

Original Article

The effects of expressive writing intervention in cancer patients and survivors: A rapid umbrella review

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ABSTRACT

Objectives: Numerous primary studies and systematic reviews, both with and without meta-analyses, examined the effects of expressive writing intervention (EWI), yielding mixed and inconsistent findings. The purpose of this review was to assess the effects of EWI on health outcomes in cancer patients using systematic reviews with or without meta-analyses.

Materials and Methods: Google Scholar, Google, and Yahoo search engines and the Cochrane databases of systematic reviews published between 1986 and October 2019 were used to conduct the searches. Five studies met all of the criteria for inclusion. According to the AMSTAR tool, 80% of the included studies achieved a moderate level of methodological quality, while the remaining 20% achieved a low level of methodological quality.

Results: There were no consistent or robust findings regarding expressive writing effects, with some studies (40%, $n = 2$) indicating that expressive writing has no general effectiveness. In comparison, others (40%, $n = 2$) indicated that expressive writing affects only physical health outcomes, and only one study (20%, $n = 1$) indicated that expressive writing has a general effect. In addition, several studies (40%, $n = 2$) discovered a moderating effect.

Conclusion: In summary, the findings of this narrative overview indicate that there are mixed or inconsistent findings and several moderators regarding expressive writing effects in the cancer population, implying that substantial clinical heterogeneity and deviation from Pennebaker and Beal's, 1986, initial experiment, as well as some moderating variables, may account for this finding. Thus, future primary and review studies should employ a more rigorous methodology and greater homogeneity, notably similar to that of Pennebaker and Beal's original study in 1986, to replicate their initial findings.

Keywords: Written disclosure, Expressive writing, Cancer

INTRODUCTION

Cancer, as a chronic disease, can be traumatic, affecting multiple facets of physical and psychological health and the quality of life (QOL) of cancer patients and survivors.^[1-3]

According to recent research, cancer patients' willingness, ability, and opportunity to express cancer-related concerns and emotions may influence their adjustment to the stressors associated with cancer and cancer treatment, thereby affecting their psychological and physical health and QOL.^[2]

Pennebaker and Beal conducted the first expressive writing experiments in the fall of 1983 and discovered that healthy college students randomly assigned to write about traumas for 4 consecutive days, 15 min a day, ended up visiting the students' health center at about half the rate of students in the control group over the next 6 months.^[4-6]

In 1985, a replication study led by Pennebaker *et al.* discovered reductions in health center visits and immune changes consistent with improved health over the next several years. Other

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laboratories replicated and failed to replicate the findings, with occasional criticisms of the methodology and theory.^[4-7]

Since then, numerous primary studies, systematic reviews, and meta-analyses have been conducted on the effects of expressive writing intervention (EWI) in various populations and methodologies, with significant deviations from Pennebaker and Beal's original paradigm or their 1986 study.

Most primary studies conducted after Pennebaker and Beal's, 1986, study significantly altered their original paradigm.^[8] For instance, several studies altered the setting variables and used home- or clinic-based settings; others altered the treatment variables, such as the number of sessions, the duration of each session, the time between sessions, and follow-up assessment; yet others altered other critical variables, such as the population studied, the type of outcome measures used, the type of instruction used, and the type of topics covered.

Meta-analyses and systematic reviews of expressive writing in healthy, clinical, and mixed populations revealed inconsistent and mixed findings. For instance, the first meta-analysis of expressive writing on a healthy college student population^[9] established that expressive writing has a moderate effect size on psychological and physical health ($d = 0.47$).

Later research on expressive writing in clinical populations (people with physical and psychological disorders) revealed a small effect ($d = 0.19$) on only physical symptoms.^[10]

In 2006, Frattaroli conducted a more extensive meta-analysis ($n = 146$) on diverse populations (student populations, clinical populations with physical and psychiatric disorders, and general populations) and discovered that expressive writing benefits an individual's psychological health, physical health, and overall functioning, with an average Cohen effect value of $d = 0.151$. The study concluded that studies in this domain had a wide range of characteristics, many of which were associated with the size of the effect.

In addition, a narrative review of expressive writing studies revealed several beneficial effects on physical and psychological health, though the empirical evidence is generally equivocal.^[11]

In contrast, several systematic reviews and meta-analyses concluded that EWI had no beneficial effect on physical or psychological health outcomes in various populations.^[12-15] Apart from the equivocal and inconsistent findings of systematic reviews and meta-analyses, the literature review revealed a dearth of systematic reviews and meta-analyses on the EWI's effects on cancer patients.

As a result, to the best of the authors' knowledge, this is the first comprehensive review of systematic reviews and meta-analyses on EWIs in cancer patients and survivors.

MATERIALS AND METHODS

The present study followed the recommendations for Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA).^[16,17] The author created a narrative synthesis of the studies included.

Search strategies

Online searches were conducted using the following keywords in Google Scholar, Google, Yahoo, and Cochrane databases of systematic reviews published between 1986 and October 2019:

Expressive writing, written emotional disclosure, written emotional expression, systematic review, meta-analysis, and cancer.

Selection procedure and data extraction

The present study considered only English and Persian reports to be admissible.

Studies were selected using the PICO approach (patients, intervention, comparison, and outcomes).^[18,19]

Eligible studies (inclusion criteria)

1. A systematic review or meta-analysis of randomized controlled trials (RCTs) examining the EWI paradigm as initially defined by Pennebaker and Beal^[5]
2. Consist of a study population of adult cancer patients or survivors (aged 18 and over)
3. Present data on both physical health (e.g., health, physical symptoms, cancer symptoms, and health-care utilization) and psychological health (e.g., distress, depression, anxiety, and stress) outcomes, as well as on the QOL
4. English or Persian language articles.

Initially, the author eliminated duplicates and screened the titles of identified reports to remove irrelevant studies. The remaining studies were then screened for eligibility using their abstracts or full text, and eligible articles with available full text were included based on the inclusion criteria.

RESULTS

The study selection process using the PRISMA flow diagram is described in [Figure 1].

The initial search returned 8388 reports, of which 23 remained after duplicates were removed and screening steps were performed. After excluding 18 reports in the third step (eligibility assessment), five systematic reviews with or without meta-analyses published between 1986 and October 2019 met the inclusion criteria and were included in

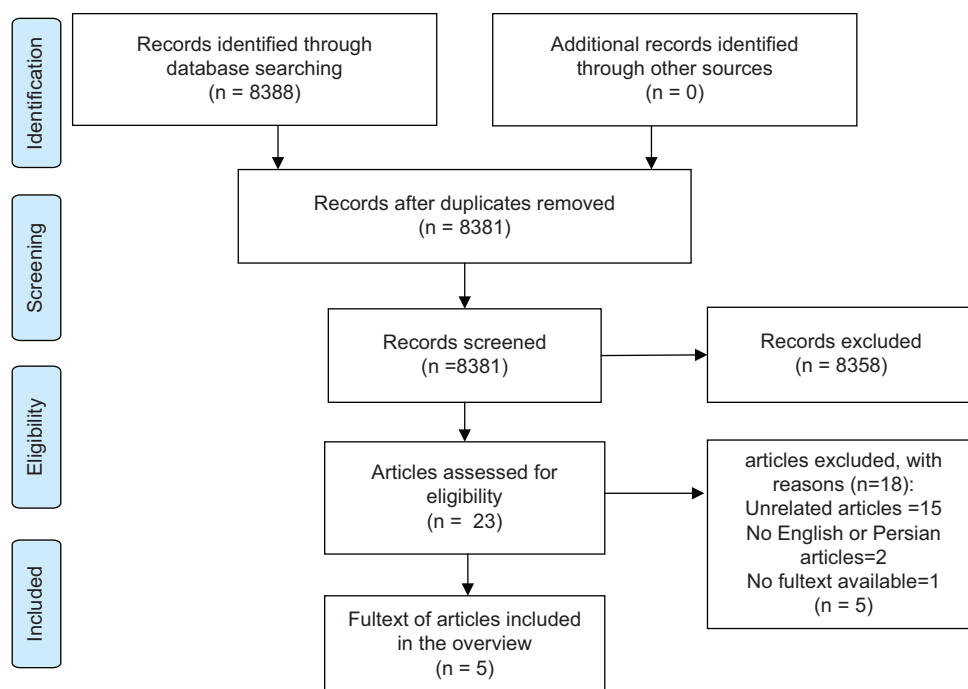


Figure 1: Preferred reporting items for systematic reviews and meta-analyses flow diagram of study selection process.

the present overview. The five studies included a total of 58 primaries (50 of which were analyzed).

Quality assessment through the AMSTAR tool^[20,21] revealed that 80% ($n = 4$) of the studies included had a moderate methodological quality, while 20% ($n = 1$) had a low methodological quality ranking, ranging from 4 to 8.

[Table 1] summarizes the characteristics of the studies included.

A total of 7235 (5771 after analysis) cancer patients or survivors were included in the five studies, with a mean sample size of 1447 (1154 of which were analyzed).

The majority (64%, $n = 36$) of primary studies examined breast cancer patients or survivors, while the remainder (36%, $n = 20$) examined other types of cancer (e.g., renal, prostate, colorectal, ovarian, and mixed cancer). A total of 80% ($n = 4$) of the studies included in this overview and 59% ($n = 3$) of primary studies reported a writing task or topic, with the majority of primary studies (70%, $n = 23$) instructing EWI participants (experimental group) to disclose their emotions about their cancer (cancer trauma), 9% ($n = 3$) about other trauma (self-selected trauma), 6% ($n = 2$) wrote about other benefits, and 15% ($n = 5$) wrote about other topics.

In addition, the number of writing sessions varied, ranging from 1 to 6. The majority of primary studies included 4 (66%, $n = 37$) or 3 (23%, $n = 13$) sessions of writing.

The spacing of writing sessions varied as well, with daily or consecutive day writing sessions (28.5%, $n = 16$), weekly

writing sessions (18%, $n = 10$), biweekly writing sessions (3.5%, $n = 2$), and triweekly writing sessions (16%, $n = 9$).

A total of 80% ($n = 4$) of the studies included and 78.6% ($n = 44$) of the primary studies reported a setting variable, with the majority of primary studies (84%, $n = 37$) having participants write in a non-laboratory setting (at home, in a clinic, or a mixed setting), while only 9% ($n = 4$) had laboratory-based designs and 7% ($n = 3$) had an unclear setting.

Furthermore, the control topic or task for the control group varied as well, with 61% ($n = 34$) of primary studies using neutral writing (facts about cancer, everyday activity, previous day activity, and health behavior), 30% ($n = 17$) using non-writing control topics (usual care), 4% ($n = 2$) using neutral non-emotional (trivial) writing, and 5% ($n = 3$) using other topics.

Moreover, post-intervention assessment time points varied, with 64% ($n = 36$) of primary studies reporting time points, from which 58% ($n = 21$) collected outcome data at two or more time points, 42% ($n = 15$) presented at a single time point, and 34% ($n = 20$) of the primary studies did not report time points.

A total of 80% ($n = 4$) of the studies included in this overview and 70% ($n = 39$) of primary studies reported the duration (time) of each session. Each session was also varied in length, with 87% of the primary studies lasting 20 min and the remaining (13%) lasting between 15, 15–20, 20–30, 30, and 90 min.

Table 1: The characteristics of the studies included in the overview.

First author (year)	Zchiaie and O'Toole (2015)	Oh and Kim (2016)	Kupeli et al. (2019)	Zhou et al. (2015)	Tim (2014)
Country	Denmark	South Korea	United Kingdom	China	United Kingdom
Number of primary studies (analyzed)	16 (16)	20 (14)	6 (4)	11 (11)	5 (5)
Total sample size (analyzed)	2392 (1797)	2510 (1718)	288 (214)	1178 (1178)	867 (864)
Quality of review (AMSTAR total score)	Moderate (7)	Moderate (6)	Moderate (8)	Moderate (8)	Low (4)
Type of cancer (%)	Breast cancer (50%) Other cancer (50%)	Breast cancer (50%) Other cancer (50%)	Metastatic breast cancer (25%) Advanced breast cancer (25%) Advanced cancer (25%) Renal cell carcinoma (25%) Advanced (100%)	Breast cancer (100%)	Breast cancer (100%)
Stage of cancer (%)	Stages 1–2 (31%) Stages 2–3 (6.25%) Stages 4 (12.5%) Stages 1–3 (6.25%)	Early stage (80%) Advanced or terminal stage (20%)		Breast cancer stages ranges from 0 to 4	Not recurrent or metastatic (100%)
Setting	No reported (44%) Laboratory based (19%) Home based (75%) Mixed (6%)	Home based (75%) Clinic based (10%) Unclear (15%)	Home based (50%) Laboratory based (25%) Clinic based (25%)	No reported	Clinic based (60%) Home based (40%)
Number of session (s)	3 sessions (31%) 4 sessions (69%)	3 sessions (20%) 4 sessions (65%) 6 sessions (5%) 1 session (10%)	4 sessions (100%)	3 sessions (18%) 4 sessions (64%) 6 sessions (9%) 1 session (9%)	3 sessions (40%) 4 sessions (40%) 1 session (20%)
Spacing (timing between sessions)	Consecutive days (37.5%) 1 and 5 days (6.25%) Over 1 week (6.25%) Biweekly (6.25%) Over 3 weeks (25%) Over 4 weeks (12.5%) Over 4–7 weeks (6.25%)	Consecutive days (30%) 1–2 days (5%) 2–3 days (15%) 4–5 days (5%) 1 week (35%) 1–2 weeks (5%) Not applicable (5%) 15 min (5%) 20 min (70%) 15–20 min (5%) 20–30 min (5%) 30 min (5%) 90 min (5%) Not reported (5%)	Over 2 weeks (20%) Over 3 weeks (20%) Over 4 weeks (20%) Over 4–7 weeks (20%) Over 4–7 weeks (20%)	Consecutive days (18%) Over 1–4 days (9%) Over 7 days (9%) Over 4–7 days (9%) Over 3 weeks (37%) Over 6 weeks (9%) Single session (9%)	Consecutive days (40%) Once per week (40%) Single session (20%)
Time of session (s)	Not reported	Not applicable (5%) 15 min (5%) 20 min (70%) 15–20 min (5%) 20–30 min (5%) 30 min (5%) 90 min (5%) Not reported (5%)	20 min (100%)	A minimum of 20 min of writing per session	20 min (100%)
Sex of participants	Not reported	Not reported	Predominantly females	All females	All females
Moderators	Perceived social constraints (emotional support)	Avoidance Alexithymia	Not reported	Time of follow-up	The choice of writing topics

(Contd...)

Table 1: (Continued).

First author (year)	Zchraie and O'Toole (2015)	Oh and Kim (2016)	Kupeli et al. (2019)	Zhou et al. (2015)	Tim (2014)
Writing topic	About cancer (81.25%) Not reported (18.75%)	Not reported	About cancer (75%) Other trauma (25%)	About cancer (54.55%) Other trauma (9.09%) Both about cancer and other trauma (9.09%) Both about cancer and benefit finding (9.09%) Benefit finding (9.09%) Multiple (emotional, benefit finding, cognitive appraisal, and coping prompts) (9.09%) All RCTs	Experimental group with two conditions: Breast cancer trauma Benefit finding (20%) Free or self-selected trauma (20%) Breast cancer trauma (20%) Benefit finding (20%) Multiple topic writing with variation each day (20%) All RCTs
Study design	All RCTs	13 (93%) RCTs 1 (7%) non RCTs Not reported	All RCTs	All RCTs	All RCTs
Post-intervention time point (s)	One time point (50%) Two or more time points (50%) Varied from 2 to 24 weeks after the intervention	Not reported	4 points (25%) 5 points (25%) 1 point (50%) varied from immediate post-intervention to 3-month follow-up	1 point (45.46%) 2 points (36.36%) 3 points (9.09%) 5 points (9.09%) Varied from 2 weeks after intervention to 9-month follow-up	1 point (0%) 2 points (60%) 3 points (20%) 5 points (20%) varied from immediately post-intervention to 9-month follow-up
Controls (%)	No writing (usual care) (18.75%) Neutral writing (50%) Facts about cancer (18.75%) Both facts about cancer and no writing (6.25%) Both neutral writing and peer helping writing (6.25%)	No writing (usual care) (35%) Neutral writing (65%)	Everyday behaviors and habits (25%) Health behaviors (25%) Facts about cancer (25%) Previous day activity (25%)	Neutral writing (cancer) (36.36%) Neutral writing (health behavior) (9.09%) Neutral writing (trivial) (9.09%) No writing (usual care) (36.37%) Non-cancer attention (9.09%)	Fact writing condition (20%) Non-emotional topic (20%) No assigned activity (no writing or usual care) (60%)
Type of analysis	Random effects model	Both the random effects model and fixed effects model	Both random effects and fixed effects model	Fixed effects model	Narrative analysis
Gray literature Language of primary studies	Not included English	Not included English and Korean	Not included English	Not included No language restriction English (91%) Korean (9%) Performed	Not included English
Subgroup analysis	Performed	Performed	Not performed	Performed	Not performed

(Contd...)

Table 1: (Continued).

First author (year)	Zchraie and O'Toole (2015)	Oh and Kim (2016)	Kupeli et al. (2019)	Zhou et al. (2015)	Tim (2014)
Overall conclusion	General effectiveness of EWI do not support for any of outcomes and its effects are context dependent.	EWI had significant small effects only on cancer symptoms (physical health outcomes).	Although the trial results suggest there is no benefit in expressive writing for people with advanced disease the current evidence is limited.	EWI may have a significantly positive impact on the physical health but not the psychological health in BC patients, but this benefit may not last long.	Regardless of prompts, among breast cancer survivors EWI is associated with higher health status and improvement in psychological well-being, however, the choice of writing topic moderated effects of the EWI.

EWI: Expressive writing, RCTs: Randomized controlled trials, BC: Breast cancer

In terms of expressive writing's overall effectiveness, 40% ($n = 2$) demonstrated no overall effectiveness, while 40% ($n = 2$) demonstrated only an effect on physical health outcomes. Only 20% ($n = 1$) of the remaining studies support expressive writing's general effectiveness and 40% ($n = 2$) of the studies included found a moderating effect.

DISCUSSION

The current review of five systematic reviews and meta-analyses of EWI in cancer patients and survivors revealed mixed and inconsistent findings, with several of the studies included finding no evidence for EWI's general effects in cancer patients and survivors. However, other studies included in this review discovered some benefits of EWI. Overall, the findings indicate that EWI trials had mixed or inconsistent effects and that some moderating variables moderated the effects of EWI in the cancer population.

The present overview's null finding on expressive writing's general effectiveness contrasts with earlier meta-analyses with healthy^[9] and mixed populations^[8] who found an overall effect for EWI. For example, Zachariae and O'Toole^[2] found no evidence for the general effects of EWI on any of the psychological or physical health outcomes in cancer patients and survivors. Although they discovered a moderating effect of social constraints in a subgroup of patients, Kupeli et al.^[22] also discovered no benefit for people with advanced disease (advanced cancer) from expressive writing.

However, Oh and Kim's meta-analysis,^[3] found that EWI had a significant effect on physical health outcomes but not on psychological or cognitive outcomes in cancer patients, and Zhou et al.,^[6] found that EWI had a positive effect on physical health outcomes but not on psychological health outcomes in breast cancer patients, are consistent with findings reported by Frisina et al.^[10] who conducted a meta-analysis of expressive writing on clinical populations. They hypothesized that the small effect sizes and nonsignificant test of homogeneity observed in several studies included in this research synthesis could be explained by the small and heterogeneous samples used in those studies. In addition, they stated in an update to their meta-analysis findings that several methodological points, such as clinical heterogeneity in the populations of RCTs and the outcome combined, are worth discussing because they believe that they can alter the authors' conclusions. Given this clinical heterogeneity, it is debatable whether the populations should be merged to produce a single effect size.^[23]

Only Tim^[24] discovered evidence for expressive writing's general effectiveness in breast cancer patients, consistent with some earlier meta-analyses conducted on healthy and mixed populations.^[8,9]

Similarly, several of the moderating effects identified in this overview are consistent with Fratarroli's^[8] findings from a

large meta-analysis ($n = 146$) and several subsequent primary studies, including our 2 min single-session expressive writing study with traumatized undergraduates.^[25]

To contextualize this finding, it is essential to note that

Even though almost all of the studies included in this review did not demonstrate statistically significant heterogeneity, substantial clinical and methodological heterogeneity at the participant, outcome, and intervention levels may account for these mixed results.

Several variables were present in all primary studies and systematic reviews included in this overview, which varied widely, including participant level (cancer patients with a variety of types and stages, as well as age, sex, race, and individual differences variables), intervention level (such as the number of session(s), the duration of session(s), and the time between sessions), outcome level (such as the timing and type of outcome measures used), and other essential variables such as instructions of disclosure used, setting variables, type of topic, and type of controls, among others.

Frattaroli^[8] concluded in her meta-analysis of EWI studies that they varied significantly on several characteristics, many of which correlate with the effect's size. Riddle *et al.*^[26] discovered that studies varied significantly regarding caregiver age, relationship to care recipient, care recipient impairment, follow-up period, and outcome measures, with frequently high or unclear bias observed.

According to Gagnier *et al.*,^[27] there are many possible sources of variability or heterogeneity among studies included in meta-analyses. Clinical heterogeneity refers to variation in the characteristics of participants, the types or timing of outcome measurements, and intervention characteristics; methodological heterogeneity refers to variation in trial designs and quality, and statistical heterogeneity refers to variation in summary treatment effects between trials. They discovered that even when statistical heterogeneity is low, there may be factors influencing the size of the treatment effect.

Furthermore, some context-dependent factors or moderators identified in moderation and subgroup analysis, such as emotional support, may obscure any effects of EWI when no moderation, subgroup analysis, or meta-regression were conducted, as some of the results in this overview indicated.

Moreover, deviation from Pennebaker and Beal's original writing paradigm may account for the mixed findings. Other possible explanations include the design, the setting, the population, the prompt or topic of writing instruction used, the dose-related variables used (such as the number of sessions, the duration of each session, and the spacing between sessions), the type of control condition used, and

other critical variables that varied widely between individual studies and different from that of Pennebaker and Beal's original study.^[5]

What is known as a topic

Expressive writing can improve psychological and physical health in non-clinical populations.

What remains unknown: Evidence of EWIs effects in clinical populations including cancer patients and survivors is mixed, it is not clear in which circumstances they may be effective or most effective.

Recommendations

It is recommended that future studies should employ a more rigorous methodology and greater homogeneity notably similar to that of Pennebaker and Beal's original study in 1986 as well as a tailored version of EWIs.

CONCLUSION

The present study reveals mixed and inconsistent findings for EWI and some moderating variables. These findings suggest significant clinical and methodological heterogeneity, deviation from Pennebaker and Beal's original paradigm,^[5] and moderating variables may be responsible.

To replicate Pennebaker and Beal's^[5] original findings on EWI, future individual studies should follow a similar design and methodology, and to achieve internal validity, future individual studies should follow a more rigorous methodology and homogeneity. Future systematic reviews and meta-analyses should be conducted using more homogeneous and rigorous primary trials with little or no statistical, methodological, or clinical heterogeneity.

The first limitation of the study was the small sample size used

The second limitation was that the studies included in this review demonstrated significant clinical heterogeneity, although they all involved the same population (cancer patients and survivors).

Third, omitting gray literature may increase the likelihood of publication bias, and omitting duplicate screening and data extraction may also contribute to the present study's bias. Despite these limitations, this study significantly adds to the body of knowledge about the effects of EWI.

Declaration of patient consent

Patient's consent not required as there are no patients in this study.

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Conflicts of interest

There are no conflicts of interest.

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