Moor, C., Sterner, J., Hall, M., et al.	2002	A pilot study of the effects of expressive writing on psychological and behavioral adjustment in patients enrolled in a Phase II trial of vaccine therapy for metastatic renal cell carcinoma.	Health Psychology, Vol. 21(6), 615-619.
Donnelly, A.A., Murray, E.J.	1991	Cognitive and emotional changes in written essays and therapy interviews.	Journal of Social and Clinical Psychology, 10(3), 334-371.

Earnhardt, Jayme L., et al.	2002	A writing intervention for negative body image: Pennebaker fails to surpass the placebo	Journal of College Student Psychotherapy, Vol 17(1), 2002. pp 19-35
Epstein, Sloan, Marx	2005	Getting to the heart of the matter: Written disclosure, gender, and heart rate	Psychosomatic Medicine, Vol. 67, 413-419.
Francis, Martha E., et al.	1992	Putting stress into words: The impact of writing on physiological, absentee, and self-reported emotional well-being measures	American Journal of Health Promotion, Vol 6(4), Mar-Apr 1002. pp 280-287
Gallagher, P., et al.	2002	Evaluation a written emotional disclosure homework intervention for lower-limb amputees	Arch Phys Med Rehabil. 2002 Oct; 83(10): 1464-6
Gallant, M. & Lafreniere, K.	2003	Effects of an emotional disclosure writing task on the physical and psychological functioning of children of alcoholics.	Alcoholism Treatment Quarterly, Vol. 21(4), 55-66.
Gidron, Y., Duncan, E., Lazar, A., et al.	2002	Effects of guided written disclosure of stressful experiences on clinic visits and symptoms in frequent clinic attenders.	Family Practice, Vol. 19(2), 161-166.
Gidron, Yori, et al.	1996	Written disclosure in posttraumatic disorder: Is it beneficial for the patient?	Journal of Nervous & Mental Disease, Vol. 184(8), Aug 1996. pp. 505-507
Greenberg, M.A., et al.	1996	Emotional expression and physical health: revising traumatic memories or fostering self-regulation?	J Pers Soc Psychol. 1996 Sep; 71(3): 588-602
Greenberg, M.A., Stone, A.A.	1992	Emotional disclosure about traumas and its relation to health: Effects of previous disclosure and trauma severity.	Journal of Personality and Social Psychology, 63(1), 75-84
Harris, A.H.S., et al.	2005	Does Writing Affect Asthma? A Randomized Trial	Psychosomatic Medicine, 67 (1), 130-136
Hemenover, S.H.	2003	The good, the bad and the healthy: Impacts of emotional disclosure of trauma on resilient self-concept and psychological distress	Pers Soc Psychol Bull. 2003 Oct; 29(10): 1236-44

King, L.A., Miner, K.N.	2000	Writing about perceived benefits of traumatic events: Implications for physical health.	Personality and Social Psychology Bulletin, 26, 220-230.
King, L.	2001	The health benefits of writing about life goals.	Personality & Social Psychology Bulletin, Vol. 27(7), 798-807.
Klapow, J.C., et al	2001	Symptom management in older primary care patients: feasibility of an experimental written self-disclosure protocol	Annals of Internal Medicine Date of publication 2001 May 1 Volume 134 Issue 9 Pt 2 Pages 905-11
Klein, K. & Boals, A.	2001	Expressive writing can increase working memory capacity.	Journal of Experimental Psychology: General, Vol. 130(3), 520-533.
Kloss, J. & Lisman, S.	2002	An exposure-based examination of the effects of written emotional disclosure.	British Journal of Health Psychology, Vol. 7(1)
Koopman, C., Ismailji, T., Holmes, D., et al.	2005	The effects of expressive writing on pain, depression, and PTSD symptoms in survivors of intimate partner violence.	Journal of Health Psychology, Special Issue: Psychological Interventions in Chronic Illness, Vol. 10(2), 211-221.
Kovac, S.H., Range, L.M.	2000	Writing projects: lessening undergraduates' unique suicidal bereavement.	Suicide and Life Threatening Behavior, 30, 50-60.
Kovac, S.H., Range, L.M.	2002	Does writing about suicidal thoughts and feelings reduce them?	Suicide and Life Threatening Behavior, 32, 428-440
Langens, T.A., Schuler, J.	2005	Written emotional expression and emotional well-being: The moderating role of fear of rejection.	Personality & Social Psychology Bulletin, Vol. 31(6), 818-830.
Lepore, S.J. & Greenberg, M.A.	2002	Mending broken hearts: Effects of expressive writing on mood, cognitive processing, social adjustment and health following a relationship breakup.	Psychology & Health, Vol. 17(5), 547-560.

Lewis, R.J., Derlega, V.J., Clarke, E.G., et al.	2005	An expressive writing intervention to cope with lesbian-related stress: The moderating effects of openness about sexual orientation.	Psychology of Women Quarterly, Vol. 29(2), 149-157.
Lumley, M. & Provenzano, K.	2003	Stress management through written emotional disclosure improves academic performance among college students with physical symptoms.	Journal of Educational Psychology, Vol. 95(3), 641-649.
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APPENDIX D:

CONSORT Checklist. Items to include when reporting a randomized trial
(David et al., 2001)

PAPER SECTION And topic	Item	Description	Reported on Page #
<i>TITLE & ABSTRACT</i>	1	How participants were allocated to interventions (e.g., "random allocation", "randomized", or "randomly assigned").	
<i>INTRODUCTION</i> Background	2	Scientific background and explanation of rationale.	
<i>METHODS</i> Participants	3	Eligibility criteria for participants and the settings and locations where the data were collected.	
Interventions	4	Precise details of the interventions intended for each group and how and when they were actually administered.	
Objectives	5	Specific objectives and hypotheses.	
Outcomes	6	Clearly defined primary and secondary outcome measures and, when applicable, any methods used to enhance the quality of measurements (e.g., multiple observations, training of assessors).	
Sample size	7	How sample size was determined and, when applicable, explanation of any interim analyses and stopping rules.	
Randomization -- Sequence generation	8	Method used to generate the random allocation sequence, including details of any restrictions (e.g., blocking, stratification)	
Randomization -- Allocation concealment	9	Method used to implement the random allocation sequence (e.g., numbered containers or central telephone), clarifying whether the sequence was concealed until interventions were assigned.	
Randomization -- Implementation	10	Who generated the allocation sequence, who enrolled participants, and who assigned participants to their groups.	
Blinding (masking)	11	Whether or not participants, those administering the interventions, and those assessing the outcomes were blinded to group assignment. When relevant, how the success of blinding was evaluated.	
Statistical methods	12	Statistical methods used to compare groups for primary outcome(s); Methods for additional analyses, such as subgroup analyses and adjusted analyses.	
RESULTS Participant flow	13	Flow of participants through each stage (a diagram is strongly recommended). Specifically, for each group report the numbers of participants randomly assigned, receiving intended treatment,	

		completing the study protocol, and analyzed for the primary outcome. Describe protocol deviations from study as planned, together with reasons.	
Recruitment	14	Dates defining the periods of recruitment and follow-up.	
Baseline data	15	Baseline demographic and clinical characteristics of each group.	
Numbers analyzed	16	Number of participants (denominator) in each group included in each analysis and whether the analysis was by "intention-to-treat". State the results in absolute numbers when feasible (<i>e.g.</i> , 10/20, not 50%).	
Outcomes and estimation	17	For each primary and secondary outcome, a summary of results for each group, and the estimated effect size and its precision (<i>e.g.</i> , 95% confidence interval).	
Ancillary analyses	18	Address multiplicity by reporting any other analyses performed , including subgroup analyses and adjusted analyses, indicating those pre-specified and those exploratory.	
Adverse events	19	All important adverse events or side effects in each intervention group.	
DISCUSSION Interpretation	20	Interpretation of the results , taking into account study hypotheses, sources of potential bias or imprecision and the dangers associated with multiplicity of analyses and outcomes.	
Generalizability	21	Generalizability (external validity) of the trial findings.	
Overall evidence	22	General interpretation of the results in the context of current evidence.	

APPENDIX E:

Rating Scheme

Rater #: __ _ Article #: __ _ _ _

Date: __ _ / __ _ / __ _

CONSORT Checklist

3a. Did the authors describe the settings and locations in which the study was carried out?

- Yes
- No

Additional Evidence-Based Behavioral Medicine-Specific Guidelines

23. Was treatment adherence monitored and reported?

- Yes
- Treatment adherence was monitored, but not reported
- Neither monitored nor reported

RATING SCHEME FOR LITERATURE REVIEW

28. How many total participants were enrolled in the study? _____

29. How many participants completed this study? _____

52. Is the location of writing described?

- Yes
- No

53. What location did participants complete their writing?

- Yes No
- University laboratory

- University office
- Medical setting (e.g., hospital, clinic)
- Participant's home
- Combination of different locations: _____
- Other: _____
- Not stated

54. Did participants complete their writing in the same location during all days of writing?

- Yes
- No
- Not stated

55. If participants completed writing in setting other than laboratory or medical setting, was adherence reported?

- Yes
- No

56. If participants wrote at home, were they contacted by the experimenter?

- Yes
- No

57. Were writing booklets and/or writing samples returned to or retained by the investigator?

- Yes
- No
- Not stated/Unclear

64. What mode of writing was used in the study?

- Long-hand (handwritten)
- Typed (in the laboratory)
- Email

- Combination of different methods: _____
- Other: _____

65. Which of the following best describes the sample of the study?

- Undergraduate students
- Individuals recruited from the general public
- Medical population
- Other: _____
- Not explicitly mentioned

68. Did the study use solitary disclosure?

- Yes
- No, writing was completed in the presence of other people
- Unclear/ not described

71. Did participants have face-to-face contact with researcher(s) in the study?

- Yes
- No (participants were mailed all materials)
- Combination—some participants did meet with the researcher(s) and others did not

APPENDIX F

Coding Rulebook

Expressive Writing Studies

Sections of Coding Rule Book

The coding rule book is divided into four content areas:

- 1. CONSORT/Evidence-Based Behavioral Medicine items*
- 2. Methodological reporting quality items*
- 3. Statistical hypothesis testing issues items*
- 4. Questions pertaining to the parameters of the expressive writing intervention*

Coding Procedures

Documentation

In order to facilitate coding decisions, the coder is encouraged to make notes on the rating scales and article. The notes will serve as guidelines for assigning scores for each scale.

Decision Rules

Two raters will independently rate all articles. Raters will then meet to resolve any discrepancies. All disagreements will be resolved via consensus and only the final consensus rating will be used for tabulation of ratings.

Previewing Articles

Coders should become very familiar with the article prior to coding each study. Coders should first read through the article, and then complete the rating scales.

Order of Coding

- 1. CONSORT/Evidence-Based Behavioral Medicine items*
- 2. Methodological reporting quality items*
- 3. Statistical hypothesis testing issues items*
- 4. Questions pertaining to the parameters of the expressive writing intervention*

CONTENT AREA 4:
CONSORT Statement Reporting Guidelines

METHODS

3(a) The settings and locations where the data were collected.

Example

"Volunteers were recruited in London from four general practices and the ear, nose, and throat outpatient department of Northwick Park Hospital. The prescribers were familiar with homoeopathic principles but were not experienced in homoeopathic immunotherapy."

Explanation

Settings and locations affect the external validity of a trial. Health care institutions vary greatly in their organization, experience, and resources and the baseline risk of the medical condition under investigation. Climate and other physical factors, economics, geography, and the social and cultural milieu can all affect a study's external validity.

Authors should report the number and type of settings and care providers involved so that readers can assess external validity. They should describe the settings and locations in which the study was carried out, including the country, city, and immediate environment (for example, community, office practice, hospital clinic, or inpatient unit). In particular, it should be clear whether the trial was carried out in one or several centers ("multi-center trials"). This description should provide enough information that readers can judge whether the results of the trial are relevant to their own setting. Authors should also report any other information about the settings and locations that could influence the observed results, such as problems with transportation that might have affected patient participation.

**ADDITIONAL EVIDENCE-BASED BEHAVIORAL MEDICINE-
SPECIFIC GUIDELINES**
(Davidson et al., 2003)

**25 Treatment adherence should also be monitored
and reported.**

Determining whether an adequate "dose" of treatment was received is a judgment that also requires evaluation of the patient's adherence to treatment. Several levels of adherence can be differentiated and should be described. The most rudimentary of these is whether or not patients attended treatment sessions and were, therefore, present to receive the intervention as delivered. A higher level of assessment of adherence is obtained by measuring whether or not patients enacted the treatment recommendations. For example, did they fill out the exercise club registration forms? Did they attend the exercise class, as evidenced by fitness counselor report or by actigraphy? Did they read or complete homework assignments in self-help materials? When assessing adherence to treatment, it is recommended that

investigators use both self-reported and objectively measured evidence of adherence with treatment recommendations and further, that they report the decision rules, if any, whereby these adherence measures were combined.

It should also be noted that behavioral adherence and health outcomes may mistakenly be assumed to be interchangeable. For example, occurrence of weight loss in a patient enrolled in a dietary intervention is often taken to signify that the patient adhered to the prescribed regimen of caloric restriction. He or she may have done so or may have implemented a different eating or activity program from the one prescribed. He or she may have lost weight due to illness or may have initiated treatment with an anorectic agent. Thus, the patients' adherence behaviors have to be assessed accurately and reported rather than being inferred from study outcomes.

CONTENT AREA 2: **Methodological reporting quality**

28. How many total participants were enrolled in this study?

This item assesses the number of subjects who were enrolled in the study and not simply screened. This should be stated in the Methods section of the article, under the subheading "Participants."

29. How many participants completed this study?

This item refers to the number of subjects who completed the study, in its entirety and were included in the statistical analysis. If there is a longitudinal component (i.e., multiple follow-ups), it is the number of subjects at *final* assessment.

CONTENT AREA 4: **Items pertaining to parameters of the expressive writing intervention**

52. Is the location of writing described?

In order for this item to be endorsed positively, the study should indicate where participants wrote (e.g., laboratory, home, etc.) If there is no description of the location of writing, check "no."

53. What location(s) did participants complete their writing?

The study must explicitly state the location where participants completed their writing. If a combination of locations were used, check all that apply.

54. Did participants complete their writing in the same location during all days of writing?

Self-explanatory.

55. If participants completed writing in setting other than laboratory or medical setting, was adherence reported?

Adherence can include any indicator that participants adhered to the protocol. This might include the number of participants that returned their writing booklets, or the number of participants that reported they completed the writing.

56. If participants wrote at home, were they contacted by the experimenter?

Experimenters might contact participants via a phone call or a post-card. If participants did not write at home, please check 'no.'

57. Were writing booklets returned to or retained by the investigator?

In order for this item to be rated yes, the investigator must have had the writing booklets returned (in the case that participants wrote in setting other than laboratory) or the investigator retained writing booklets (in the case that participants wrote in the laboratory).

64. What mode of writing was used?

Self-explanatory.

65. Which of the following best describes the sample of the study?

Self-explanatory.

68. Did the study use solitary disclosure?

If participants wrote by themselves, without the presence of anyone else in the room, then check 'yes.' If a researcher was present during the writing session or if participants wrote in a classroom setting with other students, then check 'no'. If the study does not indicate whether solitary disclosure was used, check 'Unclear.'

71. Did participants have face-to-face contact with researcher(s) in the study?

If all materials (including informed consent) were conducted via mail or email or telephone, then participants did not have any face-to-face contact with researcher(s) and the appropriate boxes should be checked.

GLOSSARY

Bias: Systematic distortion of the estimated intervention effect away from the "truth," caused by inadequacies in the design, conduct, or analysis of a trial.

Blinding (masking): The practice of keeping the trial participants, care providers, data collectors, and sometimes those analyzing data unaware of which intervention is being administered to which participant. Blinding is

intended to prevent bias on the part of study personnel. The most common application is *double-blinding*, in which participants, caregivers, and outcome assessors are blinded to intervention assignment. The term *masking* may be used instead of blinding.

Enrollment: The act of admitting a participant into a trial. Participants should be enrolled only after study personnel have confirmed that all the eligibility criteria have been met. Formal enrollment must occur before random assignment is performed.

External validity: The extent to which the results of a trial provide a correct basis for generalizations to other circumstances. Also called *generalizability* or *applicability*.

Internal validity: The extent to which the design and conduct of the trial eliminate the possibility of bias.

Intervention: The treatment or other health care course of action under investigation. The effects of an intervention are quantified by the outcome measures.

Multiple comparisons: Performance of multiple analyses on the same data. Multiple statistical comparisons increase the probability of a type I error: that is, attributing a difference to an intervention when chance is the more likely explanation.

Multiplicity: The proliferation of possible comparisons in a trial. Common sources of multiplicity are multiple outcome measures, outcomes assessed at several time points after the intervention, subgroup analyses, or multiple intervention groups.

Participant: A person who takes part in a trial. Participants usually must meet certain eligibility criteria. See also *Recruitment*, *Enrollment*.

(Adapted from "The Revised CONSORT Statement for Reporting Randomized Trials: Explanation and Elaboration", Douglas G. Altman, DSc; Kenneth F. Schulz, PhD; David Moher, MSc; Matthias Egger, MD; Frank Davidoff, MD; Diana Elbourne, PhD; Peter C. Gøtzsche, MD; Thomas Lang, MA, for the CONSORT Group, *Annals of Internal Medicine* 2001;134:553-694.)