Examining the feasibility, efficacy, and perceptions of an online writing intervention in patients with Major Depressive Disorder: A multi-methods study

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Table of Contents

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Abstract

Background: Barriers to accessing treatment for Major Depressive Disorder (MDD) highlight a need for scalable interventions that can be administered online. One such intervention is expressive writing (EW), which typically involves daily sessions of writing for at least 20 minutes about a personal problem or issue. EW has been shown to alleviate MDD symptoms and related difficulties in various samples, including those with or at-risk for MDD. Its simple format also makes it amenable to online administration.

Objective: We conducted a multi-methods study to evaluate the feasibility, efficacy, and perceived utility of online EW in patients with MDD.

Methods: We recruited a sample of 54 patients diagnosed with MDD from a large academic psychiatry hospital. Half were randomized to complete four 20-minute sessions of EW online and the other half were randomized as controls. All participants completed outcome measures before and after the intervention, and at a one-month follow up. Our primary outcome was MDD symptom severity, and secondary outcomes were symptom severity of Generalized Anxiety Disorder (GAD), functional impairment, and the perceived complexity of personal problems. We used mixed effect models to assess the impact of group (i.e., EW or control), time, and their interaction on each outcome. We also completed qualitative interviews with participants assigned to EW about their experiences and conducted a reflexive thematic analysis of these qualitative interviews.

Results: Most EW participants (n=20, 74%) completed at least three EW sessions, but only 6 (22%) wrote for the full 20 minutes. There was no evidence that condition interacted with time to impact MDD symptoms (F=0.28, P=.753), GAD symptoms (F=0.21, P=.811), functional impairment (F=0.99, P=.376), or perceived complexity of problems (F=0.66, P=.519). In qualitative interviews, some participants reported EW allowed them to offload or process negative emotions and thoughts, whereas others reported it to be unhelpful. Suggestions to improve EW included offering more specific guidance and flexibility in its duration.

Conclusions: EW was feasible to administer online to patients with MDD, with some reported benefits for emotional and cognitive processing. However, EW was not associated with improvements in MDD symptoms and personal functioning and may not be an effective online intervention for MDD in its current state. Providing more specific instructions or guidance, with some clinical oversight or support, may be a promising approach to modifying the intervention for evaluation in future work.

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Keywords: Expressive writing; Online intervention; Major Depressive Disorder; Generalized Anxiety Disorder; Multi-Methods; Digital Mental Health.

Introduction

Major Depressive Disorder (MDD) is a common and distressing mental health condition, which is often left untreated. An estimated 11-17% of Canadians will be diagnosed with MDD in their lifetime [1-2], whereas the number of individuals currently affected has increased due to the COVID-19 pandemic. Since its onset, the percentage of Canadians reporting high levels of depression has increased from 4 to 10%, with even larger increases reported for anxiety (from 5 to 20%) [1].

Psychotherapy is an effective and enduring treatment option [3], but its availability is limited. Despite an increase in psychotherapy provision over the past decade, many Canadians still cite

financial and access issues as barriers [4-6]. Recent shifts to virtual care [7] have not addressed this unmet need. Canadians feeling depressed or anxious report that the quantity and quality of mental health services has declined since the onset of the pandemic [1], potentially due to staff shortages and health system burden. Surveys indicate that over one quarter of Canadian adults are now unable to manage their sadness, anxiety, or stress, and 53% of those seeking mental health care do not receive it [7]. This leaves an estimated 5.2 million Canadians grappling with distressing symptoms and related difficulties in social, occupational, and physical functioning [7-8]. There is a clear need for interventions for MDD that can alleviate symptoms and improve functioning, while being accessible and scalable, i.e., not requiring intensive psychotherapist involvement.

One possible such intervention is Expressive Writing (EW), which involves a series of daily journaling tasks in which individuals write their deepest thoughts and feelings about a negative event or problem for at least 20 minutes [9]. EW does not require manuals or trained clinicians, making it affordable and amenable to being administered online and at scale. There is a large literature documenting its various physical and psychological benefits, with several published meta-analyses. These benefits have been linked to several proposed therapeutic mechanisms. For instance, repeated exposure to negative thoughts and feelings during EW may diminish their impact over time [10]. Temporary increases in emotional distress during EW may also underlie emotional and cognitive processing, leading to insights or changes in behaviour that improve an individual's circumstances and reduce distress over time [10-13]. However, the evidence on the extent to which EW impacts depressive symptoms and psychological wellbeing is mixed. Some meta-analyses find small but significant net effects for alleviating symptoms of depression and anxiety [10, 14], whereas others find no benefits for psychological wellbeing [15-17]. One meta-analysis of 39 randomized controlled trials by Reinhold and colleagues focused on the effect of EW on depressive symptoms and found a small and significant decrease in symptoms immediately following EW; however, decreases in symptoms at subsequent follow-ups were not statistically significant [18]. Although this finding led the authors to conclude that EW may not be helpful in the long term, large sample variances suggested that some individuals benefit whereas others do not [18].

Most studies of EW on depressive symptoms have involved homogeneous samples largely consisting of college students, and few have examined effects in patients with MDD. For example, in the meta-analysis by Reinhold and colleagues cited above, few studies focused on depressive symptoms as a primary outcome of writing and most studies involved non-clinical samples (i.e., only 6% of samples were diagnosed with MDD) [18]. Although the effects of EW did not differ between clinical and non-clinical samples in a moderator analysis, this null finding may be related to low heterogeneity between studies [18-19]. EW may be effective in samples that are more likely to experience depressive symptoms than the general population, such as outpatients undergoing psychotherapy [20], individuals seeking online resources for mood disorders [21], or college students with a history of depression [22-23]. Although studies of EW in clinical samples are scarce, one study examined the effect of administering EW in-person for 20 minutes over three consecutive days in participants diagnosed with MDD experiencing a current major depressive episode based on a structured interview [24]. Compared to participants who completed control writing tasks, participants assigned to EW had fewer depressive symptoms following the intervention, and this benefit persisted after one month [24]. Although the degree of symptom severity required for formal diagnosis of MDD is not well defined, findings from several studies suggest that individuals experiencing severe and debilitating symptoms may benefit from EW more than individuals whose symptoms are minimal [21, 22, 25-27].

At the same time, there are concerns that administering EW online to MDD patients may be unhelpful or impractical. Despite some studies suggesting that individuals with severe symptoms can benefit from EW, this is not always the case. Moreover, EW has been associated with increases in depressive symptoms or emotional distress over the long term in some samples, including those more likely to ruminate or experience severe symptoms at baseline [28-29]. These findings have led some

authors to conclude that EW may be unhelpful for MDD, because the intervention offers little guidance for processing challenging material and may exacerbate negative emotions or thoughts [28-29]. Another concern is related to feasibility. Low motivation or other depressive symptoms may prevent individuals from engaging with EW or completing it as instructed, particularly if it is administered remotely. Although no studies to-date have administered EW online to patients diagnosed with MDD, rates of attrition in participants assigned to complete EW remotely are generally high [27,29], with life commitments and difficulties engaging with the task cited as barriers [21]. Thus, it is unclear whether patients diagnosed with MDD would engage with EW administered remotely and if so, whether they would benefit from it [24].

Moreover, benefits of EW in individuals with MDD may not only reflect changes in symptoms, but they may extend to other outcomes. The proposed therapeutic mechanism of EW involves emotional and cognitive processing [10,11], suggesting that individuals with MDD may find EW valuable for thinking through difficult experiences or gaining a different understanding of events, thoughts, and feelings. These outcomes of EW may be better captured with qualitative research. In one study, for example, EW about the COVID-19 pandemic did not impact MDD symptoms as assessed via a structured questionnaire, but two thirds of participants interviewed about EW reported it to be personally beneficial [30]. Emotional or cognitive processing during EW may also be associated with changes in personal, social, or occupational functioning, which may explain noteworthy benefits observed in some EW studies. For example, unemployed participants were more likely to find a job [31], or participants struggling with marital separation either re-united with an ex-partner or reported increased emotional detachment from them [32]. Several studies have also observed higher grade point averages for students who wrote expressively about an upcoming exam or adjustment to college [33-34]. Given that depressive symptoms do not always map onto personal or functional outcomes [8], it is possible that in studies not reporting statistically significant effects of EW on MDD [18], participants might nevertheless experience benefits related to other aspects of their lives. EW may help participants reconceptualize or even address their personal problems or improve their physical, social, or occupational functioning.

Aims and Hypotheses

We conducted a multi-methods study to assess the feasibility and efficacy of administering EW online to patients with MDD recruited in a clinical setting. We also examined perceptions of its impact on emotional and cognitive wellbeing. To achieve these aims, we randomized patients into one of two groups: one group was prompted to complete four sessions of EW online, whereas the other group was not asked to complete this task. Both groups completed self-reported measures of outcomes. Our primary outcome was reduction in MDD symptoms; secondary outcomes included symptoms of Generalized Anxiety Disorder (GAD), functional impairment, and the perceived complexity of personal problems. Participants completed these measures before and after the EW task, and at a one-month follow up. We examined the rate of EW completion and adherence to the suggested writing duration, as well as its impact on outcomes over time. We also conducted qualitative interviews addressing participants' experiences with EW, with a focus on its emotional and cognitive effects.

A priori, we proposed that online administration would be deemed feasible if 70% of EW participants completed at least three 20-minute sessions of writing. We expected different changes in outcomes across time for both groups. In the control group, we anticipated no change or a slight decrease in symptoms of MDD and GAD, functional impairment, and perceived problem complexity over time. In the EW group, we expected a significant reduction in MDD and GAD symptoms following the intervention, relative to the control group [18,24]. Alternatively, EW participants could report increased symptoms, based on research finding temporary increases in emotional distress related to EW [12,13]. We expected that changes in functional impairment or perceived problem complexity may take some time to emerge, so we did not expect effects related to these outcomes

immediately following EW. At the one-month follow up, however, we expected the EW group to report fewer symptoms of MDD and GAD, less functional impairment, and less complex personal problems, relative to the control group. In qualitative interviews, we expected participants would report EW to be beneficial, particularly as related to its emotional or cognitive effects [10,30].

Methods

Recruitment

We recruited patients from the Centre for Addiction and Mental Health, a large academic psychiatry hospital located in Toronto, Ontario. Patients were referred to the study by psychiatrists during initial or follow-up appointments, or by psychotherapists either before the start or after the end of group Cognitive Behavioral Therapy (CBT). Inclusion criteria were adults aged 18 or older, who were assessed by a psychiatrist and received a diagnosis of MDD with or without another co-morbid condition. Participants also required access to the internet and an email address at which they could receive study materials. Patients were excluded if they could not understand, speak, or write in English. Clinicians were also asked not to refer patients unable to complete EW due to cognitive impairment or judged to be at risk for negative outcomes when completing the intervention remotely (e.g., for those reporting suicidal ideation). Patients were not excluded if they were receiving treatment for MDD (e.g., antidepressants, group CBT).

Measures

Demographics

Participants self-reported their demographic characteristics, which included their age, gender, racial or ethnic background, and postal code, which was used to derive socioeconomic status. We matched clients' postal codes with average incomes for their dissemination areas, using national Census statistics. Incomes represented across all provincial dissemination areas were split into four categories (i.e., low, mid-low, mid-high, high), to which incomes for individual participants were matched.

Patient Health Questionnaire (PHQ-9)

The PHQ-9 is a self-reported measure of MDD symptom severity validated for use in psychiatric samples [35-36]. It measures the frequency of 9 symptoms on a scale from 0 (not at all) to 3 (nearly everyday). Scores are summed to reflect MDD symptom severity, and they range from 0-27, with higher scores indicating greater severity.

Generalized Anxiety Disorder (GAD-7)

The GAD-7 is a self-reported measure of GAD symptom severity [37]. It has good psychometric properties [38] in measuring the frequency of 7 symptoms on a scale from 0 (not at all) to 3 (nearly everyday). Summed scores range from 0-21, with higher scores indicating greater severity.

WHO-Disability Assessment Schedule (WHODAS)

WHODAS is a self-reported measure of functional impairment [39]. It measures the degree of difficulty from the past month related to 12 activities in domains of cognition, mobility, self-care, and social participation. Activities are measured on a scale from 0 (none) to 4 (extreme or cannot do), and scores are summed to reflect overall functional impairment. They range from 0-48, with higher scores indicating greater impairment.

Problem Complexity Questionnaire (PCQ)

PCQ measures the perceived complexity of personal problems. It consists of 8 statements reflecting

the complexity of problems, such as “I do not yet know how to resolve these problems” or “These problems have left me in a dilemma”. Participants rate each item on a scale from 1 (completely disagree) to 4 (completely agree). Scores range from 8 to 32, with higher scores indicating higher perceptions of problem complexity. The PCQ has been used to measure problem complexity in samples with MDD [40].

Procedures

The study was approved by the hospital’s Research Ethics Board. Patients referred to the study were provided with a high-level description of study aims (i.e., “evaluating the extent to which completing questionnaires or a writing task is useful for people with depression”). Prior to enrollment, all participants were given information about study procedures and risks, and they provided their informed consent. Once enrolled, participants were allocated to EW or control with 4-block randomization and they were sent the first study questionnaire consisting of the demographics form, PHQ-9, GAD-7, WHODAS, and PCQ. Their electronic health records were also accessed to extract information about their diagnoses and current treatment. After completing the first questionnaire, participants assigned to EW were sent instructions to complete the first EW session on the next day. We adapted a common version of EW instructions [41], which reads:

For the next 20 minutes, please use the box below to write your very deepest thoughts and feelings about a negative issue or personal problem that you are currently being affected by. In your writing, try to let go and explore your emotions and thoughts regarding this issue or problem. Please do not worry about spelling or grammar. You may wish to set a timer or have a clock handy to make sure you write for 20 minutes.

Instructions were accompanied by a text box, in which participants could write freely. Although participants were instructed to write for 20 minutes, they were also told during the informed consent discussion that they could pause or stop the writing task at any time (e.g., if they felt unwell). EW participants were provided with the same instructions on the next three days. Participants who were allocated to control were not provided with the EW instructions. After one week (for the control group) or on the next day that participants completed their fourth EW session (for the EW group), participants received a second questionnaire containing the PHQ-9, GAD-7, WHODAS, and PCQ. One month after completing the second questionnaire, they received a third questionnaire containing the same measures. All study materials (i.e., questionnaires, EW sessions) were administered via RedCap, a web-based application for data collection available through the hospital, and instructions were sent to participants by email. If participants did not complete an EW session or follow-up questionnaire within three days of receiving it (or after one week for the first questionnaire), participants who agreed to receive reminders by text message or email were sent up to two reminders. Participants who did not respond or complete the relevant study components after two reminders were assumed to have dropped out of the study and were no longer contacted. However, participants who responded to reminders or completed the questionnaires or EW sessions within any period of time were included.

After completing the third questionnaire, all EW participants were invited to participate in a brief qualitative interview. Qualitative interviewing was guided by the question of how individuals with MDD experience online EW, with a focus on understanding its emotional and cognitive effects (see Multimedia Appendix 1 for the interview guide). At this point, control participants were given an opportunity to complete the EW task, if they wished. All participants who completed the study were sent a small gift card by mail.

Statistical Analysis

Descriptive

We examined the baseline demographic and clinical characteristics of our sample and compared them between the control and EW groups. Differences in categorical variables were compared with Chi-squared tests. Due to small samples in some racial or ethnic categories, this variable was recoded into a binary representation when testing for differences between groups. Continuous variables that were normally distributed were compared with t-tests, whereas Wilcoxon-signed rank tests were used for continuous variables with non-parametric distributions.

Feasibility and Efficacy

We examined how many EW participants completed at least three sessions, how many wrote for at least 20 minutes, the median length of time spent writing, and the median word count of EW tasks.

In our intention-to-treat analysis, we generated mixed effect models with maximum likelihood estimation using all participants in the EW group and all participants in the control group who completed the first (baseline) questionnaire. We generated four models to examine the impact of condition, time, and a condition by time interaction on each outcome (i.e., PHQ-9, GAD-7, WHODAS, PCQ). Time was treated as a categorical factor, to account for the possibility of non-linear effects. For any models with evidence of this interaction, we plotted estimated means to inspect trajectories, with 95% confidence intervals to gauge effects. In a per-protocol analysis, we generated the same mixed effect models adding number of completed sessions as a predictor, to determine whether completing fewer sessions impacted outcomes (setting all control participants to 0). As an additional per-protocol analysis, we replaced session number with text length (i.e., word counts) over the total number of sessions as a predictor, to determine whether writing more content impacted outcomes. Residuals for each model were inspected to ensure no violations in the normality assumption. Analyses were completed in R (Version 4.1.1), using the lmer package [42] for mixed effect modelling.

Experience

Our approach to analyzing qualitative interviews was guided by reflexive thematic analysis [43-44], which is a recursive and constructive process of identifying and analyzing themes. Briefly, this process involves six stages: gaining familiarity with the data item, initially coding its features, generating broader themes, reviewing, defining, and naming themes, and reporting. Our data item was the content from qualitative interviews with participants assigned to EW and agreeing to be interviewed. Given our focus on emotional and cognitive effects, we adopted a predominantly theoretical or deductive approach, to provide a nuanced account of how participants experienced these effects of EW. To accommodate the diversity of experiences, we incorporated inductive analysis [45]. Our analysis was primarily semantic and essentialist, since we wished to understand participants' explicit experiences or accounts of EW, rather than deriving latent themes. Coding and analysis of qualitative interviews was supported by Nvivo (Version 1.7).

Results

A sample of 63 patients consented to participation, were enrolled into the study, and randomized to EW or control groups. Fifty-four participants completed the baseline questionnaire, and 46 completed the study. A Consolidated Standards Of Reporting Trials (CONSORT) diagram of the recruitment and enrollment process is provided in Figure 1. Diagnosis and treatment information extracted from health records for the 54 participants who completed the baseline questionnaire are provided in Multimedia Appendix 2. Participants had multiple recorded diagnoses, which commonly included MDD (71%), another depressive disorder (24%), GAD (41%), and social anxiety disorder

or social phobia (20%). Most participants (55%) were on psychotropic medications, 29% had completed psychotherapy prior to starting the study, and 12% were in psychotherapy during the study. Descriptive statistics and relevant between-group comparisons for the demographic and clinical characteristics of the 54 participants who completed the baseline questionnaire are provided in Table 1. Comparisons show that participants assigned to the EW group had higher incomes.

Table 1. Baseline clinical and sociodemographic characteristics of all participants, and stratified by group.

	All	EW	Control	Comparison	Qualitative
N	54	27[a]	27		11
Age, M (SD)	36.50 (14.11)	37.12 (12.37)	35.93 (15.76)	*W*=310, *P*=.621	41 (14.11)
Gender, *n* (%)					
Men	17 (32)	6 (23)	11 (41)	X^2 (1) =1.17, *P*=.279	3 (27)
Women	36 (68)	20 (77)	16 (59)		8 (73)
Ethnicity, *n* (%)					
White	35 (66)	16 (62)	19 (70)	X^2 (1) =0.15, *P*=.698[b]	9 (82)
Racialized	18 (34)	10 (38)	8 (30)		2 (18)
First Nations	1 (2)	0 (0)	1 (4)		0 (0)
West Asian	3 (6)	2 (8)	1 (4)		0 (0)
East Asian	1 (2)	1 (4)	0 (0)		1 (9)
Latin American	3 (6)	2 (8)	1 (4)		0 (0)
South Asian	5 (9)	2 (8)	3 (11)		0 (0)
Mixed	4 (8)	3 (12)	1 (4)		1 (9)
Other	1 (2)	0 (0)	1 (4)		0 (0)
Income, *n* (%)					
High	22 (41)	9 (33)	13 (48)	X^2 (3) =10.87, *P*=.012	4 (36)
Mid-high	12 (22)	11 (41)	1 (4)		5 (45)
Mid-low	6 (11)	2 (7)	4 (15)		1 (9)
Low	14 (26)	5 (19)	9 (33)		1 (9)
PHQ-9, M (SD)	14.63 (6.32)	13.36 (5.96)	15.82 (6.53)	*t* (50) =1.42, *P*=.163	14.90 (4.53)
GAD-7	11.06 (6.28)	10.56 (6.61)	11.52 (6.05)	*W*=362.5, *P*= .653	10.73 (5.93)
WHODAS	17.87 (9.27)	16.60 (9.12)	19.04 (9.43)	*t* (50) =0.95, *P*=.358	18.36 (8.20)
PCQ	29.83 (5.30)	29.24 (6.46)	30.48 (3.72)	*W*=293, *P*=.917	30.55 (5.28)

[a]One participant in the EW condition did not report their age, gender, and race/ethnicity.
[b]The comparison between conditions for race/ethnicity was based on a binary representation (i.e., white vs. racialized).

Table 2 provides information on the rate of EW completion, duration, and length of the EW texts (i.e., word counts). Of the 27 participants assigned to the EW, 20 (74%) completed at least 3 sessions. Two (7%) participants dropped out before completing the first session, one of whom indicated that they preferred not to complete EW, believing it might be detrimental to their mental health. Three (11%) participants completed only one session of writing, two (7%) completed two sessions, one (4%) completed three sessions, and 19 (70%) completed all four sessions. However,

many participants did not write for at least 20 minutes, and the number of participants who wrote for at least 20 minutes decreased over subsequent sessions (see Table 2). Only 6 (22%) participants completed at least 3 sessions of EW for at least 20 minutes. The median writing duration across all sessions was 21 minutes, with the shortest writing session lasting 5 minutes and the longest lasting 4.32 days (since participants were free to leave their EW sessions open and return to them after a few days). The length of EW texts (i.e., word counts) ranged from 54 to 1,219 words.

Table 2. Descriptive information on EW tasks.

Session	Completed *n* (%)	20 minutes *n* (%)	EW writing duration *(minutes)* Median (Range)	EW text length *(words)* Median (Range)
1	25 (93%)	19 (70%)	22.50 (10-2166 or 1.5 days)	514 (171-1219)
2	22 (81%)	11 (41%)	20.50 (7-6227 or 4.32 days)	339.5 (75-1119)
3[a]	20 (74%)	9 (33%)	19 (6-208 or 3.5 hours)	384 (159-881)
4	19 (70%)	8 (30%)	19 (5-1514 or 1.05 days)	413 (54-983)

[a]The third EW session for one participant was not recorded due to computer error.

Efficacy

Intention-to-treat analyses

There was no main effect of time (F=1.57, P=.214) or condition (F=2.21, P=.143), and no evidence of their interaction (F=0.28, P=.753) on PHQ-9 scores. The adjusted intraclass correlation coefficient (ICC), which indicates the association of scores within each participant was 0.78. Similarly, there was no effect of time (F=1.91, P=.154) or condition (F=0.87, P=.355), and no evidence of their interaction (F=0.21, P=.811) on GAD-7 scores (ICC = 0.82). There was also no effect of time (F=1.35, P=.264) or condition (F=2.25, P=.140), and no evidence of their interaction (F=0.99, P=.376) on WHODAS scores (ICC=0.83). Finally, PCQ scores were not impacted by time (F=0.22, P=.801), condition (F=0.00, P=.996), or their interaction (F=0.66, P=.519; ICC=0.36).

Per-protocol analyses

The number of sessions ranged from 0-4, with 29 participants not completing any sessions, including 27 control participants and the two EW participants who withdrew prior to completing the first writing session. Word counts across all EW sessions for each participant ranged from 0 (for control participants) to 3,440 words (M=727.80, SD=1047.60). Results of the effects of time, condition, and their interaction for each outcome are provided in Multimedia Appendix 3. Findings indicate that accounting for the number of completed sessions or the length of EW content does not qualitatively change our results; there was no evidence of a condition by time interaction for any outcomes, suggesting that changes in outcome across time were not different between the EW and control groups.

Experience

A subset of 11 EW participants (41%) completed qualitative interviews. Their demographic and clinical characteristics are provided in Table 1. They were mostly women, self-identifying as white, and in high income categories. Most common diagnoses in this subset were MDD (n=8, 73%), another depressive disorder (n=3, 27%), GAD (n=4, 36%), or social anxiety (n=3, 27%). Five participants (45%) were taking psychotropic medications during the study, five (45%) completed psychotherapy prior to participating, and one (9%) was in psychotherapy during the study. All 11 participants completed four sessions of EW and writing times across all sessions ranged from 5 to 208 minutes (Median=21 minutes). Their EW text lengths ranged from 87 to 1,219 words (Median=448.5). Most participants (n=9, 82%) expressed that the EW instructions were clear and

easy to follow. Participants (*n*=10, 91%) also reported it was easy to be open and candid in expressing their thoughts and feelings, with one noting it was helpful to write from home “in a private and safe place”.

Themes emerging from our analysis and select paraphrased statements from participants are provided in Table 3. Participants could be classified in two groups based on the themes “Emotional offloading or release” and “Cognitive processing or perspective”. Seven participants (64%) found some value in EW related to one or both of these themes (i.e., the value group); four participants (36%) did not report any such benefits (i.e., the no-value group), generally finding EW to be unproductive or even harmful (see theme “Cognitive pitfalls”). Mean PHQ-9 scores at each time point for these participants, stratified by group membership, are depicted in Multimedia Appendix 4. All participants in the no-value group, as well as some participants in the value group, (*n*=8, 73%) reported negative feelings during EW, which in some cases, lingered after writing (see “Emotional re-experiencing”). Feelings were often attributed to recalling or re-experiencing past thoughts and emotions, and included feeling annoyed, frustrated, agitated, sad, and uncomfortable. Despite negative emotions, all participants in the value group reported some degree of “Emotional offloading or release”, in that EW provided an outlet for “throwing off” or offloading negative emotions, so that these emotions would not come up at less opportune times (Table 3). All but one participant in the value group additionally reported effects related to “Cognitive processing and perspective”, which involved EW offering “clarity”, a gain in perspective, or enabling participants to reconceptualize their challenges. Other benefits related to this theme involved EW helping participants to “subjectively organize [their] reactions” or “dig deeper” into their feelings, reflecting on their causes or appropriateness (Table 3). Although some participants across both groups acknowledged that EW would not solve their problems, participants in the no-value group also reported EW to be unproductive (see “Cognitive Pitfalls”). For example, EW took them to “a negative place”, got them “stuck in a negative frame of mind”, or served as a reminder that they could not fix their problems (Table 3). Accordingly, all but one participant in the no-value group expressed that they were not motivated to complete EW, reporting that they would procrastinate, not complete it daily, or find later sessions to get tedious. One participant mentioned a general malaise related to their depression, making it “hard to get going”, which carried over into EW.

Some experiences were common across participants in both groups. There were participants in the value group reporting experiences consistent with “Cognitive Pitfalls”, despite other benefits related to emotional offloading or cognitive processing. Some of them also reported issues completing EW as instructed or needing reminders. Common reasons were issues with focus and memory, procrastination, emotional barriers, and difficulties finding the time or place to write. Many participants (*n*=7, 64%) nevertheless reported that the writing task was engaging.

Participants also provided suggestions to improve EW, which were primarily related to guidance and timing. Although some participants reported enjoying the freedom to write about whatever they wanted, six (55%) expressed a desire for more structured or detailed instructions. For example, instructions could guide writers through a progressive exploration of different topics or experiences, as well as potential ways to approach personal problems. Another participant suggested reviewing and reflecting on past EW entries, perhaps with feedback from a therapist or counsellor. Five participants (45%) expressed a desire for oversight or support, suggesting that opportunities to discuss EW with another person could encourage deeper reflection or offer perspective, thereby maximizing cognitive benefits. Eight participants (73%) reported that the time limit was constraining, making them feel pressured or worried they would not have time to delve into a given topic. One participant felt strongly that 20 minutes was not enough to achieve meaningful benefits, finding that it was “hard to get going” and only getting “into a rhythm” by the end of each session. Participants suggested offering a range for EW timing or leaving its duration open-ended.

Table 3. Themes, definitions, and select quotes from the analysis of qualitative interviews.

heme	Definition	Select paraphrased statements
notional re-periencing	References to recalling or re-experiencing unpleasant emotions, thoughts, or experiences, which contribute to unpleasant emotions felt during and/or after EW.	"I didn't like having to conjure up things in my life which are painful, it was hard. It didn't go the way I thought it would - I thought getting it out would make me feel better. But I mostly felt like I was just bringing up things there were hard." "When I was writing and thinking and focusing on what has been causing my depression, I had those feelings of being uncomfortable and sad during writing." "When you remember something, you're feeling it again … those negative feelings stuck around after." "I would get frustrated about the topic, agitated, thinking about the issue."
notional floading or lease	References to EW being cathartic or offering relief, and/or offering an outlet to offload or release unpleasant emotions or thoughts.	"I knew that after I had thought about these things that bothered me, I could let it go and not think about it for the rest of the day. If I don't take time to reflect, it might hit me when I don't want to be thinking about it. It's good to get it out of the way." "It was a good experience to throw off the bad emotions, sort of like talking to a friend." "I'm glad I had a spot to put it down instead of leaving it in my head … it helps." "As I was writing, it felt good to get things off my chest. It felt like it was done. I could remove those thoughts or at least I knew I had done something about them."
gnitive ocessing or rspective	References to EW promoting emotional and/or cognitive processing (i.e., organizing or articulating thoughts and feelings), deeper reflection or insight, and/or cognitive reframing or gaining perspective	"It helped me to organize my thoughts. You know, when you have horrible reactions to things, that can be overwhelming, but getting it out and subjectively organizing these reactions is useful." "It let me reflect more than normally where I would let it just swirl in my head. Once I started understanding more about my thoughts and what was going on, rather than just saying 'I'm sad', it was more like 'why am I sad?' … it allows you to put words to emotions that you haven't before, lets you decide on whether you should be feeling things. For example, 'should I be angry in this situation?'" "I found it very helpful for me to just dig deeper than I have in the past with my emotions and feelings. In therapy, I haven't said all these things to someone, so I found it useful to express them in writing." "It helped me conceptualize some of the challenges I was facing a little, I was able to frame the challenges in a way that was not self-punishing."
gnitive tfalls	References to getting stuck in negative thoughts or emotions; references to overthinking or finding EW cognitively unproductive	"Sometimes talking to someone or writing something down can be helpful, … but the flipside is that you can talk or write too much about something. The more I talk about something or write about something, the more it keeps me stuck in a negative frame of mind." "It reminded me I could express what's on my mind, but I couldn't fix it" "I did not find it useful … I did not learn anything new, and by the time I was getting to the point emotionally where maybe I could have some catharsis, by then, it was over." "Writing by yourself is only self-thinking, for example, every day I was writing the same thing and my own perspective was the same"

Discussion

Given the potential to administer EW online as a simple and accessible intervention for MDD, we explored its feasibility, efficacy, and perceptions of its emotional and cognitive effects in a sample of 54 patients diagnosed with MDD randomized to EW or to a control condition. EW was feasible to administer online; most participants assigned to the intervention completed at least three EW sessions, but few wrote for at least 20 minutes. Our predictions with respect to efficacy were not supported. As compared to control participants, EW participants did not report reduced severity of their MDD and GAD symptoms, functional impairment, or perceived problem complexity following the intervention or at a one-month follow up. In qualitative interviews, the majority of participants

reported finding EW helpful for offloading or releasing negative emotions or thoughts, and processing or exploring them more deeply. However, a substantial minority of participants did not report these benefits, finding EW both unpleasant and unproductive.

Our findings with respect to feasibility are consistent other studies, which report that only about one quarter of participants assigned to online EW complete it as instructed [27]. With respect to our predefined criteria, most EW participants completed at least three sessions, despite some being as short as 5 minutes. Although EW may have been more effective if participants wrote for longer periods of time, research suggests that benefits can be achieved with sessions as short as 3-5 minutes [46]. In qualitative interviews, participants reported that they would have preferred an open-ended writing duration or suggested range, since there was more to write about on some days than others. We found that writing duration tended to decrease across EW sessions over time, but interestingly, the same trend was not observed for word count (Table 2). This suggests that participants became more comfortable or expressive in later sessions, writing more content in less time; however, this experience was not reported during qualitative interviews, although some participants did report becoming more engaged in EW toward the end of each session.

Contrary to our expectations, EW did not impact symptoms of MDD or GAD following the intervention or at a one-month follow up. This finding is consistent with studies of EW in undergraduate or non-clinical samples [18]. However, we anticipated EW might alleviate symptoms in our clinical sample based on findings from a study of EW administered in-person to participants diagnosed with MDD [24]. The discrepancy in findings between this study and ours may be related to the method of administration. Participants completing EW in-person may have been more likely to adhere to instructions or they may have benefitted from non-specific effects of in-person participation. Studies suggest that EW completed by hand and in-person is more effective for alleviating symptoms of post-traumatic stress disorder, potentially because writing by hand may elicit more emotional processing than typing [47], whereas individuals may be more likely to adhere to the intervention and discuss traumatic events in a clinical setting [19]. An interesting direction for future work involves comparing outcomes between EW administered online and in-person in samples with MDD.

Alternatively, EW may not have been effective in our sample of participants, regardless of its format. According to qualitative interviews, some participants found EW unproductive, not because they were not engaged in the task, but because it got them stuck in a negative place or frame of mind. This finding supports the suggestion that EW increases rumination or exacerbates negative thoughts and emotions, perhaps because it offers little guidance for processing difficult material [28-29]. Indeed, some of our participants expressed a desire for more guidance or an opportunity to convene with a counsellor or therapist. Even some participants who found value in EW offered this suggestion, acknowledging that writing on one's own can be redundant, or a form of "self-thinking". The emergence of two groups in qualitative interviews, one that found some value in EW and another that did not, suggests that EW decreased symptoms in some participants (i.e., in the value group) and increased them in others (i.e., in the no value group). Although we did not pursue this analysis formally due to our small sample size, mean PHQ-9 scores for these two groups are depicted in Multimedia Appendix 4. On average, symptoms decreased over time in both groups, but unlike participants in the value group, participants in the no-value group experienced temporary increases in symptoms following EW. Given efforts to identify moderators of EW impacts [48], reported value as a moderator of its effect on MDD symptoms may be a future direction for this work.

In qualitative interviews, participants reported emotional and cognitive effects related to EW that are consistent with its hypothesized therapeutic mechanisms. Most participants reported negative feelings during and after writing. Benefits of EW have been linked with emotional and cognitive processing [10,11], which may rely on the emergence of negative emotions while writing about a difficult personal problem or stressor [49]. Although participants reported that writing about negative topics contributed to negative emotions (Table 3), studies find that this effect is temporary [12,50].

These emotions may contribute to a better understanding of events, changes in perspective, or other relevant insights, which are thought to underlie its benefits for psychological wellbeing [10]. For example, in another study of online EW, the use of words related to negative emotion or cognitive processing were the most important predictors of decreases in MDD symptoms following the intervention [51]. These effects have been observed for other psychotherapeutic interventions as well, with spikes in symptoms during periods of intensive processing associated with better outcomes for MDD in the long-term [13,-52]. Although most participants in our study reported similar benefits related to emotional and cognitive processing (Table 3), these benefits did not translate to changes in symptom scores, functional impairment, or even perceived problem complexity. This paradoxical effect has been observed in prior work. One recent study did not find changes in symptoms of depression or anxiety related to online EW about stressors related to COVID-19, even though most participants who took part in qualitative interviews reported that the experience of writing was useful and personally meaningful [30]. A similar effect was noted in another study of EW in adolescents, leading to the suggestion that, even if EW does not result in measurable symptomatic improvements, the insights and beneficial experiences reported by participants should not be overlooked [53].

In qualitative interviews, participants also offered several suggestions on aspects of EW that could be improved. Many expressed a desire for more specific instructions or guidance, which is consistent with prior work. According to a meta-analysis conducted by Reinhold and colleagues [18], EW interventions with more specific instructions are associated with greater reductions in depressive symptom severity, potentially because they allow individuals to adhere to EW requirements more effectively [29,48]. Additionally, some of our participants expressed that the number or duration of writing sessions was not sufficient to yield meaningful benefits. Consistent with this suggestion, meta-analyses find that more sessions of EW and other journaling interventions are associated with larger improvements in MDD symptoms [14,18]. Thus, modifying EW to include more specific instructions over a longer period of time (e.g., 30 or more days) [14] may increase its efficacy. At the same time, it is unclear whether such an intervention would benefit all participants (e.g., those in the no-value group). Thus, evaluations of this modified and extended version of online EW would be necessary, potentially with some oversight to provide support for participants that find writing unhelpful.

Limitations

Our findings should be interpreted in the context of several limitations. First, because participants who could not be reached after two reminders or contact attempts were assumed to have dropped out of the study, we could not capture their outcomes or experiences. Participants who dropped out of the study before completing EW may have been less likely to benefit from it, potentially biasing results. Findings from qualitative interviews may also be biased for the same reason: participants who dropped out of the study before completing EW may not have found it to be helpful, making them less willing to share their experiences. Our qualitative analysis may therefore offer a limited understanding of the negative impacts of EW. Our randomization was also not entirely successful; participants assigned to complete EW had more individuals in the moderately-high income category as compared to those in the control group. Finally, given our focus on feasibility, our inclusion criteria were broad and included participants with co-morbid conditions and those taking psychotropic medications or undergoing psychotherapy. Due to our small sample size, we did not control for these clinical characteristics in our analysis, and they may have impacted outcomes. Over half of participants in our sample were taking psychotropic medications and many had either just completed or were undergoing group psychotherapy. We do not know whether or how these treatments (in particular, antidepressants) interfere with emotional and cognitive processing induced by EW.

Conclusions

Overall, our findings suggest that although EW can be feasibly administered online to patients with MDD, it was not associated with measurable reductions in symptoms of MDD or GAD, functional impairment, and perceived complexity of personal problems. Thus, administering EW online in its current state may not be helpful in patients diagnosed with MDD. Given benefits related to emotional and cognitive processing reported by some participants, it may be possible to improve the EW protocol for evaluation in future research, such as to offer more sessions with specific instructions or guidance [14,18] and with opportunities to discuss writing content with a coach or therapist.

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Conflicts of Interest

None declared.

Abbreviations

CBT: Cognitive Behavioral Therapy
CONSORT: Consolidated Standards Of Reporting Trials
EW: Expressive Writing
GAD: Generalized Anxiety Disorder
MDD: Major Depressive Disorder
PCQ: Problem Complexity Questionnaire
PHQ-9: Patient Health Questionnaire
WHODAS: WHO-Disability Assessment Schedule

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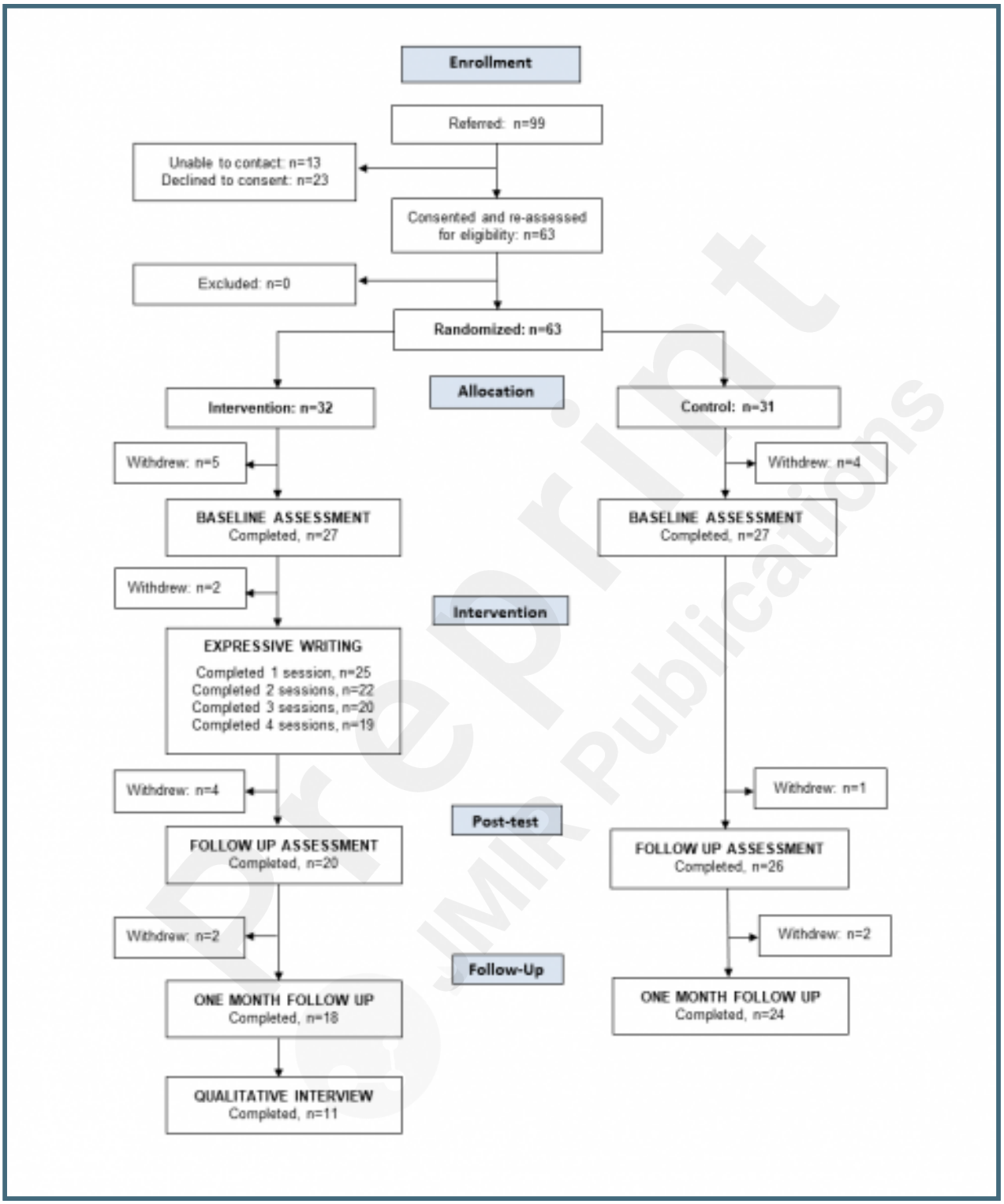
Supplementary Files

Figures

Consolidated Standards Of Reporting Trials (CONSORT) Diagram.



Multimedia Appendixes

Expressive writing interview guide.
URL: http://asset.jmir.pub/assets/fcf89b3a24d9f68c4524d9f9ca054516.docx

Clinical characteristics extracted from health records.
URL: http://asset.jmir.pub/assets/000f164c5d7c79e4a924eab175ae184e.docx

Per-protocol analyses: Results.
URL: http://asset.jmir.pub/assets/a2422fc665244b5efeb6e5446692f09e.docx

Mean PHQ-9 scores for EW participants at each time point, stratified by value group.
URL: http://asset.jmir.pub/assets/dc1e15b8a213fc1ae3a92e25e9e41bec.docx